

15 Young Monolingual and Bilingual Children's Exposure to Academic Language as Related to Language Development and School Achievement

The DASH Project

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As in many other countries across the world, the Netherlands is becoming increasingly culturally diverse. As a consequence, many elementary school classrooms – especially in urban areas – are characterized by a highly diverse student population (CBS [Statistics Netherlands], 2015). Although research into school careers shows considerable upward mobility among non-Western immigrant groups in the past decades (Ledoux, Roeleveld, Mulder et al., 2015), the education gap between these groups and the native Dutch is significant and persistent, arises already in the preschool period, and becomes hardly smaller after the preschool years. This concerns in particular Turkish Dutch and Moroccan Dutch children who are often exposed to another language than Dutch at home in their early years.

The present chapter focuses on the role of the early home language environment in the development of language skills that are relevant for school learning, in both monolingual and bilingual preschool children, and examines the relations between home language practices and family socioeconomic status. We first review research on the early arising gaps in language skills between mono- and bilingual children and examine how these gaps relate to the home language environment. We then present findings of the DASH project, a longitudinal study in the Netherlands among monolingual Dutch and bilingual Moroccan Dutch and Turkish Dutch preschool children.

Academic Language Development in Mono- and Bilingual Children

The concept of academic language, as used in this chapter, is derived from the theory of Systemic Functional Linguistics and refers to the specific lexical, grammatical, and textual choices that a speaker normally makes in the formal

context of school when communicating about school subjects (Halliday & Matthiessen, 2004; Schleppegrell, 2004; Snow & Uccelli, 2009). The language choices of speakers in school contexts realize a specific register of the language (cf. Biber & Conrad, 2009), the *academic language register*, that differs in several respects from other registers of the language, especially the register of informal communication (Schleppegrell, 2004). At the lexical level, academic language typically contains specific, technical words (e.g. ‘the industrial revolution’), lexical and grammatical strategies of condensing information (‘the old, worried history teacher’), and explicit and specific references to time and space (‘In the 18th century, in the capital of France, the guillotine . . .’) in order to establish a shared frame of reference with the audience. As a result, academic discourse consists of relatively information-dense sentences that contain many content words compared with sentences in informal talk.

Early Exposure to Academic Language

For young children starting in elementary school, the academic register appears as an already existing code that needs to be mastered. Already in kindergarten, teachers expect children to use language that displays many features of the academic language register. For instance, during sharing time, children are assumed to take up the role of an expert when sharing their personal experiences with others who did not take part in these events, and to express themselves accordingly by using particular lexical and grammatical structures that code for ‘authority’ and ‘truthfulness’ (Christie, 2002; Henrichs, 2010; Schleppegrell, 2004). Several studies indicate that preschool children differ considerably in their receptive and productive knowledge of academic vocabulary, complex grammatical constructions, and discourse structuring skills (cf. Hoff, 2006). Children’s early ability to understand and produce academic language predicts their understanding of different genres of oral discourse and, at a later stage, also their reading comprehension and achievement in several subject matter areas in elementary school (Chang, 2006; Fang, Schleppegrell, & Cox, 2006; Nagy & Townsend, 2012; Snow & Ucelli, 2009).

Although children below school age are usually not yet confronted with academic language use in formal instruction situations, several genres of informal oral and literate language use in daily family routines are presupposed to support the initial acquisition of academic language. Frequently occurring activities at home, such as talking about children’s experiences, sharing memories, explaining and discussing topics of general interest to children (for example about animals or plants), possess linguistic features that resemble academic language use in school settings (Curenton, Craig, & Flanigan, 2008; Snow & Beals, 2006; Weizman & Snow, 2001). Talking about topics of interest

elicits the use of technical vocabulary, conventional definitions, and complex sentences that express abstract relationships and processes (Weizman & Snow, 2001). Shared book reading presents children with coherently interrelated sentences that usually contain many new, often specific and rare words in a semantically rich context which helps children grasping the sophisticated meaning of these words (Hammett, Van Kleeck, & Huberty, 2003). However, the frequency of occurrence of these precursor forms of academic language in the home environment differs strongly by socioeconomic status of the family, the education level of the parents and their own literacy practices (e.g., Hoff, 2013; Leseman, Scheele, Messer, & Mayo, 2007).

