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# Active bi- and trilingualism and its influencing factors

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#### ABSTRACT

This article examines factors that promote active multilingualism. For this purpose, the *Peabody Picture Vocabulary Test* was used with 48 children. Their results were linked to a parental questionnaire designed to evaluate the children's linguistic input in their immediate environment. The study shows that, besides a minimum amount of linguistic input, the language constellation (i.e. presence/absence of the majority language at home) is also decisive. At the same time, it seems irrelevant for active bi- and trilingualism which family language policies are chosen (e.g. One person-One Language), as long as the promotion of the minority language does not only take place institutionally, but also at home. Overall, the results indicate that attending a bilingual kindergarten/school alone does not lead to active multilingualism. Family factors and family support seem to be decisive. These include the creation of a linguistically stimulating environment through cultural contact and the language constellation within the family.

### Introduction

Multilingual families in both monolingual and multilingual communities have always been confronted with the question of which language strategies and policies they should apply in their family in order to promote their multilingual children and to raise them as speakers who actively master their L1s. This situation has become even more relevant in the European countries since the European Union agreed to promote the acquisition of languages at a young age and, thus, the achievement of multilingualism during early adulthood. Meanwhile, many linguists have already identified the factors which contribute to active bilingualism. However, there are relatively few studies on the factors which enable (and foster) it. In particular, the importance of input quantity has been emphasized in studies on multilingual children, as they have inevitably less input in each language compared to monolingual and bilingual children. Apart from these factors that have been put forward in the literature, mainly for bilingual children, our study examines other factors not systematically investigated so far, such as family language policy and diversity of contact persons. In addition to categorizing these and the previous factors as being quantitative or qualitative in nature, the aim of this paper is to investigate their influence on the lexicon size of bilingual, trilingual and multilingual children who acquire at least two of the following languages as first languages: French, Spanish, Catalan or German.

# Factors contributing to active language use

#### Factors in studies on monolingual children

Vocabulary development has been examined, depending on the quantity and quality of the input. Input quantity is usually measured with the aid of the total number of *tokens* for the different lexical and

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**KEYWORDS** 

Active early child trilingualism; amount of input; quality of input; size of (receptive) vocabulary; minority/majority language

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grammatical categories, whereas vocabulary diversity measured by the number of *types* has been shown to capture input quality. Vocabulary sophistication and decontextualized speech have also been considered as qualitative factors (Beals, 1997, 2001; Beals & Tabors, 1995; Weizman & Snow, 2001).

Regarding the effect of input quantity and quality, Rowe (2012) assumes that depending on age, influence differs: While input quantity is more significant in the early stages, with increasing age and cognitive development, diversity becomes more important.

The interaction of the child with his/her environment is determined by qualitative factors. On the macro level, the variables culture, socio-economic status (SES) and ethnicity influence the interaction style, while on the micro level, the variables are age of the mother, multilingualism, order of siblings' birth, childcare, school, peers, media and parents (Hoff, 2006, p. 55).

#### Factors in studies on multilingual children

In studies on multilingual vocabulary development, the investigation of the multiple influencing factors is less systematic. Chevalier (2015, p. 30ff.) identified six factors through a synthesis of numerous longitudinal studies: (1) Consistency in family language policies, (2) Quantity of input, (3) Language constellations, (4) Variety of contact persons, (5) Variety of media input and (6) Parental discourse style. In addition, the factors (7) Direct instruction and (8) The societal status of the languages are added in the literature on trilingual children. In what follows, we will try to classify them into quantitative or qualitative factors in order to examine which are most relevant for multilingual acquisition.

#### Quantitative factors

In studies on multilingual children, quantity is generally measured in relative terms, i.e. as relative language exposure in comparison to the other L1s (Grüter, Hurtado, Marchman, & Fernald, 2014). Therefore, we define as quantitative factors all variables that guarantee a certain amount of input in the languages acquired by the child, such as both parental strategies of language use (family language policy) and the language constellations in the family, i.e. the linguistic configuration which constitutes the child's immediate environment, for instance, whether the majority language is also spoken at home.

The influence of these quantitative factors on vocabulary development is evaluated in different ways in the literature. When the relative exposure to a language is considered as quantity, some authors do not find any correlation between the amount of input and the bilingual child's linguistic development (cf. Döpke, 1992). On the contrary, others find a strong correlation between the amount of input and vocabulary size for two-year-olds (Pearson, Fernández, Lewedeg, & Oller, 1997). Whether the correlation between the amount of input and vocabulary size is restricted to an early age is unstudied for multilingual children.

Nevertheless, it is assumed that a minimum amount of input is required for a child to become actively multilingual (Chevalier, 2015; Quay, 2008; Thordardottir, 2011). Being actively multilingual can be defined as the productive use of all L1s to a certain extent.<sup>1</sup> The exact proportion of the necessary input quantity is still a matter of debate. While Thordardottir (2011) assumes that the minimum input proportion is 40–60% for bilinguals, Quay (2008) shows that for a trilingual child, 20% of language contact can already be sufficient. Independently of the methodological differences of both studies, we can infer from these percentages that a certain balance in the input seems to be necessary for active multilingualism.

In order to guarantee the minimum of input required, the language policy is of particular importance. Various studies show that consistency in the input of the minority language (MiL)

<sup>&</sup>lt;sup>1</sup>In her work on early trilingualism, Chevalier (2015, p. 4) coins the concept of active trilingualism in order to define those children who are able to speak 3L1s. One possible synonym for this concept is that of being productive in their three L1s. Cf. section 2 for a further discussion of this term along the methodology used to approach active multilingualism in our own research study.

also promotes consistency in the child's output (Chevalier, 2015; Kasuya, 1998; Lanza, 2004). In her review of the literature on early child bilingualism, Romaine (1995, p. 183f.) identifies six types of childhood bilingualism according to the *language strategies* used by the parents when they interact with their multilingual child. The categorization into different types depends on the native language-(s) of the parents, the language(s) of the community at large and the parents' use of the languages.

If we focus only on the parent-child interactions, information concerning the MaL (majority language) and the parents' native languages are omissible, the latter contributing to a definition of the *language constellation*. Three possibilities emerge: (a) Each parent speaks her/his own (native) language to the child, (b) One parent addresses the child in a language which is not her/his mother tongue,<sup>2</sup> (c) The parents mix their languages. Yet, by focusing only on the parent-child interactions, a problem for the study of early bi- and trilingualism arises. The information about the community language(s), a relevant aspect to characterize the *language constellation*, is necessary in order to determine whether the child is raised bi- or trilingually. To put it differently, and to give an example, the parent-child interaction outlined in (a) could describe a bilingual as well as a trilingual child. Only by taking the information about the MaL into consideration, we can clearly determine the number of languages which the child is exposed to. Following this line of argumentation, we would like to propose four possible *linguistic strategies* (LS) in the context of possible outcomes of the family language policy:

- LS 1 One Person-One Language (OPOL) with MaL support: The parents have different L1s and each parent speaks her/his respective (native) L1 with the child. One of these languages benefits from community support. For instance, a German father and a Catalan mother living in Germany.
- LS 2 OPOL + extra MaL: The parents have different L1s and each parent speaks her/his respective L1 with the child. None of these languages is the MaL, i.e. the child is raised trilingually. One example would be an Italian father and a Spanish mother living in France.
- LS 3 Bilingual Parent Mixed Languages: This is also a strategy to raise children trilingually. One parent (or both) is bilingual and uses both languages interchangeably to communicate with the child and at home. The community is optionally bilingual with the same languages. A possible family with this LS 3 is a bilingual Spanish-Basque mother and a French father living in the Basque country, where both Spanish and Basque are co-official languages.
- LS 4 Multilingual Home MiL in the educational institution: The child is raised bi- or trilingually at home and receives an additional support of the MiL in the day care center or at school. As an example, an English mother, a Polish father living in Germany. The child attends a bilingual English-German kindergarten, where s/he receives extra English support from the institution.

Studies which are based on the LS 1 have been shown to raise children with weak production skills in the MiL, especially when three languages are involved, i.e. in the basis of LS 2 (Chevalier, 2015; Faingold, 1999; Maneva, 2004). In other words, consistency in the input alone is not sufficient to guarantee active bi- or trilingualism (De Houwer, 2007; Döpke, 1992; Kazzazi, 2011; Quay, 2001; Stavans & Swisher, 2006). Therefore, the family language policy as well as the factor *language constellation* seem to be important. It may thus be less important to follow the LS 1, but more important to keep the MaL at a low level in the family communication and to consciously promote and use the MiL(s) (Braun & Cline, 2010, 2014; Chevalier, 2015; De Houwer, 2007; 2004, p. 127, 129; Hoffmann, 1985, p. 490).

The *language constellation* in the family has been examined in much more depth in the literature, including the parents' comprehension abilities of the languages involved. The survey by De Houwer

<sup>&</sup>lt;sup>2</sup>As one reviewer notes, it could be the case that both parents decide to speak another language to the child rather than the L1. In this case, if this language equals the MaL, the result would be a monolingual child. If the parents decide to speak another language which is not the MaL, the child would be raised bilingually (Type 5 in Romaine, 1995 typology).

