Lexical and cognitive development of children learning regional languages: Studies from the Netherlands

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Abstract

Regional language speakers are subject to negative social judgments. In this contribution, I provide an overview of research in the Netherlands with children who are regional language learners against the backdrop of this deficit perspective. Findings on the lexical and cognitive development of children from Fryslân, a northern Dutch province, and Limburg, a southern Dutch province, demonstrate that regional language acquisition is neither associated with language delays nor with any cognitive difficulties. Linguistic overlap between Frisian and Limburgish, on the one hand, and Dutch, on the other hand, results in ample opportunities to share linguistic resources, experiences, and knowledge. Especially unbalanced children benefit from this cross-linguistic overlap because they can make use of their stronger language to perform in the weaker language. Cross-linguistic regularities between the regional and national language are helpful and support performance in the regional language. Results on cognitive effects suggest that regional language learners have some selective attention advantages. Although significant, the effects are small, the advantages do not last long, and they require sufficient exposure to and proficiency in the regional language.

Keywords: Frisian, Limburgish, child language acquisition, vocabulary, selective attention

1. Introduction

Students who speak certain linguistic varieties, such as regional languages, are both within and outside the classroom subject to social judgments and deficit thinking (Hyatt et al., 2022). This deficit perspective and attribution of failure and disability to speakers of regional varieties is, for example, reflected in the letter of a special needs teacher working at an elementary school in Limburg, a province in the south of the Netherlands, who writes: "I am confronted on a daily basis with children who have learned a dialect as their first language. […] Every day at school, we experience the consequences of this situation. The children's vocabularies do not meet the requirements of the methods we use. As a result, they also have lower reading comprehension. As teachers we need to work really hard to help these children to 'catch up'." (translated from Cornips & Van den Heuij, 2015:12). Research confirms that elementary school teachers have lower expectations of students who speak a dialect than of students who speak Dutch, the national language, even though achievements suggest equal potential (Kroon & Vallen, 2004).

The question that guides this contribution is whether scientific research on regional language learners in the Netherlands provides any evidence supporting a deficit perspective, and/or whether scientific research has resulted in observations and insights that can 'debunk' certain beliefs. I provide an overview of recent research with children growing up in the provinces of Fryslân and Limburg, and who are exposed to regional languages (Frisian, Limburgish dialect) in addition to Dutch. Section 2 contains a brief description of some relevant characteristics of Frisian and Limburgish. Section 3 is focused on children's lexical development, while Section 4 is concerned with their cognitive development. In Section 5, venues for future research will be explored.

2. Frisian and Limburgish

2.1 Frisian

Frisian, an official language alongside Dutch in the northern Netherlands province of Fryslân, is taught in primary schools for a minimum of one hour per week and is often used as a medium of instruction. Frisian's recognition under Part III of the European Charter for Regional and Minority Languages (ECRML) since

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1998 mandates Dutch government action to promote it in education, administration, and the media. In 2005, the Dutch government acknowledged Frisian as the sole national minority language, and in 2014, the "Wet Gebruik Friese Taal" (Law Use Frisian Language) established Frisian and Dutch as the official languages of Fryslân. Dutch and Frisian are seen as separate by speakers, though code-mixing occurs (Muysken 2000). Although more prevalent in rural areas (Breuker 2001), a recent survey revealed that 40% of the Frisians speak Frisian at home and 34% use Frisian in social media (Schmeets & Cornips, 2022). Frisians who use Frisian at home, also use it outside the home in formal (e.g., school, work, municipality, hospital) and more informal (e.g., shops, family, friends) contexts. The survey outcomes point to limited variation by demographic variables such as gender, age, or educational level.

2.2 Limburgish

Limburgish, spoken in the southern Netherlands province of Limburg, received recognition as minority dialects in 1997 under the European Charter for Regional or Minority Languages (ECRML), which means that the language has formal recognition but is not eligible for financial support. Unlike Frisian, Limburgish is not taught in schools. Since 1997, the Province of Limburg has allocated funds to promote Limburgish, although most locals still refer to it as dialect. Code-mixing between Dutch and Limburgish is common in daily life (Giesbers, 1986). Limburgish is spoken both in rural and urban areas (except the southeast coal mining area). Forty-eight percent of the Limburgians speak Limburgish at home and about a quarter uses Limburgish in social media (Schmeets & Cornips, 2022). Both in use and distribution, there is overlap with Frisian: Limburgians who use Limburgish at home also use it in formal and informal contexts outside their homes, and there is limited variation by demographic variables such as gender, age, or educational level.

3. Lexical development

After this short introduction of Frisian and Limburgish, I now turn to lexical development, which is one of the developmental domains that we investigated in our research with Frisian and Limburgish children (Blom & Bosma, 2016; Blom et al., 2019; Bosma et al., 2019; Francot et al., 2017). Children learn words through a process of linking phonological forms and meaning, building increasingly expanding mental networks that contain form-meaning associations, form-form associations and meaning-meaning associations (see Bosma et al., 2023, for a summary of relevant research). This associative leaning process is impacted by genetic and experiential factors (Dale et al., 2000; Samuelsson et al., 2005; Kidd et al., 2018), comprising both experiences related to input quantity and quality (e.g., Anderson et al., 2021; Hoff, 2020; Rowe & Snow, 2020). Multilingual children's linguistic experiences are distributed over multiple languages (Oller & Eilers, 2002), which could lead to a situation in which the languages "stand in a competitive relation regarding available time for language learning" (Scheele et al., 2010, p. 120). In line with this assumption, research has found that multilingual children tend to have smaller vocabularies in one of their languages compared to their monolingual peers learning the same language (Bialystok et al., 2010; Umbel et al., 1992). However, when children's total vocabulary (Core et al., 2013; Pearson et al., 1993) is considered, monolingual and multilingual children's vocabulary sizes do not differ (see also Bylund et al., 2023) for a recent meta-analysis on the assumed bilingual lexical deficit).