Bilingual Development

Studies have repeatedly shown that young bilingual children's language proficiency in each language lags behind that of their monolingual peers (Bialystok, Luk, Peets, & Yang, 2010; Hammer et al., 2014; Uccelli & Páez, 2007). This disadvantage cannot be attributed to generally lower language learning abilities of bilingual children. Research has shown that bilinguals' conceptual knowledge that underlies their vocabulary in both of their languages equals that of monolinguals (Pearson, Fernandez, Ledeweg, & Oller, 1997). Previous work has also shown that bilinguals, on average, have equal learning potential as monolinguals of the same socioeconomic background (Scheele, Leseman, & Mayo, 2010). In fact, being bilingual can bring cognitive advantages such as enhanced metalinguistic awareness (Bialystok, 1987), executive control (Calvo & Bialystok, 2014), and working memory (Blom, Küntay, Messer, Verhagen, & Leseman, 2014). Therefore, a more plausible explanation of the vocabulary disadvantage is that bilinguals receive less input in each of their languages due to the fact that exposure to language has to be divided between two languages.

Cross-Language Facilitative Effects

A number of studies have pointed to possible facilitative effects of L1 skills on L2 learning (Cummins, 1991; Genesee, Paradis, & Crago, 2004). According to the linguistic interdependence hypothesis (Cummins, 1991, 2012), bilingual children can use the knowledge and skills acquired in L1 for acquiring L2 and for learning at school in L2. The expected negative effect that bilingual children experience of reduced input per language may be counteracted, at least partly, by a *positive* facilitating effect of L1 knowledge. Although it takes children longer to acquire two languages than it takes them to acquire one, it probably does not take twice as long (Hoff, 2013). Two languages may differ in several features but may also share particular grammatical rules, semantic-conceptual

knowledge, and pragmatic uses, constituting a common proficiency that, when first acquired in L1, can be transferred to L2.

The question to what extent L1 knowledge facilitates L2 acquisition and school learning in L2, however, still lacks a clear answer. Contrasting findings have been reported regarding cross-language facilitation at the conceptual level, with either no indication of facilitation (Kan & Kohnert, 2008; Uccelli & Páez, 2007) or an indication of significant positive facilitation (Atwill, Blanchard, Gorin, & Burstein, 2007; Conboy & Thal, 2006; Leseman, 2000). Also with regard to facilitating effects of bilinguals' L1 proficiency on their academic achievement in the majority language, mixed results have been reported. Davison, Hammer, and Lawrence (2011) found a positive effect of bilinguals' L1 (Spanish) receptive vocabulary on L2 (English) reading outcomes in grade 1, but Lervåg and Grøver Aukrust (2010) found only a marginal contribution of L1 (Urdu) vocabulary on L2 (Norwegian) reading comprehension.

Bilingualism, Academic Language, and Academic Achievement

The mixed findings regarding facilitative effects of L1 on L2 and on academic achievement in L2 may point to the role of other factors, in particular the linguistic distance of L1 to L2 and the ways in which L1 is predominantly used in the child's home environment. There are several indications for linguistic distance moderating the potential facilitative effects of L1 on both L2 learning and L2 school achievement (Guglielmi, 2008; Blom, Paradis, & Duncan, 2012). Regarding L1 use, several studies indicate that due to the confound of bilingualism with low socioeconomic status and low parental literacy levels, especially in immigration contexts, the quality of exposure to L1 may not provide adequate support to L2 learning or academic performance in L2. Activities such as shared book reading and decontextualized conversations in L1 occur less frequently on average in bilingual immigrant families, but this is strongly linked to family socioeconomic status (Hoff, 2013). Several studies have demonstrated that, on average, bilingual children have lower proficiency in academic language in both L1 and L2 upon their start in primary school (Leseman, 2000; Limbird, Maluch, Rjosk, Stanat, & Merkens, 2013). In addition, although studies have shown sometimes catching-up of bilingual children in L2 within a few years (Paradis & Jia, 2017), this effect may be less strong with regard to rare and specialized academic vocabulary and to grammatical features that characterize academic discourse in school, with consequences for achievement in school subjects that strongly involve the use of academic language. For example, De Jong and Leseman (2001) found that bilingual Turkish Dutch

children, compared to monolingual Dutch children, had initial delays in both word decoding and listening comprehension (seen as oral precursor of reading comprehension), assessed in L2. During the first three grades of primary school, the gap in word decoding closed completely, but the gap in reading comprehension remained substantial and showed lasting effects of the home language environment.