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(2007) shows that active bilingualism requires knowledge of the MiL by both parents if at most one parent also uses the MaL (cf. Hakuta & d'Andrea, 1992; Hoff, Rumiche, Ribot, & Welsh, 2013). The exclusion of the MaL at home increases also the probability for trilingual children to actively master all languages (Braun & Cline, 2010; Cruz-Ferreira, 2006; Dewaele, 2007; Wang, 2008). De Houwer (2004) further states that active trilingualism is additionally favored if each parent also understands the partner's respective other MiL(s). Yet, there were also children for whom the exclusion of the MaL from the family did not lead to active trilingualism with the MiLs (Faingold, 1999; Quay, 2001; Stavans & Swisher, 2006). Chevalier (2015) argues that these families showed a lack of other relevant factors, such as consistency in the language family policy.

Another factor that can influence the amount of input is the use of media. Many parents try to promote the MiL(s) through films or books. Pearson et al. (1997) conclude that it is important that media lead to an interaction with the child, that is to say, it can serve as a stimulus for parent-child interactions, indirectly influence the quantity of the input in a positive manner and create a rich linguistic environment for the child (Barnes, 2006; Cruz-Ferreira, 2006; Dewaele, 2007; Helot, 1988).

#### Qualitative factors

The fact that the children become actively multilingual despite reduced amount of input shows that not only input quantity is decisive, but that qualitative factors are also important for multilingual development (Pearson et al., 1997). All those factors which condition or guarantee a certain diversity or variety in the input could be considered qualitative factors, such as diversity of contacts (Barnes, 2011, p. 60; Dewaele, 2000, 2007; Hoffmann, 1985, p. 493; Maneva, 2004, p. 116; Quay, 2001, p. 163), parental discourse style (Chevalier, 2015; Quay, 2011;), socio-economic status (SES), status of the involved languages (prestige or lack thereof in the immediate environment, cf. Barron-Hauwaert, 2000; Faingold, 1999, p. 287; Hoffmann & Stavans, 2007, p. 63; Quay, 2001, p. 193; Wang, 2008, p. 63) and direct instruction.

The influence of contact diversity has been focused in research on early child trilingualism. Production in MiLs seems to improve with an increasing number of native speakers (Dewaele, 2000, 2007; Maneva, 2004) and is therefore an important factor in the linguistic development of the multilingual child (Chevalier, 2015; Faingold, 1999; Hoffmann, 1985).

For the quality of parental input, multilingualism research addresses the parents' persistence to use the MiL, the parental discourse styles (e.g. request for translation) and the child-centeredness of interaction. Chevalier (2015) shows that especially the first factor has an effect on active bilingualism (Döpke, 1992; Juan-Garau & Pérez-Vidal, 2001; Kasuya, 1998; Lanza, 2004), as well as for active trilingualism (Barnes, 2006; Cruz-Ferreira, 2006; Dewaele, 2007). The persistence may also include didactic style (Faingold, 2000), the use of repetitions, translations and the supply of vocabulary (Döpke, 1992; Lanza, 2004) as well as affective factors, such as a positive attitude toward multi-lingualism (De Houwer, 2009).

The role of SES is not extensively studied in research on multilingual families. The influence on the MaL and on the MiL seems to be different. While social class and economic status have an effect on the acquisition of the former, their role for preserving the latter is less clear (Cobo-Lewis, Eilers, Pearson, & Umbel, 2002).

The societal status of the MiL(s) depends significantly on society and on the country: Languages with a high status or prestige are more likely to be retained and imparted to the children (Barron-Hauwaert, 2000). The study of Helot (1988) on French in Ireland and the one of Wang (2008) on French in comparison to Chinese could prove such a relation.

The direct and institutional promotion of MiLs is also relevant. In general, access to the education system typically leads to a strong increase of MaL input for multilingual children (Oller, Pearson, & Cobo-Lewis, 2007). Similarly, the use of the MiL at home is (also) decreasing at this time (Hammer, Lawrence, & Miccio, 2008). This leads to the conclusion that actively promoting the MiL is necessary to counteract this process. However, the studies of Bohnacker, Lindgren, and Öztekin (2016) and Ganuza and Hedman (2015) demonstrate that only continuous institutional promotion of the MiL

can contribute to active bi-/trilingualism. Although this factor might be considered a quantitative one, it is also characterized by numerous qualitative aspects: The variety of contacts proliferates, the input is increasingly defined by cultivated and educational language expressions, socio-economic differences are counter-balanced in the classroom and the status of the MiL is indirectly strengthened so much that a different attitude toward the language can be gained.

The last factor also shows how interrelated quantitative and qualitative factors are. The qualitative characteristics may be an important contribution to the mere quantitative factors of input. Thus, the type of discourse style (e.g. monolingual or multilingual, request for translation, cf. Chevalier, 2015, for trilingual; Lanza, 2004, for bilingual interaction) seems to be significant in order to complement the language constellation and the language policy in school education. Particularly, with regard to the MiL, input quantity seems to be less important than qualitative characteristics (cf. Pearson et al., 1997). This suggests that quantitative factors are necessary for active bi-/trilingualism, especially with regard to the MiL, but these are not sufficient. Qualitative factors are additionally required and they are decisive.

#### The present study

The aim of the present study is to examine qualitative as well as quantitative factors of multilingual children's input deduced from a parental questionnaire in relation to the children's (passive) vocabulary size. The question we want to answer is whether there is a factor or a combination of factors that have a particularly high effect in promoting and guaranteeing active bi-/trilingualism. Our specific research questions are:

- (1) Is there a relation between the amount of input and the vocabulary competence and can we confirm the minimum proportion of 20% stated by Quay (2008)?
- (2) In terms of input quantity, is there a LS that is more successful?
- (3) Does the exclusion of the MaL at home have a positive effect on vocabulary size?
- (4) Is there a relation between input diversity and vocabulary size?
- (5) Does direct instruction promote competence in the MiL?
- (6) Does the accommodation of a linguistically stimulating environment or cultural contact with the MiL promote active bi- and trilingualism?
- (7) Does the partner's knowledge of the MiL promote vocabulary competence of the child in that language?

At the same time, we control for the qualitative factors like culture (Western culture), SES (bilingual private educational institutions) and the status of the MiL(s) French, German, Spanish and Catalan, which enjoy a relatively high prestige in the investigated environments.

# The children

Our current study was carried out in the context of our research project "Trilingualism from early childhood: German, French, Spanish",<sup>3</sup> in which the competence of the respective L1s and a series of grammatical phenomena were examined.<sup>4</sup> The research comprises a total number of 126 children. 53 were bilinguals, 64 trilinguals and 9 multilinguals (i.e. who acquire more than 3 languages) from birth. For the present article, we were able to examine the input information provided by the

<sup>&</sup>lt;sup>3</sup>The grant which made this study available comes from the German Science Foundation (Deutsche Forschungsgemeinschaft, 232285006) (Laia Arnaus Gil and Natascha Müller).

<sup>&</sup>lt;sup>4</sup>The grammatical tasks consisted of eliciting the bi-, tri- and multilingual children's placement of subjects in French (Arnaus Gil & Müller, 2018b), adjective placement in Spanish and French (Arnaus Gil, Zimmermann, Tirado Espinosa, & Müller, 2020), the placement of finite verbs in German (Arnaus Gil & Müller, 2018a) and the use of *ser* and *estar* in Spanish and Catalan (Arnaus Gil, Jiménez-Gaspar, & Müller, 2018; Kleineberg, Arnaus Gil, & Müller, 2020).

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parental questionnaire for 48 families. These 48 children (mean age in our study for German<sub>MiL</sub>:4;06; Spanish<sub>MiL</sub>:3;04; French<sub>MiL</sub>:4;09) are the ones who make up the group of multilinguals under study here.

To investigate the language development of the children in their MiL(s), the children were recruited from both a monolingual and a bilingual society. As for the monolingual society, we tested in the French school and several bilingual English/German-French/Spanish kindergartens in Hamburg, Cologne and Berlin (Germany). With respect to the bilingual environment, we carried out our study in the French and German kindergartens in Palma de Mallorca (Spain), where both Spanish and Majorcan Catalan are co-official languages, i. e. both languages are represented in all social environments, such as in the administration and everyday life. It is important to mention that all in all, the children were exposed to at least two languages, namely the MaL and one of the MiLs.

In Germany, a total of 16 children were considered for whom a parental questionnaire was available. In Palma de Mallorca, we had access to 32 parental questionnaires from children that were tested in at least one MiL (German or French, cf. Table 1).