Research on lexical development does not only point to the distributed characteristics of multilingual children's lexicon (Oller et al., 2007) and competition for resources that support lexical development (Scheele et al., 2010), but also to compensating effects and sharing of resources. Various studies with bilingual German-English or Spanish-English children have, for example, demonstrated that children who have limited exposure to the target language benefit from cognates (Schelletter, 2002; Malabonga et al., 2008; Kelley & Kohnert, 2012). Most probably, children use their more developed language to understand words in the less developed language and this strategy works particularly well for words that are highly similar in both languages, such as cognates. Taking a gradual approach to similarity, Goriot and colleagues (2021) confirmed that multilingual children share knowledge across their languages and that the degree of overlap is relevant. Administering the English Peabody Picture Vocabulary Test (PPVT), which is a receptive vocabulary test that measures children's understanding of words, to Dutch primary and secondary school children who followed an English educational program, they found that phonological similarity was

a significant predictor of vocabulary comprehension in both primary and secondary school children. The effect was stronger in the latter group, suggesting that older children benefit more from cross-linguistic similarity than younger children.

Regional language varieties typically share many characteristics with the national language, and Frisian and Limburgish are no exception. It would, therefore, be expected that for learning vocabulary in the regional language children benefit substantially from knowledge of the national language, and the other way around. If this prediction is borne out by the data, this would speak against the assumption that teachers need to work hard to help children 'catch up' in the national language because they have learned a regional language. The reason is that these children can rely on their knowledge of the regional language for understanding and using words in the national language.

3.1 Delays in the societal language?

Is there evidence that learning a regional language hampers lexical development in the national language? In our previous research we addressed questions like these by analyzing children's receptive vocabulary outcomes using the Dutch version of the Peabody Picture Vocabulary Test (PPVT; Schlichting, 2015). Specifically, Blom et al. (2019) compared the scores of children from Friesland and Limburg to those of monolingual Dutch children. The children that we selected for this comparison were six or seven years old at the time of testing, went to regular primary education, and had at least one parent who used the regional language at home. There were, on average, no significant differences between the Dutch vocabulary scores of the regional language learners (Frisian-Dutch, Limburgish-Dutch), on the one hand, and the monolingual Dutch group, on the other hand. Inspection of individual scores revealed that all 160 Frisian and Limburgish children who participated in the study scored in the normal range. That is, children's scores ranged between 88 and 133, and no child obtained a score below the threshold of 85 (i.e., below one standard deviation from 100, which is the normative mean). The six- and seven-year old Limburgish children whose data we analyzed in Blom et al. (2019) were selected from a larger sample that consisted of 128 children ranging in age between four and nine years. Including the full sample, Francot et al. (2017) found that the PPVT score was significantly higher than the standardized mean of 100.

3.2 Effects of early regional language exposure on Dutch

The findings in the previous section suggest that exposure to a regional language does not hamper children's lexical development in the societal language. What the results do not reveal is whether variation between children in intensity and length of exposure to the regional language at an early age matter. Hypothetically, children who are from a young age onwards exposed to the regional language very frequently and for a long duration could be at a greater risk for having low vocabulary in Dutch than children with infrequent use of and exposure to the regional language unless they are able to fully exploit regional language experiences for learning vocabulary in the national language.

Focusing on the Frisian context, Blom and Bosma (2016) investigated the issue of age of onset of first exposure to Dutch. An early age of onset is, in general, a success factor for becoming proficient in a new language (Hernandez & Li, 2007). Therefore, it may be expected that children with a longer duration of being solely exposed to Frisian and who have, consequently, a later onset of first exposure to Dutch are less skilled in Dutch than those with an earlier age of onset of first exposure to Dutch. Alternatively, we hypothesized that a later age of onset could also have a positive effect, as having more cognitive and conceptual resources available could enable children to expand their Dutch vocabularies relatively rapidly. For this study, we selected children who were exposed to Frisian from birth and whose age of onset to Dutch varied between ages zero and four years (n = 110). The children were five or six years old at the time of testing. Taking into account effects of length of exposure to Dutch as well as intensity of exposure to Dutch, we found that a later age of onset to Dutch (and a longer duration of exposure to Frisian) predicted higher PPVT scores and, thus, larger receptive Dutch vocabularies.

To examine the effect of intensity of early exposure to the regional language, I returned for the purpose of the current article to our previous datasets (Blom et al., 2019; Francot et al, 2017) to perform some additional analyses not reported elsewhere. In addition to collecting information about prior Dutch