The DASH Project

The DASH project¹ was initiated to investigate the early arising linguistic and educational disadvantages of bilingual Turkish Dutch and Moroccan Dutch children. The Moroccan Dutch children in the study were of Berber descent (which holds for about 70 percent of the Moroccans in the Netherlands) and had Tarifit-Berber as their L1. We specifically aimed at disentangling the effects of the use of L1 versus Dutch as L2 from the academic use of language across first and second language in the pre-school home environment. The comparison of Turkish and Tarifit as L1s was especially interesting as the two languages differ in social status and in the access parents have to academic and formal uses of L1 in the wider social context. Turkish is a written language with a rich literary and academic tradition, available to Turkish immigrants through books, newspapers, television, and new media. Tarifit, in contrast, was until recently not written and not instructed in schools in Morocco and is currently still hardly available in written form or through media to Moroccan immigrants. Moreover, Tarifit-Berber actually refers to a variety of dialects and speakers of different dialects have been reported to have difficulties with understanding each other (Laghzaoui, 2011), which enhances the likelihood that the society's majority language will be used. Monolingual Dutch children with varying socioeconomic backgrounds were involved as a comparison group. Below we report the main findings of DASH for the two phases of the study: the preschool age from three to six years and the follow-up of the sample in elementary school from age six to eleven years.

¹ The DASH (Development of Academic language in School and at Home) project was a joint research project of the Universities of Utrecht, Amsterdam, and Tilburg. The project was coordinated by Paul Leseman (Utrecht University) and funded by the Netherlands Organization for Scientific Research (file number 411-03-060). The project comprised of a longitudinal whole sample study with three- to six-year-old Dutch, Turkish Dutch and Moroccan Dutch children ($N = 165$ at the start), three longitudinal in-depth studies in small nested sub-samples of the three groups and a follow-up study, following part of the original DASH sample of children through elementary school ($N = 111$). Note that bilingual children were included only if, at the start of the study, their L1 was used in the majority of everyday communicative situations at home.

Early Exposure to Academic Language

Exposure to academic language in children's home environment was examined in two ways. First, we interviewed children's main caregivers using a structured questionnaire in the whole sample, in order to gain insight in the occurrence of particular language practices in the home context. We focused specifically on language practices that would elicit (precursor forms of) school-relevant academic language, such as shared book reading, personal conversations, conversations about topics of interest (e.g., dinosaurs), and story-telling. This revealed large differences between families and, in case of the immigrant families, different patterns of L1 and L2 use across these language practices (Leseman, Mayo, & Scheele, 2009; Scheele et al., 2010). The reported mean frequency of reading with children, regardless of the language in which this was done, was highest in Dutch families, followed by Turkish Dutch families and then the Moroccan Dutch families. Dutch and Turkish Dutch families did not differ significantly in the reported mean frequencies of story-telling and conversations. The Moroccan Dutch families reported a significantly lower frequency of most language practices. Regarding the use of L1 and L2, Turkish Dutch families reported to use L1 more often in all activities than Moroccan Dutch families. Moroccan Dutch families, in contrast, used L2 more often, except in conversations where they, just as the Turkish Dutch families, mainly used L1. Importantly, reading to children in L1 did virtually not occur in Moroccan Dutch families due to the fact that parents could not read in Tarifit and the lack of children's books in this language (a few parents reported to use picture books to tell stories in L1 occasionally). In both groups, overall L1 use was much higher than L2 use.

To obtain an in-depth measure of the use of academic language in children's families, we visited small sub-samples of the participating families at home and videotaped them in a range of semi-standardized conversational settings (Aarts, Demir-Vegter, Kurvers, & Henrichs, 2016). We presented the parents with an age-appropriate picture book, a set of wooden blocks to build a marble slide and a large picture with complex scenery to elicit narrative and explanatory talk. In all three groups, parents sometimes did create linguistic contexts that resembled those of the preschool setting. This typically occurred when parents used a particular conversational situation as an opportunity to teach the children something. Parents then more often asked open-ended questions, expanded on children's utterances, added new information to the conversation, and engaged their children in extended discourse. In doing so, they familiarized their children with the communicative expectations of (pre)school settings and

created opportunities for their children to practice academic language. However, most children were not made familiar with the academic register at home (Aarts et al., 2016; Henrichs, 2010; Laghzaoui, 2011).

The variability in academic language input found in both the whole sample questionnaire study and in the sub-sample observational studies could to a large extent be explained by parents' educational levels and jobs, the presence of more than one language at home, parents' literacy levels, and the family constellation (Leseman, Scheele, Messer, & Mayo, 2009). In the in-depth study, in all three groups, higher educated parents were more likely to use features of academic language than lower educated parents (Aarts et al., 2016; Henrichs, 2010; Laghzaoui, 2011). The Moroccan Dutch families participating in the DASH project had on average a lower socioeconomic status than the families in the other two groups, more children per family, and they reported higher levels of parenting stress, which all appeared to be related to the lower reported frequencies of school-related academic language activities (Leseman, Mayo et al., 2009).