## **Procedures**

#### Receptive vocabulary

We tested the receptive vocabulary with the *Peabody Picture Vocabulary Test* in the different languages of the bilingual, trilingual and multilingual children (PPVT, Lenhard, Lenhard, Segerer, & Suggate, 2015, for German; TVIP, Dunn, Padilla, Lugo, & Dunn, 1986, for Spanish and EVIP; Dunn, Thériault-Whalen, & Dunn, 1993, for French) by a native speaker of each of the languages. The Peabody Test, which was also used as a measuring instrument for Catalan, was translated from their respective French and Spanish versions.<sup>5</sup> For the other languages, the PPVT as a standardized measuring instrument offers an age-related comparison with a standardized, predominantly mono-lingual sample (for a detailed description see Sivakumar, Sette, Müller & Arnaus Gil, 2020).

We used the vocabulary in this study as an indication of the children's lexical competence and correlate it with the quantifiable data of a parental questionnaire (cf. the following section).

Each Peabody test provides IQ scales (M = 100; SD = 15) and six descriptive categories (cf. Lenhard et al., 2015, for a visual representation of the relation between the categories and the distribution of the IQ points). The descriptive category "average" is comprised between the IQ-points 85 and 115 (cf. Table 2).

Country: MiL tested	bilingual	trilingual	multilingual
Germany: French	1	6	0
Germany: Spanish	5	4	0
Spain: French	4	14	2
Spain: German	9	1	2
Total 48 children tested in	their MiL		

Table 1. No. of children tested in their MiLs.

Table 2. Active language cont	ol using the IQ scale	and corresponding linguistic	description categories.
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	non	active			active	
lQ value	>55-70	70-85	85-100	100-115	115-130	130-145
Categories	extremely low	moderately low	low average	high average	moderately high	extremely high

<sup>5</sup>Admittedly, it is problematic to use a translation of the French PPVT in order to examine the children's vocabulary size in Catalan. Such practice may result in obtaining items which are close in meaning, but do not necessarily correspond with respect to other criteria, e.g. structural word complexity, cultural interpretation, familiarity, or frequency of occurrence (Peña, 2007). Nevertheless, looking at the French and Spanish PPVT in detail, even though the norming sample and the total number of test items differ, the distribution of the standard scores and the linguistic categories are the same (cf. Dunn et al., 1986, p. 40, 1993, p. 37). Since no other solution was available at the time of testing, the Catalan translation of the French and the Spanish PPVT were thus implemented in order to measure the Catalan receptive vocabulary. To date, a standardized version of the PPVT in Catalan is lacking. Between 115 and 145 IQ-points, the category high is assigned. Children who reach threshold values such as 85, 100, 115, 130 have been assigned to the lower category.

The range of IQ-points can thus be regarded as a criterion for active bi-/trilingualism, as it describes an age-appropriate development. In order to be an actively bi-/trilingual, the child must be at least "average" in all languages, that is, s/he should reach, for all tested languages, at least an IQ value of 85 (i.e. s/he should get at least the descriptive category "low average" for all his/her L1s). The standardized test also allows an objective comparison between bi-, tri- and multilingual children.

For some of the children tested in German, a result of the Wechsler intelligence test (Petermann & Lipsius, 2009) was used. At that time of testing, the standardized German version of the PPVT had not been published yet. The raw values reached by the children in the Wechsler test (1–19 points) have been converted into age-related scaled scores (the program is provided by the editors of the tests, https://www.psychometrica.de/normwertrechner.html) (Lenhard & Lenhard, 2015), in order to convert them in IQ values that also cover the normal range provided by the Peabody Test. However, by converting from 1–19 to 55–145 points, the IQ values are not as differentiated as the Peabody values since the scaled scores attained in the Wechsler test correspond to intervals of 5 points on the IQ-scale (see Appendix).

For the current study, active bi- and trilingualism are thus defined on the basis of measurable criteria (i.e. average, at least 85 IQ points in the PPVT of the respective L1s). The size of the vocabulary measures lexical competence.

#### The parental questionnaire

The children's parents were given a parental questionnaire in order to examine input quantity and quality of their children's L1s. The questionnaire is divided into three parts in which information about the child, the mother and the father are requested, respectively. As can be seen from the Appendix, part two and three of the questionnaire try to obtain information about the parents' competences of the language of the partner. The information of the child in the first part of the parental questionnaire (cf. Appendix) is organized as follows. First, general information about name, date and place of birth are requested. Second, the parents have to indicate the family language policy and the language constellation at and outside home. In this section, questions on both quantity (e.g. time in the MiL-country) and quality (for instance contact diversity) of input are posed.

We could gather such information from 48 families. Of these 48 children, 19 are bilinguals, 25 trilinguals and 4 multilinguals. As for the Peabody Test, 104 test results are available on the overall children's receptive vocabulary in their various L1s.

#### Influencing factors

Just like in other studies on multilingual children, input quantity and quality are not measured on the basis of tokens or types, but according to the information provided by parents in the parental questionnaires. Taking into consideration the several factors on input quantity and quality that might influence active multilingualism, we provided the parents with a questionnaire to explore the following potential influencing factors:

Amount of input

The amount of input is determined by the information provided by the parents regarding the languages the child is exposed to and in which contexts. Following the work by Helot (1988) on the scoring of different individual contexts for each L1s of two trilingual Irish-French-English children being raised in Dublin (Ireland), the following individual contexts have been scored from 2 to 0 points and summed up to form the total amount of input and its interactional potential: parent with child, family language, siblings, friends and relatives, educational institution, MaL, media and holidays. For instance (and as can be seen in the Appendix), both the language of the environment, that is, the majority language(s) (i.e. languages spoken outside home) and the language of the family

(LoF) are given 2 points each, since the amount of input received in those two contexts in the everyday life of the child are more than relevant.<sup>6</sup>

Taking this into consideration, we therefore do not determine the amount of input in the respective language on the basis of hours of exposure, but on the basis of the number of people and the different contexts to which the child is exposed in her/his respective L1s.

Family language policy

Since there are no voice recordings of parent-child interactions, we cannot make any statement about how consistent the parents' language strategy was (cf. section 1.2.1 for a literature review). Yet, we can determine which language strategies have been used on the basis of the parents' responses to the parental questionnaire in which this was explicitly asked and relate those answers to the children's vocabulary competence, measured via the PPVT. The strategies are determined on the basis of the MiL that we examined.

Language constellations

For the quantitative analysis, the language constellation will initially be examined exclusively with regard to the presence/absence of the MaL at home. Since tests have been carried out in which the languages German, Spanish, French and Catalan were sometimes MaL (except for French) and sometimes MiL, this analysis will be performed for the respective environment (i.e. German environment, Spanish-Catalan environment). However, since Sivakumar, Sette, Müller, and Arnaus Gil (2020, p. 22) could not detect any difference in lexical competence between the multi-lingual children, we examined the lexical competence independently of the number of L1s.

Quality as an interactional potential

The qualitative input analysis focuses on communication and less on the pure perception of the input. Hence, we consider input quality from an interactionist perspective. Bronfenbrenner and Morris (1998) assume that direct interaction is a driving force in a child's linguistic development. Although we cannot make a statement about the child's actual interaction, we can determine her/his basic interactional potential, which we define as the child's possibility to speak the respective language(s) depending on the number of people and the number of different contexts.<sup>7</sup> For instance, both the MaL and the LoF were assigned 3 points from a 3 to 0 scale, since the potential interactional partners in those contexts can be high. Family and friends also play an important role, if we consider a child-centered-way of his/her world. In this respect, we decided to score this variable with 3 points, as we mentioned for the MaL.

Direct instruction

Although all children went to bilingual institutions, in some cases the children also spoke a MiL at home which was not promoted by the institution. In order to investigate the influence of direct instruction, the vocabulary competence in this MiL is compared to the competence in the other MiL(s) that were directly promoted in the institution.

Cultural contact

Cultural contact describes a combination of different individual factors by which parents can create a linguistically stimulating environment. This includes regular holidays, social contacts outside the family and media support. Although these factors can also be considered individually, we opted for examining their combination in order to state whether a linguistically stimulating environment is a qualitative characteristic that has an impact on vocabulary development.

<sup>&</sup>lt;sup>6</sup>In the case of siblings, we are well aware, as one reviewer points out, that older siblings might not necessarily use the MiL at home with younger siblings and, therefore, the amount of input in the MaL increases. A specific question in the parental questionnaire (cf. Appendix) actually aimed at asking for this information, namely, which language the siblings normally use among them.

<sup>&</sup>lt;sup>7</sup>Unfortunately, the parental questionnaire did not employ the Likert scale to ask for the child's actual interaction and so the parents had the possibility to freely fill in the questionnaire, something that made the analysis of the information in the questionnaire difficult and complicated the application of statistical procedures. Therefore, the assignment of different values had to be carried out rather arbitrarily and had to consider all possible parental answers. See the Appendix for a detailed description of the factors and the assignment of values for each factor. Notice, however, that our attempt to quantify is of little importance in absolute terms; it simply allowed a comparative analysis.