input (i.e., exposure before age four years, which is reported in Blom et al., 2019), we also collected information about prior input in the regional language, using the same measures based on the PaBiQ parental questionnaire (Tuller, 2015). In the Frisian sample, prior regional language input showed a significant weak, negative correlation with Dutch PPVT results suggesting that children with frequent early exposure to Frisian score somewhat lower on Dutch receptive vocabulary at age six or seven years ($r(107) = -.20$, $p = .04$). However, the relationship is weak and becomes non-significant when the effect of parental education is taken into account by calculating partial correlations that control for parental education ($r(104) = -.19$, $p = .06$). In the Limburgish sample, the correlation between prior regional language input and Dutch receptive vocabulary is weakly positive and not significant ($r(52) = .22$, $p = .13$); this is not altered when partial correlations are run that control for parental education ($r(48) = .21$, $p = .15$). The full Limburgish sample, which included children from a wider age range between 4 and 9 years (Francot et al., 2017) shows a very weakly positive and non-significant correlation ($r(104) = .17$, $p = .10$), showing that there is no robust connection between prior regional language input and Dutch receptive vocabulary. As a final step in the additional analyses, I selected the PPVT scores of those Frisian ($n = 43$) and Limburgish ($n = 22$) children who before age four years had 80% or more regional language exposure at home. These children had relatively high PPVT scores of respectively 106 and 109, on average, and no individual PPVT scores below 85, showing that for all children, their PPVT scores fell within one standard deviation from the normative mean of 100.

To conclude, children can make use of their regional language experiences when learning the national language. Results from the Dutch context indicate that frequent exposure to a regional language at home before children start attending primary school at the age of four years does not present a risk for children's lexical development in the national language at later ages. Moreover, there are no indications that children with an earlier age of onset to Dutch have larger Dutch receptive vocabularies. On the contrary, in Blom and Bosma (2016), we found that a later age of onset to Dutch, and a longer exposure to Frisian, was linked to higher Dutch vocabulary outcomes.

3.3 Sharing of resources: Frisian

It is expected that sharing of resources is bi-directional and that children will not only make use of regional language resources for learning the national language, but also use national language resources for learning vocabulary in the regional language. To test this hypothesis, Bosma and colleagues (2019) administered a Frisian receptive vocabulary test in order to assess children's Frisian lexical knowledge. In this test, cognate status was manipulated in such a way that there were four types of test items: identical cognates (e.g., Frisian *poes* and Dutch *poes* 'cat'), non-cognates (e.g., Frisian *bern* and Dutch *kind* 'child'), and two in-between categories consisting of non-identical cognates that share some but not all phonological characteristics in Frisian and Dutch. These two in-between categories systematically differed in how many phonological characteristics they shared with Dutch (see below for some further explanation). The items in these four cognate status conditions had similar levels of difficulty. While for children with high exposure to Frisian it was not expected that cognate status would play a significant role, we expected that children with low exposure to Frisian would perform better with cognates because they could rely on their knowledge of Dutch. As expected, the high exposure group, which included children with 80–100% exposure to Frisian at home, showed no effect of cognate status. The results of the low exposure group, which included children with 0–50% to Frisian at home, showed a gradual effect of cognate status: their accuracy was highest in the identical cognate condition, lowest in the non-cognate condition, and accuracy in the two non-identical cognate conditions was in-between.

The observation that children with low exposure to Frisian were better at understanding words that show a greater overlap with Dutch points to close links between lexical knowledge in Frisian and Dutch. The non-identical cognates are particularly interesting as they share some of their phonological features across the two languages but not all, and the differences are, in part, systematic and rule-governed. For example, the first non-identical cognate category ("Category 2") in Bosma et al. (2019) consisted of cognates with a cross-linguistic phonological regularity of one, two or three phonemes, e.g., [u:] in Frisian corresponds with [œy] in Dutch, as in the word 'safe' which is [klu:s] in Frisian and [klœys] in Dutch.

Another example is the Frisian phoneme combination [ɔ:n] which corresponds with the Dutch phoneme combination [ɑnt], as in the word 'hand' which is [hɔ:n] in Frisian and [hɑnt] in Dutch. The second non-identical cognate category ("Category 3") comprised items that also showed cross-linguistic phonological regularities, but less systematic than those in Category 2. Children in the low exposure group were more accurate with Category 2 compared to Category 3 items, confirming the graduality of the cognate effect. Owing to the longitudinal design of the study, we could also look into developmental changes. Children in the low exposure group improved most on the non-identical cognates in Category 2, that is, the items with the clearest and most systematic cross-linguistic phonological regularities between Frisian and Dutch.

3.4 Sharing of resources: Limburgish

The Frisian data revealed that children make use of cross-linguistic regularities for their understanding of words in Frisian. A closer look at the Limburgish data suggested that cross-linguistic regularities are also employed by children to produce words in this regional variety (Blom et al., in prep). In the Limburgish study, children's task was to name thirty pictures using their local Limburgish dialect (Francot et al., 2017). In this study, which included 128 children between ages four and nine years, one of our observations was that the children varied strongly in the words they used for each item. Moreover, several children used words that seem to combine features of Dutch and their local dialect. To determine whether cross-linguistic regularities played a role in children's responses, we singled out the oldest age group which consisted of 15 eight- and nine-year old children. At this age, discrimination ability between local dialect and societal language is stable (Kaiser & Kasberger, 2018), and children are better able to understand what is asked of them (i.e., *name this picture in your local dialect*). Moreover, older children may be more likely to make use of cross-linguistic phonological rules (Bosma et al., 2019).