Home Language Input and Academic Language Skills

The full DASH sample of monolingual Dutch and bilingual Turkish Dutch and Moroccan Dutch children was followed from age three to age six to examine the relationships between parental language input and children's academic vocabulary development. A test of vocabulary was used that was based on a corpus of words deemed relevant by kindergarten and elementary school teachers for learning in preschool and elementary school. For the purpose of research into bilingual development, equivalent parallel forms of the test were available in Dutch, Turkish, and Tarifit. The questionnaire on language practices at home was administered in personal interviews at four measurement times with a final measurement when children were about six years of age, shortly before their start in grade 1 of elementary school. The reported occurrence of academic language use (a composite of book reading, conversations on topics of interest and story-telling) slightly increased in both the native Dutch and immigrant families over the years. Moreover, in the Turkish Dutch and Moroccan Dutch families, there was a shift from using L1 most in all situations (Turkish Dutch families) or in conversations and story-telling (Moroccan Dutch families) at time 1 to increased use of L2 and decreased use of L1 at later times. More frequent use of L1 was associated with less use of L2 in these families. We termed this pattern 'competition between L1 and L2 for scarce family interaction time' (Leseman, Scheele et al., 2009; Van Dijk, Blom, & Leseman, 2015), a phenomenon that has also been reported by Place and Hoff (2011) regarding Spanish-English bilingual families in the United States.

Table 15.1 *Developmental Relations between L1 and L2 Exposure and Vocabulary Development from Age Three to Age Six Based on Multi-Group Latent Growth Models*

	Moroccan Dutch	Turkish Dutch
Direct transfer		
Intercept L1 vocabulary → intercept L2 vocabulary	.52**	.48**
Competition for exposure time		
Intercept L1 exposure ↔ intercept L2 exposure	-.44**	-.41**
Slope L1 exposure ↔ slope L2 exposure	-.66**	-.66**
Within-language exposure effects		
Intercept L1 exposure → intercept L1 vocabulary	.45**	.37*
Slope L1 exposure → slope L1 vocabulary	.53**	.36*
Intercept L2 exposure → intercept L2 vocabulary	.49**	.50**
Slope L2 exposure → slope L2 vocabulary	.44**	.44***
Cross-language exposure effects		
Intercept L1 exposure → intercept L2 vocabulary	.30 ⁺	.34*
Slope L1 exposure → slope L2 vocabulary	.57**	.57**

Note. Significant regressions (→) and covariances (↔) are presented as standardized values. ⁺ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Latent growth modelling was applied to relate the changes in the language input that children received to their vocabulary development. The main results are summarized in Table 15.1. The results for the immigrant children, first of all, confirmed the competition hypothesis. Both the overall level (intercept) and the changes (slope) in L1 and L2 input over time were significantly negatively correlated. The results, secondly, provided indications of two types of facilitating effects of L1 on L2. First, both the overall level and growth in L1 vocabulary were substantially positively related to the overall level and growth of L2 vocabulary. Second, *L1 input* was also positively related to *L2 vocabulary*. L2 input, however, was not related to L1 vocabulary. These results suggest that a higher level of academic language input in L1, the language parents are likely most proficient in, can contribute to children's L2 academic vocabulary development in the preschool period (Van Dijk et al., 2015).

L2 Academic Achievement as Related to Academic Language at Age Six

A follow-up study of the DASH project was conducted when the children of the original DASH sample were eleven years old. The guiding question of the follow-up study was to what extent academic language skills at age six, the final measurement time of the first stage of the DASH project, predicted children's

academic achievement from age seven to eleven years. Academic language skills at age six were indexed by a composite measure of academic L2 vocabulary and L2 conceptual knowledge (e.g., knowledge of superordinate semantic categories and logo-mathematical concepts such as 'more', 'smaller', 'equal'), on the one hand, and a composite measure of L2 academic discourse comprehension, on the other, as assessed with a narrative task and an instruction task (for details, see Scheele, Leseman, Mayo, & Elbers, 2012). In addition, for the Turkish Dutch and Moroccan Dutch children, we had parallel composite measures of academic vocabulary and discourse skills in their L1.²

