Bilingual Preschools

Volume I

Learning and Development

Edited by Kristin Kersten, Andreas Rohde,
Christina Schelletter, Anja K. Steinlen

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Table of Contents

Introduction

The recent and intensified implementation of early foreign language education in European policies shows how multilingual competence has become increasingly important in a globalised world:

> Language competencies are part of the core of skills that every citizen needs for training, employment, cultural exchange and personal fulfilment … It is a **priority for Member States** to ensure that language learning **in kindergarten and primary school** is effective, for it is here that **key attitudes towards other languages and cultures** are formed, and the foundations for later language learning are laid, … **in particular by teaching at least two foreign languages from a very early age**.[1]

Early bilingual programmes are one of the most successful options to address the need for early foreign language education. However, compared to research in primary and secondary schools, there are very few systematic large-scale studies on very young learners at the preschool level.

The two volumes of this publication aim to fill this gap in the current research debate. They provide an insight into research studies which were carried out in eleven different bilingual preschools across Europe. The studies derive from a multilateral EU Comenius project carried out in Germany, Belgium, Sweden and England between 2008 and 2010. The ELIAS project (Early Language and Intercultural Acquisition Studies) comprises eighteen partners including academic and educational institutions, preschools, as well as the Magdeburg Zoological Garden in Germany. Under the lead management of Otto von Guericke University Magdeburg, every bilingual preschool in the project has been monitored by researchers over the last two years. The studies cover first and second language acquisition[2] of the children, the language input of the preschool teachers[3] who provide the input in the second language (L2) to the children, as well as intercultural education and bilingual environmental education ("green immersion") at the zoo preschool in Magdeburg.

More than 400 children and over 20 L2 preschool teachers participated in the ELIAS studies. To our knowledge, the project represents the largest longitudinal study in European preschools to date. The research team combined qualitative and quantitative approaches. Field observations and data elicitation were carried out by participant observers who took part in the daily preschool routines once a week over a span of two years between 2008 and 2010. Where possible, the team used existing data elicitation procedures. However, due to the special focus on very young learners not all required

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1 European Commission: *Promoting Language Learning and Linguistic Diversity: An Action Plan 2004 – 2006* (p. 8), emphases added.

2 The terms 'second language' and 'foreign language' are used interchangeably throughout the book.

3 Due to the vast differences in preschool terminology throughout Europe, educators and other pedagogical staff in the preschools is referred to as 'preschool teachers,' independent of the pedagogical approach used in the respective institution.

tools were available on the market. Thus, an observation checklist for the input of the L2 teachers, a score for the intensity of the L2 input, a comprehension test for grammatical phenomena, a field guide for the observation of intercultural encounters, and an observation tool for green immersion were developed by the research group. They represent an innovation to systematic data elicitation at preschool level.

Volume I presents the results of the different research studies in detail. It has a strong theoretical and empirical focus and is aimed at the research community in the fields of first and second language acquisition, intercultural communication, environmental education and foreign language teaching. The volume begins with a study on the L2 teachers' input and its relation to the results of the test results by Martina Weitz and her team. The data were elicited with a newly developed ELIAS observation tool, the IQOS (Input Quality Observation Scheme). In the following four chapters, the results of the language studies are presented, starting with Andreas Rohde's paper on L2 lexical comprehension based on the standardised and readily available BPVS II (British Picture Vocabulary Scale II), and Steinlen et al.'s paper on the comprehension of L2 grammatical phenomena based on the ELIAS L2 grammar comprehension test. Christina Schelletter & Rachel Ramsey's chapter includes comparison data of monolingual and bilingual speakers in England on both comprehension tests. Steinlen et al. then go on to describe the children's first language acquisition in the German project preschools, which is based on the standardised SETK test. Kersten et al. introduce a new angle to the preschool studies, describing the intercultural encounters observed in bilingual preschools between children of various cultural backgrounds, and between children and their non-native teachers who provide the L2 input in each programme. This paper develops categories of ICC observation, which present a new step in the research on intercultural behaviour of very young children. The following two chapters by Shannon Thomas and Inge Strunz & Shannon Thomas focus on research in the zoo preschool. Thomas identifies stages of development in the L2 encounters with nature and animals while Strunz & Thomas include the perspective of parents and teachers on the reactions of the children at the zoo preschool. Volume I concludes with a presentation of the profiles of each project preschool. Insa Wipperman & Christine Tiefenthal take various factors into account which constitute the unique structure of each programme and which help understand the multifaceted nature of preschools that the research studies were faced with. This final chapter may serve as a detailed reference point for the data presented in the preceding sections.

Volume II, on the other hand, contains a description of best practices in various different bilingual preschool programmes as well as background information on important preschool-related topics, which was derived from teacher training units developed in the ELIAS framework. It is of interest for practitioners, teachers and other educational staff, parents, politicians and researchers alike. The volume starts out with Henning Wode's introduction to bilingual preschools on the European level, which gives an example of a successful model of bilingual immersion education from preschool to high school in Kiel, Germany. The second chapter summarises the most important research

results from the first volume. It gives an insight into the studies without going into too much technical detail for the convenience of the reader. This chapter simultaneously constitutes a part of the project's final report (www.elias.bilikita.org). In the third and fourth chapter, a team of authors develop practical guidelines for the implementation of bilingual preschools and the role of language interaction between the L2 teachers and the children in the bilingual programme. The following part contains four chapters by Andreas Rohde, Ute Massler, Shannon Thomas and Christine Tiefenthal, which give introductory insight into the fields of second language acquisition, intercultural communication, green immersion and the development of learning materials for bilingual preschools.

The two volumes together give a comprehensive overview of research studies carried out as part of the ELIAS project as well as practical aspects of bilingual preschool education. They highlight the project's interdisciplinary approach to the both fresh and exciting research field of bilingual preschools in Europe. The editors hope that the studies presented in this two-volume work will foster theory construction in second language acquisition to pave the way for future studies, and that the chapters will be informative and inspirational to anyone involved in bilingual preschool education. The work has just begun.

This immense work would not have been possible without the tremendous help from over 60 members of the ELIAS team, and from many more colleagues and friends. We are very grateful for all the expertise and time they devoted to the project. A very special thanks must firstly go to the group of participant observers who contributed the data to the studies: Aafke Buyl, Maria Büllesfeld, Jutta Daszenies, Anna Flyman Mattsson, Lydia Gerlich, Lena Gotthardt, Sylvia Luft, Svenja Pahl, Rachel Ramsey, Annelie Schober, Marion Salentin, Ramona Thierer, Shannon Thomas, Martina Weitz, and Insa Wippermann. Their tasks were multifaceted, and their talents were required on many different levels. Not only did they have to make systematic observations, collect the data in the preschools and contribute to data analysis, they also functioned as an important connecting link between the preschools with their children and staff, and the research teams. The Zoological Garden in Magdeburg opened its gates for children and adults alike. The team shared their expertise on nature topics and, on top of that, left us with many unforgettable experiences of the animal world. Elke Kalbe and Dario Klemm provided us with a sound statistical analysis and an important focus in what at times seemed an overwhelming amount of data. Alexandra Hähnert, Jessica Levin and Reiner Lauer spent countless hours helping with the editorial process. We have to express our gratitude and appreciation for their patience and their keen eye for details. The European Commission provided us with a financial grant within the LLP Comenius Programme, which made the work possible in the first place.[4] We would also like to thank our partner institutions, and especially the English Department at Magdeburg

4 These volumes reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

University, directed by Holger Kersten, for making available substantial additional resources without which the work could not have been completed. The administration of the project turned out to be more challenging than expected, and we are grateful to all administration staff at our various institutions, notably Veronika Kauert and the team at Magdeburg University, and above all to Jane Gronner, the financial manager, whose relentless initiative in countless hours of work and her unparalleled communicative skills guaranteed a smooth and competent process at all times. Thanks also have to go to representatives at the political level for their support, first of all to Norbert Bischoff, Minister of Health and Social Affairs in Saxony-Anhalt, Germany, and patron of the project's final conference, Thomas Gericke from the Ministry of Health and Social Affairs, and Dr. Uwe Birkholz from the Ministry of Education and Cultural Affairs in Saxony-Anhalt. Most of all, however, we would like to thank our preschool partners for their contributions: the staff for their competent teaching and partnership, the parents for their confidence in the project and their time filling out our questionnaires, and last but not least all the children for their enthusiasm and their willingness to let us share their openness and their enthusiasm in learning. Apart from gaining important academic insights into their development, it has been a pleasure accompanying them in these steps over the last two years and sharing their excitement for the new language and all the persons they encountered with it.

Magdeburg, Cologne, Hatfield, and Kiel, October 2010,

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The Input Quality Observation Scheme (IQOS): The Nature of L2 Input and its Influence on L2 Development in Bilingual Preschools[1]

Martina Weitz, Svenja Pahl, Anna Flyman Mattsson, Aafke Buyl, Elke Kalbe

1. Introduction

The role of input and interaction in second language acquisition

Second language input has been discussed in several studies supporting different views of the role that input may play in second language acquisition. That input is necessary in second language acquisition is beyond doubt; the subject of the debate, however, has been what the input should look like and how acquisition is achieved as a result. One of the most influential theoretical positions has been the one proposed by Krashen in his Input Hypothesis, where he claims that comprehensible input is the single crucial and necessary factor in acquiring a language and that input becomes comprehensible through simplification and with the help of contextual and extralinguistic clues (Krashen 1981).

The role of comprehensible input in second language acquisition was further stressed by Michael Long (1981), but with a greater emphasis on interactive input. Long does not deny simplification and context being influential but claims that it is the interactional modifications that occur in negotiating meaning when a communication problem arises that makes input comprehensible rather than the non-interactive input modifications. In interactional modifications, he includes features such as clarification requests and confirmation checks used by the listener, and comprehension checks used by the speaker.

In addition to comprehensible input, Merrill Swain pointed to comprehensible output as a crucial factor in negotiation of meaning that leads the learners to native-like speech (Swain 1985). In producing the target language, the learners will discover gaps in their interlanguage and thus become aware of a linguistic structure through feedback. The learner moves from primarily semantic processing in trying to understand the input, to syntactic processing in producing sentences in the target language. Output

1 We are very grateful to Maria Büllesfeld, Lydia Gerlich, Sylvia Luft, Marion Salentin, Annelie Schober, Anja Steinlen, Ramona Thierer, and Insa Wippermann for the data elicitation and their valuable feedback on previous drafts of the IQOS. Furthermore, we are especially indebted to Gisela Håkansson, Kristin Kersten, and Andreas Rohde for all the fruitful discussions and their contributions to the text. Last but not least, we would like to thank Dario Klemm for the statistical analyses.

gives the learner opportunities to formulate and test hypotheses, and thereby use the output to try out new language forms and structures (Swain 1998).

When language learners produce output, feedback becomes an important part of second language development. Basically, two types of feedback can be identified in the classroom: positive feedback that usually consists of praise or repetition of the learner's utterance; and negative feedback, which is generally known as error correction. Especially negative feedback has been subject to studies that evaluate its effect on language acquisition. The most common form of negative feedback by teachers is a recast of the learner's utterance (*"I goed there yesterday" "Oh you went there yesterday").* This type of implicit feedback, however, has shown to be less effective in communicatively oriented classrooms than in form-focused ones (Lyster & Mori 2006). The relation between recasts and acquisition, however, has not yet been solved, and a lot more research is needed. Research on feedback in the classroom is very complex; the amount and types of feedback differ according to variables such as instructional setting, linguistic type (phonological, lexical, syntactical, etc.), level of instruction, activity type, and the individual teacher.

Input directed to children and non-native speakers often differs in a systematic way from that directed to adult native speakers. Numerous studies have been carried out on the characteristics of child-directed speech (CDS, cf. section 2, this chapter) and foreigner talk (FT) showing facilitating features like slow speech rate, long pauses, exaggerated articulation as well as basic vocabulary and simplified grammatical structures (Wesche 1994). Studies have also been conducted on how teachers modify their language to second language students (teacher talk), which show similar features, with the exception of more grammatically correct utterances. Adapted speech as described above is mostly performed unconsciously but is yet adjusted to the receiver's language proficiency level (Håkansson 1987). Foreigner talk and child-directed speech are commonly used, although studies of various speech communities have revealed that children learn to speak their language age-adequately without being addressed with CDS. Also, many second language learners succeed without any specific input simplification. Still, it is widely accepted that second language development depends upon input that is modified to be comprehensible for the learner, either through structural changes or some way of contextualisation.

Observation schemes: Input and interaction in the L2 classroom

One of the ELIAS project's aims was to investigate the nature of input provided in bilingual preschools and, therefore, to develop an instrument which is able to capture the quality of the input offered by the L2 teachers. The assumption then is that the quality of input matters in SLA,[2] i.e. that a qualitatively more beneficial input correlates with

2 In our understanding, the term *input quality* comprises both qualitative and quantitative aspects. However, it exclusively refers to the input which is provided by one particular person, i.e., it is concerned with one particular person's use of his or her L1 (the children's L2) when interacting

a more successful L2 development. As quantifiable data can be compared more easily, the ELIAS team aspired to develop a quantitative observation tool to gather quantifiable data in the different preschools which would describe the input and interactive features used in the preschool settings. Prior quantitative observation methods served as a first point of departure.

Quantitative observational research is usually

> based on an observation scheme or descriptive categories that have been developed prior to the research. Moreover, these observations are made in a planned way, according to an order determined by the design of the research, and with categories that cannot be changed once the research is underway (Chaudron 2000: 7).

As the interest in second language teaching, and especially in input and interaction in the L2 classroom, through classroom observation grew in the 1980s, several systematic observation schemes were developed. The main purpose of these schemes was to capture aspects of the classroom that were assumed to contribute to language learning, although the schemes were directed towards different types of aspects and thus varied in their outline. One of the earlier models, which served as a starting point to a lot of researchers, was Flanders' 'Interaction Analysis' that had been proposed two decades earlier (1960). Flanders' view of effective teaching was that teachers' influence on learners should be indirect rather than direct, which could be observed through a schedule of ten categories. Interaction Analysis was further developed by Moskowitz (1971) into what she referred to as FLint (Foreign Language interaction), giving a more linguistic perspective to a general educational schedule and also combining two purposes of the schedule: a research tool to identify "good" language teaching and the more traditional teacher training tool (i.e. a means of raising the teachers' awareness for their way of teaching). Another frequently used observation schedule, primarily aimed at language teacher training, was proposed by Fanselow (1977). Even though this schedule, called FOCUS (Foci for Observing Communications Used in Settings), was developed as a teacher training tool, its number of categories for describing interaction may also be put to work in other interactive situations. Ullman & Geva (1983) combined two instruments in one scheme with TALOS (Target Language Observation Scheme) whose first part is rated in real-time in the classroom and the second after the lesson. Such a comparison ensures a better control of interrater agreement. The most well-known and used observation scheme is COLT (Communicative Orientation of Language Teaching), developed by Allen et al. (1984). At the time when the COLT

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with preschool children. Quite obviously, people differ in their language use: some tend to use more words than others when communicating which may be due to manifold reasons such as temperament, etc. These *quantitative* differences will also be captured in the instrument which aimed at an analysis of input quality. *Opportunities for input* (i.e. the quantitative aspect, the intensity of input), however, will be seen as a different independent variable (cf. section 4.5.1, this chapter) which is not concerned with the specific language use of one particular L2 teacher, but with external circumstances (such as opening hours of the preschool, L2 teachers' attendance time, etc.), which are not determined by the way a certain L2 teacher uses the L2. For a more detailed distinction of opportunities for input and input quality cf. section 4.5, this chapter.

scheme was being developed, communicative language teaching was at its peak and the notion of communicative competence (proposed by Hymes 1972) influenced contemporary teaching methods and consequently also the observation schemes. COLT was developed with the purpose of investigating the effects of instructional variables on learning outcomes and aimed at a systematic description of instructional practices and procedures in different L2 classrooms. One of the main questions for the authors was whether more or less communicatively oriented instruction had different effects on L2 development, the underlying thought at the time being that only communicative teaching was effective. Since the scheme is focused on what takes place in the classroom, such as type of activity, language use, and interactive features, and on language production rather than on any particular method of language instruction, COLT is still very useful in classroom research more than two decades later.

Yet, as the ELIAS project is concerned with immersion preschool settings, which differ in many respects from the L2 classroom, the existing observation schemes could not be transferred directly to the ELIAS project's needs. Hence, although already existing observation schemes served as an important basis for the development of the ELIAS observation scheme, a new observation tool had to be designed which would account for the peculiarities of the preschool setting.

Observational research in bilingual preschools

Though the ELIAS team strove to develop a quantitative observation scheme to collect quantifiable data in the different preschools, the development of this instrument was both quantitative and qualitative in nature.