The relevant responses (i.e., those that matched the pictures) of these 15 children comprised 436 responses: 262 were classified as Dutch (60.1%), 62 as target dialect (14.2%), and 112 could not be classified as either local dialect or Dutch (25.7%). Examination of the responses that were neither the targeted dialect form nor Dutch pointed to hybridization, i.e., forms in which dialect and Dutch elements are blended. Children used, for example, code-mixed forms and responded with words consisting of a stem associated with Dutch and a suffix associated with the dialect. An example is the Dutch word [vɪʃə] referring to a small fish which is realized as [vɪʃkə] with the diminutive suffix [kə] associated with the dialect. Children also responded with words consisting of a dialect stem and a Dutch suffix. An example is the Dutch word [vouχołcə] referring to a small bird which is realized as [vø:ɣɔłcə] with the stem (but not the diminutive suffix) associated with the dialect. Interestingly, several children also appeared to transform Dutch words to Limburgish by applying cross-linguistic phonological rules, similar to those described in the Frisian study. In addition to the regional features characteristic of many dialects in Limburg such as the umlaut in diminutive formation, and pronunciation of Dutch [ɛi] and [œy] versus dialect [i:] and [ʏ], respectively, there were other local features that children used, such as pronunciation of [a:] in Dutch versus [oɑ] in dialect or [ɛ] in Dutch versus [æ] in dialect. Examples of such responses are [y:] and [loɑʁsə] for the words onion and boots, which in Dutch are [œy] and [la:rsə(n)], respectively, whereas the target dialect forms are [ʏn] and [ʃte:vələ]. These transformations were observed both in children with frequent (i.e., 80% of the time or more) exposure to Limburgish and infrequent exposure (i.e., 20% of the time or less), indicating that children with low exposure also develop sensitivity to the local dialect and that they can use this sensitivity productively and generate hybrid forms. Note that adults who are speakers of Limburgish did not recognize or perceive the hybrid, blended forms that the children produced as Limburgish, suggesting that these are not merged forms used by adult speakers of Limburgish.

4. Cognitive development

During the last decades, many studies have reported results suggesting that speakers of multiple languages score higher on cognitive tasks than monolinguals do (Adesope et al., 2010; Ware et al., 2020). It is thought that such cognitive effects stem from the effort involved in managing and monitoring different languages on a daily basis. In fact, research has found that even in monolingual settings, all languages of multilingual speakers are, to some degree, active (Kroll et al., 2014), which implies that multilingual speakers always

need to control their languages when speaking. Depending on the demands and requirements of the specific interactive setting, several cognitive functions may be involved, such as goal maintenance, interference control, salient cue detection, selective response inhibition, task disengagement, task engagement, or opportunistic planning (Green & Abutalebi, 2013). Bialystok (2017) argues that attentional networks specifically are recruited for the purpose of selective attention and control of interference (i.e., executive attention), which are involved in focusing on the designated language in an interactive setting and suppressing interference of the non-designated language. Although multiple studies have found that multilinguals outperform monolinguals on executive attention, findings are also highly variable, and task- and age-dependent (Ware et al., 2020). Moreover, cognitive benefits have been found across the life span (Bialystok, 2017; Poarch & Krott, 2019), but seem most prominent in elderly participants, and least prominent in young adults (Antoniou, 2019; Hilchey & Klein, 2011). In the context of this contribution, the question is whether cognitive effects are more likely for certain language combinations, and if degree of overlap between the languages is a modulating factor, given that there is typically much overlap between national languages and regional languages. According to Bialystok (2017), this question is still largely unresolved. Below, I will discuss some findings from our work on regional language learners in the Netherlands that shed some light on this issue.

4.1 Comparing Frisian-Dutch, Limburgish-Dutch and Polish-Dutch children

In our previous research, we addressed the question if cognitive benefits are also found for children who simultaneously learn a regional language and the national language (Blom et al., 2017). In this study, we compared Frisian-Dutch, Limburgish-Dutch and Polish-Dutch children, aged six and seven years, with a monolingual Dutch-speaking control group. In the first three groups, children were only included if at least one of their parents spoke the non-Dutch language with the child. The four groups did not differ in age, non-verbal intelligence, or gender. All children participated in two working memory tasks (verbal, visuo-spatial) and two attention tasks (selective attention, interference control). A broad comparison of monolinguals versus the other three groups (constituting a group that consisted of children with diverse multilingual experiences) showed that the monolingual group was outperformed by the combined, multilingual group on selective attention. More fine-grained analyses suggested that the positive effect in the combined group was carried by the children from Fryslân who performed significantly better than the Dutch monolinguals, and by a subgroup of Polish-Dutch children. This subgroup outperformed the Dutch monolinguals in the selective attention task, and consisted of children who were more proficient bilinguals, suggesting that a certain level of bilingualism is required for cognitive effects to surface (e.g., Blom et al., 2014; Videsott et al., 2012). The difference between the Limburgish-Dutch group and the Dutch monolinguals was in the expected direction, showing an advantage for the Limburgish children, but it did not reach statistical significance.

These results point to subtle differences between regional language learners that affect cognitive development, in line with observations from colleagues who administered cognitive tasks to children learning regional languages in Cyprus, Sardinia, and Scotland (Antoniou et al., 2016; Garaffa et al., 2015; Lauchlan et al., 2012). Lauchlan and colleagues (2012) suggest that in their study the cognitive advantages found for Scottish-Gaelic children (also learning English), which were not replicated for the Sardinian children (also learning Italian), may be related to the fact that the Scottish-Gaelic children received formal education in the regional language, and, as a result, have a stronger level of bilingual proficiency. Something similar could hold for the Frisian children, who are taught Frisian for at least 1 hour per week, in contrast to the children in Limburg, where the regional language is not taught in schools. Also, although both Frisian and Limburgish are frequently mixed with Dutch (Muysken, 2000; Giesbers, 1986), there are some indications that there is more intense mixing of Limburgish and Dutch compared to Frisian and Dutch (Trieschnigg et al., 2015). Consequently, there could be a lower degree of separation between the languages and less need to control languages in the Limburgish context compared to the Frisian context, resulting in less cognitive ‘training’ in the Limburgish context compared to the Frisian one.