The analyses proceeded in two steps. First, latent growth models of children's achievement in reading comprehension and mathematics over five measurement waves from grade 1 to grade 5 were estimated in a multi-group design. Figure 15.1 shows the average growth trajectories of the three groups. The results showed that growth in both reading comprehension and math was nearly linear (with a slight acceleration in the early grades). Factor loadings could be constrained to be equal across the three groups. The intercepts, however, differed significantly. Specifically, for reading, the Dutch children outperformed the Turkish Dutch children (with strong effect sizes according to Cohen's criteria) and the Turkish Dutch children outperformed the Moroccan Dutch children. For mathematics, the Dutch children outperformed both immigrant groups as well (again strong effects), but there were no differences between these groups. Our analyses did not show differences in slopes across the groups for reading comprehension, indicating that the initial gaps between the Dutch, Turkish Dutch, and Moroccan Dutch children remained the same over time and that children grew at similar rates. For mathematics, the two immigrant groups showed significantly *faster* growth than the Dutch group, indicating that the immigrant children significantly and substantially caught up in mathematics during elementary school, with the initial gap in mathematics achievement at age seven being about halved at age eleven.

In the second step, we analysed the relationships of age six academic language proficiency in L1 and L2 with the overall level (intercept) and growth (slope) of reading comprehension and math during elementary school. The main results are presented in Table 15.2. The composite measures of academic language skills in L2 at age six were strong significant predictors of the overall level in reading comprehension in all groups and slightly less so, but still significantly, of mathematics. There were no significant relations between children's proficiency in academic language at age six, on the one

² Productive academic discourse skills could not be used in these analyses as the vast majority of the Moroccan Dutch children were no longer able or willing to use their L1 in the productive narrative and instruction tasks.

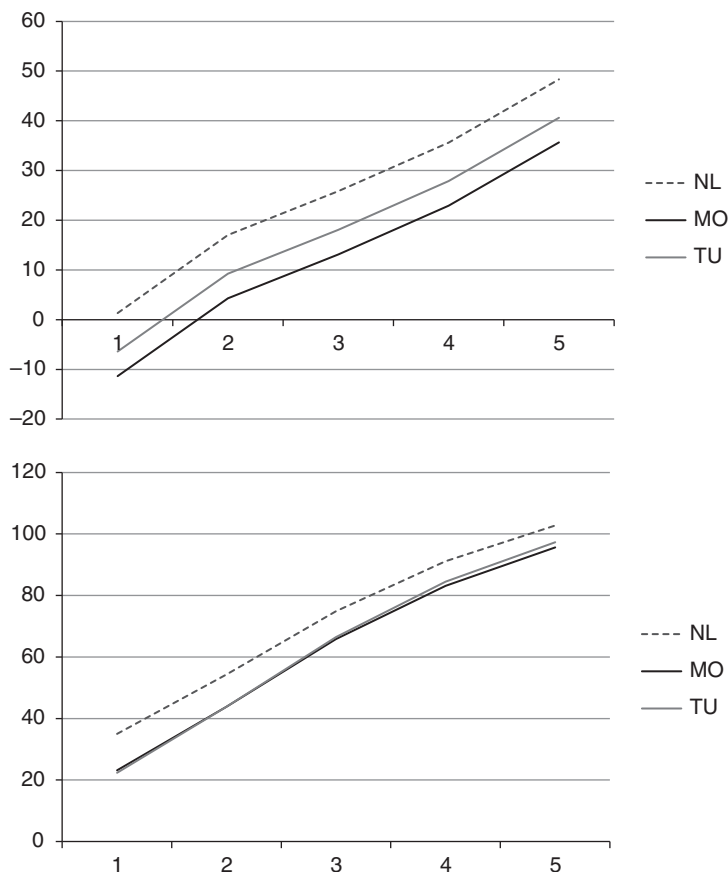


Figure 15.1 Development of reading comprehension and mathematical achievement from first to fifth grade of elementary school, based on latent growth modelling.

hand, and the growth of reading comprehension and math thereafter, on the other hand. Taken together, these findings provide evidence that differences in early Dutch academic language skills are related to subsequent academic achievement. Note that the intercept in growth modelling is not merely the first measurement of an ability but present as a component in all subsequent measurements of this ability.