Parental knowledge of the minority language

The interactional perspective builds a bridge to the language skills of the parents, since even a parent who does not speak the partner's MiL but at least understands it, is considered a potential interaction partner. Therefore, we will group the children depending on the language skills of the parents in the MiL. Parents' answers can be categorized into five groups: 1) Both parents speak the MiL, 2) one parent speaks the MiL, the other parent understands the language (and at least sometimes uses it or reacts to it when it is spoken), 3) one parent speaks the MiL, the other parent does not understand it, 4) the MiL was learned by the parent as a foreign language (FL or also called L2) but is not spoken at home, 5) the MiL is not spoken at all (although one parent can understand the language).

# Results

#### Quantitative factors

## Family language policy

As mentioned in Section 1.2.1, four different *language strategies* have been found in the parental questionnaires. Furthermore, we added LS 5 to the analysis for the sake of illustration, since some parents did not fill in the information concerning this question.

Overall, LS 1 was used the most with a total of 20 parents, followed by LS 4 and LS 3. In order to evaluate the success of the different strategies, we also calculated the proportion of children who are (not) actively bi-/trilingual. This can be seen in the following Figure 1.

We conducted a two-sided *t*-test to check whether the vocabulary competence in the MiL depends on the LS types. We did not find a statistical difference neither between the bilingual and the two trilingual types (LS 1 vs. LS 2 LS 3), nor within the two trilingual types (LS 2 LS 3). Consequently, it can be concluded that the different LSs are equally suitable for promoting active bi-/trilingualism. Interestingly, it does not seem to be a disadvantage to acquire three L1s instead of just two. Notice, however, that all sorts of LSs, according to which the languages are supported in the family context, led to significantly better vocabulary skills than the acquisition in an educational institution alone ((LS 1/LS 4:  $t(31) = 3,01 \ p < .05$ ; LS 2/LS 4:  $t(6) = 3,87, \ p < .05$ ; LS 3/LS 4:  $t(19) = -2,17, \ p < .05$ ). This means that children whose MiL is promoted by the parents at home have significantly better vocabulary skills than children who do not use the language of the educational institutional setting with their parents at home. The latter reached on average an IQ value below the value set for active mastery (M = 80.23).



number of actively multilingual children number of non-actively multilingual children

Figure 1. Overview of LS types and the proportion of (non)actively multilingual children.

#### Language constellations

For the German environment, and concerning the MiL, we found that the children were significantly better in the MiL when this language was exclusively spoken at home. They obtained better results than those children who, apart from the MiL, also spoke the MaL at home (t(14) = -3,28,p < .05). Regarding the competence in the MaL, we found no statistical difference depending on the factor whether the MaL was excluded from or present in the family (cf. Appendix, section 9.3b). On the basis of this result, we can conclude that it is irrelevant for vocabulary competence in the MaL whether it is used in family communication. However, it seems to have an effect on the competence in the MiL if the MaL is present in the family or not.

With regard to the Spanish-Catalan environment and taking the MaLs Spanish and Catalan into consideration, the evaluation of the parental questionnaires shows that all children spoke at least one of the MaLs in the family. Therefore, we used a two-sided *t*-test to examine whether children with the presence of both MaLs at home perform statistically worse than children with only one MaL at home. We did not find any statistical difference (cf. Appendix, section 9.3 c). Thus, we can conclude that both MaLs are acquired equally successfully in the Spanish-Catalan environment, regardless of whether one or both languages are spoken in the family.

Concerning the competence in the MiL, only two children could be identified who speak Catalan and Spanish in addition to the MiL at home, while the other 15 children speak Spanish in addition to the MiL. The low number of children who only speak the MiL at home is due to the high proportion of children who also learn it at school. Therefore, we compared the competence of the children who acquire the MiL exclusively at school with the children acquiring it also at home. A two-sided *t*-test shows that the former perform at a statistically significant lower level (t(26) = 3,23; p < .05). Thus, it can be assumed that it is not sufficient for active bi-/trilingualism if one of the 3L1s is only spoken in the educational institution. A home support of the MiL is necessary.

#### Amount of input

After having examined the several quantitative factors, we turn to an evaluation of the relation of the sum<sup>8</sup> of the different quantitative factors with the vocabulary competence. We could not find any significant correlation for the MaL (cf. Appendix, section 9.3d). The situation is different with regard to the MiLs in the bilingual (French and German) and in the monolingual environment (French and Spanish). For French, there is a medium, statistically significant correlation (N = 27; r = .457; p = .017). For Spanish, there is even a high correlation (N = 9; r = .707; p = .003). The relationship between vocabulary competence and the amount of German input is not statistically significant, even though the trend is also positive.

Despite the correlation found, Figure 2 shows that some children do not actively master the MiL irrespective of a relatively high input (critical IQ value: 85). Surprisingly, this case can be identified at least once for each MiL.

In addition to the correlation between the amount of input and vocabulary competence, we calculated the percentage of the child's exposure to the MiL (and the MaL). This was determined with the point scale (cf. Appendix 9.1) assigned to the questions of the parental questionnaire. Since children were only non-actively multilingual in their MiLs, only the proportion of MiLs is compared. The next Table 3 shows the results for the bilingual children.

The average percentage of language contact in the MiL is surprisingly similar for both groups (actively multilingual children in the MiL: 44%; non-actively multilingual children in the MiL: 35%). This is due to the enormous amount of variation. While the range for actively bilingual children is 20-70%, the range for non-actively bilingual children is 13-45%.

As can be seen from Table 4 below, trilingual children are as scattered as bilingual children. Language contact for children who can be said to be actively trilingual ranges from 11-58%. This



Figure 2. Relationship between input quantity and vocabulary size in the respective MiLs.

 Table 3. Comparison of language contact with the MiL: bilingual children.

Percentage of	the MiL in the input	
	Actively bilingual (≥ 85 IQ)	non-actively bilingual (< 85 lQ)
N	14	5
Min.	20%	13%
Max.	70%	45%
Mean (M)	44,3%	35%

Table 4. Comparison of language contact with the MiL: trilingual children.

Percentage of the	MiL in the input	
	Actively trilingual (> 85 IQ)	Non-actively trilingual (< 85 IQ)
Ν	7	4
Min.	11%**/16%	8%
Max.	36%/58**%	22%
Mean (M)	29%	14,5%
For Children, of wh	nom not all languages have been to	ested*.
Ν	6	8
Min.	27%	14%
Max.	50%	36%
Mean (M)	40,5%	20,5%

\* Percentage of that minority language tested

range is lower (16-36%) if the Ger-Sp-Cat trilingual child Alma\*\* is not considered. If we now look at children who are certainly not actively trilingual in at least one MiL, the range is between 8-22%.

The range for actively multilingual children is 20-35%, while the range for non-actively multilingual children is 9-11% (cf. Table 5). The distribution is smaller, since the sample consists of just two children each.

In sum, considering all the minimal and maximal proportions of input quantity, the minimum amount ranges at a level of 20%, independent of the number of L1s.

Percentage of t	he MiLin the input	
	Actively multilingual*	Non-actively multilingual*
Ν	2	2
Min.	20%	9%
Max.	35%**	11%
Mean (M)	27,5%	10%

 Table 5. Comparison of language contact with the MiL: multilingual children.

 Descentage of the MiL in the input

\*Only three of the four languages tested, two of them from the bilingual environment (Sp-Cat)

# **Qualitative factors**

## **Direct instruction**

Only three out of 48 children speak a language that was not supported by direct instruction. Although the comparison of the average IQ value of the group with and without instruction shows a difference of one full competence level (instruction: M = 93.35; without instruction: M = 79.33), this difference is not statistically significant (cf. Appendix, section 9.3e).

In a comparison of actively and non-actively bi-, tri- and multilingual children, the 66% of the latter group without instruction is not representative due to the small sample size. Still, even 37.7% of the children with instruction are non-actively multilingual in their MiL. The percentage also includes those children who only learn a language at the educational institution and do not receive any additional MiL support at home. If these children are removed from the analysis, there is still no statistical difference, yet the proportion of children who do not master the MiL actively but receive school instruction decreases to 26%. Thus, <sup>1</sup>/<sub>4</sub> of all children who use the MiL at home and at the same time receive institutional support are not actively bi-/trilingual. This suggests that direct instruction has a low influence on vocabulary development.

## **Cultural contact**

We carried out an analysis of the overall cultural contact considering the sum of the factors "cultural contact through media", "cultural contact by other family members" and "holidays in the destination country". We related these factors to the IQ value and a statistical significance of t(141) = 3,76, p < .01 could be observed. We also examined the factors individually. For the factor "cultural contact through media", 68% of families stated that the input in the MiL is supported by media.<sup>9</sup> Compared to children who do not use media in the MiL at home, a two-sided *t*-test including the children's IQ values showed a statistically significant difference (t(23) = 2,45; p < .05). The factor "holidays in the destination country" was attested by 46% of families as support for the linguistic input in the MiL. A two-sided *t*-test showed a significant difference (t(42) = 2,3; p < .05) compared to children who do not go on holidays in the country of the MiL on a regular basis. Only for the factor "cultural contact by other family members", we could not find a significant difference between children who regularly speak the MiL with friends or relatives of the family (46%) and those who do not (54%) (cf. Appendix, section 9.3f).