4.2 Continuous and longitudinal approach

In their review about cognitive benefits of bilingualism, Poarch and Krott (2019: 6) write: "Against the backdrop of ever more non-homogeneous participant groups and the increasingly problematic distribution of individuals into dichotomous groups of purely monolinguals and bilinguals/multilinguals, the time may have come to disregard group designs." Assigning regional language learners to groups is equally problematic, given the heterogeneity of their regional language experiences. Moreover, a gradual approach focused on within-group variation is also a way to overcome confounding variables such as cultural, social or educational differences that, when not taken into account, may invalidate conclusions based on comparisons between groups. Following such a gradual approach to investigate relationships between Frisian language experiences/proficiency and cognitive outcomes of children, Bosma et al. (2017) found that intensity of exposure to Frisian predicted selective attention: children with more exposure to and use of Frisian at home had better selective attention outcomes. The relationship was mediated by degree of bilingualism, in line with earlier findings suggesting that a certain level of bilingualism is required for any measurable cognitive effects (Barac & Bialystok, 2012; Blom et al., 2014; Blom et al., 2017).

Bosma et al. (2017) also observed that the size of the effect of Frisian exposure on selective attention decreased with age. In this study, the children were tested three times with one year between each measurement. While the effect of Frisian exposure reached statistical significance at the first measurement when the children were five or six years old, it did not reach significance at the second and third measurement when the children were six or seven, respectively, and seven or eight years old. These findings from the Frisian context suggest that cognitive effects may vanish over time as a function of the multitude of factors impact on cognitive development. Conceivably, spending more time at school may have had a positive effect on the cognitive development of the children; for example, research suggests that classroom context and teacher-child interactions can improve children's cognitive performance (Koskulu-Sancar et al., 2023; VandenBroucke et al., 2018). Such effects of schooling may accumulate and could become more prominent than the effects of Frisian exposure at home, explaining why the effect of Frisian exposure on the cognitive outcomes of children declined over time.

5. Conclusions and avenues for future research

In this article, I reviewed previous research in the Netherlands with two groups of children who are regional language learners and who simultaneously acquire two closely related varieties, i.e., Frisian and Dutch and Limburgish and Dutch. Frisian and Limburgish children do not show any delays in their Dutch development, and even children who grow up in households that are predominantly Frisian or Limburgish do not differ in their Dutch vocabulary from their monolingual Dutch-speaking peers. These findings, which are based on samples of over a hundred children per group, do not support the idea that early and frequent exposure to a regional language presents a risk for learning the national language. Regarding their cognitive development, there is no evidence that Frisian and Limburgish children experience any negative effects of learning a regional language. If any cognitive effects are found, then these are positive and suggest that the regional language learners have a – small and temporary – selective attention advantage compared to their monolingual peers. All in all, these findings from the Netherlands refute a deficit view of regional language learners and debunk beliefs that exposure to and use of regional languages have a detrimental effect on children's linguistic and cognitive development.

Cognitive advantages are most prominent in children with a higher degree of regional language exposure at home. Substantial regional language exposure at home enables the children to develop into more balanced and proficient bilinguals; the Frisian data indeed suggest that bilingual proficiency explains why more regional language exposure at home predicts better selective attention. These findings resemble observations for other groups of minority language learners, including children with migration backgrounds, which show that frequent exposure to and use of the minority language at home is needed for the minority language to develop alongside the societal language (De Houwer, 2007). Research with Polish-Dutch and Turkish-Dutch children confirms that proficiency in the different languages, i.e., a sufficient level of bilingualism, is a prerequisite for positive cognitive effects (Blom et al., 2014; Blom et al., 2017).

In addition to the national language, we investigated children's proficiency in the regional language. Previous research has found that a larger degree of cross-linguistic overlap helps Dutch-speaking children with low exposure to English to understand English words (Goriot et al., 2021). The same mechanism appeared to underlie the performance of Frisian children with low exposure to Frisian who showed a gradual cognate facilitation effect, performing most accurately on identical cognates and worst on non-cognates. In addition, both Frisian and Limburgish children showed sensitivity to cross-linguistic regularities between Dutch, on the one hand, and Frisian and Limburgish, on the other hand. Such regularities are especially helpful for children with low exposure to the regional language, as suggested by Frisian receptive vocabulary outcomes and Limburgish expressive vocabulary responses.

Our research with regional language learners in the Netherlands addresses important questions, but it is also limited and thus merely a starting point for further investigations. A first avenue for future research concerns expanding the measures for capturing language outcomes. As Hoff (2020) points out, language skill is multifaceted. In our research we focused on vocabulary. In the Frisian context we investigated receptive vocabulary (in both Frisian and Dutch). In the Limburgish context we examined Dutch receptive vocabulary, and Limburgish expressive vocabulary. Future research should expand language measures according to traditional linguistic subfields (e.g., phonology, grammar, pragmatics), modality (receptive, expressive), or other indicators of proficiency (e.g., fluency, accuracy, complexity).

