Bilingual and second language development and literacy
Emerging perspectives on an intimate relationship

Christiane M. Bongartz
University of Cologne
chris.bongartz@uni-koeln.de

Abstract
The central issue of this paper is the role of literacy in bilingual and second language development. Even though traditionally viewed as an educational issue, the “linguistics of literacy” have increasingly been drawing attention in psycholinguistic research. How do L1 and L2 literacy practices affect L2 development? I suggest an integrated layered approach; i.e. a comprehensive research design that addresses both the socio-cultural and psycholinguistic contexts of bilingual and L2 acquisition. Such a design would then encompass literacy practices as well as more narrowly defined literacy indicators, and it would contribute to a more precise understanding of how literacy affects the interrelation of the two language systems.

Keywords: bilingualism, L2, language acquisition, literacy, literacy indicators, development, reference, cohesion

1. Introduction
Exploring the role of literacy in linguistic development has long been a pursuit of language practitioners and educators, i.e. those concerned with the participatory access and academic challenges that accompany literacy. Their work often involves school- and, increasingly, pre-school settings with monolingual children, heritage-language speaking children, bilingual children, and recent arrivals learning the language of the classroom as a second language. While it seems intuitive that literacy aids in the acquisition process - it is, in effect, another form of exposure to and engagement with language - the exact nature of the interaction of literacy and linguistic development remains elusive. This is so, in part, because to date there has been little systematic and straightforwardly operationalized research on their reciprocal influence by those concerned with language acquisition proper, namely psycholinguists.

Even though literacy practices are now continuously addressed more in psycholinguistic research, it seems hard to disentangle literacy effects from other
effects of exposure, and many of our insights are indirect; i.e. they are insights about the alignment of life variables with language and literacy skills. For instance, the more proficient and literate a mother is in the L2, the better the performance of her offspring in psycholinguistic assessments, such as language processing or parsing in online reading tasks (cf. Pliatsikas & Marinis 2013). Increasingly, however, a need is felt to find a way to look at the role of literacy more directly and to align the methodology of such inquiry with other types of empirical research in psycholinguistics (cf. Francis 2012). In this article, I am proposing a comprehensive research design that combines insights about the role of literacy that can be inferred via correlations of socio-contextual variables with results from research into linguistic development. To this end, I will first look at the various ways that linguistic development and literacy development interact, and I will then suggest how this overlapping relationship might be addressed in a research design. Based on these recommendations, I will outline guidelines for the joint experimental exploration of literacy development and language acquisition in different contexts. These include

- an index of literacy preparedness of participants (in-home pre-literacy and literacy practices; literacy exposure in educational contexts; current language use)
- aligned non-verbal and verbal assessments (to account for processing demands)
- multi-modal data from oral and written production (control for development effects and effects of bilingualism)
- identification of linguistic indicators for primary and secondary discourse ability in literacy development (referential cohesion).

To illustrate how such guidelines might be put into practice, I will, in what follows, outline an exemplary research design and, where available, draw on preliminary data from a research project where the design was first employed. In collaboration of Aristotle University Thessaloniki and the University of Cologne,¹ we looked into the bilingual and biliterate development of the language pairs Greek and German in the research effort of ‘Cognition, Literacy, and Bilingualism’ (CoLiBi).² From the onset, literacy served as one of our main concerns.

¹ I thank Ianthi Maria Tsimpali, Maria Andreou, and Eva Knopp of CoLiBi for their invaluable contributions to the ideas laid out in this paper. I enjoyed learning from them.
² CoLiBi was supported by funding from the DAAD (German Academic Exchange Service) and IKY (Greek Scholarships Foundation).
2. **Intersections of linguistic development and literacy**

Very generally speaking, studies in psycholinguistics aim to explore the different types of language acquisition over the lifespan in accordance with the relevant ages. By now, we know a lot about the assorted similarities and differences between first language (L1) acquisition on the one hand and adult second language (L2) acquisition on the other. Bilingual (2L1) acquisition, by definition and by nature, patterns with L1 acquisition, especially when exposure begins simultaneously for both languages or with little delay during the first two or three years of life (de Houwer 2006). A somewhat less clear picture emerges with respect to the differentiation of sequential bilingualism in childhood and child L2 acquisition: is it a difference of substance with clearly demarcated separate trajectories (cf. acquisition versus learning), or are we looking at a graded slope towards the point on the age scale where the variability of outcome associated with adult L2 acquisition begins (at age 7, according to Meisel 2011)? Simultaneous and sequential bilingualism, of course, also can and often do differ from one another, especially with respect to onset of exposure and available input. Here, the difference seems mainly relational: Simultaneous 2L1 acquisition results in a balanced competence in both languages (L_a and L_b), sequential bilingualism may involve a weaker and a stronger language, a situation that not necessarily coincides with the dominance relationship characterizing language use outside the home in the larger speech community.

There are, then, five different types of language acquisition during the first seven years of life (cf. Meisel 2011; Francis 2012). L1 and simultaneous 2L1 acquisition pattern largely together, even though in the latter we may see exposure-related delays in the rate of acquisition. Sequential 2L1 acquisition, child L2 acquisition, and adult L2 acquisition all overlap with the neighboring type during the relevant age frames, often referred to in the literature as critical and, more recently, sensitive ages. Moreover, and this a pivotal issue with respect to the intersection with literacy development, the relationship between L_a and L_b or L1 and L2 respectively is often one of imbalance, with differences in underlying knowledge and use between the two languages (Francis 2011). (Of course, life events have an impact on overall balance or imbalance and can lead to attrition effects already during childhood.) With the onset of schooling around five or six years of age, the scales for bilingual children are usually tipped further in favor of the dominant language in society via literacy.
instruction in that language. Child second language learners, at this point, experience systematic exposure to their L2 for the first time, sometimes in conjunction with reading and writing in that language, sometimes not.

Something shared in common between 2L1 and L2 acquisition is that they involve language contact in the mind and hence potential cross-linguistic influence between the languages involved. For the investigation of literacy as a variable impacting linguistic development, cross-linguistic influence takes on added significance in that it might facilitate bi-literate acquisition, e.g. in terms of head-first or head-last correspondences between the two languages and reading directionality, or in terms of transfer of decoding skills between morphologically rich languages (Bialystok, Luk & Kwan 2005). 3 Carry-over may also occur for phonological awareness and metalinguistic ability that tend to be more developed in bilinguals than in monolinguals; it is of yet unclear whether or not literacy exposure in child L2 acquisition helps narrow the gap between L2 learners and bilinguals (Bialystok Craik & Luk 2012).

Teasing apart trajectories of language development from those of literacy development, then, must involve a cross-linguistic perspective; this will also allow for a comparison of monolingual literacy development to literacy development involving more languages with various degrees of exposure and hence of mastery. Variability of outcome, as already said, characterizes L2 acquisition, and the acquisition of literacy will lead to further variability, first, because there are no uniform but only individual outcomes of literacy education, and second because of the aforementioned exposure effects during instruction.

In educational contexts and sometimes in bilinguals studies the notion of ‘continua of biliteracy’ (Hornberger 1990: 213) serves to illustrate the multiple and complex interrelationships between language and literacy development and the importance of the instructional contexts, the media, and the content of instruction. A strong connection is made between identity, education, and outcomes; a perspective commonly taken in education, but difficult to operationalize in terms of linguistic indicators. One influential attempt at doing so by Cummins (1983; 2012) is to distinguish ‘Basic Interpersonal Communication Skills (BICS)’ from ‘Cognitive

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3 A detailed discussion of the processes of reading and writing acquisition is beyond the scope of this article; however, cross-linguistic similarities have been shown to be of facilitating effect (cf. Francis 2012, ch. 3).
Academic Language Proficiency (CALP).’ The distinction roughly corresponds to another proposal by Francis (2012) to differentiate between ‘primary discourse ability,’ achieved by everybody, and ‘secondary discourse ability,’ i.e. the more and more decontextualized linguistic practices of literacy associated with education which do not become uniformly available to all. In other words, basic or primary communication is universal, while CALP or secondary discourse is subject to variation, in monolingual as well as multilingual populations.