In a separate analysis, we examined the relationships between L1 academic language proficiency and L2 academic achievement of the Turkish Dutch and Moroccan Dutch children (see Table 15.2). L1 academic language skill was significantly and positively related to the intercept of

Table 15.2 *Academic Language Skills in Dutch and L1 Predicting the Intercept and Slope of Reading Comprehension and Mathematical Achievement through Elementary School (Standardized Regression Coefficients)*

	Dutch		Moroccan Dutch		Turkish Dutch	
	Intercept	Slope	Intercept	Slope	Intercept	Slope
Reading comprehension						
Dutch academic vocabulary	.54**	.25	.50**	.03	.61**	.15
Dutch academic discourse	.59**	.25	.54**	-.09	.60**	.08
L1 academic vocabulary			-.39*	.32 ⁺	.33*	.21
L1 academic discourse			.25	.01	.30 ⁺	.25
Mathematical achievement						
Dutch academic vocabulary	.30*	-.17	.48**	-.26	.55**	-.21
Dutch academic discourse	.36*	-.01	.41*	-.27	.47**	-.32 ⁺
L1 academic vocabulary			-.13	.01	.39*	-.36*
L1 academic discourse			.27	.03	.39*	-.28

Note. Separate analyses were conducted with Dutch, respectively, L1 academic skills as predictors.
⁺ $p < .10$. * $p < .05$. ** $p < .01$.

reading comprehension and math in the Turkish Dutch group, but not (composite of L1 academic discourse skills) or significantly negatively (composite of L1 academic vocabulary and concept knowledge) in the Moroccan Dutch group. These findings suggest a facilitating effect of L1 academic language skills on L2 academic achievement for the Turkish Dutch group, supporting Cummins' interdependency hypothesis, but not for the Moroccan Dutch group. It is likely that the aforementioned difference in social prestige between Turkish and Tarafit-Berber plays a role. The findings suggest that a facilitating effect of L1 on L2 is limited in situations in which academic use of L1 is not supported in the wider social-cultural context, and examples of formal academic use of L1 are not easily accessible through, for example, books, newspapers, television, and new media (Leseman, Mayo et al., 2009).

Conclusions and Implications

The studies of the DASH project described in this chapter show that the experience young children have with school-relevant academic language use at home before they start elementary education differs greatly depending on socioeconomic status and immigrant background. These differences are related to differences in the development of academic language skills in the preschool years, and are likely to explain, at least in part, the early

education gap of children from low socioeconomic and immigrant backgrounds. These findings are fully in line with the literature reviewed in the first part of this chapter. For bilingual children in the Netherlands, the lower amount of exposure and overall lower degree of academic use of Dutch is an additional explanation of the early education gap. Yet, regarding academic achievement in elementary school, at least for the Turkish Dutch children investigated, exposure to academic Turkish language was found to partly compensate for this disadvantage. For the Moroccan Dutch group, no compensatory effect of L1 on academic achievement was found, which was likely due to the lower social status of their L1, the lack of literacy materials in L1 and the lower maintenance of L1 compared to the Turkish group, as was argued above. In both the Turkish Dutch and Moroccan Dutch group, during the preschool period, L1 academic vocabulary was positively related to L2 academic language skills, and L1 academic language exposure was positively related to L2 academic vocabulary, suggesting facilitating effects of L1 on L2 in both groups, at least in the preschool period.

Although exposure to Dutch academic language at home was found beneficial for the immigrant children in the current studies, immigrant parents may lack the proficiency to provide the linguistic structures and vocabulary of Dutch academic language to their children. In these cases, it is recommendable to provide Dutch language education to children from these groups through high-quality centre-based programmes at an early age, as is currently the case on a large scale in the Netherlands. In addition, non-Dutch speaking parents can be effectively involved in familiarizing their children with academic language in their L1, which may contribute to L2 development in the preschool period as well as subsequent academic achievement in elementary school, via facilitating effects of L1 on L2. Supporting parents by providing home-based programmes that can increase the occurrence of academic language use in L1 is recommendable. Regarding languages such as Tarifit, contextual resources that can support academic use of these languages in families should be made available.

In the above-reviewed research, early academic language skills were not related to the *growth* of academic skills in elementary school. This suggests that further development of these skills during elementary school depends on other factors than the preschool home environment and the language skills acquired in that period. Instruction in school is a likely candidate. Especially in the case of mathematics, the substantial catching-up effect that was found for the immigrant children is likely to be attributable to effective instruction in a domain that is relatively new for all children. The lack of such catching-up effect for reading

comprehension is a worrying finding of the current study, because it suggests that instruction in school may not reduce early gaps in this domain. We recommend a stronger focus in the early grades of elementary school on explicit academic language instruction as a new subject domain, much like mathematics, both at the lexical, syntactic and pragmatic level, instead of academic language skills being merely presupposed.