One drawback of the above-described quantitative type of observation, i.e. systematic observation, is that observation categories need to be determined at the onset and thereby other potentially important aspects might be missed. Hence, instead of implementing one fixed observation scheme from the start, the ELIAS team developed a final draft of the IQOS after using more than 10 different observation scheme drafts within a 12-month-pilot phase.[3] Starting off with a set of categories which were partly taken from already existing observation schemes and partly developed systematically from research on first language acquisition (FLA) and second language acquisition (SLA) (cf. section 2), the ELIAS team recurred to the qualitative approach of less structured observations in order to refine and improve the observation scheme.

According to Mackey & Gass (2005: 162f.), qualitative research usually aims at the provision of careful and detailed descriptions and a holistic representation of the field of interest. Moreover, it "often follows an inducive path that begins with few perceived

3 In each of the participating ELIAS preschools, up to three university members (student assistants, research assistants or professors) would spend approximately 5 hours per week observing and participating in the daily routines and getting to know the children and staff. Furthermore, the *observers* subsequently administered the language tests (cf. Rohde, this volume; Steinlen et al., this volume).

notions, followed by a gradual fine-tuning and narrowing of focus" (Mackey & Gass 2005: 163).

The aim of the less structured observations was therefore to collect data (via field notes, visual recordings, etc.) which would allow for the identification of factors which seem especially conducive to language learning. Information thus gained by the observers was used to continuously discuss among the team members which aspects needed to be captured in the IQOS and how to modify the scheme.

Doing field research and carrying out observations, however, always entails the risk of, unwillingly, influencing the subjects' behaviour or the particular situation by the observers' mere presence. An overt form of observation (i.e. in which the subjects know that they are being observed) might lead to further behavioural modifications (cf. Bortz & Döring 2006: 267f.) due to the subjects' conscious or unconscious attempt to conform to the observer's expectations. The fact that subjects of interest may behave differently (or "better," respectively) due to an observer's presence and due to the fact that they are aware of being observed has become known as "observer's paradox" (or "Hawthorne Effect," respectively, cf. Mackey & Gass 2005: 167). According to Mellow et al. (1996), however, this effect seems to decrease in research designs in which the observer(s) spend a lot of time with the research subjects "as students and teachers begin to feel more comfortable and natural about being observed" (Mackey & Gass 2005: 188). Accordingly, it was assumed that due to the observers' weekly presence (and their, at times, active engagement in, e.g., play and story telling activities), both children and early childhood teachers got used to and felt at ease in the observers' presence.

The qualitative method of less structured observation significantly contributed to the development of the final observation scheme, which attempts to capture and analyse the nature of L2 input (cf. section 2.). The ELIAS project, thus, strove for a triangulation of quantitative and qualitative data in order to seize as many details and factors as possible which are likely to contribute to successful SLA in bilingual preschools.

2. The Input Quality Observation Scheme (IQOS)

As mentioned before, several existing observation schemes are available to evaluate the communicative level of foreign language teaching, classroom behaviour, or the use of the target language in the foreign language classroom. The categories in these checklists needed to be modified in the IQOS as it is an observation scheme for bilingual *preschool* settings, which obviously differ from classroom settings. Categories needed to be formed according to the various preschool settings, and they needed to account for daily routines and typical language behaviour when dealing with children from one to six years of age.

As stated in the introduction, the IQOS was developed on the basis of both existing categories and those which were refined and further developed during the ongoing

process of observing. Each week, the ELIAS observers spent a couple of hours in the preschools, taking part in the daily activities and communicating in the preschool's L2 English. By thus enabling the children and the teachers to get used to their presence, the observers tried to decrease the amount of influence which their mere presence may have had on a subject's behaviour (cf. section 1).

Just as COLT or TALOS, the IQOS is an instrument that uses a systematic approach to observations, i.e., it clearly states what is to be observed (and thus excludes aspects which are irrelevant for the purpose of the study), by whom and when the observations should take place, and how the observed behaviour should be recorded (Bortz & Döring 2006: 270). The aim of the IQOS is to compare different L2 preschool teachers with regard to their language use and to relate the obtained data to the children's L2 development. We therefore chose a quantitative observation tool over purely ethnographic observations in order to allow for better comparability of the collected data in the various preschools.

In order to capture the variety of preschool settings and the varying communicative contexts that are observed, the IQOS distinguishes between *situation* and *activity*, *situation* being the overall context in which a particular activity takes place (e.g. a regular sequence or a daily routine, such as the morning circle) and *activity* being a smaller unit (among others) within a given situation (e.g. story telling). This distinction is a means of classifying the observations and marking off different sequences that are observed and, by this, establishing a common ground to start with. Limiting the possible types of interactions that can be observed renders the collected data more comparable as similar activities can now be compared to each other.

In spite of the various differences among the preschools (concerning their pedagogical concept, the number of L2 teachers, group structure, etc.), similar daily routines could be found for all 9 preschools. The following situations and activities were agreed upon:

Situations: 1. breakfast, 2. morning circle, 3. free play, 4. guided task and 5. outdoors.

The suggested activities within these situations include: 1. free conversation, 2. games/ songs, 3. story telling, 4. organisational routines, and 5. others, for all those activities that cannot be included in one of the other four types. Longer-lasting activities should be re-evaluated after 10 minutes in order to reconsider their status and to decide whether the quality of input has changed.

The IQOS incorporates both low-inference and high-inference categories (cf. Mackey & Gass 2005: 191ff.). Low-inference categories do not require any judgement and comprise general information, such as the above mentioned categorisation of situation and activity or the duration and the overall focus of the activity (i.e. form, when the activity is clearly language centred; form in a communicative context, when specific linguistic elements are emphasised and embedded in the context of a game/song, or meaning, e.g. genuine discussions or conversations which clearly focus on the con-

tent). Furthermore, the categories include information on the number of children who are participating, their average age, etc.[4] Low-inference categories are used in order to obtain background information on the setting of the activity and to facilitate a general description of the observed sequence. Some of the information might also be used in order to compare the input addressed to younger or older children, or for analysing whether the input quality changes when native speakers of English are part of the group, etc. These are, however, aspects that need to be addressed in further studies.

The second part of the observation scheme comprises high-inference categories, i.e. categories which require more judgement and interpretation on the part of the observer. The observer has to decide whether a certain feature is present to a "very low," "low," "high" or "very high" degree. According to what is seen as *best practices* in the literature and what the ELIAS team considered to be beneficial in SLA in the preschool context, a high use of a certain feature is believed to have a positive effect on the children's L2 development. In order to guarantee a high interrater reliability, the range of possible interpretations needs to be limited. This is achieved by providing both detailed guidelines for each category and examples of rated activities (see section 3.4 on standardisation for more detailed information).

Before further discussing the individual categories, it is crucial to mention the L2 teacher's primary task. As we assume that the three components input, interaction and output play a crucial role in second language development (see above), the L2 teacher needs to provide comprehensible input. Furthermore, the input needs to be rendered comprehensible by different means (interaction, contextualisation, i.e. non-verbal behavior, etc.) and the L2 teacher has to create opportunities for the children to actively use the L2. In the following, these supercategories, i.e., quantity, input characteristics, promoting comprehension, output, and children's reactions will serve as a framework to discuss the individual *high-inference categories*.

High inference categories

a) Quantity

Category	Guideline Description
L2 Amount	How much input is offered to the children? This category is important in order to distinguish between more introverted and more extroverted teachers, as these characteristics influence the amount of input the children get. As there are no clear-cut definitions as to what is considered as a very high or very low amount of input, observers may compare different teachers with each other within the restraints of the activity (i.e. during a football game there is probably less talking than in a one-to-one conversation, nevertheless it is possible for teacher A to talk more during that football game than teacher B).
Absence of L1 use / translation	Does the teacher address the children in their L1 and/or translate her utterances into the children's L1? The category would be graded as high (or very high) if the teacher constantly addresses the children in their L2 (as L1 use / translations are absent and not present).

4 For a more detailed overview see Appendix.

L2 amount

With reference to Krashen's Input Hypothesis (1982), a language learner needs to receive language input in order to learn the language. This category refers to the amount of input provided by one particular person, i.e. it is concerned with one particular person's target language use when interacting with preschool children. Quite obviously, people differ in their language use: some tend to use more words than others when communicating. The category thus allows for a distinction between, e.g., more introverted and more extroverted teachers; furthermore, this category codes whether the teacher uses the multiple opportunities to offer L2 input to the children or not.

Absence of translation / L1 use

"Absence of translation" of L2 data into the children's L1 deals with the consistent use of the L2 by the L2 teacher and the question whether he or she switches languages. One of the key features of immersion "teaching" is to enable the learners to experience the target language as an authentic means of communication, as a language system that is capable of transmitting everything that a speaker wants and needs to express and which is as rich and powerful as the learner's first language.

Various case studies of children who are raised bilingually by their parents suggest positive effects on language acquisition (and the future active use of two languages) when languages are used consistently by one person (cf. Harding and Riley 1986, Hoffmann 1985, Porsché 1983, Ronjat 1913, Saunders 1982, 1988, Taeschner 1983). This seems to be especially important with regard to the minority language, i.e., the language that is not the ambient language, as quite often input is only given by one person. Different reasons for the positive effects of consistency in language use are suggested in various studies on simultaneous bilingual language acquisition (for an overview cf. Döpke 1992: 13ff.). With reference to these findings, switching between the children's L1 and the target language can give the children the impression that the L2 is not capable of expressing everything that the learner needs to express. Furthermore, in case of translations into the children's L1, children may stop trying to make sense of what is said and wait for the translation instead. This can have serious effects on their L2 development as negotiation of meaning is seen as a crucial factor in language acquisition (cf. Long 1981, 1996). Moreover, the L2 would not be used as an authentic means of communication, but become a "pretend-language" which seems to be implemented for educational reasons only. This is not in line with the idea of immersion and, as several ELIAS observers have experienced, seems to be quite demotivating for the children.

Thus, code switching by the L2 teacher and translations into the children's L1 do not seem favourable and should therefore be avoided. Hence, the axiom of *one person – one language*, mentioned as early as 1913 in Ronjat's account on the bilingual upbringing of his own child ("une personne, une langue") has long been an essential principle in immersion preschool programmes (Kersten et al. 2009, Snow 1987).

b) Input Characteristics

Category	Guideline Description
Adapted speech	Does the teacher use a higher pitch, a slower rate of speech and stress and intonation to highlight parts of speech when addressing the children? This category is exclusively concerned with articulation; i.e. other features of child directed speech, such as adapted vocabulary, modified syntax or various strategies which are used to promote comprehension are not included here.
Varied input	Does the teacher offer a wide range of vocabulary, and complex and varying syntactic structures? The category would be graded as low (or very low) if the teacher's vocabulary was very limited and if she frequently offered the same phrases and/or structures within an activity.
Ritualised language	1. Does the teacher use formulas which are frequently used in the respective preschool (e.g. "It's tidy up time")? 2. Does the teacher use the same words / the same phrases (within an activity) very often and does the teacher repeat his or her own utterances?
Verbal acknowledgment of children's interactional moves	Does the teacher **verbally** show appreciation of the children's attempts to communicate / to interact with them? Verbal acknowledgment does not only include praise or positive reactions; not allowing children to play somewhere (or to use specific materials) can also be an appropriate reaction to the child's request.
Focus on form	Does the teacher explicitly reflect upon language and linguistic structures together with the children? Does the teacher attempt to raise the children's metalinguistic awareness?

Is there a form of input which seems particularly conducive to second language development? The five categories under the heading "input characteristics" capture different aspects which have been put forward by various SLA researchers as having a positive influence on L2 learning.

Adapted speech

Numerous studies have been carried out on the characteristics of CDS as an adapted form of input which aims at fostering language development in children (cf. Gallaway & Richards 1994, Solokov & Snow 1994). CDS (also referred to as *motherese*; Newport et al. 1977) is a form of input which chooses recasts over more explicit forms of correcting, by enunciating and intonating more clearly, speaking at a higher pitch, using a slower rate of speech and by usually revolving around everyday and more concrete topics in order to facilitate and ensure comprehension. Perceived as a seemingly *natural* way of talking to children, CDS can be found in numerous Western societies. However, cross-cultural studies have shown that CDS is not a universally valid form of relating to children. By contrast, studies of various speech communities have revealed that children learn to speak their L1 age adequately even without being personally addressed until an age when they can actually produce multi-word utterances (cf. Lieven 1994, Mitchell & Myles 2004: 163). However, as far as CDS in Western societies is concerned, it has been the focus of various studies which suggest that a slower rate of speech, a rise in the fundamental frequency and a clear enunciation seem to be

used to aid communication and foster comprehension (Broen 1972, Ferguson 1977, Garnica 1977, Sachs 1977). Whether, in turn, comprehension leads to acquisition (input vs. intake) has yet to be determined.

Furthermore, the higher the learner's language level, the less adapted speech seems to be necessary, i.e., the extent of speech modification naturally varies according to the different needs of the children (Cross 1977, Wells 1985). In the IQOS, however, adapted speech is generally assumed to be a conducive factor in L2 development (i.e. if a given L2 teacher has used *adapted speech* extensively in a given activity and if this category is consequently rated "very high," this will increase the L2 teacher's overall IQOS score). Due to the ambiguous nature of this category, further studies are needed in order to show to what extent adapted speech varies according to different ages and different levels of language proficiency.

Varied Input

This category is concerned with the level of complexity of the input offered by the L2 teacher. As put forward in Krashen's Input Hypothesis, "[h]umans acquire language in only one way – by understanding messages, or by receiving 'comprehensible input'" (Krashen 1985: 2). According to Krashen, receiving input which is on a slightly higher level (grammatically, lexically, etc.) than the language learner's current level of linguistic competence (i.e., *i+1*, with "i" representing the learner's current level of competence and "+1" indicating the next step in the developmental sequence) suffices to foster learning: In this sense, input would need to be both comprehensible, and rich and complex enough to provide the learner with new grammatical structures and lexical items. Acquiring a language is a dynamic process in which the learner constructs his knowledge actively. L1 and L2 data suggest that the acquisition of morpho-syntactic structures is a hierarchically ordered process in which the learner goes through fixed stages and thus cannot master certain forms before others (Brown 1973, Pienemann 1998, Wode 1981). Cognitivists (e.g. Pienemann 1998, Towel & Hawkins 1994, etc.) argue that this phenomenon can be explained by a gradual acquisition of procedural skills. Hence, the learner naturally needs to be exposed to input that is not restricted to a certain ritualised and routined language. In order to be able to acquire new morpho-syntactic structures, i.e. to integrate new forms into the developing interlanguage system, the input needs to be rich and must offer a great variety of syntactic structures. In the category "varied input," we address the question whether this necessity is reflected in the L2 teacher's language use.

Ritualised Language

Besides varied, rich and complex input, the use of *ritualised language* is regarded as equally important, especially in the beginning of the learning process. Ritualised language is understood as recurring phrases that introduce or accompany typical activities in daily routines. Thus, phrases such as "It's pack up time," "Get your cups," "Stop wiggling," or "Tie your shoes, please" are typical phrases used by the L2 teacher,

which become familiar to the children within the first weeks of preschool because of their extensive and repetitive use.

At first, phrases like these only accompany situations already familiar to the children; thus the children do not need to understand what is *said* as they understand what is *meant* due to contextual cues. Later then, the phrases which are very much bound to the context and at first memorised as chunks, can be used and understood outside of their contextual setting and can be further analysed (i.e. individual words will be identified within the phrase). Ritualised language and routines can therefore be seen as scaffolds which help children to find their way into a new situation and the language (cf. Burmeister 2006: 204).

A high use of ritualised language throughout the learning process, however, might not always be favourable. Although this quite restricted use of language seems to be especially important in the beginning of the learning process, it might be less valuable when dealing with more experienced learners. According to various researchers (e.g. Lyster 2007, Netten 1991), language should thus constantly become more complex. Further studies with the IQOS are therefore needed in order to show whether the use of ritualised language changes considerably when dealing with different communicative partners (i.e. children with different levels of language proficiency). In the present analysis, a high use of ritualised language by a particular teacher leads to higher (i.e. better) IQOS scores. The overall score of this particular teacher, however, would decrease if she consistently and exclusively used such resticted forms of input (as, consequently, "varied input" would be rated as "very low"). So far, observations carried out by the ELIAS team have shown that the L2 teachers can react to the needs of learners with different proficiency levels by first using a typical formula and then offering a more elaborate form by paraphrasing their own utterance (e.g. "Pack up time" (formula); followed by: "Please, put away everything that you've played with and sit down quietly").

Verbal acknowledgment of children's interactional moves

This category deals with the L2 teacher's reactions to the children's attempts to communicate. Its focus is not linguistic in nature as in the category "implicit corrective feedback" which focuses on language forms (e.g. words, structures, sounds, etc.) that are used to implicitly correct (i.e. recast) the children's output. Within this category, the question is whether the teacher uses the L2 to react to a child's interactional move instead of reacting e.g. by shaking/nodding their head, or by only summoning a child in order to discipline him or her. These reactions seem to be especially important for bonding as children need to feel that they are taken seriously and that their attempts to interact (e.g. by showing a drawing to the teacher, by telling a story or asking for permission to do sth./go somewhere, etc.) are appreciated (cf. Klann-Delius & Hofmeister 1997, Lieven 1978). Verbal acknowledgment, within our definition, does not only include praise or positive reactions; refusing permission to do something (e.g. to play some-

where, to use certain materials, etc.) can also be an appropriate reaction to a child's question. Responding *verbally* to requests not only increases the L2 input amount in general, but again ascertains the L2's role as an authentic means of communication.