The dimension of variability added by literacy development in turn connects back to age effects; for example, early bilinguals with an age of first exposure before the age of 3 outperformed other bilingual groups with first exposure between the ages of 3 and 6 (Kovelman, Baker & Petitto 2008). In fact, age of first exposure appears to override length of exposure: “we observed a stark qualitative difference between monolingual and early bilinguals versus all late bilinguals” (ibid.: 218). Monolinguals and early bilinguals shared advantages in phonological awareness and reading achievement over late bilinguals (cf. Pettito 2009).

Bilinguals, then, match monolinguals in outcomes even though the amount of exposure to the language of instruction in early life is perhaps only half that of monolinguals. One reason for this may lay in the triangulation among the sources of knowledge applied in linguistic and literacy practice. Two language systems are involved, but they interface with just one cognitive-perceptual system that is shared between these languages (‘Tripartite bilingual architecture’; cf. Francis 2012, 2013), referred to as ‘common underlying proficiency (CUP)’ by Cummins (1983). According to Francis (2008), this view sustains interdisciplinary research in affording the separate study of the modules involved: a distinction can be made between ‘literacy-related (largely non-linguistic) underlying proficiencies’ and linguistic knowledge of the languages involved. In other words, we can keep our psycholinguistic focus on the linguistics of acquisition and developmental sequences, but we can then inquire into the interaction of those with non-linguistic, cognitive aspects of literacy.

However promising such a modular approach might appear, there are still intangibles, in particular concerning the effects of literacy on language processing, as Tarone (2010) observes: “… alphabetic print literacy level has such a significant impact on oral L2 processing that existing research cannot be assumed to apply across the board to illiterate and low-literate L2 learners (ibid.: 82).” Linguistic and literacy
effects, as far as processing is concerned, may display conflation because of the very nature of their interdependencies. Strictly speaking, a valid comparison of monolinguals, bilinguals, and L2 learners depends on selecting participants with a similar degree of literacy.

Still, if we agree that the onset of variability of outcome typical for adult L2 acquisition is around the age of 7, and if we consider the age of exposure effects discussed by Kovelman et al. (2008), this leads to a new set of very interesting questions: Can a high level of literacy eventually even out differences in linguistic and literacy achievement?, or, to put it more broadly, can literacy help build linguistic competence? Framed in such a way, it becomes easier to delineate a methodology that keeps track of both linguistic and literacy development. What remains elusive nonetheless is how the transition from primary to secondary discourse might be pinned down in terms of linguistic indicators. The distinction between language in everyday use and in educational contexts seems intuitively valid, but other than in large corpus studies (Biber & Gray 2013) the necessary multidimensional model of variance appears impossible to imply, which leaves us in need of another heuristics to account for the transition from primary to secondary discourse ability.

To sum up thus far, the study of linguistic development in conjunction with literacy development adds to linguistic variability (balanced versus non-balanced bilingualism; L2 acquisition) another dimension of variability of outcome. Conceptually speaking, literacy practices are cognitively independent of linguistic ones, such that the languages an individual knows draw on a shared underlying cognitive resource for literacy. In actual practice, however, literacy effects on language processing cannot easily be accounted for. What is called for is a methodology of reflected inferencing; i.e. one that combines extensive contextual information on literacy practices inside the home and in schooling contexts with narrower linguistic observation. Ideally, the latter should address the issue of primary versus secondary discourse ability because it is in the transition from one to the other that the dimension of variability added by literacy resides.

3. In search of a methodology: Profiling and experimental data
The study of linguistic development in conjunction with literacy development, as we have seen, involves stages of language development, cross-linguistic considerations, extra-linguistic context all in interaction with pre-literacy and literacy practices in one
or both of the languages of a bilingual child. Because of the individual nature and complexity of the intersection of all these factors, establishing comparability among bilingual and monolingual participants poses an intricate methodological challenge: while core aspects of both languages have been shown to develop in bilinguals as they do in monolinguals (cf. Sorace 2014; Tsimili 2014), differences in social dominance and individual life circumstances give rise to different patterns of exposure to both language and literacy (cf. Francis 2012 for an extensive discussion; also Meisel, 2011). An added complication comes from the fact that late bilingualism and early second language acquisition cannot easily be separated; conceivably, the sensitive period between the two marks not only a transition towards variability in outcome in terms of proficiency, but it may also very well mark a transition towards an increased importance of rule-based explicit learning (cf. Meisel 2011). In other words, when the transition occurs, the role of literacy might increase substantially because of the metalinguistic awareness it induces, something that may in turn facilitate explicit learning and can then lead to compensatory effects on proficiency.

Because of the complexity of the picture, a relevant longitudinal study would be very difficult to design; life variables can hardly be kept constant, and even siblings that share many of these may have very different linguistic and literacy biographies (cf. Leikin, Schwartz & Tobin 2012). However, as I stated earlier, surveying language use in context must rely on inferencing; i.e. we can calculate correlations of quantified results from ethnographic questionnaires with linguistic variables, but we are, for practical reasons, unable to verify via direct observation the amount and quality of input received in each reported case. It is therefore necessary to use a deliberate mix of data: on the one hand, we must elicit via interviews or questionnaires ethnographic data on language use inside the home and in school contexts, and on the other, we combine it with data from quantifiable experimental research.

3.1 The CoLiBi research design

To illustrate how these considerations might be put into research practice, I will report here on the design of a study on the bilingual and biliterate acquisition of Greek and German conducted between 2012 and 2014 in Greek and German schools as part of the CoLiBi project. We worked with 38 Greek-German bilinguals in Greece (Bilinguals_GR; 20 male, 18 female) and 39 Greek-German bilinguals in Germany (Bilinguals_DE; 20 male, 19 female) between the ages of 8 to 12 years old. Our
objective was to infer individual profiles by tracking exposure, literacy preparedness, and use for each of the two languages and then to look into the linguistic development of each of these languages in conjunction with data obtained from cognitive tasks. The extra-linguistic factors that we operationalized were (1) input via the interaction with the mother, (2) input via the interaction with the father, (3) literacy preparedness, and (4) current language use, and we calculated these scores by grouping the questionnaire items from the parental and participant questionnaires with respect to each of the four factors, and assigned numerical scores for each language.4

Admittedly, our quantification cannot eliminate inferencing about actual exposure or trace effects of exposure. However, it can provide profiles which then serve as baseline data with which to correlate further observations we had available with respect to the bilingual experience of our individual participants. In proceeding like this, our expectation was that the degree of score discrepancy found in this part of our study would be mirrored by linguistic measures of bilingual balance or dominance effects. In other words, the scores would diverge more when one language was the dominant one in a child’s experience, and this would be mirrored by proficiency effects in vocabulary knowledge.

The vocabulary tasks were normed for monolinguals in Greek (Renfrew Word Finding Vocabulary Test; adapted by Vogindroukas, Protopapas & Sideridis 2009) and in German (SET 5-10 Subtest 1; Petermann, Fröhlich & Metz 2010). Both involve picture naming (50 nouns for Greek, 40 items for German, 30 nouns and 10 verbs). We scaled the results for both languages and then compared them, which allowed us to see whether they were similar and hence indicative of a balanced bilingual experience. Scores that diverged by more than ten percentage points we took as indicative of non-balanced bilingualism. We could then see that divergence in our extra-linguistic scores patterned with those from the vocabulary measures.