## Parental knowledge of the minority language

For the present analysis, the average competence in the MiL was determined based on the language skills of the parents. A two-sided *t*-test shows that children whose both parents speak the MiL perform significantly better than children in all other groups (cf. Appendix, section 9.3 g). There is no significant difference between the other groups. It should be noted, however, that only the children whose one parent understands but does not speak the MiL reached an average vocabulary

<sup>&</sup>lt;sup>9</sup>It should be noted that no information is available on the interactional potential of the medium, since the question on the use of media could only be answered with "yes" or "no" in the parent questionnaire. We therefore cannot assess whether media use is reducible, for example, to simply read books together in the MiL or whether books were used to initiate a conversation about the contents among the family members.

knowledge (M = 92.28), all other mean vocabulary values were below the critical value of 85 IQ points.

#### Quality as an interactional potential

Besides the influence of the individual qualitative factors, we evaluated the relation of the sum of the different people and contexts with the vocabulary competence. Similar to the results for input quantity, there is no significant correlation for the MaLs, but the trend is also negative (cf. Appendix, section 9.3h). With regard to the MiLs, a strong, significant correlation can only be observed for French (N = 27; p = .00; r = .711). We could not find a significant correlation for Spanish and German as MiLs, although there is a positive trend with increasing interactional potential (see Figure 3).

We also checked the proportion of actively and non-actively bi- and trilingual children for each qualitative factor. In total, 28 out of the 48 children analyzed (58%) were actively multilingual in the MiL and 20 (42%) were non-actively multilingual.

Figure 4 illustrates the different interactional potentials in the MiL with respect to the active or non-active mastery of the MiL. As can be seen, the interactional potential with parents (both and alone) in the MiL is much higher among actively than among non-actively multilingual children.

The proportion of actively multilingual children is also slightly higher under the condition of cultural contact (holidays/friends and relatives), although the difference is not as clear as in the former case. The bilingual school as an interactional potential with probably several interaction partners proves to be fairly constant for the actively as well as for the non-actively multilingual children in the MiL.

### Discussion

The analysis of the individual factors and their possible influence on the vocabulary competence in the L1s of the multilingual children allows us to confirm some existing hypotheses, while relativizing others. At first sight, it seems irrelevant for active bi- and trilingualism which is the family language policy adopted, since no statistical difference could be determined (cf. also Müller et al. 2015, p. 110 for the amount of code-mixing in relation to the language strategy in simultaneously bilingual



Figure 3. Relationship between input quality and vocabulary competence in the respective MiLs.



Figure 4. Percentage of actively or non-actively multilingual children depending on the interactional potential in the MiL for each factor.

children). All LSs which are characterized by at least one parent talking to the child in the (tested) MiL have a similar (positive) influence on vocabulary competence. Interestingly, it does not seem to be a disadvantage to acquire three L1s instead of "just" two. Furthermore, institutional support alone cannot be recommended as a strategy for active bi-/trilingualism: When institutional support in the MiL takes place, it should be accompanied by home reinforcement.

Although we could only examine the consistency of language family policy indirectly with the aid of the parental questionnaire, Poeste, Müller, and Arnaus Gil (2019) examined the mixing rates of these children during the testing condition. Among the children who mix, there is a high proportion (63%) of children with at least one parent who speaks more than one language to the child. This LS is used to a much lower degree by the parents of children who do not mix (42%). With respect to the LS 1, the parental data show that 58% of the parents, whose children did not mix, used this strategy. Yet, also 37% of the families whose children mixed also applied this strategy. Considering the overall LSs used by the parents, it seems to be more frequent that one parent speaks two languages with the child. We may thus deduce that the children with bilingual directed speech from one parent are more likely to mix their languages. Our data indicates that consistency of input favors consistency of output, although it should be noted that it does not guarantee active bi-/trilingualism as already shown in various previous studies (De Houwer, 2007; Döpke, 1992; Kazzazi, 2011; Quay, 2001; Stavans & Swisher, 2006). We can consequently confirm the assumption that input consistency does not guarantee active multilingualism, but favors it.

The analysis of the language constellation in the monolingual environment confirms De Houwer's (2004, 2007) assumption that the presence of the MaL at home has a negative impact on the (vocabulary) competence in the MiL. The presence of the MaL in the family may be an obstacle for the development of active bi – and trilingualism. However, this must be relativized since even children who acquire the MaL with home support become active multilinguals on average (IQ $\geq$  85).

Similarly, children in the Spanish-Catalan environment achieved an average IQ value over 85 points, regardless of whether one or both MaLs were spoken in the family. Moreover, we could also observe that the MaL(s) is (are) successfully acquired even when it is (they are) not spoken in the family. This means that the promotion of the MiL is particularly relevant and important for fostering active bi – and trilingualism in this environment. Furthermore, it can be assumed that the Romance languages French, Spanish and Catalan influence each other positively in terms of vocabulary acquisition due to typological similarities within the Romance language family. More research is needed in this area of facilitating effects of multilingualism (cf. Sivakumar et al., 2020).

In addition to the individual quantitative factors, there was generally a positive correlation between input quantity and vocabulary competence in the MiL with the exception of German. Interestingly, the minimum input for successful multilingualism, regardless of the number of L1s, is around 20%, similar to the value identified by Quay (2008). However, an input quantity that exceeds this proportion does not necessarily lead to active multilingualism. Consequently, the quantity of input alone does not suffice.

Direct instruction as a qualitative addition to the amount of input does not seem to be sufficient either. The findings related to the types of early child multilingualism, direct instruction and the language constellation indicate that direct instruction cannot (in most cases) replace intra-family promotion. The lack of effect may also be due to the young age of the children (cf. Bohnacker et al., 2016). Nevertheless, it should not be underestimated that the bilingual institutions allow contact in the MiL with other interactional partners. Although it is not possible to prove a direct effect on vocabulary competence, this factor may add positively to the quality of input. Despite low input in the MiL(s), the children were very accurate in the grammatical test and hardly mixed their languages (Poeste et al., 2019). These positive results on accuracy with respect to the grammatical phenomena tested may be due to direct instruction. Thus, it can be assumed that children with direct instruction in the MiL do not possess better vocabulary competence (as compared with children without instruction), but direct instruction might favor grammatical accuracy and language choice as desired by the interacting adult.

In contrast, promotion on the part of the family seems decisive for active vocabulary competence in the MiL(s). These include the provision of a linguistically stimulating environment through cultural contact and the language constellation within the family. With regard to cultural contact, there is a positive influence of the combination as well as the individual factors "media" and "holidays". In order to clarify the lack of significance for the factor "family and friends", it would be necessary to provide precise information on regularity and contact duration, which was not taken into account in the parental questionnaire.

With respect to the language constellation, one qualitative factor should be emphasized particularly: The language skills in the MiL (of the partner). 86% of actively multilingual children were able to address both parents in the MiL. It can therefore be concluded that active bi- and trilingualism are promoted when both parents are able to speak the MiL (this does not imply that both must be native speakers). Consequently, we can confirm De Houwer's (2007) assumption that it is beneficial for active bi- and trilingualism that both parents speak the MiL.

Even if we could not find a statistically significant difference between the ability to understand the MiL of the partner and the lack of the ability to understand it, children of the former group are actively multilingual according to our definition (IQ  $\geq$  85 points). Thus, although we cannot verify that the passive knowledge of the partner's MiL favors active bi- and trilingualism (although to a weaker extent), this may be due to the low number of children per group. The passive knowledge may create a particular stimulus for children to use and maintain the MiL as it can be used in family communication.

With regard to passive knowledge, however, it should be noted that it does not lead to active multilingualism if the MiL is not even spoken in the family. Since the passive comprehension skills of those parents whose children acquire the MiL at school were only taken into account in the interactional potential, this fact may explain the lower or missing correlation in comparison to

quantity. In such families, the MiL would rather be a foreign language for family communication, which is probably less incentive for the child to use the language with the parents. Consequently, it is important that at least one parent actively uses the MiL with the child which is supported in the educational institution.

We assumed that qualitative factors play an important role in active multilingualism. The results show that the parents' language skills are of particular importance. The choice of the LS or even the number of parent's L1s is irrelevant. Much more important is the language constellation and the language skills of the parents in the MiL. However, the possibility of interaction in the MiL with both parents is no guarantee for active multilingualism. This may be due to the fact that individual differences could not be taken into account, but these, together with the language skills of the parents, can be decisive. Future research on multilingual children should therefore take into account the relationship between macro- and micro-level factors, which also includes an analysis of types and tokens (cf. Grüter et al., 2014).