Focus on form

The underlying assumption is that, although the overall focus in content-based classrooms is meaning, form and function do not need to be kept separate at all times (cf. Lyster 2007: 26f.). Instead, the two aspects can be combined, by focussing on grammatical features in content-based settings (ibid).

According to Long (1991), focus on form needs to be clearly distinguished from "focus on formS" [sic]. *Focus on formS* entails the rather traditional view of explicit language teaching (e.g. the use of certain words, verb endings, etc.), in which language forms are removed from a meaningful context. Focus on form, on the other hand, "overtly draws student's attention to linguistic elements as they arise incidentally in lessons whose overriding focus is on meaning or communication" (ibid.: 45f.). Incidents in which the focus is shifted from meaning to a certain linguistic feature can thus be initiated by either the students (children) or the teacher (cf. Long & Robinson 1991: 23). It is crucial, however, that these situations "are not scheduled in advance but occur incidentally as a function of the interaction of learners with the subject matter or task that constitute the learners' and their teacher's predominant focus" (Long 1997: n.p.).

As far as preschools are concerned, the ELIAS observers noticed that focus on form is relatively rare. This is not surprising as, most of the time, conversations evolve around basic and authentic needs in which focus on form would interrupt the natural course of the communicative exchange. At times, however, children might initiate a *focus on form* by laughing about a word that sounds peculiar to them, by explicitly asking for translations or by mispronouncing a word. Whether the teacher thematises these language forms and uses the children's interest for (brief) metalinguistic discussions is checked within the catgegory "focus on form." Teachers might also spontaneously focus on form by, e.g., offering and discussing two distinct phonological forms of a word (e.g. [təˈmɑːtəʊ] in Received Pronunciation vs. [təˈmeɪroʊ] in General American) or two possible sentence structures (e.g. "Have you got my honey?" vs. "Do you have my honey?").

c) Input: Promoting Comprehension

Category	Guideline Description
Contextualisation I: gestures, facial expressions	Different ways of contextualising language with the help of the teacher's own body (without any external means, such as pictures, objects, etc.). The point of reference (in order to decide on the rating) is the language that is used within the specific activity, i.e. how much of the language that is used is also contextualised?
Contextualisation II: pictures, objects, realia	Different ways of contextualising language with the help of external means, i.e. everything that the teacher uses for contextualising language apart from his own body (e.g. pictures, objects, realia).

Explanation and comparison	Does the teacher paraphrase his or her own utterances and use further explanations and comparisons in order to guarantee comprehension on the children's side (e.g. offering synonyms / various sentences when explaining something)?
Ensuring children's comprehension	Does the teacher use some kinds of strategies to ensure that children understand tasks / words / utterances? The observer should not only focus on the teacher's active attempts to guarantee comprehension; questions or instructions that are answered or accomplished by the children can be seen as a means to check comprehension as well (as the children's "appropriate" behaviour shows their understanding).

The categories which are included in "promoting comprehension" focus on different means of making content comprehensible.

Contextualisation I and II

It is widely accepted that children will not be able to learn a language "to which they are merely exposed in a decontextualised way, for example on television" (Snow et al. 1976, quoted in Mitchell & Myles 2004: 163). They need some sort of (contextual) framework which makes input accessible and comprehensible. For learners, being able to make a connection between the words/language and the intended meaning thus requires various means of contextualisation on the part of the teacher. Therefore, language can be complemented by gestures, facial expressions or body language, or teachers can use external means, such as pictures, objects, or any kind of manipulatives which help to contextualise their speech.

Explanation & comparison

Furthermore, complementing non-verbal with verbal cues to facilitate comprehension is considered an important factor in language acquisition (Lyster 2007: 5). In the beginning of the learning process, the children almost exclusively rely on non-verbal support, with the language only accompanying the situation. The amount of verbal support, however, should gradually increase (cf. Netten 1991). By using more abstract language, children cannot exclusively rely on what they can see but need to pay more attention to what is being said. Netten (1991: 302) argues that "[t]eachers should be encouraged not to rely on non-verbal depictions of meaning for the second language, but should develop as many verbal connections as possible for the pupils." She furthermore claims that "[t]hey should also be alerted to the tendency to use fewer verbal messages with low achievers, and be aware of the probable need for the low achievers to receive more rather than less verbal stimulation" (ibid.).

These verbal means of making content comprehensible are focused on in the category "explanation & comparison." This category includes several strategies mentioned in studies concerned with modified speech in NS-NNS (native speaker-non-native speaker) communication. Such strategies include narrowing down a topic (from broader and open questions to more concrete examples), asking a question and providing several possible answers/choices, and rephrasing words or sentences that have not

been understood (Gass & Selinker 2008: 320ff.). These strategies are normally used in one-to-one conversations and are summarised under the broader concept of *negotiation of meaning* (NoM, Long 1981). In Long's interactionist approach, one of the key features of NoM is not that the input is comprehensible per se, but that the NSs' modifications occur while interacting with – and in response to – less experienced learners.[5] Thus, according to Long, it is at the point where meaning is negotiated that learning occurs.

In the ELIAS study, however, we often observed interactions in which these strategies were used by the native speaker without an overt misunderstanding on the part of the children. Due to the fact that the L2 teacher often addresses more than one child at the same time, there would need to be an exact definition as to when the children actually engage in meaning negotiation. The question would then be: Can we consider only those instances as negotiation of meaning if a child explicitly states his or her need for clarification? As children sometimes show their lack of understanding non-verbally or by not doing what they are asked to, it is difficult to draw a clear-cut line when deciding whether negotiation has actually taken place. Here, again, the involvement of several children makes it, at times, impossible for the observers (who rate in real-time) to see every child's reaction to the L2 teacher. At this point, we decided to only check the input modifications, i.e. further explanations, paraphrasing utterances, using comparisons, etc., as provided by the L2 teacher – instead of checking whether or not the children actually showed their lack of understanding.

Ensuring children's comprehension

The question captured in this category is whether the teacher ascertains children's comprehension. The focus thus is on the success or failure of the communicative exchange. However, the category does not only comprise the teacher's *active* attempts to check the children's comprehension (e.g. by asking whether something has been understood); questions or instructions that are answered or accomplished by the children can be seen as an indication of comprehension as well.

d) Output

Category	Guideline Description
Encourages and maintains L2 output	Does the teacher encourage (NOT force!) the children to use their L2 (i.e. English) and/or maintains their L2 use (in case they are already producing output without explicit encouragement)?
Implicit corrective feedback	1. Does the teacher recast/paraphrase the children's L2 utterances, i.e. does she either offer the correct form of the children's L2 utterance or give a more elaborate form of the children's L2 utterance (expands the utterances)? 2. Does the teacher translate the children's L1 utterances into the L2 (i.e. English) and/or offer a more elaborate form (expands the utterances)?

5 Means by which NNSs normally show their misunderstanding are, e.g. clarification requests or confirmation checks (see Mitchell & Myles 2004: 168)

Absence of explicit corrections / absence of forcing correct imitation	Does the teacher explicitly correct children's utterances (e.g. "No, this is wrong. You say … and not …") and/or does the teacher "force" the children to (correctly) imitate certain utterances? If the teacher frequently uses such explicit corrections and/or constantly asks the children to imitate a certain utterance, the category would be graded as very low (as explicit corrections are present and not absent).

Encouraging and maintaining L2 output vs. forcing correct imitation

Another component that seems to facilitate language acquisition is the production of *comprehensible output* (Swain 1985; see above). Whereas in earlier views on language acquisition (e.g. in behaviourist approaches) output was primarily considered as a means of practicing the skills and structures that were previously learned, Swain regards output as *a part of learning* (Gass & Selinker 2008: 326). It is vital for her argument that students should not only make themselves understood but need to be pushed [sic] to produce *comprehensible* output, i.e. convey a message "precisely, coherently, and appropriately" (ibid.: 327). Swain's initial motivation for considering output as a crucial factor for language acquisition was the unsatisfying results in immersion classes in Canada in which students showed native-like receptive skills and communicative competence but a lack of target-like proficiency as far as the production of speech and grammatical accuracy were concerned. She ascribed this lack of competence to the missing opportunities for students in immersion classrooms to use the target language.

In the preschool context, the situation is different. A basic principle of, e.g., German preschool education is "never [to] force the children to do something" but rather to encourage them and invite them to participate (Wode 2001: 5, cf. also Schäfer 2007: 40f.). This principle also holds true for language production; usually, preschool children are free to choose which activity to engage in and whether to speak or not (both in their L1 and their L2). Thus, especially initially when a second language is introduced, children should be allowed a "silent phase" in which they are not forced to produce any L2 output (Ellis 2008).

Furthermore, learning a second language in an immersion context offers authentic communicative situations in which it does not seem reasonable to focus on the production of target-like forms but on the overall meaning of the utterance (just as in early L1 acquisition, cf. Sokolov & Snow 1994). This, however, strongly depends on the situation and on the focus of the activity: When children are asked to repeat certain formulae, i.e. phrases that are used often within a game (e.g. "How old are you?" or "What's your favourite animal?"), the *correct* production of the sentences seems to be more crucial and more favourable than in spontaneous L2 production. However, when children produce the L2 spontaneously, the primary focus seems to be on encouraging and maintaining L2 output and acknowledging the child's attempt to produce and construct language. This is especially important because spontaneous L2 production can be regarded as unusual in a context in which most L2 teachers understand the children's L1 and where the common language among the children usually is the ambient language.

Hence, it seems difficult to put Swain's claim concerning the seemingly required nature of L2 output in preschool settings into practice. Nonetheless, with respect to the remaining benefits of L2 output (i.e., noticing function, hypothesis testing, enhancing corrective feedback), promoting L2 output in preschools is desirable: The ELIAS observers were able to notice that children in the different preschools tested hypotheses about L2 words or sentence structures, and that they rehearsed new phrases or the sound sequences of certain words. However, insisting on "comprehensible output," which goes together with Swain's demand for more explicit corrective feedback, seems less favourable in preschool settings in which feedback is rather implicit in order to encourage the children and keep frustration to a minimum.

Implicit vs. explicit corrective feedback

Several researchers have been concerned with the question of feedback and whether a more explicit or implicit way of correcting learners' output promotes language learning. According to the basic ideas of immersion, a more implicit form of correction would be preferred, by modelling the correct utterance for the learners, i.e. by recasting their sentences (cf. Snow 1987: 22). However, the need for more *focus on form* and more explicit corrections becomes increasingly prevalent (cf. Lyster 2007: 5).

Results concerning either explicit or implicit feedback on language learner output are quite mixed and cannot be interpreted unambiguously. Studies in CDS show that recasts as a reaction to children's errors naturally are much more common than explicit corrections (Mitchell & Myles 2004: 162). Several studies on NS/NNS interactions also show a high amount of recasts used by the NSs as a means of feedback and imply their positive effect on acquisition (cf. Gass 2003: 239ff., Mitchell & Myles 2004: 171ff.). Acquisition should ideally take place in these situations because learners notice the difference between their interlanguage form and the target-like reformulations. These results, however, are discussed controversially, and the positive effects of recasts seem to depend strongly on the learner's attention to the correcting and on the type of error (e.g. recasts seem to be more effective with pronunciation and the basic meanings of lexical items than with morphosyntactic structures, cf. Gass 2003). An additional problem with implicit corrective feedback, especially in immersion settings, or generally in more content based language learning contexts, is that a recast is often not likely to be noticed as a form-directed modification by the learner as the overall focus of the interaction is on meaning rather than on form (Lyster 2007: 98f.).

We included "focus on form" as an IQOS-category (cf. section "Input Quality") in order to take the above mentioned findings into account and at the same time adhere to the aforesaid preference for implicit corrective feedback over explicit corrections. The assumption thus is, instead of explicitly correcting children's L2 utterances, a mispronounced word or any other non target-like form can be used for metalinguistic discussions (cf. Long 1997: n.p.).

e) Children listen

Category	Guideline Description
Children listen	Do the children listen and are they "attentive enough" to actually take in the input which is offered to them?

The IQOS aims at measuring the input quality offered by the L2 teacher, i.e. the obtained data exclusively refer to the input giver and not to those who receive the input. During the ongoing observations and the development of the IQOS, however, one factor concerning the children seemed to be of importance when analysing the effect of input quality on L2 development. While observing interactions between the L2 teacher and the children, observers at times noticed that, although the children were highly engaged in the activity (e.g. crafting, painting, etc.), they did not seem to pay attention to the teacher. Hence, they were not likely to take in what the teacher said and thus probably did not profit from the input. At this point, we decided to include the category "children listen" in order to factor in the children's attention to the provided input.

3. Method

3.1 Research Questions

Before presenting the data which were obtained by implementing the IQOS in 9 bilingual preschools in 3 European countries (Germany, Sweden, and Belgium), a brief outline of both method and research questions will be given in the following sections.

Questions of particular interest are:

1. To what extent do the various L2 teachers differ in their language use?
2. Does input quality interact with the children's amount of progress in receptive L2 grammar knowledge over a period of ± 12 months?
3. Does input quality interact with the children's amount of progress in receptive L2 lexical knowledge over a period of ± 12 months?
4. How can we account for other independent variables that might interact with the children's receptive L2 knowledge (i.e. amount of progress), such as age, opportunities for input (L2 contact and input intensity), when measuring the impact of input quality?

3.2 Procedure

The aim of the IQOS was to collect quantitative input data to which the children were exposed. In order to achieve this, the ELIAS team used the IQOS during their weekly observations. The checklist was used with every L2 teacher who participated in the ELIAS project and provided input to the preschool children.

Observers selected an activity[6] in which an interaction between the L2 teacher and the children took place, and in which the input was rated by means of the checklist. Observed interactions typically lasted less than 10 minutes, so that several sequences could be rated during one observational sequence.

As mentioned before, the checklist includes 9 low- and 15 high-inference categories (cf. section 2.). In every observed activity, each of the high-inference categories is given a score on a Likert scale from 1 to 4, with 1 indicating a 'very low' presence of the observed category, 2 indicating a 'low' presence, 3 a 'high' presence and finally 4 signalling that the category was present in the observed situation to a 'very high' extent. It was hypothesised that a very high use of a certain feature would be particularly conducive for L2 development. In a number of categories (i.e. "encourages and maintains L2 output," "absence of explicit corrections / forcing correct imitation" and "implicit corrective feedback"), observers are given the possibility to use a "not applicable"-option (N.A.). As far as the first two categories are concerned, the N.A. option is given for those activities in which no output on the children's side is required (neither in their L1 nor in their L2), e.g. when the teacher explains a task or gives instructions. The latter category ("implicit corrective feedback") can be judged as *not applicable* in cases where the children do not produce any output (neither L1 nor L2 output) and thus cannot be corrected. However, for the purpose of comparing the various preschool teachers with each other, the checklist was primarily used in situations which required output both by the teachers (L2) **and** by the children (L1 or L2). In this way, we tried to obtain as much data as possible for every L2 teacher who participated in the ELIAS project.

The IQOS categories were scored in real-time, i.e. filled out during the observed activity. If this was not possible, for example because the observer participated in the activity, the checklist was completed shortly after the observation. The teachers knew about the observations since the checklist was used openly. They did not, however, know any details about the areas of interest in order to reduce the influence on their behaviour. Furthermore, both children and teachers were familiar with the observers as they had been participating in preschool activities on a weekly basis for more than a year before the checklist was implemented (see above). Hence, the influence on the teachers' and the children's behaviour due to observations could be kept to a minimum.

3.3 Subjects

The checklist results were obtained between February and April 2010 in 9 of the bilingual ELIAS preschools (i.e. in all preschools except for the two comparison groups in England). The preschools were situated in Germany, Sweden and Belgium. A detailed description of these preschools can be found in Wippermann et al., this volume. It suffices to say here that the schools differed in terms of a wide variety of factors, such as

6 For the distinction between situation and activity cf. section 2.

their pedagogical philosophy (e.g. Montessori, regular community school), group sizes and the number of L2 teachers per group, which also affects the intensity of L2 exposure per child (a factor which is further discussed in 4.5.1).

In total, 21 teachers were observed. Every L2 teacher was rated within at least 15 activities, with the number of observed activities per teacher ranging from 15 to 36. In total, 372 observations were used for analysis.

3.4 Quality criteria for the IQOS

If we intend to relate the findings of the Input Quality Observation Scheme (IQOS) to the children's results as achieved in the British Picture Vocabulary Scale II (BPVS II, Dunn et al. 1997) and in the ELIAS Grammar Test (cf. Rohde, this volume; Steinlen et al., this volume), the observation scheme needs to fulfil certain quality control criteria. Therefore, the IQOS' degree of standardisation and the most important quality control criteria (i.e. objectivity, reliability and validity) will be discussed in the following sections.