As is common practice, our research design involved a battery of non-verbal, as well as verbal assessments related to processing.5 While there is no direct link to the interaction of linguistic and literacy development, these tasks can again serve as a

4 The questionnaires are available in the appendix; for current language use, see appendix 1, child questionnaire, for factors 2, 3 and 4 see appendix 2 (parent questionnaire). See Andreou et al. 2015, for a detailed description of the scoring procedure.

5 We used Raven’s Progressive Colored Matrices Test, Mister X, digit backwards and other measures. See Andreou et al. (2015) for a complete listing of all assessments.
back-drop to the investigation: on the one hand, they can reveal cognitive differences between bilinguals and monolinguals, on the other hand, they are windows into processing that can be correlated in turn with the demands of discourse processing.

Note at this point that with respect to CoLiBi’s concern with the interaction of linguistic and literacy development, the domain of discourse is of central importance because it is in discourse, and in narrative in particular, where primary discourse ability and secondary discourse ability meet (cf. Francis, 2006): it is via literacy practices that children move from the highly context-dependent deictic speech of primary discourse to the more and more context-independent language use of secondary discourse ability. Hence narrative production is a domain of bilingual linguistic performance where literacy effects might affect linguistic choice, and we therefore speculate that cognitive measures can, at least to some extent, model the processing requirements of narrative production involved in establishing discourse cohesion, something I will elaborate on below.

In order to account for profile effects (Oller, Cobo-Lewis & Pearson 2007) in terms of both linguistic and literacy development, we included a narrative production task designed as a diagnostic tool for age appropriate performance in terms of linguistic means and story structure, the Edmonton Narrative Norms Instrument (ENNI; Schneider, Hayward & Dubé 2006). In addition to giving us a window into the participants’ general language ability in terms of grammar, the stories elicited orally and in writing from the picture panels in ENNI allowed for a comparison between production modes and between discursive organization in both languages. We could then compare bilingual performance to that of monolinguals, as well as the performance of bilinguals in Greek and German production.

3.1.1 Referential expressions at the intersection of primary and secondary discourse

Results from the elicitation of narratives and their scoring have been shown to be “accurate and reproducible (Beswick 2008),” and their use for developmental research is therefore a valid choice. However, the discourse dimension of story-telling and its relatedness to literacy development has not been discussed systematically in psycholinguistic research as of yet (Bigelow & Tarone 2004). Much research has dealt with the relationship somewhat indirectly based on the observation that narratives or stories can be told felicitously only when the narrator manages to keep track of the characters involved in the plot (Bamberg 1987; Berman 2009; Schneider
& Hayward 2010). They have to be introduced appropriately upon first mention, kept in the listener’s attention, or switch places with other characters (see appendix 3, image 1), something that can, depending on the complexities of events and the personnel involved, lead to a complex dynamic interweaving of reference to characters (see appendix 3, image 2).

The linguistic means for achieving cohesion may vary; languages encode familiarity of characters to the listener with a range of linguistic forms that presuppose various degrees of accessibility (Ariel 2001). Choosing among such referential expressions on the part of the speaker involves picking out the form best suited to the accessibility of the character in terms of the preceding discourse. This choice, notably, is one of preference, not one of mutual exclusivity: referential expressions can be used interchangeably with respect to the grammar; i.e. a full determiner phrase (DP), a proper name, a pronoun or clitic or zero subject can all fill the subject position of a a given sentence. Making a choice between different referential expressions does have a grammar dimension with respect to syntactic position, but, in addition to grammar, it crucially also has a discourse dimension, and it is in the latter that we expect a reflection of literacy. One could, for example, tell ‘Goldilocks and the Three Bears’ (cf. Bongartz & Schöneberger 2009) easily by always referring to the main character by her name, Goldilocks. Switching to alternate referential forms is a choice governed by discourse constraints: once we know her name is Goldilocks, we can then refer to her with ‘she’ or ‘her’ in appropriate syntactic positions.

Let me come back at this point to the notion of discourse cohesion (Halliday & Hasan, 1976), i.e. the ensemble of internal ties between elements of a narrative that allow us to make sense of it in the absence of access to the situational context in which the story unfolds. Telling a story that a listener can follow is something children have to learn, and stories involving several characters prove challenging in early development: younger children tend to follow a thematic strategy and reserve pronominal reference for the main character of a story (cf. Hickmann & Hendriks 1999), thus neglecting other characters and important aspects of the story plot.

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6 Various proposals exist about the discourse constraints on use of referential expression; e.g. ‘Givenness Hierarchy,’ (cf. Gundel & Johnson 2013) or ‘Centering Theory’ (Grosz & Sidner 1986) to name a couple. Our choice of the ‘Accessibility Scale’ proposed by Ariel (2001) seems best suited to psycholinguistic exploration (cf. Arnold, 2010; Leclercq & Lenart, 2013).
Mentioning different characters and switching between them is, at least in part, a matter of rhetorics.

In fact, not all languages differentiate referential expressions in the same way but offer different grammatical and rhetorical strategies (Hickmann et al. 1996; Chen & Lei 2012). Coming back to the distinction between primary and secondary discourse abilities, it appears obvious that referential cohesion connects up one to the other, such that ultimate mastery of the interweaving patterns for characters in narrative production transcends the core grammar and primary abilities shared by all speakers.

One reason that this should be so is that referential expressions must be chosen with various degrees of context-independency. When speaker and hearer are not in the same situational context, linguistic means must provide unambiguous referential choices relying on discourse context alone. This is something perhaps most obvious in written production, but also relevant to felicitous oral story telling. A work of fiction exploring the lives of many different characters, for example, requires great scrutiny on the part of the writer with respect to character introduction, maintenance, or re-introduction.7 Primary discourse ability, by contrast, develops in a contextually situated manner and allows for deictic elements, thereby making it possible to follow a story told by a young child that only uses the pronouns ‘he’ or ‘him’ or even leaves them out altogether: sharing the child’s situational context will enable us to identify the referent in the context, perhaps a teddy bear or Cookie Monster.

3.2 Developmental trajectories, cross-linguistic and cross-modal effects

The analysis of elicited narratives in CoLiBi, then, serves several purposes: first, we can compare stories told by bilinguals to those of monolinguals, and second, we can compare the bilingual performance in each respective language. Further, we can trace developmental effects in referential cohesion (the benchmarks on the age trajectory for monolinguals are 7 and 10 years respectively; cf. Hickmann et al. 1996), as well as effects of oral versus written mode of production. These can in turn be triangulated with the profiling data obtained from the questionnaires and the cognitive and linguistic measures from the other tasks.

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7 Oral traditions and oral narrative may involve some of the same features (cf. Tappe & Hara 2013) and are part of what is understood by ‘literacy’ here.
Developmental effects can be expected in terms of age, as well as in terms of type of bilingualism: younger monolingual children under-specify and tend to use ambiguous referential expressions (cf. Hickmann et al. 1996), and bilinguals and very advanced second language learners have been shown to over-specify by using referential expressions that encode a lower degree of accessibility than would be afforded by the discourse context: e.g., DPs instead of pronouns (cf. Leclercq & Lenart 2013; Serratrice 2007). From a processing perspective, it is over-specification in particular that would be of interest since also monolinguals tend to over-specify when their processing load is increased (cf. Rosa & Arnold 2011). If balanced bilinguals were to over-specify consistently in both of their languages, then it would follow that the linguistic scale of referential accessibility shares an interface with cognition as hypothesized in Cummins’s (1983) CUP model.