Furthermore, it is essential to replicate the results for a larger sample, since the analysis, once split according to the respective MiL, included a relatively small sample (Spanish<sub>MiL</sub>: N = 9; German<sub>MiL</sub>: N = 12). Perhaps the small sample is also the reason for the non-significant correlation between vocabulary competence and the amount of input in the MiL German. Another reason for this lack of significance could be the conversion of the scaled scores (1–19 points) of the Wechsler Test into IQ values (55-145 points) for German as a MiL. The conversion results in IQ values are less accurate than the IQ values of the Peabody Test. A linguistically motivated interpretation, however, could explain these results due to the complexity of the German language itself. Sivakumar, Müller, and Arnaus Gil (2020) observe an overall negative effect in the German passive vocabulary test when analyzing all 126 children (i.e. including those for whom there was no parental questionnaire available). They attribute this result to the different architecture of the German mental lexicon, on the one hand, and the Romance languages, on the other hand. Thus, the acquisition of German in addition to the Romance languages may require a higher amount of German input than the Romance MiL(s). However, our study of a German subsample (children with parental questionnaire) does not show the same significant difference between German and the Romance languages when the average vocabulary competence is compared, something that does show the complete sample investigated by Sivakumar et al. (2020). Moreover, no significant difference in the vocabulary competence in German taking the number of L1 into consideration has been found either (cf. Appendix, section 9.3i). The differences between the arbitrary sample here (with a parent questionnaire) and the total sample in Sivakumar et al. (2020) illustrate the need for a larger group to verify the linguistic rationale. Furthermore, a larger sample would also allow an age-related comparison for both qualitative and quantitative factors as well as the evaluation of the effect of direct instruction on older children.

The overall results of this study are relevant not only for the early acquisition of several languages as L1s but also for the factors that can play a role to promote an active use of these L1s. We could thus confirm that the parents' persistence of communicating with the child in the MiL has a positive impact on the child's linguistic competence in the MiLs. Linguistic quantity does not capture, however, the whole picture: different contact persons for the child in the MiL influence positively the child's linguistic competence in the MiL, as well as the partner's ability to speak it. Finally, our study has shown that a specific family language policy does not primarily favor active multilingualism, but the absence of the MaL from home.

#### List of abbreviations

LS Language Strategy Min. Minimum Max. Maximum MaL Majority Language MiL Minority Language LoF Language of Family SES Socio-Economic Status

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## References

- Arnaus Gil, L., Jiménez-Gaspar, A., & Müller, N. (2018). The acquisition of Spanish SER and ESTAR in bilingual and trilingual children: Delay and enhancement. In A. Cuza & P. Guijarro-Fuentes (Eds.), Language acquisition and contact in the Iberian Peninsula (pp. 91–124). Berlin, Boston: De Gruyter Mouton.
- Arnaus Gil, L., & Müller, N. (2018a). Acceleration and delay in bilingual, trilingual and multilingual German-Romance children: Finite verb placement in German. In *Linguistic approaches to bilingualism* (pp. 1–29). Published online. doi:10.1075/lab.17081.arn
- Arnaus Gil, L., & Müller, N. (2018b). French postverbal subjects: A comparison of monolingual, bilingual, trilingual, and multilingual French. *Languages*, *3*, 1–29.
- Arnaus Gil, L., Zimmermann, K., Tirado Espinosa, M., & Müller, N. (2020). The acquisition of French adjective placement in monolingual, bilingual, trilingual and multilingual children: A robust syntactic domain. Submitted. Zeitschrift für französische Sprache und Literatur

Barnes, J. (2006). Early trilingualism. A focus on questions. Clevedon, UK: Multilingual Matters.

- Barnes, J. (2011). The influence of child-directed speech in early trilingualism. International Journal of Multilingualism, 8(1), 42-62. doi:10.1080/14790711003671861
- Barron-Hauwaert, S. (2000). Issues surrounding trilingual families: Children with simultaneous exposure to three languages. Zeitschrift für Interkulturellen Fremdsprachenunterricht, 5(1), 1–13.
- Beals, D. (1997). Sources of support for learning words in conversation: Evidence from mealtimes. *Journal of Child Language*, 24, 673-693. doi:10.1017/S0305000997003267
- Beals, D. (2001). Eating and reading: Links between family conversations with preschoolers and later language and literacy. In D. K. Dickinson & P. O. Tabors (Eds.), *Beginning literacy with language: Young children learning at home and school* (pp. 75–92). Baltimore, USA: Brookes.
- Beals, D., & Tabors, P. (1995). Arboretum, bureaucratic, and carbohydrates: Preschoolers' exposure to rare vocabulary at home. *First Language*, 15, 57–76.
- Bohnacker, U., Lindgren, J., & Öztekin, B. (2016). Turkish- and German-speaking bilingual 4-to-6-years-olds living in Sweden: Effects of age, SES and home language input on vocabulary production. *Journal of Home Language Research*, 1, 17–41. doi:10.16993/jhlr.26
- Braun, A., & Cline, T. (2010). Trilingual families in mainly monolingual societies: Working towards a typology. International Journal of Multilingualism, 7(2), 110-127. doi:10.1080/14790710903414323
- Braun, A., & Cline, T. (2014). Language strategies for trilingual families. Parents' perspectives. Bristol, UK: Multilingual Matters.
- Bronfenbrenner, U., & Morris, P. A. (1998). The ecology of developmental processes. In W. Damon & R. M. Lerner (Eds.), Handbook of child psychology: Theoretical models of human development (pp. 993–1028). Hoboken, NJ, US: John Wiley & Sons Inc.
- Chevalier, S. (2015). *Trilingual language acquisition: Contextual factors affecting active trilingualism.* Amsterdam, The Netherlands: John Benjamis.
- Cobo-Lewis, A. B., Eilers, R. E., Pearson, B. Z., & Umbel, V. C. (2002). Interdependence of Spanish and English knowledge in language and literacy among bilingual children. In K. Oller & R. Eilers (Eds.), *Language and literacy in bilingual children* (pp. 118–134). Clevedon, UK: Multilingual Matters.
- Cruz-Ferreira, M. (2006). Three is a crowd? Acquiring Portuguese in a trilingual environment. Clevedon, UK: Multilingual Matters.