A second avenue for future research concerns determining the optimal conditions for regional language learners to develop all their languages. Given that the national language is omnipresent, has prestige, and is the (main) language used at school, it may be the regional language that requires special attention (Bosma & Blom, 2020). Bosma and Blom (2020) found that reading activities in Frisian at home were linked to both vocabulary and grammar outcomes in Frisian, such that children raised in families where more reading activities in Frisian are undertaken, score better on Frisian vocabulary comprehension and production of inflectional morphology. Watching TV and storytelling did not have an impact. However, in this research, we investigated children's participation in book-reading, oral storytelling, and watching TV only globally. That is, we used parental retrospective report to measure how often children participated in these activities. To be better able to advise and support parents and caregivers who wish to transmit and maintain the regional language, it is important that future research looks more closely into qualitative aspects of the input that children receive, and how these impact on regional language proficiency. Such research could look at interactive, linguistic and conceptual dimensions of input quality (Rowe & Snow, 2020). In addition, it would be important to consider the conceptualization of input quality in the context of regional languages (MacLeod & Demers, 2023).

A third avenue for future research is looking at the mechanisms that underlie cognitive effects of regional language learning and use. Sufficient regional language proficiency is a prerequisite and is associated with exposure at home (Bosma & Blom, 2020), and, presumably, also with support at school (Lauchlan et al., 2012). In addition, it has been suggested that degree of separation between the languages is a relevant factor (Green & Abutalebi, 2013). Both in the Frisian and Limburgish context, code-mixing is frequent (Giesbers, 1986; Muysken, 2000), suggesting that there may be limited need to separate and control the languages. Yet, the need to exert language control might differ across the two contexts. Whether controlling languages is indeed more important in Fryslân, as we suggested, still needs to be verified. In addition, specific interaction settings may be more or less effortful. For example, it is more common to mix Dutch into Frisian than to mix Frisian into Dutch. As a consequence, Frisian language settings may require a lower level of control than Dutch language settings, which may have implications for cognitive effects. In previous research, we found some support for the hypothesis that mixing Frisian into Dutch is more effortful for children than the other way around (Bosma & Blom, 2019), but conclusions are limited by the measures and the design. More research is needed to allow the identification of causal pathways and for establishing to what extent needing to separate the regional and national language affects cognitive control, and/or whether cognitive control affects how well regional language learners are able to separate their languages.

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References

Adesope, O. O., Lavin, T., Thompson, T., and Ungerleider, C. 2010. A systematic review and meta-analysis of the cognitive correlates of bilingualism. *Review of Educational Research* 80: 207–245. https://doi.org/10.3102/0034654310368803

Anderson, N. J., Graham, S. A., Prime, H., Jenkins, J. M., and Madigan, S. 2021. Linking quality and quantity of parental linguistic input to child language skills: A meta-analysis. *Child Development* 92(2): 484–501. https://doi.org/10.1111/cdev.13508

Antoniou, K., Grohmann, K. K., Kambanaros, M., and Katsos, N. 2016. The effect of childhood bilectalism and multilingualism on executive control. *Cognition* 149: 18–30. https://doi.org/10.1016/j.cognition.2015.12.002

Antoniou, M. 2019. The advantages of bilingualism debate. *Annual Review of Linguistics* 5: 395–415. https://doi.org/10.1146/annurev-linguistics-011718-011820

Bialystok E. 2017. The bilingual adaptation: How minds accommodate experience. *Psychological Bulletin* 143(3): 233–262. https://doi.org/10.1037/bul0000099

Bialystok, E., and Barac, R. 2012. Emerging bilingualism: dissociating advantages for metalinguistic awareness and executive control. *Cognition* 122: 67–73. https://doi.org/10.1016/j.cognition.2011.08.003

Bialystok E., Luk G., Peets K. F., and Yang S. 2010. Receptive vocabulary differences in monolingual and bilingual children. *Bilingualism: Language and Cognition* 13(4): 525–531. https://doi.org/10.1017/S1366728909990423

Blom, E., and Bosma, E. 2016. The sooner the better? An investigation into the role of age of onset and its relation with transfer and exposure in bilingual Frisian–Dutch children. *Journal of Child Language* 43: 581–607. https://doi.org/10.1017/S0305000915000574

Blom, E., Küntay, A. C., Messer, M., Verhagen, J., and Leseman, P. 2014. The benefits of being bilingual: working memory in bilingual Turkish–Dutch children. *Journal of Experimental Child Psychology* 128: 105–119. https://doi.org/10.1016/j.jecp.2014.06.007

Blom, E., Boerma, T., Bosma, E., Cornips, L., and Everaert, E. 2017. Cognitive advantages of bilingual children in different sociolinguistic contexts. *Frontiers in Psychology* 8: 552. https://doi.org/10.3389/fpsyg.2017.00552

Blom, E., Boerma, T., Bosma, E., Cornips, L., van den Heuij, K., and Timmermeister, M. 2020. Cross-language distance influences receptive vocabulary outcomes of bilingual children. *First Language* 40(2): 151–171. https://doi.org/10.1177/0142723719892794

Bosma, E., Blom, E., Hoekstra, E., and Versloot, A. 2019. A longitudinal study on the gradual cognate facilitation effect in bilingual children's Frisian receptive vocabulary. *International Journal of Bilingual Education and Bilingualism* 22(4): 371–385. https://doi.org/10.1080/13670050.2016.1254152

Bosma, E., and Blom, E. 2019. A code-switching asymmetry in bilingual children: Code-switching from Dutch to Frisian requires more cognitive control than code-switching from Frisian to Dutch. *International Journal of Bilingualism* 23(6): 1431–1447. https://doi.org/10.1177/1367006918798972

Bosma, E., and Blom, E. 2020. Language activities in a minority–majority language context: Book-reading at home is more important for Frisian than for Dutch. *Journal of Child Language* 47(2): 289–308. https://doi.org/10.1017/S0305000919000023

Bosma, E., Bakker, A., Zenger, L. and Blom, E., 2023. Supporting the development of the bilingual lexicon through translanguaging: a realist review integrating psycholinguistics with educational sciences. European Journal of Psychology of Education 38: 225–247. https://doi.org/10.1007/s10212-021-00586-6

Blom, E., Cornips, L., and Vangsnes, Ø. A. (in preparation). Age, interactions with peers, and proficiency in the standard variety predict children's dialect proficiency.