With respect to our profiling, also cross-linguistics effects are of great interest. While Greek and German, the languages of CoLiBi, pattern together in many ways (both languages have definite articles and encode gender, number, and case in inflectional morphology), there are also important differences with respect to referential cohesion: in Greek, subjects can be phonetically empty when identified by verbal morphology, and these zero subjects have the same free referential properties as a personal pronoun. In German, by contrast, two verbs may have the same subject in coordinate sentences, but the elided subject in the second clause is referentially restricted to that of the first clause and hence uniquely identifiable. Depending on whether Greek or German respectively is the stronger language in a non-balanced bilingual, one might observe over-restriction for zero subjects in Greek narrative production, or under-restriction for elided subjects in German narratives. Other cross-linguistic differences such as the existence of object clitics in Greek but not in German afford further hypothesis space about referential choices that can be explored based on our elicited narratives.

As regards the interaction of linguistic development and literacy, both developmental and cross-linguistic results provide key empirical evidence: in a first step, they help us establish how balanced bilinguals perform with respect to each of these perspectives. Subsequently, they provide a baseline to which the production of

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8 For a more extensive comparison of referential expressions in Greek and German see Andreou et al. (2015).
non-balanced bilinguals can be compared. In those cases where non-balanced bilinguals match the performance of balanced bilinguals, we hypothesize that this could be a literacy-effect, something we can in turn check for by going back to the profiling scores.

Finally, concerning the modes of production, we can compare oral and written choice of referential expressions. Textual integration achieved by density of cohesive ties (cf. Halliday & Hasan, 1976) might lead to different degrees of syntactic complexity in both modes: switches between characters, specifically, and choice of highly accessible referential expressions might interact more strongly in the written mode than in the oral. In addition, we can control for over-specification and under-specification and see whether or not it persists across modes, something that would underscore the claims made about these phenomena with respect to their relatedness to development and bilingual proficiency.

4. Literacy effects in bilingual development - Indicators and open questions
At this point, many of the expectations motivating our CoLiBi design are being subjected to analysis. With the process of data collection completed, we have been able to obtain some preliminary evidence: our profiling data appear to lead to the best kind of inferencing about profile effects when we are looking at individual children; i.e. when we compare the performance of a child in one language to her or his own in the other language, even though we also find group effects between Bilinguals_GR and Bilinguals_DE (cf. Andreou et al. 2015; Bongartz, Andreou & Knopp 2014a). As a rule, language dominance as observed in individual bilingual biographies correlates with variability of performance in the linguistic measures and in story telling. Concerning linguistic development in terms of grammar, there was no effect of mode on the production of gender morphology on nouns and their satellites, such that on-mastery of gender in Greek in oral production coincided with non-mastery in the written narratives (Bongartz, Marinis & Tsimpli 2014b).

Most relevant with respect to the discussion here are findings from a comparison of the balanced bilinguals in CoLiBi (N=9) with their monolingual peers in each of their languages for the written narratives. We found that their choices of referential expressions converged neither entirely with that of the Greek monolinguals, who tended to use more high accessibility markers, nor with that of the German monolinguals, who used the fewest high accessibility markers of the three
Their bilingualism, one might speculate, has led them to develop a third, in-between preferential bias, something that must certainly be related to effects from the underlying cognitive component, but that awaits further investigation.

Overall, in our preliminary analyses we have found choice of referential expressions a very promising potential micro-indicator of literacy development that patterns reliably with individual profiles. While we cannot say at this point how exactly one might characterize the transition form primary to secondary discourse ability, we are confident that this will eventually become possible, and we see much promise in a weighted factorial analysis. The factors under analysis are coded separately for each referential expression, and they include distance to the antecedent, syntactic position, topic-hood, semantic role and prominence of the character (cf. Bongartz & Torregrossa, 2014). Ultimately, this kind of coding together with the weighted analysis will reveal individual patterns that should allow us to discern measures of textual integration. We expect to be able to identify a threshold via the latter that would be indicative of the transition from primary to secondary discourse.

In the matter of literacy effects on bilinguals and L2 learners, the interweaving of characters in narratives has several directly observable facets that can be correlated with the profiles obtained from ethnographic questionnaires. In addition to development effects (under-specification) and effects of bilingual proficiency (over-specification), one can envision the emergence of distinct ‘weaving patterns’ in referential cohesion that might well be situated at the typological intersection (cf. Nemser1971) of languages involved. For bilinguals, L2 learners, and monolinguals alike one can further identify measures of textual integration based on such patterns.

Certainly, the outlook given here is tentative and infused with the optimism of preliminarity. However, it seems quite clear that literacy effects and linguistic development always occur intertwined and inseparably. Hence, a proper heuristics for teasing apart language and literacy development might be impossible to delineate. Nonetheless it has been my objective in this article to provide an approximation of one in suggesting that profiling data be matched with results from cognitive tasks and linguistic tasks for the purpose of cross-checking them against each other. Such cross-validation is, of course, already a much practiced approach. The novelty in what is proposed with the CoLiBi approach is the inclusion of a micro-analysis of literacy effects in the research design: the transition of primary to secondary discourse.
abilities ought to be captured, and I have mapped out here how this could be done using narrative data and examining choices of referential cohesion.

5. (Almost a) conclusion
Given that linguistics and literacy always appear in concert with one another, it is important to identify the contribution of literacy as an additional source of linguistic input to language development. In this article I have attempted to address how psycholinguists might tackle the joint occurrence of language development and literacy in monolingual, bilingual, and L2 children. The added layer of variability that comes with literacy practices can potentially even out imbalances in the bilingual experience or support the rule-based processes involved in child L2 acquisition. In order to move away from solely inferring the role of literacy based on profiling data from questionnaire, the quasi-heuristics proposed here involve a best-practice scenario that I have exemplified via the research design used in the CoLiBi project (cf. Bongartz & Tsimpli 2013).

Two basic tenets about literacy motivate the suggested methodology: the first is that narratives are ideally suited to investigate the transition from primary to secondary discourse ability, and the second that choices made for referential expressions and the resulting weaving patterns can provide stable indicators of literacy development. Over and above these tenets, the proposed data mix of ethnographic profiling and cognitive and linguistic tasks makes it possible to investigate linguistic development in various acquisition contexts in conjunction with cross-linguistic effects and effects of literacy and bilingualism. In this way, we might eventually arrive at a more fine-grained understanding of how literacy effects may interact with and even out effects of language dominance.

Many relevant insights will, no doubt, emerge from the increasingly sophisticated analysis of language processing, and direct observation from reading or writing tasks will aid in operationalizing literacy effects. Of great interest are issues concerning the triangulation of literacy, language, and cognitive development. With the methodology proposed here it will be possible to evaluate models of bilingual competence such as Francis’ (2012) tripartite bilingual architecture; i.e. we will be in a position to show that common cognitive resources inform both linguistic systems in a bilingual person. Discourse cohesion and choice of referential expressions in their duality of
grammatical constraints and accessibility preferences, I am convinced, make for a relevant and very promising testing ground.

References


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Appendix I

**CHILD QUESTIONNAIRE**
[To be administered as oral interview by the researcher]

**ADVICE FOR THE INTERVIEWER:**

- Interviews should be recorded, in case interviewer accidentally ticks wrong boxes.
- Anything that doesn’t fit into the question framework (e.g. child grew up with other languages next to Greek and German) should be added by hand by the interviewer.
- In questions 3.4, 3.5, 4.3 („How often“-Questions to be answered with often/sometimes/rarely), always ask about the differences between Gr/Ge/other language. That will help the child to make more accurate estimates.