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- De Houwer, A. (2004). Trilingual input and children's language use in trilingual families in Flanders. In C. Hoffmann & J. Ytsma (Eds.), *Trilingualism in family, school and community* (pp. 118–135). Clevedon, UK: Multilingual Matters.
- De Houwer, A. (2007). Parental language input patterns and children's bilingual use. *Applied Psycholinguistics*, 28, 411-424. doi:10.1017/S0142716407070221
- De Houwer, A. (2009). Bilingual first language acquisition. Bristol, UK: Multilingual Matters.
- Dewaele, J. (2000). Trilingual first language acquisition: Exploration of a linguistic miracle. La Chouette, 31, 41-45.
- Dewaele, J. (2007). Still trilingual at ten: Livia's multilingual journey. Multilingual Living Magazine, pp. 68-71.
- Döpke, S. (1992). One parent one language: An interactional approach. Amsterdam, The Netherlands: John Benjamins.
- Dunn, L. M., Padilla, E. R., Lugo, D. E., & Dunn, L. M. (1986). Test de Vocabulario en Imágenes Peabody. Adaptación Hispanoamericana. Minneapolis, USA: Pearson.
- Dunn, L. M., Thériault-Whalen, C. M., & Dunn, L. M. (1993). Échelle de vocabulaire en images Peabody. Toronto, Canada: Pearson.
- Faingold, E. D. (1999). The re-emergence of Spanish and Hebrew in a multilingual adolescent. International Journal of Bilingual Education and Bilingualism, 2(4), 283–295. doi:10.1080/13670059908667695
- Faingold, E. D. (2000). Pro-active attitudes and educational strategies in early trilingual acquisition: Referential avoidance and parental intervention at the one-word stage. *Estudios de Lingüística Aplicada*, 32, 58–73.
- Ganuza, N., & Hedman, C. (2015). Modersmålsundervisningens roll för utvecklingen av bilitteracitet: Somalisksvensktalande elever i skolans tidigare år. Uppsala, SwedenTalk given in Uppsala University.
- Grüter, T., Hurtado, N., Marchman, V. A., & Fernald, A. (2014). Language exposure and online processing effiency in bilingual development. Relative versus absolute measures. In T. Grüter & J. Paradis (Eds.), *Input and experience in bilingual development* (pp. 15–36). Amsterdam, The Netherlands: John Benjamins.
- Hakuta, K., & d'Andrea, D. (1992). Some properties of bilingual maintenance and loss in Mexican background high-school students. *Applied Linguistics*, 13(1), 72–99.
- Hammer, C., Lawrence, F. R., & Miccio, A. W. (2008). Exposure to English before and after entry into head start1: Bilingual children's receptive language growth in Spanish and English. *International Journal of Bilingual Education* and Bilingualism, 11, 30–56. doi:10.2167/beb376.0
- Helot, C. (1988). Bringing up children in English, French and Irish: Two case studies. Language Culture and Curriculum, 1 (3), 281–287. UK: Taylor & Francis.
- Hoff, E. (2006). How social contexts support and shape language development. *Developmental Review*, 26, 55-88. doi:10.1016/j.dr.2005.11.002
- Hoff, E., Rumiche, R., Ribot, K., & Welsh, S. (2013). English language acquisition without heritage language loss: Who succeeds? Poster presented at: The Meetings of the Society for Research in Child Development, Seattle, WA.
- Hoffmann, C. (1985). Language acquisition in two trilingual children. Journal of Multilingual and Multicultural Development, 6(6), 479-495. doi:10.1080/01434632.1985.9994222
- Hoffmann, C., & Stavans, A. (2007). The evolution of trilingual codeswitching from infancy to school age: The shaping of trilingual competence through dynamic language dominance. *International Journal of Bilingualism*, 11(1), 55–72. doi:10.1177/13670069070110010401
- Juan-Garau, M., & Pérez-Vidal, C. (2001). Mixing and pragmatic parental strategies in early bilingual acquisition. Journal of Child Language, 28, 59-86. doi:10.1017/S0305000900004591
- Kasuya, H. (1998). Determinants of language choice in bilingual children: The role of input. *The International Journal of Bilingualism*, 2(3), 327–346. doi:10.1177/136700699800200304
- Kazzazi, K. (2011). Ich brauche mix-cough: Cross-linguistic influence involving German, English and Farsi. International Journal of Multilingualism, 8(1), 63–79. doi:10.1080/14790711003671879
- Kleineberg, D., Arnaus Gil, L., & Müller, N. (2020). The acquisition of the Spanish copula system in mono-, bi- and trilingual children. Submitted. Revista Española de Lingüística Aplicada
- Lanza, E. (2004). Language mixing in infant bilingualism: A sociolinguistic perspective (2 ed.). Oxford: Oxford University Press.
- Lenhard, A., Lenhard, W., Segerer, R., & Suggate, S. (2015). *Peabody picture vocabulary test. PPVT-4.* Germany: Pearson.
- Lenhard, W., & Lenhard, A. (2015). *Normwertrechner*. Bibergau: Psychometrica. Retrieved from https://www.psychometrica.de/normwertrechner.html
- Maneva, B. (2004). 'Maman, je suis polyglotte!': A case study of multilingual language acquisition from 0 to 5 years. International Journal of Multilingualism, 1(2), 109–122. doi:10.1080/14790710408668182
- Müller, N., Arnaus Gil, L., Eichler, N., Geveler, J., Hager, M., Jansen, V., Patuto, M., Repetto, V., & Schmeißer, A. (2015). Code-Switching: Spanisch, Italienisch, Französisch. Eine Einführung. Tübingen: Narr.
- Oller, K., Pearson, B., & Cobo-Lewis, A. (2007). Profile effects in early bilingual language and literacy. *Applied Psycholinguistics*, 28, 191–230. doi:10.1017/S0142716407070117
- Pearson, B., Fernández, S., Lewedeg, V., & Oller, D. (1997). The relation of input factors to lexical learning by bilingual infants. *Applied Psycholinguist*, *18*, 41–58. doi:10.1017/S0142716400009863

- Peña, E. (2007). Lost in translation: Methodological considerations in cross-cultural research. *Child Development*, 18 (4), 1255–1264. doi:10.1111/j.1467-8624.2007.01064.x
- Petermann, F., & Lipsius, M. (2009). WPPSI-III Wechsler preschool and primary scale of intelligence- Third edition deutsche Version (2 ed.). Frankfurt a. M, Germany: Pearson.
- Poeste, M., Müller, N., & Arnaus Gil, L. (2019). Code-mixing and language dominance: Bilingual, trilingual and multilingual children compared. *International Journal of Multilingualism*, 16(4), 459–491. doi:10.1080/ 14790718.2019.1569017
- Quay, S. (2001). Managing linguistic boundaries in early trilingual development. In J. Cenoz & F. Genesee (Eds.), *Trends in Bilingual Acquisition* (pp. 149–199). Amsterdam, The Netherlands: John Benjamins.
- Quay, S. (2008). Dinner conversations with a trilingual two-year-old: Language socialization in a multilingual context. *First Language*, 28(1), 5–33. doi:10.1177/0142723707083557
- Quay, S. (2011). Trilingual toddlers at daycare centres: The role of caregivers and peers in language development. *International Journal of Multilingualism*, 8(1), 22–41. doi:10.1080/14790711003671853
- Romaine, S. (1995). Bilingualism (2 ed.). Oxford, UK: Blackwell.
- Rowe, M. L. (2012). A longitudinal investigation of the role of quantity and quality of child-directed speech in vocabulary development. *Child Development*, *8*, 1762–1774. doi:10.1111/j.1467-8624.2012.01805.x
- Sivakumar, A., Müller, N., & Arnaus Gil, L. (2020). Code-mixing in the weak language: A case study of the simultaneous acquisition of French, Italian and Spanish. In P. Guijarro Fuentes & C. Suarez (Eds.), New trends in language acquisition within the generative perspective (pp.165–193). Dordrecht: Springer. doi: 10.1007/978-94-024-1932-0
- Sivakumar, A., Sette, N., Müller, N., & Arnaus Gil, L. (2020). Die Entwicklung des rezeptiven Wortschatzes bei bi-, triund multilingual aufwachsenden Kindern. Hamburg. Helmut Busse Verlag GmbH: Linguistische Berichte. doi: 10.1007/978-94-024-1932-0
- Stavans, A., & Swisher, V. (2006). Language switching as a window on trilingual acquisition. International Journal of Multilingualism, 3(3), 193-220. doi:10.2167/ijm020.0
- Thordardottir, E. (2011). The relationship between bilingual exposure and vocabulary development. *International Journal of Bilingual Education and Bilingualism*, 15, 426–445. doi:10.1177/1367006911403202
- Wang, X. (2008). Growing up with three languages. birth to eleven. Parents' and teachers' guides. Bristol, UK: Multilingual Matters.
- Weizman, Z. O., & Snow, C. E. (2001). Lexical input as related to children's vocabulary acquisition: Effects of sophisticated exposure and support for meaning. *Developmental Psychology*, 37, 265–279. doi:10.1037/0012-1649.37.2.265

# **Appendix**

#### 1. Scoring

Scoring after calculating the amount of input per questionnaire and the potential interaction

Amount of input		Potential interaction	
Context	Score	Context	Score
MaL	2	MaL	3
LoF	2	LoF	3
Institutional Language	1	Family & friends	3
Parents Language (each)	1	Parents (comprehensive skills)	1
Holidays over 4 weeks	1	Sibblings (each)	1
Holidays under 4 weeks	0,5	Holidays	1
Family & friends	0,5		
Media	0,5		

#### 2. Conversion of scaled points

Conversion of scaled points (Wechsler Intelligence Test) to IQ values according to Lenhard and Lenhard (2015)

1 = 55 IQ	11 = 105 IQ
2 = 50 IQ	12 = 110 IQ
3 = 65 IQ	13 = 115 IQ
4 = 70 IQ	14 = 120 IQ
5 = 75 IQ	15 = 125 IQ
6 = 80 IQ	16 = 130 IQ
7 = 85 IQ	17 = 135 IQ
8 = 90 IQ	18 = 140 IQ
9 = 95 IQ	19 = 145 IQ
10 = 100  IQ	

#### 3. Statistical analyzes

- (a) LS 1/LS 2: t(25) = 1.10, p > .05; LS 1/LS 3: t(7) = 1.23, p > .05; LS 2/LS 3: t(6) = 2.16, p > .05.
- (b) MaL excluded/present: r(4) = 1,59 p > .05.
- (c) *t*-test results for the MaLs in Palma: r(12) = -1,10, p > .05. It should also be noted that the average vocabulary competence in the MaL that was not spoken in the family was even higher (M = 130; LoF = MaL: M = 122).
- (d) Spanish<sub>MaL</sub>: N = 40, p =.669, r = -.070; Catalan<sub>MaL</sub>: N = 13, p =.556, r = -.180; German<sub>MaL</sub>: N = 14, p =.485, r =.204.
- (e) t-Test: r(2) = -1,41; p > .05.
- (f) *t*-test results: t(40) = 1,62; p > .05.
- (g) G1/G2: t(20) = 2,12, p < .05; G1/G3: t(11) = 3,27, p < .01; G1/G4: t(4) = 2,81, p < .05; G1/G5: t(11) = 4,24, p < .01. G1: Both parents speak the MiL; G2: one parent speaks the MiL, the other parent understands the language (and at least sometimes uses it or reacts to it when it is spoken).
- (h) Spanish<sub>MiL</sub>: N = 40; p = .293; r = -.170; Catalan<sub>MiL</sub>: N = 13; p = .322; r = -.298; German<sub>MiL</sub>: N = 14; p = .151; r = -.405.
- (i) Children with parental questionnaire: Competence in German as MaL depending on the number of L1 (bilinguals/trilinguals): t = 1.76; df = 10; p >.05; Competence in German depending on the region (German as MaL/German as MiL): t = 1,178; df = 24; p >.05; Children in total (Sivakumar, Sette, Müller & Arnaus Gil, 2020): Competence in German as MaL depending on the number of L1 (bilingual/trilingual): F(70) = 3.725, p = .029.