Breuker, P. 2001. West Frisian in Language Contact. In *Handbook of Frisian Studies*, edited by H. H. Munske, N. Århammar, V. F. Faltings, J. F. Hoekstra, O. Vries, A. G. H. Walker, and O. Wilts, pp. 121–129. Tübingen: Max Niemeyer. https://doi.org/10.1515/9783110946925.121

Bylund, E., Antfolk, J., Abrahamsson, N., Olstad, A. M. H., Norrman, G., and Lehtonen, M. 2023. Does bilingualism come with linguistic costs? A meta-analytic review of the bilingual lexical deficit. *Psychonomic Bulletin & Review* 30(3): 897–913. https://doi.org/10.3758/s13423-022-02136-7

Core, C., Hoff, E., Rumiche, R., and Señor, M. 2013. Total and conceptual vocabulary in Spanish-English bilinguals from 22 to 30 months: implications for assessment. *Journal of Speech, Language, and Hearing Research* 56(5): 1637–1649. https://doi.org/10.1044/1092-4388(2013/11-0044)

Cornips, L. M. E. A., and Van den Heuij, K. 2015. Staat het opgroeien in dialect een goede woordenschat in het Nederlands in de weg? *Levende Talen Magazine* 102(7): 12–16.

Dale, P. S., Dionne, G., Eley, T. C., and Plomin, R. 2000. Lexical and grammatical development: a behavioural genetic perspective. *Journal of Child Language* 27(3): 619–642. https://doi.org/10.1017/s0305000900004281

De Houwer, A. 2007. Parental language imput patterns and children's bilingual use. *Applied Psycholinguistics* 28(3): 411–424. https://doi.org/10.1017/S0142716407070221

Francot R. J., van den Heuij K., Blom E., Heeringa W., and Cornips L. 2017. Inter- individual variation among young children growing up in a bidialectal community: The acquisition of dialect and standard Dutch vocabulary. In *Language variation – European perspectives VI: Selected papers from the eight international conference on language variation in Europe (ICLaVE 8)*, edited by Buchstaller I., Siebenhaar B., pp. 85–98. John Benjamins. https://doi.org/10.1075/silv.19.05fra

Garraffa, M., Beveridge, M., and Sorace, A. 2015. Linguistic and cognitive skills in Sardinian–Italian bilingual children. *Frontiers in Psychology* 6:1898. https://doi.org/10.3389/fpsyg.2015.01898

Giesbers, H. 1986. Code-switching, dialectverlies en dialectbehoud. *Taal & Tongval* 38: 128–145

Goriot, C., van Hout, R., Broersma, M., Lobo, V., McQueen, J.M. and Unsworth, S. 2021. Using the Peabody Picture Vocabulary Test in L2 children and adolescents: effects of L1. *International Journal of Bilingual Education and Bilingualism* 24(4): 546–568. https://doi.org/10.1080/13670050.2018.1494131

Green, D. W. and Abutalebi, J. 2013. Language control in bilinguals: The adaptive control hypothesis. *Journal of Cognitive Psychology* 25: 515–530. https://doi.org/10.1080/20445911.2013.796377

Hernandez, A. E., and Li, P. 2007. Age of acquisition: its neural and computational mechanisms. *Psychological Bulletin* 133(4): 638–650. https://doi.org/10.1037/0033-2909.133.4.638

Hilchey, M. D., and Klein, R. M. 2011. Are there bilingual advantages on nonlinguistic interference tasks? Implications for the plasticity of executive control processes. *Psychonomic Bulletin & Review* 18(4): 625–658. https://doi.org/10.3758/s13423-011-0116-7

Hoff, E. 2020. Lessons from the study of input effects on bilingual development. *International Journal of Bilingualism* 24(1): 82–88. https://doi.org/10.1177/1367006918768370

Hyatt, D., Escott, H., and Bone, R. 2022. 'Addressing' language deficit: valuing children's variational repertories. *Literacy* 56: 212–224. https://doi.org/10.1111/lit.12303

Kaiser, I. and Kasberger, G. 2018. Children's emerging ability to discriminate L1-varieties. *First Language* 38 (5): 447–480.

Kelley, A., and Kohnert, K. 2012. Is there a cognate advantage for typically developing Spanish-speaking English-language learners?. *Language, Speech, and Hearing Services in Schools* 43(2): 191–204. https://doi.org/10.1044/0161-1461%282011/10-0022%29

Kidd, E., Donnelly, S., and Christiansen, M. H. 2018. Individual differences in language acquisition and processing. *Trends in Cognitive Sciences* 22(2): 154–169. https://doi.org/10.1016/j.tics.2017.11.006

Koskulu-Sancar, S., van de Weijer-Bergsma, E., Mulder, H., & Blom, E. (2023). Examining the role of parents and teachers in executive function development in early and middle childhood: A systematic review. *Developmental Review*, *67*, 101063. https://doi.org/10.1016/j.dr.2022.101063

Kroll, J., Bobb, S. and Hoshino, N. 2014. Two languages in mind: Bilingualism as a tool to investigate language, cognition, and the brain. *Current Directions in Psychological Science* 23(3): 159–163. https://doi.org/10.1177/0963721414528511

Kroon, S., and Vallen, T. 2004. Zorgen om dialect en school. In *Dialect en school in Limburg (Studies in Meertaligheid; No. 5)*, edited by S. Kroon, & T. Vallen, 1–10. Aksant Academic Publishers.