**DATE OF INTERVIEW** __________________________
**NAME OF INTERVIEWER** ________________________
**NAME OF SCHOOL/CLASS** _______________________

*Introductory Sentence:*
„I speak both German and Greek, so we can use both languages in this interview. In which language should I ask the questions?“
OR: „Sorry, I only speak Gr/Ge! I hope this is ok for you!”

**PART A: DEMOGRAPHIC INFORMATION**

A1 What is your name and surname? ____________________________
A2 ☐ girl ☐ boy
A3 When and where were you born? ____________________________
A3.1 If you weren’t born in Germany, do you remember how old you were, when you arrived here? ______________________
A4 Do you have any brothers and sisters? ☐ yes ☐ no
A4.1 If so, let us know, if you are
☐ the oldest
☐ the middle
☐ the youngest
A5 Your friends are mainly children
☐ with parents from other countries (not from Greece)
☐ with parents from Greece
☐ with parents from Germany
☐ with parents from Greece and other countries
PART B: 
LANGUAGE ACQUISITION AND DEVELOPMENT

B1  Do you know which languages you heard and used when you were a baby until you were three? (To fill in the empty rows, ask: And who else did you spend a lot of time with, then? Your grandmother, grandfather, an au-pair, child-minder… )

<table>
<thead>
<tr>
<th></th>
<th>mainly Greek</th>
<th>both languages</th>
<th>mainly German</th>
</tr>
</thead>
<tbody>
<tr>
<td>mother</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>father</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>grandparents</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>siblings</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B2  And do you know which languages you heard and used when you were about three and/or started going to kindergarten? (To fill in the empty rows, ask: And who else did you spend a lot of time with, then? Your grandmother, grandfather, an au-pair, kindergarten friends, kindergarten teacher…)

<table>
<thead>
<tr>
<th></th>
<th>mainly Greek</th>
<th>both languages</th>
<th>mainly German</th>
</tr>
</thead>
<tbody>
<tr>
<td>mother</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>father</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>grandparents</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>siblings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>kindergarten teacher</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>kindergarten friends</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B3  And how was it when you were about six and started going to school?

<table>
<thead>
<tr>
<th></th>
<th>mainly Greek</th>
<th>both languages</th>
<th>mainly German</th>
</tr>
</thead>
<tbody>
<tr>
<td>mother</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>father</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>grandparents</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>siblings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>teacher</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>friends at school</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PART C: 
LITERACY DEVELOPMENT IN BOTH LANGUAGES

C1  Did your parents or other people read you books with stories and fairytales when you were younger? □ yes □ no

C1.1 If yes, I would like you to tell me, in which language they did this? 
□ My mother read to me…
□ mostly in Greek □ mostly in German
□ about the same in both languages □ in another language
☐ My father read to me…
   ☐ mostly in Greek  ☐ mostly in German
   ☐ about the same in both languages  ☐ in another language

☐ My brothers and sisters read to me…
   ☐ mostly in Greek  ☐ mostly in German
   ☐ about the same in both languages  ☐ in another language

☐ __________________ read to me…
   ☐ mostly in Greek  ☐ mostly in German
   ☐ about the same in both languages  ☐ in another language

C2  Which grade do you attend? _____________

C3  Except from your German class in school, do you have any other lessons in German?
   ☐ yes  ☐ no

C3.1 If yes, what do these lessons look like?
   ☐ I have additional private lessons in German.
   ☐ I have additional German lessons at school.

C3.2 Since when do you have these lessons?
   I have additional lessons in German
   • since/for _______ years or
   • since/for _______ months

C3.3 How often do the lessons take place
   The lessons take place _________ times a week and last for ____________ minutes.

C4  Does anyone help you with your homework?  ☐ yes  ☐ no

C4.1 If yes, who?
   ☐ father  ☐ mother  ☐ older sibling  ☐ someone else

C4.2 Which language do you use when he/she helps you with your homework?
   ☐ mostly Greek  ☐ mostly German  ☐ both languages to the same extent

C5  Do you have any Greek language lessons?
   ☐ yes  ☐ no

C5.1 If so, what do these lessons look like?
   ☐ Do you have private lessons with a teacher at home, where you learn how to read and write?
   ☐ Do you have Greek lessons at your German school, where you learn how to read and write?
   ☐ Do you have lessons at your German school, where you learn Greek and other subjects in Greek, which ones? ____________________________

C5.2 Since when do you have these lessons?
   I have Greek lessons
   • since/for _______ years or
   • since/for _______ months
C5.3 How often do the lessons take place?  
The lessons take place _________ times a week and last for __________ minutes.

C6 Does anyone in your family help you to learn how to read and write in Greek?  
☐ yes ☐ no

C6.1 If yes, who?  
☐ father ☐ mother ☐ older sibling ☐ someone else

---

**PART D: LANGUAGE USE TODAY**

D1 And today? Who speaks each language to you and which language do you use when you talk to that person?

<table>
<thead>
<tr>
<th></th>
<th>mainly in Greek</th>
<th>in both languages</th>
<th>mainly in German</th>
</tr>
</thead>
<tbody>
<tr>
<td>my mother talks to me ...</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... and I talk to my mother</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>my father talks to me...</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>.... and I talk to my father</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>my older siblings talk to me...</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... and I talk to my older siblings</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>my younger siblings talk to me...</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... and I talk to my younger siblings</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>my grandparents talk to me...</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... and I talk to my grandparents</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>my friends, who know German, talk to me...</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>.... and I talk to them</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

D2 In which language …

<table>
<thead>
<tr>
<th></th>
<th>mainly in Greek</th>
<th>in both languages</th>
<th>mainly in German</th>
</tr>
</thead>
<tbody>
<tr>
<td>... do you memorize telephone numbers?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... do you swear?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... do you tell the time?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... do you count and calculate – not in school, but, for example when you go shopping?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
... do you talk to yourself? ☐ ☐ ☐
... do you write shopping lists? ☐ ☐ ☐
... do you read aloud, when you are alone (if you do that) ☐ ☐ ☐
... do you read aloud when other people are present (not in school, but in your free time, for pleasure). ☐ ☐ ☐

**D3** And for these activities, which language do you use?

<table>
<thead>
<tr>
<th></th>
<th>mainly in Greek</th>
<th>in both languages</th>
<th>mainly in German</th>
</tr>
</thead>
<tbody>
<tr>
<td>... do you text on your mobile?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... do you write emails?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... do you write letters, postcards or greeting cards?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

**D3.1** When you text or email in Greek, which alphabet do you use?  
☐ Greek alphabet ☐ Latin alphabet ☐ both

**D4** How often...

<table>
<thead>
<tr>
<th></th>
<th>often</th>
<th>sometimes</th>
<th>rarely</th>
</tr>
</thead>
<tbody>
<tr>
<td>... do you watch TV or films in Greek?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... do you watch TV or films in German?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... do you visit websites in Greek?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... do you visit websites in German?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... do you play video/computer games in Greek?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... do you play video/computer games in German?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... do you read books/magazines/comics in Greek?</td>
<td>☐</td>
<td>☐</td>
<td>☐ I cannot read Greek</td>
</tr>
<tr>
<td>... do you read books/magazines/comics in German?</td>
<td>☐</td>
<td>☐</td>
<td>☐ I cannot read German</td>
</tr>
</tbody>
</table>
D5  In general, how often do you communicate in each language in all your daily activities?