Standardisation

The IQOS is a standardised instrument as it specifies i) what exactly to observe and ii) how to record the observed data. The observed activities are generally well-known and can be segmented into component parts (here: categories) which are of exclusive interest to the observer (Bortz & Döring 2006: 270). It is crucial that an observation scheme prevents the observer from the temptation to interpret the observed activities by providing detailed and reliable guidelines. The specifications provided in these guidelines are to ensure an identical understanding of each category by each individual observer (ibid.). The IQOS not only provides comments on and examples of each category in a written form but also includes video examples: Typical activities of interest were video-taped and each category was rated according to the rating scale (1-4) in order to give each observer a better idea of how to implement the observation scheme.

Objectivity

Obviously, it is crucial that every observer using the IQOS needs to rate activities according to the pre-specified instructions (as presented in the guidelines). Still, some category guidelines leave room for interpretation as the behavior which is to be observed might be more implicit, "thus lead[ing] to more judgment and inference on the part of the observer" (Spada & Fröhlich 1995: 10; cf. IQOS guidelines). Though it is impossible to resolve this problem of subjectivity entirely, objectivity can be enhanced by showing that observations as recorded with the IQOS are interrater-reliable: i.e., it has to be tested whether different observers do not only have a similar understanding of the observed categories but also rate them in a similar way (Bortz & Döring 2006:

268, Spada & Fröhlich 1995: 10). Only if high correlation coefficients and statistical significance between the ratings of different observers can be found, the observation scheme can be called interraterreliable and thus be evaluated an objective test instrument.

As to the IQOS, significant correlations between two observers' ratings of seventeen different activities indicate a high degree of intersubjectivity.[7] These highly significant correlations between the two observers were shown for i) each supercategory, ii) the overall scores (including the N.A. categories) and iii) the overall scores (without N.A. categories).

Reliability

Reliability was determined by measuring the *internal consistency* of the instrument (Mackey & Gass 2005: 129f.). The internal consistency of the IQOS was tested by using Cronbach's Alpha: The values varied from .819 (for all 15 categories) to .761 (for all 5 supercategories). Hence, reliability can be assumed for the IQOS as Cronbach's Alpha values were in the range of acceptability for an empirical measurement instrument.

Validity

The approach that has been chosen to determine validity is *content validity*: In this approach, the question whether the observation scheme measures what it intends to measure (i.e. input quality) and whether it actually represents the phenomena which we want to address (i.e. input that might be beneficial for L2 development), is discussed in terms of content.

As discussed in section 2, every category that is included in the IQOS is based on first and second language acquisition research on the role of input, interaction and output and, more precisely, on studies which suggest a positive effect of these features on language acquisition. During the first 12 months of participant observation, the ELIAS members constantly discussed their experiences in the various preschools in order to refine, reject and add categories. This modification process was completed once all participant observers agreed upon the scope of each category.

Content validity is thus assumed for the IQOS as the items (categories) reflect the knowledge and expertise of the ELIAS members.

4. Results and discussion

In the following sections, the results which were obtained by using the IQOS in 9 different preschools will be presented. After giving a brief overview of the general IQOS results and outlining the disparities between the different preschool teachers, the scores

7 Correlation (Pearson): 0.966, $p < 0.05$.

will be related to the children's receptive L2 grammar and lexical knowledge in terms of the amount of progress.

4.1 IQOS results: Descriptive analysis

Considering the data obtained for all 21 subjects, the teachers' medians[8] of the overall scores (henceforth IQOS scores) range from 30 to 51; with 60 being the highest and 15 being the lowest possible score that can be achieved. A normal distribution of the data is not given; this result, however, is neither unexpected nor undesirable as a normal distribution would imply that some teachers neither used any means to render their input comprehensible nor adhered to any other features which seem to be supportive for L2 development. This would be rather unusual as most of the L2 teachers took part in one of the teacher trainings which were offered within the ELIAS project. As these trainings emphasised exactly those aspects which are assumed to foster L2 development, the ELIAS team naturally hoped for (and expected) an implementation of the presented *best practices* (which would, in turn, result in higher IQOS-scores).

The teachers' input differed quite dramatically in terms of individual category scores. Except for the category "absence of translation / absence of L1 use" (rated between "2" and "4"), all category scores alternate between 1 and 4 (for 336 observations), thus exhausting the full range of possible ratings.

4.2 IQOS and amount of progress in receptive L2 knowledge: All preschools

In the following analyses, the IQOS scores will be related to the amount of progress over a period of ±12 months concerning the children's receptive L2 grammar and lexical knowledge. Hence, it will be discussed whether a qualitatively more beneficial input actually leads to a higher amount of progress in L2 grammar and lexical knowledge respectively.

In order to understand and interpret the following analyses correctly, it is vital to explain how the independent variable *input quality* was related to the children's second language development. In this interrelation, we were concerned with the quality of input which a child had access to and the receptive (lexical or grammar) knowledge of this child. However, input quality had been measured for a particular L2 teacher, not for a particular child.

Furthermore, in many preschools more than one L2 teacher provided input to the children (cf. Wippermann et al., this volume). In order to take the different IQOS scores (elicited for every teacher) into account, the scores of the various L2 teachers, who had

8 For every L2 teacher, the IQOS score medians are based on 15 to 36 observations (cf. section 3.3, this chapter).

provided input to a given child, were combined and weighted according to the proportion of time the teachers had spent with the children.[9] This way, every child's IQOS score (i.e. the score that indicates the quality of input the child had access to) consists of the scores of all teachers who had provided input to the child in question. In a second step, IQOS score groups were formed which were comparable in size (i.e. in the number of children) but which differed with respect to the quality of the input which the children had previously received. These IQOS score groups were then related to the children's receptive L2 development.

4.2.1 IQOS and amount of progress in receptive L2 grammar knowledge

Taking into account all 147 children who completed the ELIAS Grammar Test at both test dates (T1 and T2), 3 IQOS-score groups could be established: low 35.7-43.0 (60 children), middle 43.1-45.8 (53 children) and high 45.9-50.8 (34 children).

At first glance, Figure 1 purports the idea that there are differences in the level of grammar knowledge (both at T1 and T2) due to differences in input quality: it seems that the children who had received qualitatively less beneficial input perform more poorly than those who had received more beneficial input. However, these differences may also be due to other variables which are impossible to factor out here, such as L2 contact time, age and the nature of input which some of the children had received by other (non-documented) L2 teachers prior to the ELIAS project's start. However, as we hypothesised that a qualitatively more beneficial input may have an impact on the rate of acquisition (irrespective of the children's age or contact time), it is reasonable to relate input quality to L2 (grammar or lexical) development over time.

As is evident in Figure 1, there are significant differences between the IQOS score groups as to the rate of acquisition:[10] children of the highest IQOS score group display a significantly greater increase of receptive L2 grammar knowledge than children with a middle or low IQOS score. The same holds true for children with middle IQOS scores, who develop significantly better (in terms of L2 grammar knowledge) than those children who had received the least beneficial input (IQOS score low). The results, therefore, suggest that a qualitatively more beneficial input results in a greater amount of progress in receptive L2 grammar knowledge.

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9 This means that if a child had access to L2 input offered by three different teachers, and if this child could spend an approximately equal amount of time with each of the three teachers, the L2 teachers' IQOS scores would be weighted with 33% each. Both the L2 teachers' employment contracts (e.g. how many hours are the teachers present in the preschool? Which shifts?) and organisational aspects (e.g. which teacher is responsible for which group of children?) were considered when calculating the (hypothetical) weight of each of the L2 teachers' IQOS scores.

10 A repeated measure analysis showed significant differences for time (Time: $F(1,144) = 95{,}877$, $p < 0.05$) and for the interaction (Time*IQOS_group_: $F(2,144) = 4{,}485$, $p < 0.05$).

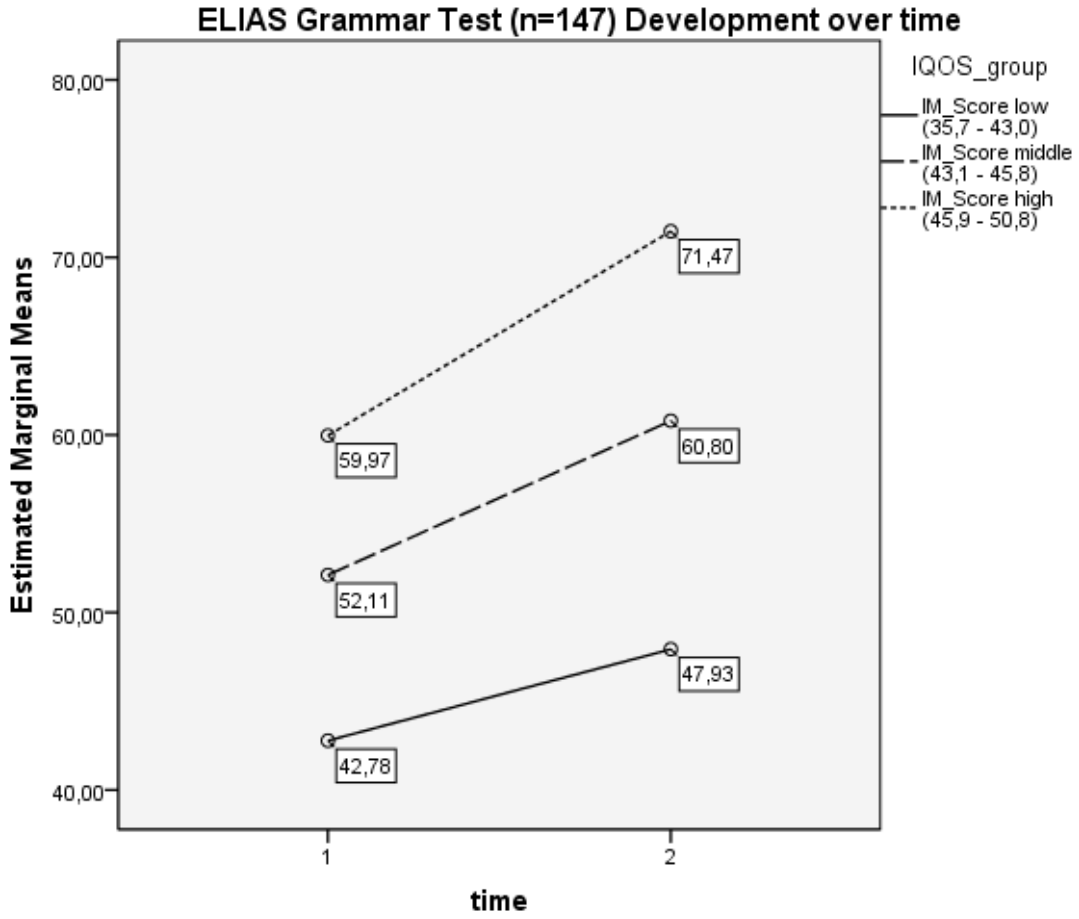

Fig. 1: Relation of total IQOS scores and grammar development (all 9 preschools)

4.2.2 IQOS and amount of progress in receptive L2 lexical knowledge

Taking into account all 199 children who completed the BPVS II at both T1 and T2, 3 IQOS-score groups could be established: low 35.7-43.0 (71 children), middle 43.1-45.8 (69 children) and high 45.9-50.8 (59 children).

As shown in Figure 2, there are no significant differences between the IQOS score groups as to the children's lexical development:[11] with respect to lexical knowledge, children of the highest IQOS score group do not develop significantly better than those of the lower two groups.

Although the children who had received the qualitatively most favourable input performed best (i.e. considering their level of receptive L2 lexical knowledge at T1 and T2), this, again, may be due to many different variables (cf. 5.2.1).

11 A repeated measure analysis showed significant differences for time (time: $F(1,196) = 5{,}887$, $p < 0.05$) but not for the interaction (Time*IQOS_group_: $F(2,196) = 0{,}626$, $p > 0.05$).

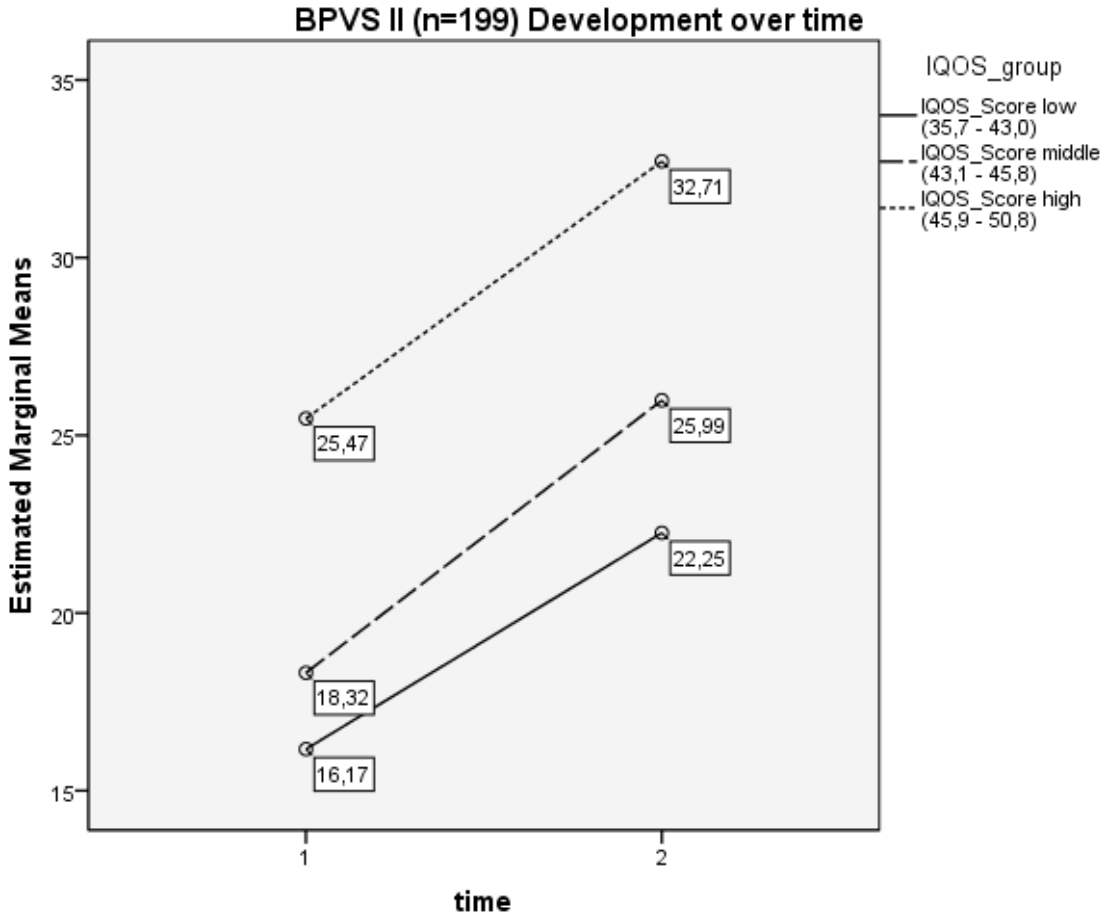

Fig. 2: Relation of total IQOS scores and lexical development (all 9 preschools)

4.3 IQOS and amount of progress in receptive L2 knowledge: German preschools

As mentioned previously, many independent variables may have an influence on children's L2 development, such as the children's age, L2 contact or their opportunities to access L2 input. Another variable, which has not been taken into account so far, is the majority language, i.e. the ambient language of the children (in our study those languages are German, Swedish and French). As a greater typological distance between the L1 and the L2 can lead to a slower rate of L2 progress (Ringbom 2007), the following analyses will only include children from the 7 preschools situated in Germany. For reasons which have been explained in the previous sections, only the amount of progress will be considered.

4.3.1 IQOS and amount of progress in receptive L2 grammar knowledge

In the following analysis, 123 children (tested with the ELIAS Grammar Test at T1 and T2) can be allocated to 2 IQOS-score groups: The *low* input quality group (IQOS scores between 35.7 and 43.0) consisted of 60 children, the *high* input quality group (IQOS scores between 43.1 and 50.8) of 63 children.

The difference among the two groups as to the amount of progress in receptive L2 grammar knowledge is significant:[12] children who are exposed to qualitatively more beneficial input show a significantly greater amount of progress over a period of ±12 months.

Here, too, the IQOS score groups differ significantly in their respective level of attainment. These differences, however, may again be allocated to various other factors (cf. section 4.2.1).