Lauchlan, F., Parisi, M., and Fadda, R. 2013. Bilingualism in Sardinia and Scotland: exploring the cognitive benefits of speaking a 'minority' language. *International Journal of Bilingualism* 17: 43–56. https://doi.org/10.1177/1367006911429622

MacLeod, A.A.N., and Demers, C. 2023. Transmitting white monolingual Anglo-American norms: A concept analysis of "quality of language" in parent-child interactions. *Applied Psycholinguistics* 44(4): 431-459. https://doi.org/10.1017/S014271642300005X

Malabonga, V., Kenyon, D. M., Carlo, M., August, D., and Louguit, M. 2008. Development of a cognate awareness measure for Spanish-speaking English language learners. *Language Testing* 25(4): 495–519. https://doi.org/10.1177/0265532208094274

Muysken, P. 2000. *Bilingual speech: A typology of code-mixing*. Cambridge: Cambridge University Press.

Oller, D. K., and Eilers, R. E. 2002. *Language and literacy in bilingual children*. Clevedon, UK Multilingual Matters. https://doi.org/10.21832/9781853595721

Oller, D. K., Pearson, B. Z., and Cobo-Lewis, A. B. (2007). Profile effects in early bilingual language and literacy. *Applied psycholinguistics* 28(2): 191–230. https://doi.org/10.1017/S0142716407070117

Pearson, B. Z., Fernández, S. C., and Oller, D. K. 1993. Lexical development in bilingual infants and toddlers: Comparison to monolingual norms. *Language Learning* 43(1): 93–120. https://doi.org/10.1111/j.1467-1770.1993.tb00174.x

Poarch, G. J., and Krott, A. 2019. A bilingual advantage? An appeal for a change in perspective and recommendations for future research. *Behavioral Sciences* 9(9): 95. https://doi.org/10.3390/bs9090095

Provinsje, Fryslân. 2015. *De Fryske taalatlas 2015. De Fryske taal yn* byld. Leeuwarden: Provinsje Fryslân.

Rowe, M., and Snow, C. 2020. Analyzing input quality along three dimensions: Interactive, linguistic, and conceptual. *Journal of Child Language* 47(1): 5–21. https://doi.org/10.1017/S0305000919000655

Samuelsson, S., Byrne, B., Quain, P., Wadsworth, S., Corley, R., DeFries, J. C., and Olson, R. 2005. Environmental and genetic influences on pre-reading skills in Australia, Scandinavia, and the United States. *Journal of Educational Psychology* 97:705–722. https://doi.org/10.1037/0022-0663.97.4.705

Scheele, A., Leseman, P., and Mayo, A. 2010. The home language environment of monolingual and bilingual children and their language proficiency. *Applied Psycholinguistics* 31(1): 117–140. https://doi.org/10.1017/S0142716409990191

Schelletter, C. 2002. The effect of form similarity on bilingual children's lexical development. *Bilingualism: Language and Cognition* 5(2): 93–107. https://doi.org/10.1017/S1366728902000214

Schlichting, J. E. P. T. 2005. *Peabody Picture Vocabulary test-III-NL*, based on Dunn, M., and Dunn, L. M. (1997). Amsterdam: Harcourt Test Publishers.

Schmeets, H. and Cornips, L. (2022). Taaldiversiteit in Nederland. *Taal en Tongval* 74(1): 75–106. https://doi.org/10.5117/TET2022.1.004.SCHM

Trieschnigg, D., Nguyen, D., Jongbloed, L., Van Loo, J., Cornips, L., and Meder, T. 2015. Finding and analyzing tweets from Limburg and Friesland. Paper Presented at the 25th Meeting of Computational Linguistics in the Netherlands (CLIN 25), Antwerp.

Tuller, L. 2015. Clinical use of parental questionnaires in multilingual contexts. In *Assessing multilingual children: Disentangling bilingualism from language impairment*, edited by S. Armon-Lotem, J. de Jong, and N. Meir, 301–330. Bristol: Multilingual Matters. https://doi.org/10.21832/9781783093137-013

Umbel, V. M., Pearson, B. Z., Fernández, M. C., and Oller, D. K. 1992. Measuring bilingual children's receptive vocabularies. *Child Development* 63(4): 1012–1020. https://doi.org/10.2307/1131250

Vandenbroucke, L., Spilt, J., Verschueren, K., Piccinin, C., & Baeyens, D. (2018). The classroom as a developmental context for cognitive development: A meta-analysis on the importance of teacher–student interactions for children's executive functions. *Review of Educational Research*, *88*(1), 125–164. https://doi.org/10.3102/0034654317743200

Videsott, G., Della Rosa, P., Wiater, W., Franceschini, R., & Abutalebi, J. (2012). How does linguistic competence enhance cognitive functions in children? A study in multilingual children with different linguistic competences. *Bilingualism: Language and Cognition*, *15*(4), 884–895. https://doi.org/10.1017/S1366728912000119

Ware, A. T., Kirkovski, M., and Lum, J. A. G. 2020. Meta-Analysis reveals a bilingual advantage that is dependent on task and age. *Frontiers in Psychology* 11: 1458. https://doi.org/10.3389/fpsyg.2020.01458