<table>
<thead>
<tr>
<th>Language</th>
<th>Often</th>
<th>Sometimes</th>
<th>Almost Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greek</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>German</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

D6  Which language do you usually use

D6.1  …in school?

<table>
<thead>
<tr>
<th>Language</th>
<th>Mostly Greek</th>
<th>Mostly German</th>
<th>Both the Same</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greek</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>German</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

D6.2  …your family?

<table>
<thead>
<tr>
<th>Language</th>
<th>Mostly Greek</th>
<th>Mostly German</th>
<th>Both the Same</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greek</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>German</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

D6.3  …with your friends?

<table>
<thead>
<tr>
<th>Language</th>
<th>Mostly Greek</th>
<th>Mostly German</th>
<th>Both the Same</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greek</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>German</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PART E:
CHILD’S LANGUAGE ABILITIES

E1  How well, do you think,…

<table>
<thead>
<tr>
<th>Task</th>
<th>Very Well</th>
<th>Well</th>
<th>Not So Well</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understand German</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speak German</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read German</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Write German</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

E2  How well, do you think,…

<table>
<thead>
<tr>
<th>Task</th>
<th>Very Well</th>
<th>Well</th>
<th>Not So Well</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understand Greek</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speak Greek</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read Greek</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Write Greek</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

E3  How well, do you think,…

<table>
<thead>
<tr>
<th>Task</th>
<th>Very Well</th>
<th>Well</th>
<th>Not So Well</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understand another language</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speak another language</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read another language</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Write another language</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
E4  Which language, do you think, you…

<table>
<thead>
<tr>
<th></th>
<th>Greek</th>
<th>both the same</th>
<th>German</th>
</tr>
</thead>
<tbody>
<tr>
<td>understand better</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>speak better</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>read better</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write better</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

E5  Do you prefer to speak one of the languages you know?

☐ No  ☐ Yes, which: ______________________________

E6  Do you prefer to read and write in one of the languages you know?

☐ No  ☐ Yes, which: ______________________________

PART F: LANGUAGE BACKGROUND IN THE FAMILY

F1  In your opinion, which language does your mother

<table>
<thead>
<tr>
<th></th>
<th>Greek</th>
<th>both the same</th>
<th>German</th>
</tr>
</thead>
<tbody>
<tr>
<td>understand better</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>speak better</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>read better</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write better</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

F2  Are you happy with this?  ☐ yes  ☐ I don’t mind  ☐ no

Why? ____________________________________________

F3  In your opinion, which language does your father

<table>
<thead>
<tr>
<th></th>
<th>Greek</th>
<th>both the same</th>
<th>German</th>
</tr>
</thead>
<tbody>
<tr>
<td>understand better</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>speak better</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>read better</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write better</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

F4  Are you happy with this?  ☐ yes  ☐ I don’t mind  ☐ no

Why? ____________________________________________
PART G: TRAVELLING

E.1 How often and how long in a year do you travel to Greece?
☐ never
☐ less often than once a year for how long? ________________
☐ once a year for how long? ________________
☐ 2 to 3 times per year for how long? ________________
☐ more often than 2 to 3 times per year for how long? ________________

E.2 Which language(s) do you speak, when visiting Greece?
☐ mostly Greek ☐ both languages ☐ mostly German

PART H: EVALUATION OF BILINGUALISM

F1 How important is it to you to …

<table>
<thead>
<tr>
<th></th>
<th>very important</th>
<th>important</th>
<th>not very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>…to be able to speak Greek?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>… to be able to read and write Greek?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>… ...to be able to speak German?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>… to be able to read and write German?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>……to be able to speak English?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>… to be able to read and write English?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>… …to be able to speak another language? (which?)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>… to be able to read and write another language?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

F2 Do you like learning…?
Greek: ☐ yes ☐ I don’t mind ☐ no
German: ☐ yes ☐ I don’t mind ☐ no
another language: ☐ yes ☐ I don’t mind ☐ no
F3  Are you happy learning and using those languages at school?

_____________________________________________________________________

_____________________________________________________________________

F4  Do you think that the teachers at your school think it is good that you speak both Greek and German? Or rather not? Can you give an example?

_____________________________________________________________________

_____________________________________________________________________

Is there anything you would like to add? If not, thank you very much for answering all these questions!
Appendix II

**German Questionnaire**

**For Parents of Greek-German Bilinguals in Germany**

**PART A: DEMOGRAPHIC INFORMATION**

A1 You are: ☐ female ☐ male

A2 Apart from you, how many adults in your family help to raise your child? _____

A3 You are: ☐ 25-35 years old ☐ 36-45 years old ☐ over 45 years old

A4 Your partner is: ☐ 25-35 years old ☐ 36-45 years old ☐ over 45 years old

A5 Where did you grow up?
☐ Germany ☐ Greece ☐ in both countries ☐ if elsewhere, where? ________

A6 Where did your partner grow up?
☐ Germany ☐ Greece ☐ in both countries ☐ if elsewhere, where? ________

A7 How long have you been in Germany?
☐ from birth ☐ 1-2 years ☐ 3-5 years ☐ 6-9 years ☐ over 10 years

A8 Where were your parents born?
☐ Germany ☐ Greece ☐ in both countries ☐ if elsewhere, where? ________

A9 Where do your parents live?
☐ Germany ☐ Greece ☐ in both countries ☐ if elsewhere, where? ________

A10 How long has your partner been in Germany?
☐ from birth ☐ 1-2 years ☐ 3-5 years ☐ 6-9 years ☐ over 10 years

A11 Where were your partner’s parents born?
☐ Germany ☐ Greece ☐ in both countries ☐ if elsewhere, where? ________

A12 Where do your partner’s parents live?
☐ Germany ☐ Greece ☐ in both countries ☐ if elsewhere, where? ________

A13 In which country did you attend the following levels of education:

<table>
<thead>
<tr>
<th>Level of Education</th>
<th>Germany</th>
<th>Greece</th>
<th>other Country</th>
<th>not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Education (Grundschule / Δημοτικό σχολείο)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Compulsory Secondary Education (Haupt-/Realschule / Γυμνάσιο)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Higher Secondary Education (Gymnasium / Λύκειο)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Professional training / Berufsausbildung / Τεχνική σχολή</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
A14 In which country did your partner attend the following levels of education:

<table>
<thead>
<tr>
<th>Level of Education</th>
<th>Germany</th>
<th>Greece</th>
<th>other Country</th>
<th>not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Education (Grundschule / Δημοτικό σχολείο)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Compulsory Secondary Education (Haupt-/Realschule / Γυμνάσιο)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Higher Secondary Education (Gymnasium / Δίκειο)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Professional training / Berufsausbildung / Τεχνική σχολή</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>University (Fachhochschule / Universität / Πανεπιστήμιο Ανώτατη σχολή)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

A15 What is your profession? _________________________________

A16 What is your partner’s profession? _________________________________

A17 How long do you plan to stay in Germany? Choose the answer that suits you:

☐ at most one more year
☐ 2 to 3 more years
☐ 4 to 5 more years
☐ as long as possible
☐ don’t know yet

A18 How many children do you have? _________________________________

A19 What are their ages? _________________________________

A20 When was ______________________ born? ________________ (Day/Month/Year)

A17 Where was he/she born?

☐ in Greece ☐ in Germany ☐ if elsewhere, where? ________________

A17.1 If not born in Germany, how old was he/she when he/she came to this country?