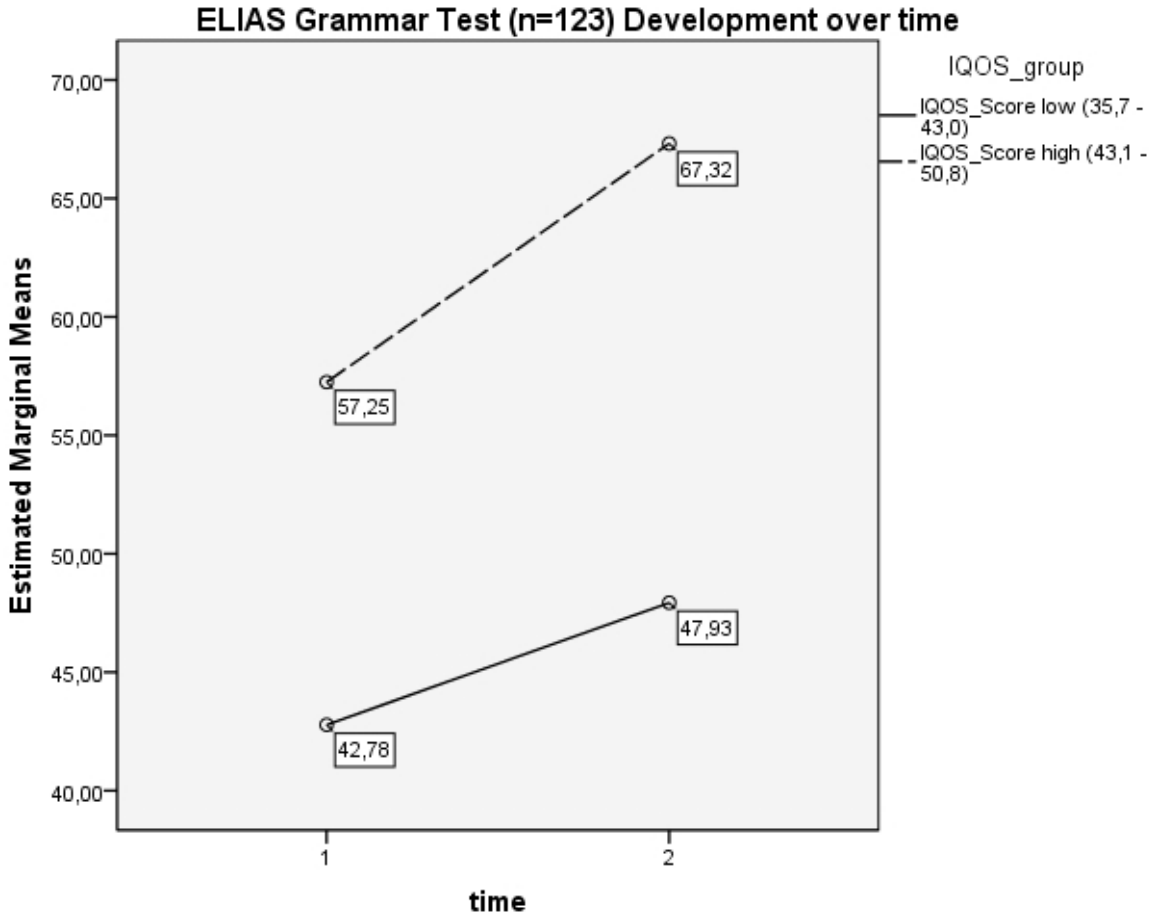

Fig. 3: Relation of total IQOS scores and grammar development (German preschools)

4.3.2 IQOS and amount of progress in receptive L2 lexical knowledge

Considering the IQOS scores for all 138 German preschoolers who took the BPVS II at T1 and T2, 2 IQOS score groups could be formed: The *low* input quality group (IQOS scores between 35.7 and 43.0) consisted of 71 children, the *high* input quality group (IQOS scores between 43.1-50.8) of 67 children.

The analysis of the relation of input quality and amount of progress in receptive L2 lexical knowledge for the German preschools only yielded the same results as obtained

12 A repeated measure analysis showed significant differences for time (time: $F(1,121) = 63{,}754$, $p < 0.05$) and for the interaction (Time*IQOS_group_: $F(1,121) = 6{,}635$, $p < 0.05$).

for the entire sample: No significant differences were found between the groups of children who had received a qualitatively either less or more beneficial input.[13]

Though generally implying that a qualitatively more beneficial input does not seem to influence the rate of L2 lexical development, this rather disappointing result calls for an in-depth analysis of the individual IQOS categories (cf. section 5).

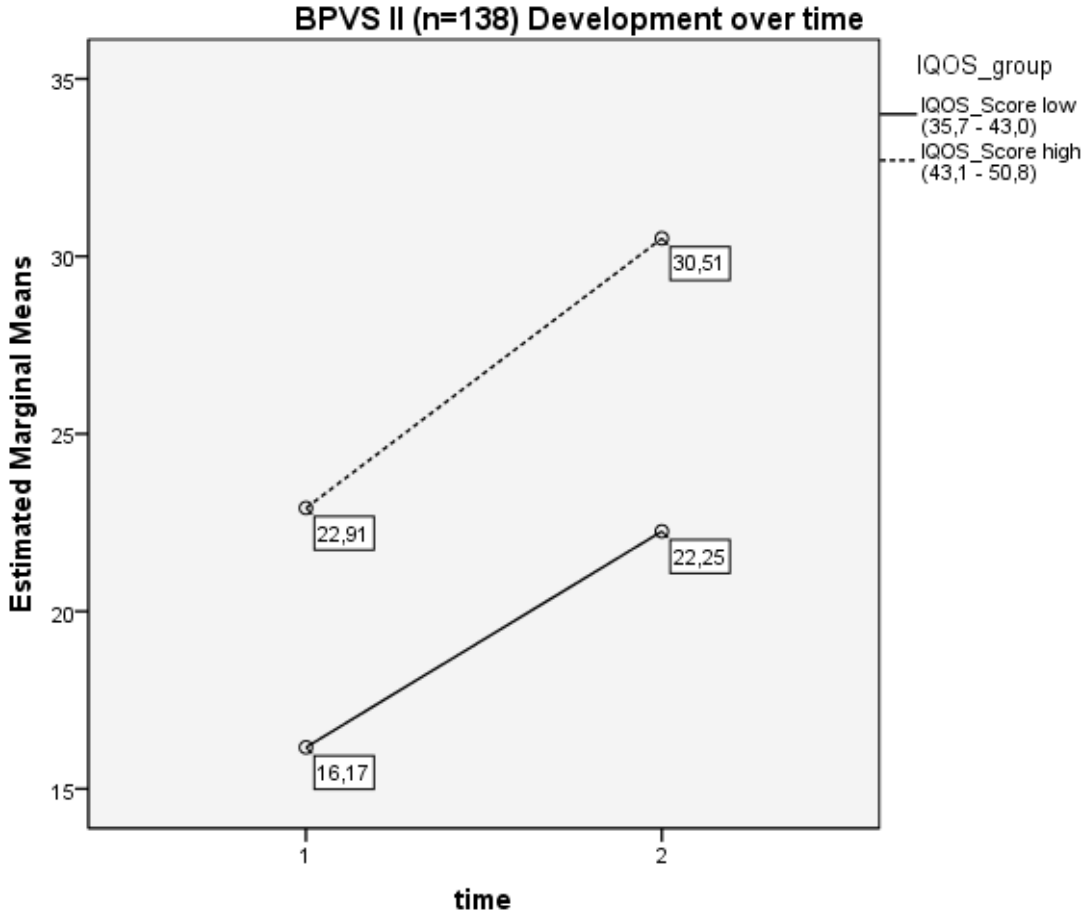

Fig. 4: Relation of total IQOS scores and lexical development (German preschools)

Once more, the level of L2 lexical attainment achieved by the higher input quality group is significantly higher (both at T1 and T2) than the level achieved by the children who had received a less beneficial input.

4.4 Input quality vs. input intensity

We hypothesise that the nature of input plays a decisive role in SLA. Nonetheless, we neither deny nor disregard the fact that other independent variables may have an impact on second language development. However, focusing on the role of input quality in this chapter, we dealt with the question how to account for other independent vari-

13 A repeated measure analysis showed significant differences for time (time: $F(1,136) = 5{,}287$, $p < 0.05$) but not for the interaction (Time*IQOS_group_: $F(1,136) = 0{,}056$, $p > 0.05$).

ables that might interact with the children's receptive L2 knowledge (i.e. level or amount of progress) when really trying to measure the impact of input quality. Other independent variables include, e.g., age, L2 contact time and the intensity of input, some of which are dealt with separately in the chapters on L2 receptive grammar knowledge (cf. Steinlen et al., this volume) and on L2 receptive lexical knowledge (cf. Rohde, this volume).

However, it does not seem compulsory to factor out all the other independent variables because, in terms of content, it can be argued that the different variables are independent from and have no influence on each other.[14] However, as this chapter's focus is on the role of input and its impact on second language development, it seems advisable to consider, at least, the quantitative side of input. Therefore, instead of only considering the nature, or, the quality of input, we wanted to take into account the children's opportunities to actually access a particular L2 teacher's input. But how can we measure input intensity, i.e. the children's opportunity to access L2 input, in preschools which differ so strongly from each other?

Several studies have been concerned with the intensity of L2 exposure and its influence on both L1 and L2 acquisition, e.g. in terms of rate of acquisition, ultimate attainment, motivation in SLA, transfer in SLA, etc. (cf., e.g., Bournot-Trites & Tellowitz. 2002, de Jabrun 1997, Kecskes 1998, Pavlenko & Jarvis.2002, Peters et al. 2004).

One finding concerned with input intensity and its impact on L2 development derives from research on French immersion in Canada. In early immersion settings, a general distinction is made between total and partial immersion programmes: Whereas in total immersion programmes, 100% of the subjects are taught through the medium of the second language from the start, partial immersion programmes offer 50% of the subjects in the L2 (and 50% in the ambient language; mostly the children's L1). Comparative studies of children in different immersion (and non-immersion) settings have revealed that a more intensive exposure to the second language (as, e.g., provided in total immersion programmes) leads to higher gains in the L2, e.g. higher levels of oral proficiency (cf. Germain et al. 2004a, Lightbown & Spada 1994), improved listening skills (cf. Lightbown & Spada 1994), higher writing skills (cf. Germain et al 2004b, Lapkin et al. 1998), higher levels of reading proficiency (cf. Lapkin et al. 1998), and increased confidence in communicating in the L2 (cf. Peters et al. 2004), etc.

In the school context, the extent of L2 intensity strongly depends on the number of subjects taught through the second language. According to immersion terminology, all ELIAS preschools offer a partial immersion format, as all of them employ at least one teacher who speaks the ambient language to the children. Though all ELIAS pre-

14 There is, e.g., no direct connection between, on the one hand, the input quality provided by a certain L2 teacher and, on the other hand, the opening hours of a preschool, L2 teachers' attendance time, i.e. their contracts, and the time the children actually attend the preschool.

schools may be labelled partial immersion settings,[15] a comparable input intensity cannot be assumed: a variety of external and organisational factors contribute to the amount of input which is in fact accessible for a child in a given preschool.

4.4.1 The input intensity factor

When transferring the question of input intensity to the various ELIAS preschool settings, several variables can be identified which may increase or decrease the amount of L2 input which is accessible to the children: How many L2 teachers provide input in the L2 and for how many hours per week? Is the ratio of L2 teacher per child more or less beneficial? And how many hours do the children spend in the preschool so that they can benefit from the provided input?

Accordingly, a mathematical formula needed to be developed which would be able to answer these questions for each of the participating preschools, i.e., which would take several variables into account. The formula needs to take into account the mean number of hours during which a child can actually have access to L2 input. This is achieved in two steps:

1. q = t(L2 teachers' presence) / t(opening hours) * t(children's presence) * 1 / n(children)

1a. First, the L2 teachers' attendance time's portion of the total amount of opening hours needs to be calculated by dividing the number of hours during which the L2 teachers are present in the preschool by the total number of opening hours [t(L2 teachers' presence) / t(opening hours)]. A thus calculated number indicates whether i), at least, one L2 teacher is (theoretically) present during the entire range of opening hours [e.g. 45h = t(L2 teachers' presence) = t(opening hours)], ii) whether even more than one L2 teacher is present during this time span [e.g. t(L2 teachers' presence) = 60h, 45 = t(opening hours), i.e., t(L2 teachers' presence) > t(opening hours)], or iii) whether the L2 teachers cannot cover the whole range of opening hours due to their limited working hours [e.g. t(L2 teachers' presence) = 35h, t(opening hours) = 45h, i.e., t(L2 teachers' presence) < t(opening hours)].

Example A: If a given preschool employs three different L2 teachers with 20hrs-working contracts each, the total amount of L2 teacher-attendance time would be 60h [t(teachers' presence) = 60h]. If this preschool offers a wide range of opening hours (with t = 55h), the L2 teachers' attendance time's proportion would still be very desirable [t(L2 teachers' presence) > t(opening hours)]: In theory, 1.1 L2 teachers can be present from Monday through Wednesday, from aperture to closing of the preschool.

15 Although the term "partial immersion" usually refers to the number of school subjects taught in the target language, here it is used to distinguish between a more or less intensive L2 exposure in preschool settings.

Example B: If a preschool opens for 38 hours per week and the sum of the L2 teacher-hours amounts to 45 hours (45h/38h = 1,18), the ratio of the given preschool is considerably more favourable than in a different preschool which opens 55 hours per week, offering the same number of L2 teacher-hours (45h/55h = 0,82). Offering a wide range of opening hours not necessarily implies that the children who attend that preschool spend an equally large amount of time there; rather, the preschool's offer gives the children's parents a greater flexibility. A drawback of this enhanced flexibility is, however, that the presence of at least one teacher needs to be ensured at all times. Given that in most preschools, teachers work varying shifts, it is likely that, just like the other preschool teachers, the L2 teacher sometimes has to work shifts which are less frequented by children (e.g. starting at 7.30 a.m. although most children do arrive at 9 a.m.). This fact naturally decreases the opportunity of all children to access the entire amount of L2 teacher-hours.

Obviously, this first part of the formula can only capture the proportion of L2 teachers as well as opening hours, i.e. the theoretical availability of L2 input. If, in a worst-case scenario, three L2 teachers were working exactly the same shifts (e.g. Monday through Friday from 7.30 a.m. to 11.30 a.m.), the accessibility of L2 input would decrease considerably. Such a conduct on the preschool management side, however, is highly unlikely considering that the preschool has deliberately chosen its bilingual emphasis.

1b. Second, to calculate the mean number of hours during which L2 input is accessible to a child, the above-explained proportion [t(L2 teachers' presence) / t(opening hours)] is multiplied with the children's attendance time.

Example C: Recurring to the second preschool in Example B, the L2 teachers' attendance time's proportion amounts to .82 (45h/55h = 0,82), i.e. approximately 80% of the opening hours are covered by English speaking teaching staff. If any five children attend this preschool for 35 hours per week each, their mean number of possible L2 access amounts to 28.7 hours per week (45h/55h*35h = 28.7h).

2. Another important variable which needs to be considered is the number of children who have access to the provided L2 input as an increasing number of children will naturally diminish the intensity. Just as increasing student numbers in a classroom reduce each individual student's opportunity to interact with the teacher, a large number of children (within a group, or within a preschool with an open group structure in which all children can, but do not necessarily have to have access to the L2 teacher's input) has an impact on each individual child's possibility to benefit from the L2 input. Therefore, the before-mentioned part of the formula, i.e. the mean number of hours during which L2 input is accessible to a child, needs to be divided by the number of children who have access to the L2 input. The formula thus achieved reads:

q (intensity) = t(L2 teachers'_presence) / t(opening hours) *t(children's_presence) / n(children)

Example D: In the preschool mentioned above (*Example C*), the average number of accessible L2 input amounts to 28.7 hours for a child who spends 35 hours in the preschool. Given that 15 children have access to the same L2 input, each child could, in theory, receive almost 2 hours of L2 input per week on a **one-on-one basis** (28,7h/15 = 1.91h). This number, obviously, is fictitious to the extent that, most of the time, early childhood teachers address a group of children so that the number of L2 input hours per week is presumably much higher than the calculated number. Nonetheless, as this caveat holds true for all children, the so-calculated numbers are able to reflect the differences in intensity which exist between the different preschools.

Example F: A different preschool employs one L2 teacher for 35 hours per week with opening hours ranging from 8 a.m. to 4 p.m. [t(opening hours) = 40h]. The average child spends approximately 35 hours per week in this preschool. Each of the 80 attending children has the opportunity to access the L2 teacher's input as an open group structure and the warrant for individuality is at the heart of the preschool's pedagogical concept. Thus, the theoretical intensity would amount to less than half an hour per week (35/40*35/80 = 0.38). However, it may still hold true for one child that he or she receives more than thirty hours of input per week due to his or her special preference for the L2 teacher.

Hence, to end with, it needs to be stressed that the thus calculated quotient can only describe a theoretical intensity, i.e. the theoretical and probable amount of time during which an individual child has access to L2 input. Individual preferences of children for a particular teacher, as mentioned in *Example D*, cannot be captured in such a formula.