#### 4. Parental questionnaire

Parental questionnaire using the example of the German-Spanish questionnaire administered in the German school in the bilingual Spanish-Catalan society.

Informationen zum Kind Información sobre el niño	
Name des Kindes	
Geburtsdatum des Kindes	

Unser Kind ist in Spanien geboren und wir leben seitdem hier. Nuestrola hijola ha nacido en España y vivimos desde entonces aquí.

- Unser Kind ist Deutschland geboren
  Nuestroia hijoia ha nacido en Alemania
   und wir leben seit \_\_\_\_\_\_in Spanien.
   yvivimo deche hace \_\_\_\_\_ en España.
- Unser Kind ist in einem nicht spanisch-sprachigen Land (außer Deutschland) geboren (und zwar Nuestrola hijola ha nacido en un país de había no española (excepto Alemania), concretamente

in \_\_\_\_\_\_) und wir leben seit \_\_\_\_\_\_ in Spanien. en ... y vivimos desde hace ... en España.

Unser Kind besucht seit \_\_\_\_\_\_\_ die deutsche Schule in Madrid.
 Nuestrola hijola viene a la escuela alemana en Madrid deute hace \_\_\_\_\_\_\_

Normalerweise spricht die Mutter mit dem Kind: Normalmente la madre habla con el miño:

- nur Spanisch / sólo español
- nur Deutsch / sólo alemán
- manchmal Spanisch, manchmal Deutsch / a veces español, a veces alemán
- weitere Sprachen / otras lenguas: \_\_\_\_\_\_

Normalerweise spricht der Vater mit dem Kind: Normalmente el padre habla con el niño:

- nur Spanisch / sólo español
- nur Deutsch / sólo alemán
- manchmal Spanisch, manchmal Deutsch / a veces español, a veces alemán
- weitere Sprachen / otras lenguas:

Unsere Familiensprache (d.h. beide Eltern und das Kind sowie evtl. Geschwister sind anwesend) ist: Nuestra lengua familiar (esto es, cuando el padre, la madre y el niño, así como hermanosias están prese

- □ Spanisch / español
- Deutsch / alemán
- manchmal Spanisch, manchmal Deutsch / a veces español, a veces alemán
- weitere Sprachen / otras lenguas: \_\_\_\_\_\_

Unser Kind hat Geschwister:

nein / no

- ja, und zwar im Alter von \_\_\_\_\_\_. Normalerweise sprechen die Kinder untereinander si, concretamente tiene ... akos. Normalmente los nikos kablan entre si:
  - nur Spanisch / sólo español
  - nur Deutsch / sólo alemán
  - manchmal Spanisch, manchmal Deutsch / a veces español, a veces alemán
  - weitere Sprachen / otras lenguas: \_\_\_\_\_\_

Außer zu Hause und in der Kita erhält unser Kind noch weiteren regelmäßigen deutschen Input: Excepto en casa y en la guarderia, nuestro/a hijo/a recibe regularmente input alemán:

- nein / no
- ja, und zwar:
  - Familie (Großeltern, Tante, Onkel, etc.) aus Deutschland sind oft zu Besuch la família (abuelos, tía, tío, etc.) de Alemania vienen de visita a menado
  - deutsche Medien (Fernsehen, Radio, Internet, Musik, Bücher, ...) medios de comunicación alemanes (televisión, radio, internet, misica, libras, ...)

□ Sonstiges / Otros:

Neben Spanisch / Deutsch spricht unser Kind noch weitere Sprachen Aparte del español / alemán muestroia hijola habla otra lengua

- □ nein/no
- □ ja, und zwar / sí, concretamente: \_

Pro Jahr verbringen wir mit unserem Kind etwa \_\_\_\_\_ Wochen in Deutschland, Cada aho vamos nosotros y nuestro/a hijo/a a Alemania durante ... semanas,

und zwar in \_\_\_\_\_

1

2

#### Informationen zur Mutter

## Geburtsort: Lugar de nacimiento

Ich lebe in Spanien seit \_\_\_\_\_

# Meine Muttersprache(n) ist/sind: Mils lenguals maternals uters

- Spanisch (Sie brauchen dann (1) NICHT auszufüllen) Español (NO necesitan rellenar el apartado (1))
- Deutsch (Sie brauchen dann (2) NICHT auszufüllen) Alemán (NO necesitan relienar el apartado (2))
- Andere / Otras:
- (1) Spanisch ist nicht meine Muttersprache. El español no es mi lengua materna.
- Trotzdem beherrsche ich die Sprache gut. Sin embargo domino este idioma bien.
- Trotzdem kann ich mich auf Spanisch halbwegs verständigen. Sin embargo me puedo comunicar medianamente en esta lengua.
- Ich kann Spanisch zwar verstehen, aber nicht sprechen. Puedo entender el español pero no lo puedo hablar.
- □ Ich verstehe die Sprache gar nicht.

#### (2) Deutsch ist nicht meine Muttersprache. El alemán no es mi lengua materna.

(Mehrfachnennungen sind möglich) (Más de una opción posible)

- Trotzdem beherrsche ich die Sprache gut. Sin embargo domino este idioma bien.
- Trotzdem kann ich mich auf Deutsch halbwegs verständigen. Sin embargo me puedo comunicar medianamente en esta lengua.
- Ich kann Deutsch zwar verstehen, aber nicht sprechen. Puedo entender el alemán pero no lo puedo habíar.
- Ich verstehe die Sprache gar nicht. No entiendo esta lemma.

#### Ich habe Deutsch als Fremdsprache gelernt He aprendido alemán como lengua extranjera

#### nein / no

- □ ja und zwar / sí, concretamente durch den Aufenthalt hier in Deutschland mediante una estancia aauf en Alemania
  - in der Schule / en la escuela
  - durch meine(n) deutsch-sprachige(n) Partner(in) a través de mi pareja alemanoparlante
  - Sonstiges / Otros: \_\_\_\_\_

# Ich habe Spanisch als Fremdsprache gelernt, und zwar He aprendido el español como lengua extranjera, concretamente

- durch einen Aufenthalt in einem spanisch-sprachigen Land, nämlich in \_\_\_\_\_\_ mediante una estancia en el país hispanohablante:...
- in der Schule / en la escuela
- durch meine(n) spanisch-sprachige(n) Partner(in) a través de mi pareja hispanohabilante
- Sonstiges / Otros: \_\_\_\_\_

#### Informationen zum Vater

Geburtsort:

Ich lebe in Spanien seit \_\_\_\_\_\_ Vivo en España desde el año....

#### Meine Muttersprache(n) ist/sind:

- Spanisch (Sie brauchen dann (1) NICHT auszufüllen) Español (NO necesitan relienar el apartado (1))
- Deutsch (Sie brauchen dann (2) NICHT auszufüllen) Alemán (NO necesitan rellenar el apartado (2))
- Andere / Otras:
- (1) Spanisch ist nicht meine Muttersprache.
- Trotzdem beherrsche ich die Sprache gut. Sin embargo domino este idioma bien.
- Trotzdem kann ich mich auf Spanisch halbwegs verständigen. Sin embargo me puedo comunicar medianamente en esta lengua.
- Ich kann Spanisch zwar verstehen, aber nicht sprechen. Puedo entender el español pero no lo puedo hablar.
- Ich verstehe die Sprache gar nicht.

#### Ich habe Spanisch als Fremdsprache gelernt, und zwar He aprendido el español como lengua extraniera, concretamente

- durch einen Aufenthalt in einem spanisch-sprachigen Land, nämlich in \_\_\_\_\_ medlante una estancia en el país hispanohabilante:...
- in der Schule / en la escuela
- durch meine(n) spanisch-sprachige(n) Partner(in) a través de mi pareja hispanahablante
- Sonstiges / Otros: \_\_\_\_\_



3

5

(Mehrfachnennungen sind möglich) (Más de una opción posible)

- Trotzdem beherrsche ich die Sprache gut.
- Trotzdem kann ich mich auf Deutsch halbwegs verständigen. Sin enharen me nuede commicer medianamente en etta lenna.
- Ich kann Deutsch zwar verstehen, aber nicht sprechen. Purda entender el alemán nera no la nucla habler.
- Ich verstehe die Sprache gar nicht. No entiendo esta lengua.

#### Ich habe Deutsch als Fremdsprache gelernt He avrendido alemán como lengua extraniera

#### nein / no

- ja und zwar / sí, concretamente
  - durch den Aufenthalt hier in Deutschland icia aquí en Al
  - in der Schule / en la escuela
  - durch meine(n) deutsch-sprachige(n) Partner(in) a través de mi pareia alemanoparlate

Sonstiges / Otros: \_\_\_\_\_



6