________________________
PART B: PARENTS’ LANGUAGE ABILITY & USE

B1 Which language or languages do you speak with these people? *(Please tick the boxes!)*

<table>
<thead>
<tr>
<th></th>
<th>German only</th>
<th>more German than Greek</th>
<th>both languages equally often</th>
<th>more Greek than German</th>
<th>Greek only</th>
</tr>
</thead>
<tbody>
<tr>
<td>With my partner I speak</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>With my child I speak</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>With Greek relatives and friends living in Germany I speak</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>With other Greek people living in Germany I speak</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

B2 Do you use any dialect at home? If so which one? __________________________

B3 How would you assess your language abilities in German for the following cases? *(Please tick the boxes!)*

<table>
<thead>
<tr>
<th></th>
<th>not at all</th>
<th>a little</th>
<th>adequately</th>
<th>well</th>
<th>very well</th>
</tr>
</thead>
<tbody>
<tr>
<td>... understand German when I hear other Germans speaking to one another.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... understand German when I watch TV</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... speak German</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... read German</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... write German</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

B4 How would you assess your partner’s language abilities in German for the following cases? *(Please tick the boxes!)*

<table>
<thead>
<tr>
<th></th>
<th>not at all</th>
<th>a little</th>
<th>adequately</th>
<th>well</th>
<th>very well</th>
</tr>
</thead>
<tbody>
<tr>
<td>... understands German when he/she hears other Germans speaking to one another.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... understands German when he/she watches TV</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... speaks German</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... reads German</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... writes German</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
B5  How would you assess your language abilities in Greek for the following cases? (Please tick the boxes!)

<table>
<thead>
<tr>
<th>I…</th>
<th>not at all</th>
<th>a little</th>
<th>adequately</th>
<th>well</th>
<th>very well</th>
</tr>
</thead>
<tbody>
<tr>
<td>... understand Greek when I hear other Greeks speaking to one another.</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... understand Greek when I watch TV</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... speak Greek</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... read Greek</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... write Greek</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

B6  How would you assess your partner’s language abilities in Greek for the following cases? (Please tick the boxes!)

<table>
<thead>
<tr>
<th>He/she…</th>
<th>not at all</th>
<th>a little</th>
<th>adequately</th>
<th>well</th>
<th>very well</th>
</tr>
</thead>
<tbody>
<tr>
<td>... understands Greek when he/she hears other Greeks speaking to one another.</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... understands Greek when he/she watches TV</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... speaks Greek</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... reads Greek</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>... writes Greek</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

B7  Do you know other languages than German and Greek?  ☐ Yes ☐ No

B7.1  If so, which one(s)? ______________________________________________________

B7.2  Do you use these languages at home with your family members?  ☐ Yes ☐ No

B7.3  If so, with whom?
☐ with your parents (if living with you) ☐ with your siblings (if living with you)
☐ with your partner ☐ with your kids

B8  Does your partner know other languages than German and Greek?  ☐ Yes ☐ No

B8.1  If so, which one(s)? ______________________________________________________

B8.2  Does he/she use these languages at home with family members?  ☐ Yes ☐ No

B8.3  If so, with whom?
☐ with his/her parents (if living with you) ☐ with his/her siblings (if living with you)
☐ with you ☐ with your kids
PART C: YOUR CHILD’S LANGUAGE USE IN DIFFERENT LANGUAGES

C1  As far you know, your child’s friends are:
- □ mainly children with parents from other countries (not from Greece)
- □ mainly children with Greek parents
- □ mainly children with German parents
- □ mainly children with parents from Greece and other countries

C2  Which languages does your child use with these people? (Please tick the boxes!)

<table>
<thead>
<tr>
<th>My child speaks…</th>
<th>German only</th>
<th>more German than Greek</th>
<th>same frequency in both languages</th>
<th>more Greek than German</th>
<th>Greek only</th>
</tr>
</thead>
<tbody>
<tr>
<td>...with me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>...with my partner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>...with his/her brothers and sisters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>...with other children from Greece</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>...with other Greek relatives and friends who live in Germany</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>...with other Greek adults who live in Germany</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C3  When you ask your child in German and the child responds to you in Greek, you continue the conversation in:
- □ Greek  □ German  □ not applicable

C3.1 When you ask your child in Greek and the child responds to you in German, you continue the conversation in:
- □ Greek  □ German  □ not applicable

C4  Where has your child attended primary school so far?
- □ Greece, If so, from which age? ____________________________
  for how long? ____________________________
  which grades? ____________________________
  what was the main language at the school? ______________

- □ Germany, If so, from which age? ____________________________
  for how many years? ____________________________
  which grades? ____________________________
  what was the main language at the school? ______________

C5 Does anyone help your child with his homework? □ Yes  □ No
C5.1 If so, who is this person?
☐ me  ☐ my partner  ☐ older brother or sister  ☐ someone else

C5.2 Which language is used when helping your child with homework?
☐ mainly German  ☐ mainly Greek  ☐ both languages

C6 Does your child use a computer at home?  ☐ Yes  ☐ No
[If so, please answer the questions below]

C6.1 If yes, how many hours per day does your child spend using the computer in which the child hears or uses language, e.g. playing games, exchanging messages (email, chat), reading websites, watching videos or listening to songs? _______ (hours per day)

C6.2 Which language does your child use / read / hear on the computer, in general?

<table>
<thead>
<tr>
<th>Language</th>
<th>not at all</th>
<th>rarely</th>
<th>sometimes</th>
<th>often</th>
<th>very often</th>
</tr>
</thead>
<tbody>
<tr>
<td>in Greek</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>in German</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>in another language</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

C7 How often does your child communicate in different languages every day (for all daily circumstances)?

<table>
<thead>
<tr>
<th>Language</th>
<th>not at all</th>
<th>rarely</th>
<th>sometimes</th>
<th>often</th>
<th>very often</th>
</tr>
</thead>
<tbody>
<tr>
<td>in Greek</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>in German</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>in other languages</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

PART D:
ACQUISITION & DEVELOPMENT OF YOUR CHILD’S LANGUAGE ABILITY IN GERMAN AND PARENTAL EFFORTS IN TERMS OF THE DEVELOPMENT OF GERMAN

D1 How would you assess your child’s language abilities in Greek for the following cases?

<table>
<thead>
<tr>
<th>My child…</th>
</tr>
</thead>
<tbody>
<tr>
<td>… understands German when he/she hears other Germans speak to one another.</td>
</tr>
<tr>
<td>… understands German when he/she watches TV</td>
</tr>
<tr>
<td>not at all</td>
</tr>
<tr>
<td>☐</td>
</tr>
<tr>
<td>☐</td>
</tr>
<tr>
<td>... speaks German</td>
</tr>
<tr>
<td>... reads German</td>
</tr>
<tr>
<td>... writes German</td>
</tr>
</tbody>
</table>

**D2** Does he/she also use Greek words when speaking German?  
☐ almost never  ☐ rarely  ☐ sometimes  ☐ often  ☐ almost always

**D3** At what age was your child’s first regular contact with the German language?  
(Choose the answer that most closely matches your situation, starting with the boxes on the left and then tick for the reason why or give it to us.)