4.4.2 Input intensity and L2 grammar development

As significant differences between the different input quality groups with respect to grammar development had been found (cf. section 4.2.1 and 4.3.1), we wanted to know if the same applies for the differences in input intensity.[16] Therefore, considering all preschools, four groups were formed which were comparable in size (i.e., in the number of children) but which differed with respect to the children's opportunities to access L2 input (4 input intensity groups: low, lower middle, upper middle, high, cf. Figure 5).[17] Then, the different input intensity groups were related to the children's L2

16 Moreover, it was not possible to factor out input intensity as an additional factor influencing the results presented before: the results of a bivariate correlation analysis (Spearman's rho) showed a strong correlation between the children's opportunities for input (input intensity) and the input quality they are exposed to (German preschools: 0.496, $p < 0.01$, all preschools: 0.506, $p < 0.01$).

17 All 147 children who completed the Grammar Test at T1 and T2 could be allocated to the following groups: low 0.2-0.49 (40 children), lower middle: 0.5-0.8 (39 children), upper middle: 0.81-1.2 (41 children), and high: > 1.21 (27 children).

receptive grammar development over time. Interestingly, no significant differences could be found between the four *input intensity* groups,[18] i.e. the children who had more opportunities to access L2 input do not seem to develop significantly better than those with fewer opportunities for L2 input (cf. Figure 5). The same holds true for the German preschools only (cf. Figure 6).[19]

Yet, we do not deny that input intensity has an impact on second language acquisition; in fact it could be shown for our data that the intensity of L2 input correlates with L2 development (cf. Rohde, this volume; Steinlen et al., this volume). As for the present data, however, there are significant differences between the different input quality groups but not between the different intensity groups with respect to the amount of progress in receptive L2 grammar knowledge. This again strengthens the point that input quality really matters in SLA.

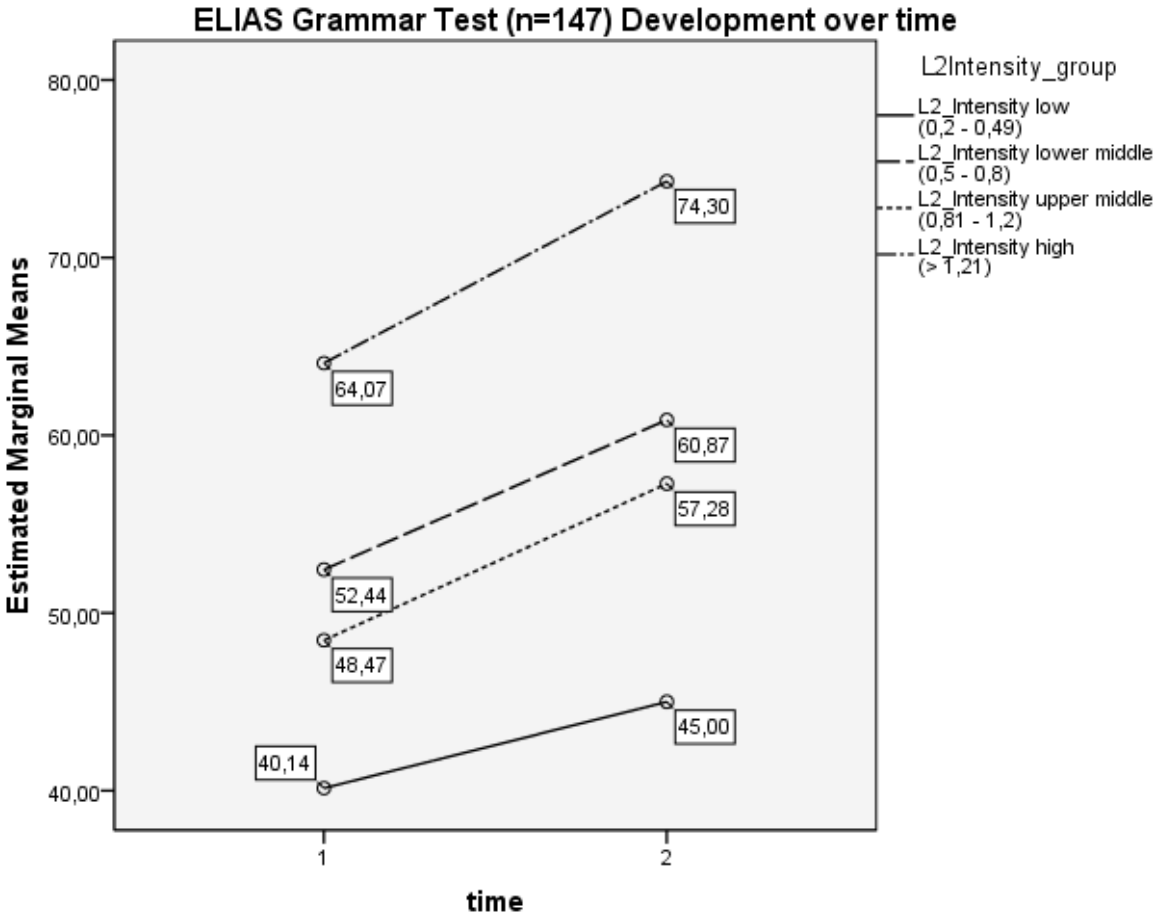

Fig. 5: Relation of *input intensity* and grammar development (all 9 preschools)

18 A repeated measure analysis showed significant differences for time (time: F (1,143) = 87,685, p < 0.05) but not for the interaction (Time*IQOS_group_: F (3,143) = 1,760, p > 0.05).

19 All 123 children who completed the Grammar Test at T1 and T2 are assigned to two input intensity goups: low < 1.0 (64 children) and high > 1.0 (59 children). A repeated measure analysis showed significant differences for time (time: F (1,121) = 63,688, p < 0.05) but not for the interaction (Time*IQOS_group_: F (1,121) = 2,597, p > 0.05).

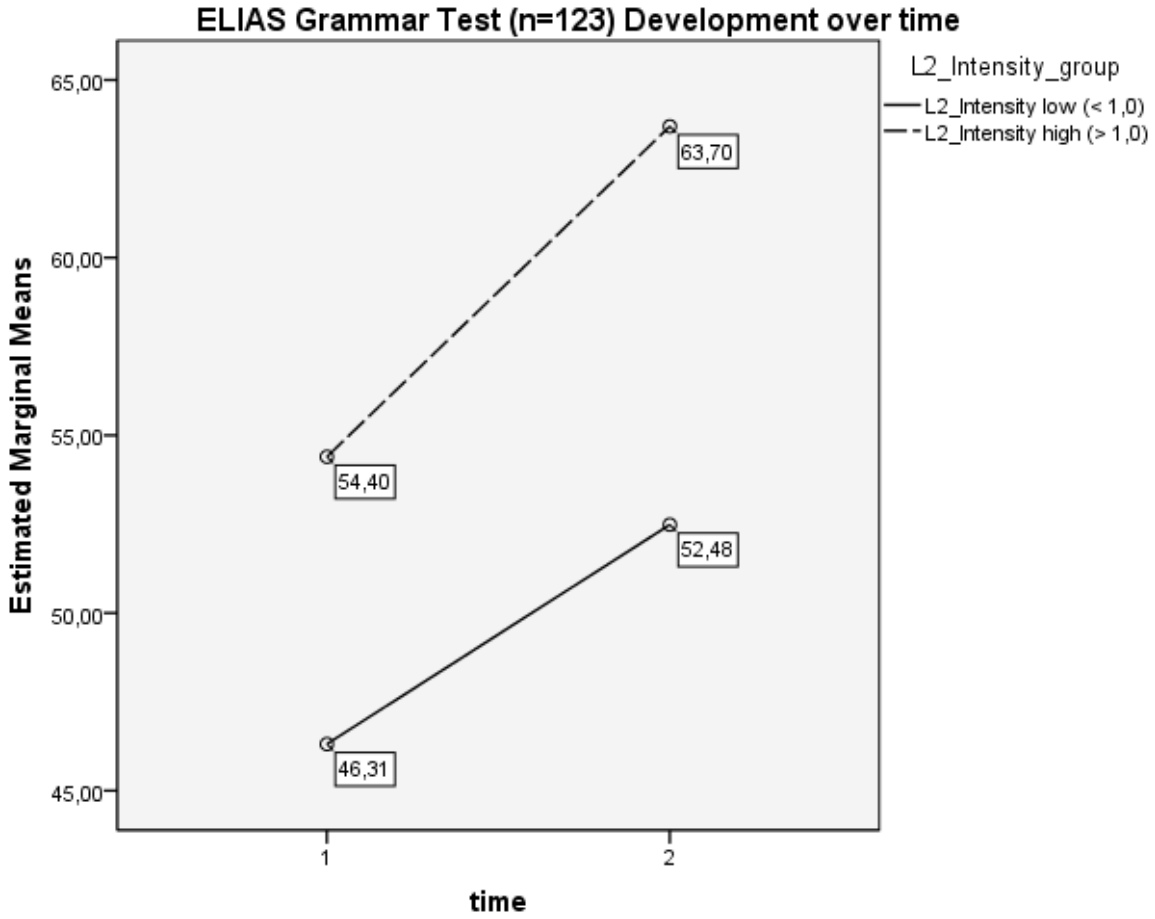

Fig. 6: Relation of *input intensity* and grammar development (German preschools)

As shown in Figure 6, for both goups no significant correlations could be found for grammar development and input intensity. Whereas in the case of the German preschools, this result may be explained with the unfortunate division of input quality into two groups only, the data of all preschools (subdivided into four input intensity groups) display the same results. Therefore, we can clearly state that input which is qualitatively more beneficial seems to increase the rate of aquisition in receptive L2 grammar knowledge.

5. General discussion

The nature of input and the potential impact of a certain type of input on language development has been addressed in various studies and examined for many different contexts, such as L1 acquisition and SLA in naturalistic and instructional settings (Arthur et al. 1980, Braidi 2002, Ellis et al. 2001, Ferguson & Debose 1977, Gaies 1983, Gass 2003, Hatch et al. 1978, Hatch 1980, Loewen 2005, Long 1981, 1983, Long & Sato 1983, Lyster 2007, Lyster & Ranta 1997, Scarcella & Higa 1981, Sokolov & Snow 1994).

The IQOS, being an observational tool for immersion preschool settings aimed at i) identifying and describing differences in the nature and quality of the L2 input offered to children in these settings and ii) further analysing the effects that these differences may have on the children's L2 development. In order to find out whether the IQOS actually is a valid tool to identify differences in input quality, in section 4.1, the ELIAS L2 teachers' scores were presented and compared. As previously mentioned, quantitative data concerning the qualitative differences in input quality among L2 teachers could indeed be found.

Furthermore, the analyses show that input quality significantly correlates with the amount of progress in receptive L2 grammar knowledge. This result could be shown for both samples: all preschools and German preschools only.

Considering the interrelation of input quality and rate of receptive L2 lexical acquisition, unfortunately, no such correlations could be found. Thus, neither in the data obtained for all preschools, nor for the smaller group, containing only the German preschoolers, the quality of input seemed to have a decisive influence on receptive L2 lexical development. Given the result that a more beneficial input quality actually correlates with a faster rate of acquisition with respect to grammar knowledge, how can this lack of interaction between input quality and lexical development be explained? Looking into these differences, it may be argued that new vocabulary can become accessible to learners also with a qualitatively less beneficial input. Whereas rich sentence structures are indispensable for the development of morpho-syntactic knowledge, receptive word learning and the development of the mental lexicon (in terms of breadth, cf. Quian 2002) may be less dependent on rich input. Word meanings may, thus, be accessible merely from a high frequency of certain lexical items in the input and deduced from the use of these items within a clear context. Therefore, naming objects or activities without embedding these forms in structurally rich sentences may be sufficient for understanding (and passively recalling) these labels. Furthermore, it is vitally important to distinguish between receptive and productive lexical knowledge. Whereas the *productive* use of lexical items often requires the speaker to connect the words with each other and impose syntactic structures on their utterances (cf. Gass 2003: 227), the perception of words may not necessarily inlcude any morpho-syntactic knowledge of the given lexemes (i.e. vocabulary known in depth, cf. Wesche & Paribakht 1996).

As for the quantitative side of input, no significant differences could be found between the low and the high input intensity groups as to grammar development: It seems that input quality has a greater impact on the rate of acquisition of receptive L2 grammar knowledge than the mere amount of L2 input per week (input intensity). One difficulty when interpreting the results arises from the fact that, with respect to the calculations which included the German preschools only, it had not been possible to form more than two IQOS-groups or intensity groups respectively. By using the IQOS, huge (qualitative) differences between the various input givers (L2 teachers) could be

shown: The L2 teachers' IQOS scores ranged from 30 to 51. According to the 4-level Likert scale which is used in the IQOS (which rates the presence of categories as either "very low," "low," "high" or "very high"), it would have made sense to divide the children into four groups according to the quality of input they received, i.e., the input which they were able to access. Dividing the possible range of input scores (15-60) into four equal groups (according to the IQOS' assumptions; not according to group size) would have resulted in the following grouping: "very low input quality" (IQOS-score 15-26), "low input quality" (IQOS-score 26.25-37.25), "high input quality" (IQOS-score 37.5-48.75), "very high input quality" (IQOS-score 49-60). Due to the unequal distribution of the scores, however, no such groups could be formed. As could be shown for the data of all preschools, however, even a division into four groups does not reveal a correlation between input intensity and the amount of progress in receptive L2 grammar knowledge.

Although the present study indicates correlations between input quality and the children's receptive L2 grammar development, the data obtained with the IQOS needs to be considered critically. Despite the attempt to account for other independent variables that may interact with the children's L2 development apart from input quality (i.e. input intensity, L2 contact time and age), there are still numerous factors which could not be controlled for. These are, e.g., the individual child's motivation to learn a second language or to interact with the L2 teacher(s) (cf. Dörnyei 2001, Gardner & MacIntyre 1993, Gardner 2010, MacIntyre et al. 2002, Masgoret & Gardner 2003), the group strucure in terms of monolingual and bilingual children (native speakers of English may again quantitatively increase L2 input intensity), language learning aptitude (cf. Carroll & Sapon 1959, Carroll 1991, Wesche 1981), the relationship between individual children and the L2 teachers (emotional level, bonding), or the parents' attitude towards bilingualism (cf. Fantini 1985), etc.

Furthermore, relating the total IQOS scores to L2 development may disregard important differences between the scores for individual IQOS categories: A teacher who uses e.g. ritualised language to a very high extent without offering syntactically rich strucures, may obtain the same score as a teacher who deals with more experienced learners and thus uses more elaborate language forms and no ritualised language (see above). Ellis (1986) states that the use of adapted speech or ritualised language "is influenced by a whole host of variables such as the topic of conversation, the age of the participants [...], and, in particular the proficiency of the learners" (ibid.: 133). It is thus indispensable to account for these differences when analysing the data. In order to investigate which aspects of input (i.e. which categories) seem to be particularly influential on L2 development, further studies are needed. Therefore, we intend to form groups of children who are fairly similar with respect to as many independent variables as possible (L2 age of onset, i.e. contact time; age; input; intensity and home languages) and relate these groups to the L2 language test results. Furthermore, we would like to focus on and compare different age groups in order to show differences with respect to particular categories (e.g. adapted speech, ritualised language).

Finally, the IQOS may be implemented by trained teachers as a means of self-evaluation. This, however, requires that the teachers are familiar with the basics of SLA research and aware of the dynamic nature of language acquisition and the ambiguous results indicated for some of the categories. This is especially important as teachers should not take the features addressed in the 15 high inference categories as axiomatic (for reasons discussed above). If used with caution, the IQOS may thus be a valid tool to stimulate discussions among the preschool teachers and support and guide them in their task as language role models.