☐ from birth  
☐ because you spoke German too  
☐ because you only spoke German  
☐ because:____________________________________________________

☐ between 1 and 3 years:  
☐ because you started to speak German to him/her  
☐ because childcare was provided by German speakers  
☐ because:____________________________________________________

☐ after 4:  
☐ because you started to speak German to him/her  
☐ because he/she went to a German kindergarten  
☐ because:____________________________________________________

☐ after 6:  
☐ because it was then that he/she came to Germany  
☐ because he/she went to German school for the first time  
☐ because:____________________________________________________

**D4** Were there periods during which your child did not have contact with the German language since he/she began to use it (e.g. because he/she returned to Greece for a few months)?  
☐ Yes  ☐ No

**D4.1** If so, please indicate at what age this happened and for how long.  
____________________________________________________________________

**D5** From how many different people does your child hear German?  
☐ teachers  ☐ classmates  ☐ relatives  ☐ family friends  ☐ friends

**D6** Do make any effort to help your child to learn German or improve his/her German, or have you done so?  
☐ Yes  ☐ No
D6.1 If so, select all of the following possibilities that apply:
☐ We try or tried to always speak German to him/her.
☐ We make sure or made sure that he/she watches German TV programs, etc.
☐ We read German books to him/her or we used to, when he/she was small.
☐ We make or made sure that he/she reads German books.
☐ We help or helped him/her with his/her homework in German.
☐ He/she has or had additional lessons in German.
☐ Other: ____________________________

D6.2 If your child attends or has attended additional German lessons, please tick the box that explains how this was done…
☐ My child has or has had additional private German lessons.
☐ My child attends or has attended additional German lessons at school.

D6.3 If your child takes or has taken additional lessons in German, privately or in school, please let us know since when he/she attends or attended these lessons:
• since/for __________ years or
• since/for __________ months.

D6.4 How often does or did he/she attend these lessons?
The lessons take/took place ________ times a week and last for ________ minutes.

D6.5 If your child attends or has attended additional German lessons, why have you chosen this particular way of support?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

D7 How does or did your child react to your efforts to help him/her learn German?
☐ very negative ☐ negative ☐ indifferent ☐ positive ☐ very positive

D8 How important is it for you that your child learns German well?
☐ not at all ☐ a little ☐ quite important ☐ very important ☐ absolutely

D8.1 Why? (Note the most important reasons, in your opinion)
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
PART E:
ACQUISITION & DEVELOPMENT OF YOUR CHILD’S LANGUAGE ABILITY IN GREEK AND THE PARENTAL EFFORTS IN TERMS OF THE DEVELOPMENT OF GREEK

E1 How would you assess your child’s language abilities in Greek for the following cases?

<table>
<thead>
<tr>
<th>My child…</th>
<th>not at all</th>
<th>a little</th>
<th>adequately</th>
<th>well</th>
<th>very well</th>
</tr>
</thead>
<tbody>
<tr>
<td>… understands Greek when he/she hears other Greeks speak to one another.</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td>… understands Greek when he/she watches TV.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>… speaks Greek</td>
<td>☐</td>
<td>☑</td>
<td>☐</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>… reads Greek</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>… writes Greek</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>☐</td>
<td>☑</td>
</tr>
</tbody>
</table>

E2 Does he/she also use German words when speaking Greek?
☐ almost never    ☐ rarely    ☐ sometimes    ☐ often    ☐ almost always

E3 At what age was your child’s first regular contact with the Greek language? Choose the answer that most closely matches your situation.
☐ from birth
  ☐ because you spoke Greek too
  ☐ because you only spoke Greek
  ☐ because:________________________________________________________

☐ between 1 and 3 years:
  ☐ because you started to speak Greek to him/her
  ☐ because childcare was provided by Greek speakers
  ☐ because:________________________________________________________

☐ after 4:
  ☐ because you started to speak Greek to him/her
  ☐ because he/she went to a Greek kindergarten
  ☐ because:________________________________________________________

☐ after 6:
  ☐ because you started to speak Greek to him/her
  ☐ because he/she went to a Greek school for the first time
  ☐ because:________________________________________________________
E4  Were there periods during which your child did not have contact with the Greek language since he/she began to use it?
☐ Yes    ☐ No

E4.1 If so, please indicate at what age this happened and for how long?
_____________________________________________________________________

E5  From how many different people does your child hear Greek?
☐ teachers    ☐ classmates    ☐ relatives    ☐ family friends    ☐ friends

E6  Do do anything in order for your child to improve his/her Greek, or have you done so?
☐ Yes    ☐ No

E6.1 If so, select which of the following apply.
☐ We always try or have tried to speak Greek with him/her.
☐ We make sure or have made sure that he/she watches Greek TV programs, etc.
☐ We read or have read Greek books to him/her or we used to, when he/she was small.
☐ We make sure or have made sure that he/she reads Greek books.
☐ We help or have helped him/her with his/her homework in Greek.
☐ We send or have sent him to additional Greek classes.
☐ Other: ____________________________________________________________

E6.2 If your child attends or has attended additional Greek lessons, please tick the box that explains how this was done…
☐ My child has or has had additional private Greek lessons.
☐ My child attends or has attended additional Greek lessons at school.

E6.3 If your child takes or has taken additional lessons in Greek, privately or at school, please let us know since when he/she attends these lessons:
  • since/for ________ years or
  • since/for ________ months.

E6.4 How often does or did he/she attend these lessons?
The lessons take/took place ________ times a week and last for ________ minutes.

E6.5 If your child attends or has attended additional Greek lessons, why have you chosen this particular way of support?
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

E7  How does or did your child react to your efforts to help him/her learn Greek?
☐ very negative    ☐ negative    ☐ indifferent    ☐ positive    ☐ very positive

E8  How important is it for you that your child learns Greek well?
☐ not at all    ☐ a little    ☐ quite important    ☐ very important    ☐ absolutely
PART F:
YOUR CHILD’S KNOWLEDGE & USE OF OTHER LANGUAGES

F1  Does the child hear another language in the family?
☐ Yes  ☐ No
F1.1 If so, which one? _________________________________
F1.2 Who speaks this language in the family?
☐ me  ☐ my partner  ☐ both parents  ☐ grandparents  ☐ siblings

F2  How well does your child know this language?

<table>
<thead>
<tr>
<th>My child…</th>
<th>not at all</th>
<th>a little</th>
<th>adequately</th>
<th>well</th>
<th>very well</th>
</tr>
</thead>
<tbody>
<tr>
<td>… understands when he/she hears others to talk to each other</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>… understands when he/she watches TV</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>… speaks</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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F3  Does the child attend any courses in other languages besides Greek and German?
☐ Yes  ☐ No
F3.1 If so, which one(s)?
☐ English  ☐ French  ☐ Spanish  ☐ Italian  ☐ other: ______________________
F3.2 How many hours per week? _________________________________

F4  Has the child lived permanently in another country except for Greece and Germany?
☐ Yes  ☐ No
F4.1 If so, in which country and for how long?
____________________________________________________________________
F4.2 Did he/she attend school in this country?  ☐ Yes  ☐ No
F4.3 If so, for how long? _________________________________
PART G:
DIFFICULTIES WITH YOUR CHILD’S LANGUAGE DEVELOPMENT

G1 Does your child have a hearing problem or has he/she ever had one?
☐ Yes ☐ No

G2 Does your child have problems with the languages that he/she speaks or has he/she ever had any (e.g. difficulties with the pronunciation of sounds or words)?
☐ Yes ☐ No

G2.1 If so, in which language? ☐ German ☐ Greek ☐ both

G2.2 Can you describe these problems?
______________________________________________________________________________________________
______________________________________________________________________________________________

G3 Does your child have any reading or writing problems or has he/she ever had any?
☐ Yes ☐ No

G3.1 If so, in which language? ☐ German ☐ Greek ☐ both

G3.2 Can you describe these problems?
______________________________________________________________________________________________
______________________________________________________________________________________________

G4 Is there anything that you would like to add or let us know about?
______________________________________________________________________________________________
______________________________________________________________________________________________

Thank you very much for your cooperation!
Appendix III
Character tracking modeling

*Image 1. Tracking of story characters*

*Image 2. Interweaving of story characters*