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Appendix: IQOS – Input Quality Observation Scheme

Name of researcher/s:		**Date:**												
Name of preschool:		**L2 Teacher:**												
Please use the following scores for all checklist-observations: Codes: VL (Very Low): 1 L (Low): 2 H (High): 3 VH (Very High): 4 N.A. (Not Applicable): leave blank (only applies to grey fields!)														
Observation	Date													
	Situation													
	Activity													
General information	Duration (min)													
	Number of children													
	Average age of children													
	Number of native speakers (children)													
	Number of *participating* L1 teachers													
	Number of L2 teachers present													
	Activity: Focus on A: form, B: form (communicative context), C: meaning													
TEACHER														
Quantity	L2 amount													
	Absence of L1 use / translation													
Input characteristics	Adapted speech (rate of speech, intonation)													
	Varied input (complex/diverse/"rich")													
	Ritualised language/phrases													
	Verbal acknowledgment of children's interactional moves													
	Focus on form (metalinguistic)													
Promoting comprehension	Contextualisation I: gestures, facial expressions, acting, etc.													
	Contextualisation II: pictures, objects, realia, etc.													
	Explanation & comparison													
	Ensuring children's comprehension													
Reacting to children's output	Encourages and maintains L2 output													
	Implicit corrective feedback													
	Absence of explicit corrections / forcing correct imitation													
CHILDREN														
Children's reaction	Children listen													

Receptive L2 Lexical Knowledge in Bilingual Preschool Children[1]

Andreas Rohde

1. Introduction

It is not the speech sounds or the rules of grammar that require the most extensive learning, but the lexicon (Miller 1996: 5), yet in 1984, Meara stated "interlanguage theory has traditionally had very little to say about the lexical behaviour of non-native speakers" (Meara 1984: 225). One of the reasons why L2 lexical acquisition or L2 vocabulary learning[2] was not given much attention well into the 1980s may have been that it was not clear which research questions should be asked in connection with the L2 lexicon: Unlike L2 phonological or morpho-syntactic development, where similar developmental sequences were able to be identified for large populations of L2 learners (Ellis 2008, Wode 1993 for reviews), lexical development evades the notion of developmental stages and appears to be highly individual (Rohde 2005, Singleton 1999). In the past 25 years, however, not least due to new approaches such as minimalism (Radford 2004), the lexicon has no longer been viewed as a separate issue, as an isolated inventory of content and function words. Rather, it has been regarded as playing a dynamic part in morpho-syntax. It is the choice of lexical items that drives the syntax, determining what structures are and are not possible in a sentence (Cook & Newson 2007: 8). Due to this "new dynamic image," the lexicon has gained new ground, leading to a number of research questions in vocabulary learning (Ma 2009, Singleton 1999).

Before the results of the ELIAS study are presented and discussed, some of the essential issues in L1 and L2 lexical acquisition have to be addressed in order to place our study within the framework of vocabulary research. Naturalistic and classroom L2 acquisition will be distinguished in the following, not because there are fundamental differences between these two types of acquisition, but rather because the research questions often differ depending on whether children acquire their vocabulary with or without formal teaching.

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1 Acknowledgments: Data collection was carried out by Aafke Buyl, Maria Büllesfeld, Anna Flyman Mattsson, Lydia Gerlich, Lena Gotthardt, Sylvia Luft, Svenja Pahl, Rachel Ramsey, Annelie Schober, Marion Salentin, Anja Steinlen, Ramona Thierer, Shannon Thomas, Martina Weitz, and Insa Wippermann; statistical analyses were carried out by Elke Kalbe and Dario Klemm.

2 Both expressions are used synonymously in this chapter. There appears to be a tendency to refer to "vocabulary" in lieu of "words" or "lexicon" in L2 contexts as "vocabulary" often refers to specific word lists used in classroom scenarios (Hatch & Brown 1995: 1, Lipka 2002). However, I do not see a substantial difference between "lexicon" and "vocabulary," especially in view of the fact that the term "L2 mental lexicon" (Singleton 1999) is well established.

2. The study of L2 lexical acquisition

The task of the naturalistic L2 learner resembles the task which confronts the infant: Lexical units in the speech stream have to be isolated and connections have to be made between these units and the meanings they are intended to communicate. The difference is that the L2 learner can draw on her experience of making such connections between lexical forms and meanings in her L1 (Singleton 1999: 48). The involved languages in the ELIAS study (i.e. French, German and Swedish) are typologically and genealogically related to the target L2 English to varying degrees, therefore, a considerable amount of cultural overlap can be assumed between them, so that a large number of concepts that has been lexicalised in the learners' L1 can be expected to be at least similar in the L2 and to facilitate the formation of new concepts (ibid.).

2.1 Prerequisites for lexical learning: Lexical principles vs. socio-pragmatic approaches

One of the major debates in L1 acquisition has been the question of whether or not we have to posit constraints on lexical learning. Whereas some authors claim that there is no specific word learning mechanism and that the child acquires her lexicon in social interaction by using her theory of mind (the ability to put oneself into somebody else's shoes in order to interpret his or her intentions), others assume that learners have to be constrained as to the potential meanings of words (Golinkoff et al. 2000). Markman (1989, 1994) postulates lexical principles which are to be viewed as basic assumptions as to which referents words refer to. They limit the potentially infinite number of possible referents in a concrete situation: How does a young child who hears the word *dog* or *doggie* for the very first time know that it is the dog being referred to and not the dog's fur, shape, colour, size, or the dog plus the ground it is running on etc.? The lexical principle that the child applies in this scenario is referred to as the *whole object assumption* according to which labels/words refer to objects in their entirety and not to their parts or substances. Two other lexical principles Markman posits are the *taxonomic assumption* (words refer to objects of like kind; when a dog has been referred to as *dog*, other "objects" which have been recognised as being similar are also referred to by the same label) and the *mutual exclusivity assumption* (young learners prefer one label per object, they initially refuse synonyms) (Markman 1989, Rohde 2005).[3]

In contrast to the claim that innate constraints in the shape of lexical principles guide children's L1 word learning, other authors adopt a socio-pragmatic approach, "[…] adopting instead an experientalist and conceptualist view of language in which linguistic symbols are used by human beings to invite others to experience situations in par-

3 The lexical-principle-models traditionally focused on object words only, however, the assumption of lexical principles is in fact compatible with verbs and adjectives (Golinkoff et al. 1995, Rohde 2005: 102ff.).

ticular ways" (Tomasello 2001: 134, 2003). According to this view, parents and teachers invite children to "attend to certain aspects of a shared social situation" (ibid.). In order to then understand or learn new words in a shared social situation, the child makes use of her theory of mind (see above), uses cues of joint attention (e.g. eye gaze) and does not have to revert to lexical principles (Grassmann et al. 2009). In a disambiguation experiment, for example, a child is shown a banana and a whisk (an object the child has never seen before and does not have a name for). The child is now asked to "show me the *fendle*" (*fendle* being a nonce word). She could now proceed as follows:

(a) I know that a banana is called *banana*.

(b) If the speaker meant to refer to the banana, she would have asked me to show her the banana.

(c) But she didn't; she used a strange word, *fendle*.

(d) So she must intend to refer to something other than the banana.

(e) A plausible candidate is the unknown object [the whisk]

(f) *Fendle* must refer to the unknown object (Bloom 2000: 68, Rohde 2005: 128f.).

Note that the child does not have to assume that labels are mutually exclusive. Rather, she has to be able to interpret the speaker's intention. In a nutshell, according to the socio-pragmatic view, the interpretation of intentions does the work of lexical principles. There is no space here to discuss the debate of constraints vs. socio-pragmatic learning in more detail (cf. Golinkoff et al. 2000, Rohde 2008, Rohde & Tiefenthal 2002), suffice it to say that both approaches are in fact compatible with each other if lexical principles are not regarded as innate constraints but, rather, as assumptions which are acquired and based (amongst other things) on early object perception and which are entertained until there is counterevidence (Rohde 2005: 113). Obviously, the principles have to be overridden when parts of objects, taxonomic hierarchies, (intra- as well as interlingual) synonyms are acquired.

However, there is evidence that, in L2 acquisition, children revert back to the lexical principles and use them as vocabulary learning strategies, i.e. as first assumptions as to what new labels may mean. This has been shown in comprehension as well as production (Rohde 2005). The children tested have experienced, via their L1 acquisition, that lexical principles have to be violated when the context requires it (e.g. when a child is explicitly told that a flower is a plant, the taxonomic assumption is overridden) or when she is told that a specific part of the dog is called "tail" (the whole object assumption is violated) (Rohde & Tiefenthal 2002: 467). L2 production data from four German children's naturalistic acquisition of English in the U.S. suggest that despite the children's L1 lexical knowledge (they were aged 4 to 9) their productive L2 lexicons after six months of L2 exposure appear to be strongly influenced by the three discussed principles: Almost all the object words refer to whole objects,[4] 87% of the ob-

4 "Whole object" (Markman 1989) is obviously a relative term and can, if at all, only be determined in a concrete context. The decision whether or not a word refers to a whole object had to be made on the basis of the described contexts in the diary data of the children and has to remain speculative.

ject words are basic level items, there are no taxonomies in production (Witt 1990), and there are no synonyms (Rohde 2005: 154). This may suggest a rather "one-dimensional" lexical development; however, the use of basic level terms ascertains that the developing L2 lexicon covers a maximum of concrete individual entities in communicative situations. It has yet to be investigated whether the four children's L2 lexical acquisition is singular and has to be accounted for by their age or their specific situation. Unfortunately, there are only a handful of studies in naturalistic L2 lexical acquisition which all suggest steady vocabulary growth rates within the period of study but high variability as far as the distribution of word classes and semantic fields are concerned (Broeder et al. 1988, 1993, Rescorla & Okuda 1984, Yoshida 1978).

2.2 What is lexical/vocabulary knowledge?

Since the publication of Laufer's (1986) plea in favour of L2 vocabulary research, there has been a growing interest in L2 classroom vocabulary acquisition (Coady & Huckin 1997, Daniel 2001, Ma 2009, Singleton 1999), one of the key issues being: What is L2 lexical/vocabulary knowledge? In order to answer this question, Chapelle (1998) proposes a four-dimensional model which includes (a) vocabulary size, (b) knowledge of word characteristics, (c) lexical organisation and (d) lexical access. (a) refers to the question of how many words (receptive or productive) the learner knows, (b) is about knowledge of frequency, register, collocations, grammatical information, semantic features, (c) exemplifies the lexical networks and sense relations a word is part of, and (d) refers to the speed at which a lexical item can be accessed in order to be recognised or used productively (see also Nation 2001).

In connection with (a), (b) and (c), one major issue has been the distinction between the breadth and the depth of lexical knowledge (Anderson & Freebody 1981, Wesche & Paribakht 1996, Paribakht & Wesche 1997). Breadth usually refers to the size of a learner's L2 lexicon/vocabulary and, according to Quian (2002), to the number of words a learner may, also partially, know. Depth, on the other hand, refers to the qualitative dimension of the lexicon and comprises the word characteristics (size, knowledge, organisation, access, see above) as well as knowledge of a word's links within a network. As a measure of lexical depth, Wesche & Paribakht (1996: 30) propose the vocabulary knowledge scale (VKS):

1. I don't remember having seen this word before.
2. I have seen this word before, but I don't know what it means.
3. I have seen this word before, and I think it means _____ (synonym or translation).
4. I know this word. It means _____ (synonym or translation).
5. I can use this word in a sentence: _____ .

This measure, which taps both receptive and productive vocabulary, was predominantly applied in classroom settings to measure learners' initial progress in word learning. However, it is obviously inadequate to test larger amounts of vocabulary and it is

questionable whether it really reflects key stages in vocabulary acquisition (Read 1997).

The breadth-depth dichotomy relates to the knowledge of single words, however, it can also be applied to the entire lexicon characterising its structure: In naturalistic L2 acquisition, a preliminary analysis of L2 learners' object word lexicons suggests that learners first build up "flat lexicons" which heavily rely on basic level items (*cat*, *fish*, *car*) rather than hierarchical structures including super- and subordinate lexemes (Rohde 2005, see above). It remains to be seen, however, whether this is the result of an idiosyncratic lexical learning strategy employed by the four siblings analyzed or whether this could be a more universal modus operandi that initially enables naturalistic L2 learners to quickly refer to as many concrete objects as possible.

2.3 The L2 mental lexicon

A topic of major interest in the more recent past has been the L2 mental lexicon. To what extent is it similar or different from the L1 mental lexicon? Word association studies in both L1 and L2 lexical learning have revealed three types of associative links between words: *syntagmatic* (e.g. collocations: "hard" and "work"), *paradigmatic* (e.g. taxonomic: "flower" and "rose") and *clang* (e.g. similar sounding words: "pink" and "sink") (Meara 1983). Meara argues that the L2 mental lexicon is significantly different from that of L1 speakers but it may change when the learners' proficiency increases. Word association tests with L2 learners reveal more idiosyncratic responses than L1 speakers and they display a large number of clang associations. Semantic links between L1 and L2 words (English and French in this case) are tenuous and easily overridden by phonological similarities (Meara 1983: 3). In contrast, Schmitt (2000) has shown that children's L1 mental lexicon is more strongly characterised by syntagmatic and clang associations, whereas paradigmatic associations increase in adolescents and adults. However, Wolter (2001) argues that there may be no inherent difference between the L1 and L2 mental lexicons. Rather, the structure of the L1 and L2 mental lexicon may be characterised by the degree of individual word knowledge, which is measured with the VKS (see above under 2.2). In the same vein, Namei (2004) suggests that there is no general syntagmatic-paradigmatic shift in the L1 and L2 mental lexicon which would indicate increased knowledge for all words in the lexicon. Instead, the mental lexicons are organised according to the stages at which words develop. She proposes a model in which word-knowledge is structured along a continuum:[5]

5 More recently, Bagger Nissen & Henriksen (2006) have pointed out that the word class of the stimulus word in an association test plays an important role in the subjects' selection of a syntagmatic or paradigmatic response. They suggest that nouns tend to elicit paradigmatic associations whereas adjectives rather prompt a syntagmatic response.

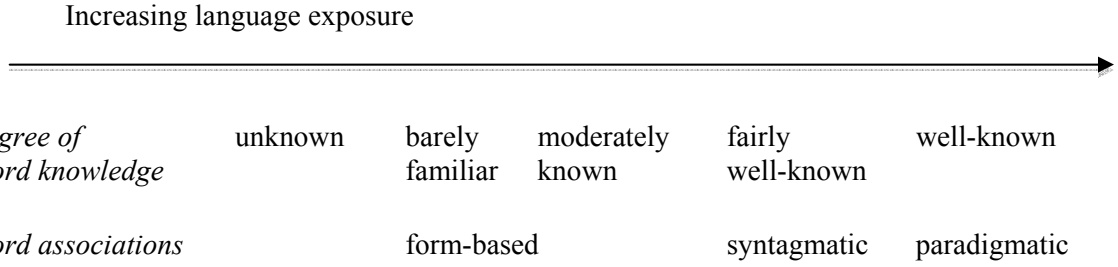

Fig. 1: Word-knowledge continuum and main organisational features of words in the L1 and L2 mental lexicon (Namei 2004: 382)

2.4 Lexical quantity: Growth rates in L1 and L2 vocabulary acquisition

As far as quantitative issues are concerned, it is assumed for L1 acquisition that children acquire between 20 and 80 words in a relatively long drawn-out process and that, at between 16 and 21 months, many children experience a word spurt, meaning that their vocabulary growth suddenly sharply increases (Kauschke & Hofmeister 2002, Rohde 2005 for a review and a discussion of the elicitation criteria). In naturalistic L2 acquisition, in contrast, the scant available data for the four children mentioned above suggest that L2 growth curves appear to peak early on within their six-month stay and then decrease gradually. In other words, the lexicon keeps growing, however, the rate at which acquisition proceeds slows down (Wode et al. 1992). In L1 acquisition the spurt is possibly due to differences in the way linguistic information is stored and processed in memory rather than a marked increase in conceptual development (ibid.).

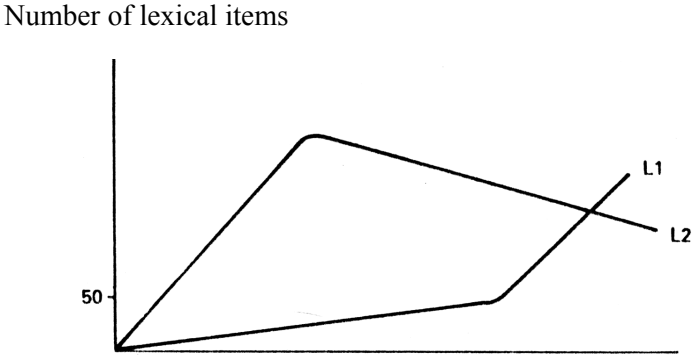

Fig. 2: Schematic comparison of L1 and L2 growth curves (Wode et al. 1992: 58)

Note that this schematic comparison only captures the naturalistic L2 acquisition of English during the first six months by children aged 4 to 9 (whereas the L1 curve roughly represents the span between 12 and 24 months). Neither do we know how the L2 curve would theoretically continue for these children, nor whether older L2 learners would display a similar growth curve.

Bloom (2000) reminds us that in view of the L1 lexicon a 10- or 12-year old has accumulated, a "real spurt" can probably be expected between the ages of 6 to 10 years rather than earlier so that the first 24 months are comparatively insignificant for lexical development. There are as yet no studies looking at naturalistic L2 lexical acquisition over a time span of several years. The schematic comparison would suggest that the L2 growth curve steadily decreases. If this were true, there should be major differences in the vocabulary of L1 speakers and L2 speakers depending on how long the L2 learners have been acquiring their L2. There is an additional problem: We do not know whether naturalistic L2 learners all show a similar growth curve. However, there is some evidence to suggest that an L2 lexicon is unlikely to become native-like if the onset of L2 acquisition is after age 6 (cf. Long 2007 for a review). This at least indicates that there are limits to growth rates and, more important, to the ultimate lexical attainment of L2 learners.

As noted above, the observations for naturalistic L2 lexical acquisition have to be taken with a pinch of salt as they are based on diary and tape data that were not decidedly elicited for lexical research questions. Further comprehensive studies on individual L2 lexicons have to reveal whether other L2 learners also build up flat lexicons first or whether this is simply one of several lexical learning strategies employed by young L2 learners.

2.5 Receptive and productive vocabulary knowledge

It may be stated that, more often than not, breadth of vocabulary corresponds to receptive vocabulary. Conversely, however, being able to produce a word does not necessarily require deep word knowledge. "A word can be used productively in a narrow context without knowledge of other meanings or inflected forms" (Ma 2009: 40). Therefore, it makes sense to distinguish between receptive and productive vocabulary alongside the breadth/depth dichotomy.

In L1 and L2 acquisition, productive vocabulary knowledge has been observed to lag behind the learners' receptive knowledge so that the three following assumptions have been formulated (the studies in parentheses also reporting on evidence):

(a) The receptive vocabulary is larger than the productive vocabulary (Laufer 1998, Laufer & Paribakht 1998, Melka 1997)

(b) Reception precedes production (Melka 1997)

(c) Production is more difficult than reception (Mondria & Wiersma 2004)

Note that the discrepancy between receptive and productive vocabulary may not always be observed. Ringbom (2007: 23) states that it may be pronounced in L1 and naturalistic L2 acquisition, however, in L2 classroom scenarios with limited input, the learners' receptive vocabulary may be much closer to their productive lexicons.

In the bilingual preschools studied prior to and within the ELIAS study, it was obvious that the children in these programmes quickly developed receptive skills in the L2 with their L2 production conspicuously lagging behind (Rohde & Tiefenthal 2000, Tiefenthal 1999, Westphal 1998). As the L1 English preschool teachers were able to understand German, there never was the communicative need to produce the L2 – especially not amongst the children. "Children all share the same first language so that from their point of view, there is no vital reason at all to take the trouble of resorting to an unknown language" (Wode 2001: 429).[6]

Given this situation it was decided to primarily study the children's growing receptive lexical knowledge as they seemed to understand single words and formulas after only few exposures. The first lexicon tests prior to the ELIAS study were designed by the student researchers to exclusively cover nouns, verbs and adjectives that were reportedly used in the preschools (Tiefenthal 1999, Steinlen i.pr., Westphal 1998). These were complemented by an adaptation of Weber & Tardif's (1991) formula test (Maibaum 2000, Tiefenthal 1999). In order to also cover vocabulary which is no longer exclusively preschool-specific the British Picture Vocabulary Scale II (Dunn et al. 1997, henceforth BPVS II) was chosen in order to test and compare vocabulary growth in three German preschools on a larger scale (Weitz & Rohde 2010).

3. Method

3.1 Research questions

In the following section, the results of the vocabulary test, the BPVS II, which was administered in ten preschools in four different European countries, will be presented. The following questions will be addressed and discussed:

1. How does receptive vocabulary knowledge of the children in bilingual preschools develop over a period of ± 12 months?
2. What is the impact of L2 contact duration on the amount of progress made in receptive L2 vocabulary for children in bilingual preschools over a period of ± 12 months?
3. What is the impact of L2 intensity (exemplified as the so-called "input intensity factor" which consists of factors such as opening hours, ratio between L2 teacher/s and children, attendance time per day of children and L2 teacher/s) on receptive L2

6 This situation shows why L2 acquisition in a bilingual preschool programme cannot easily be classified as either naturalistic or classroom L2 acquisition. It has naturalistic features because the L2 is spoken in everyday situations and activities and there neither is formal teaching nor a specific language focus involved. On the other hand, the L2 is only spoken by the native speaker preschool teachers and is thus not the main ambient language. In addition, it may be argued that, due to the group structure in a preschool, situations and activities have to be arranged and organised to some extent and may thus be formal rather than naturalistic.

grammar knowledge by children in bilingual preschools over a period of ± 12 months?

4. What is the impact of sex on the amount of progress made in receptive L2 vocabulary by children in bilingual preschools over a period of ±12 months?
5. What is the impact of the children's home language background in these bilingual preschools on their levels of receptive L2 vocabulary and on the amount of progress they make over a period of ± 12 months? Do minority language children reach similar levels of L2 vocabulary and show similar progress as majority language children?

3.2 Procedure – The British Picture Vocabulary Scale II

The BPVS II is a standardised test instrument to determine the receptive vocabulary of 3- to 15-year old L1 speakers of English as well as the vocabulary of children learning English in Great Britain as an additional language (EAL).[7] It is based on the US-American Peabody Picture Vocabulary Test (PPVT, Dunn, Dunn & Williams 1997) and accounts for various British cultural particularities. The BPVS was preferred to the PPVT because the English speaking preschool teachers in the German and the other European programmes are mostly British or British-oriented.

The BPVS II is composed of 480 entries from the PPVT II, 182 entries from the BPVS I (Dunn et al. 1982) and 10 further selected items. 250 out of the total of 672 pictures are allocated to different semantic and/or grammatical groupings (actions, adjectives, animals and parts, books, body parts of humans, buildings and all other structures, emotions and social expression, food, geographic scenery including space, household items etc., cf. Dunn et al. 1997: 25, Weitz & Rohde 2010). The entries were examined in order to cover a wide range of language levels as well as word classes. "The stimulus words were primarily selected as being 'operational': that is, functional in the context of everyday life […]" (Dunn et al. 1997: 25). All items were tested with the help of more than 1,000 subjects from more than 100 British schools and preschools. On the basis of the test run, 14 sets with 12 cards each were created. Every card contains 4 pictured items, one of which is asked for when the BPVS II is administered. Thus, maximally, 168 words are tested. When administering the BPVS II, instructions are introduced as "Show me …," "Can you find …" or "Point to …." Note that, although the above mentioned *whole object assumption* is not explicitly tested here, it is taken for granted and tested implicitly. Moreover, many of the test items (especially in the early sets) are basic level terms. Some of the test items (e.g. *hand*, *baby*, *bus*, *tractor*, *dancing*, *nest*, *penguin*, *panda*) are cognates of the respective German words so that, in these cases, L1 German children may have profited from the phonological similarity between the German and English words in order to select the target item. Many of

7 EAL does not necessarily mean the children's L2 but can be any further language added to the L1.

these items, however, could also have been recognised by the L1 French (bar *hand*, *nest* and *penguin*) and Swedish (only *nest* is different) children without really knowing them in English.

Nouns are not preceded by an article (*a, an, the*) as it would give a clue as to which word class is required (Dunn et al. 1997: 8f.). For the standardisation of the materials, 2,600 subjects (an equal share of boys and girls) from more than 150 schools and pre-schools were involved (Dunn et al. 1997: 28, Weitz & Rohde 2010).

The individual sets are allocated to age levels: The first set has been conceived for two-and-a-half to three-year old children, the second one for four- to five-year-olds etc. When administering the BPVS II for L1 speakers, the first set is selected according to the age of the tested children. If there is more than one error in the basal set, however, the previous set is tested next and functions as the basal set. For L2 speakers, the first set is always the basal set irrespective of the children's age as there is no obvious correlation of L2 vocabulary and age in L2 acquisition. Testing is discontinued if 8 or more errors are made; this set then is the ceiling set. In other words, children have to score at least 5 correct answers in the sets in order to be tested on higher sets. All correct answers form the raw score, which is later transferred to a standardised score for a particular age level with the help of a conversion table (Dunn et al. 1997: 40-47). The standardised score for L1 children then reveals the grade of deviation from an average score which is attained by L1 English children of the same age (Weitz & Rohde 2010). Thus, it can be established whether a score correlates with a certain age group or whether it is ahead of it or lagging behind

As mentioned above, the BPVS II has also been standardised for learners aged 3 to 8 with English as an additional language in Great Britain. For these learners the test was standardised with the help of 410 subjects from 77 schools. Results showed that the EAL learners' scores were significantly lower than for the L1 group. There is also evidence that the difference between L1 learners and the EAL group increases with age (recall our reflections on growth rates above). "There is a difference of ten months for the Pre-school sample, about one and a half years for the Year 1 group [age 5 to 6 years], and nearly two years for the Year 3 group [7 to 8 years]" (Dunn et al.: 37). Dunn et al. (1997) find this increase surprising. They had expected the largest differences with the youngest children without schooling experience and smallest for the oldest age group. However, in view of the data from naturalistic L2 acquisition reported above, child L2 learners show an early peaking L2 curve before growth rates gradually decrease. This may be accounted for by the communicative needs of the learners which they are able to satisfy after a relatively short time so that unless they are making a conscious effort, their lexical growth rates may strongly hinge on individual interests. As mentioned above, after the age of 6, an L2 learner is unlikely to develop a native-like lexicon (Long 2007). Unfortunately, Dunn et al. (1997) have no data on how long the EAL learners had attended British schools and when they had actually started to learn English. Furthermore, what was not controlled for was the im-

portant question of whether English as an "additional" language was the L2, L3 or even L4. Therefore, every comparison between European L2 learners of English acquiring English in their home country and the EAL learners in the BPVS II has to be treated with caution.

Despite these shortcomings, we decided to use the BPVS II in the ELIAS study as it had proven to produce coherent results in the study of three German preschools. Most of the German children's test results fell within the EAL scores and could thus be set in relation to the vocabulary of children acquiring English in an English speaking environment (Weitz & Rohde 2010).

Each child is tested individually by two experimenters in a quiet, familiar preschool room. Testing usually does not exceed 10 minutes. One examiner asks the child to point to the appropriate picture when giving the respective prompt (e.g. "Show me *baby*"). In this prompt, it is important to not change any word endings or embed the items into a sentence, since this may provide extra clues for the children to guess which one the target picture is. In order to warrant the child's understanding of the task, two training sets are run with the child before starting with the first test item. While the first experimenter interacts with the child, the second observes the situation outside the child's focus and records the child's answer on the performance record sheet. If a child is either unwilling to point to a picture or does not know the appropriate selection (although guessing is explicitly allowed), the item is counted as wrong and testing is continued with the next set card. Testing starts with the initial set, the *basal set*, for every child, and is discontinued after the *ceiling set* in which 8 or more incorrect answers have been provided.

3.3 Subjects

In 2009 and 2010, a total of 200 children, 96 girls and 104 boys (48% girls and 52% boys) from seven bilingual preschools in Germany, one in Sweden and one in Belgium were tested on the BPVS II twice at an interval of 5 to 15 months. The children's age range was between 34 and 88 months at T1 (test/time 1) (mean: 56.4 months, SD = 13.1 months) and they had been exposed to English between 1 and 50 months at the time of T1 (mean: 14.2 months, SD = 9.7 months). At the time of T2, the children were between 42 and 98 months old (mean: 67.3 months, SD = 13.3 months) and their contact time to English was between 10 and 61 months (mean: 25.1 months, SD = 9.3 months). These children will be referred to as "L2 children," although in fact, for some of the children with a migration background, English may be the L3 or even the L4.

20 children from the German, Belgian and Swedish preschools whose L1 is English have been eliminated from the calculations. The data of 20 L1 English speaking children from a preschool in England are included in the discussions of the development of scores over time (4.1), contact (4.2) and sex (4.4) but are not looked at separately. This data will be analyzed in detail in Schelletter & Ramsey (this volume).

4. Results

In this section, the results of the BPVS II study will be presented. They reveal whether and to what extent the scores differed from test 1 to test 2 (5 to 15 months elapsed between test 1 and test 2). The focus will be on the nine bilingual preschools from Belgium, Germany and Sweden.

4.1 Development over time

In Figure 3 the results for the bilingual preschools are collapsed and shown in relation to the L1 data of 20 children from a monolingual English preschool. The L2 children received lower scores at T1 (mean 79,39, SD = 15.18) than at T2 (mean 81,72, SD = 14,0). This difference is significant, as statistical analyses revealed.[8]

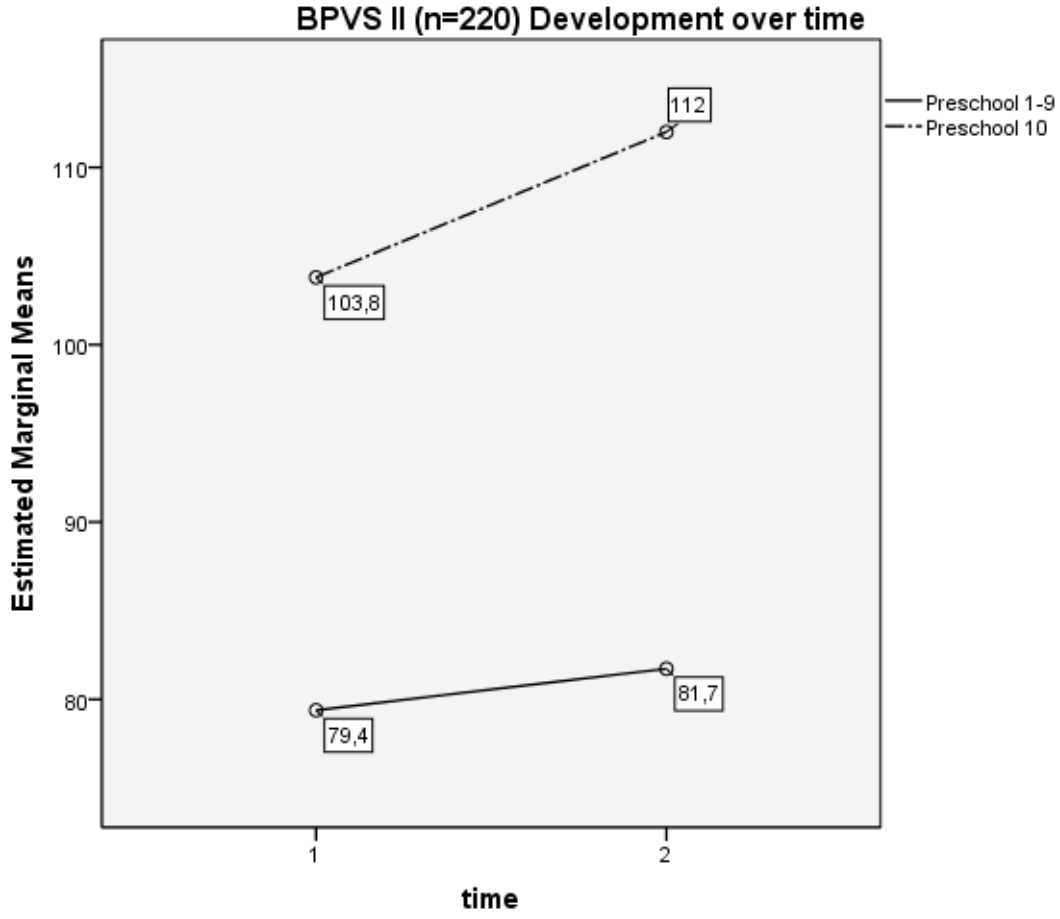

Fig. 3: BPVS II scores for all bilingual preschools combined and for the monolingual English preschool (preschool 10) as obtained at T1 and T2

8 A test of within subject contrasts for the bilingual preschoolers revealed significant differences for time (Time: F (6,094) = 547,560, $p < 0.014$).

The 20 L1 children from the English preschool also obtained higher results at T2 than T1 (T1: mean 103,8, SD = 13,25; T2: mean 112, SD = 11,95).[9]

"The EAL standardised score indicates the degree to which an individual's score deviates from the average for EAL children of the same age" (Whetton 1997: 2). The scale is based on the normal distribution of scores which is expected for the EAL population in the UK. It is calculated on the basis that the average standardised score is 100 with a standard deviation of 15 (ibid.).

4.2 L2 contact

Despite the different programme setups, it was assumed that the length of exposure to the L2 influences the receptive vocabulary scores for the preschool children. Contact was identified as the time the children had been in the programme at the two times of testing. Note that this does not say anything about the actual intensity of the input – this being a variable that will be looked at separately below. The 200 L2 children were subdivided into three groups, depending on how much L2 contact they had had at the time of T1 and T2 respectively. Group 1 had 1-12 months of L2 contact (n = 92), group 2 had 13-24 months (n = 82) and group 3 had 25-72 months of L2 contact at the time of test 1 (n = 26). In addition, the results for the twenty monolingual English children were added. Figure 4 gives the results. According to statistical analyses, all three bilingual groups improved significantly from time 1 to time 2, independent of how low their L2 contact at test 1 had been.[10] However, a comparison of the three contact groups revealed that group 1 (1-12 months) differed significantly from group 3 (25-72 months) but not from group 2 (13-24 months). The L1 children's growth rate differed highly significantly from all the L2 groups ($p < 0.00$).

9 Note that the monolingual children's scores are the L1 and not the EAL scores given for the bilingual children. For this reason the bilingual children cannot be compared to the monolingual ones.

10 A test of within-subjects contrasts showed significant differences for time (Time: $F (10,36) = 919,552$, $p < 0.01$) but not for the interaction (Time*L2 contact_T1: $F (2, 23) = 197,861$, $p > 0.5$).

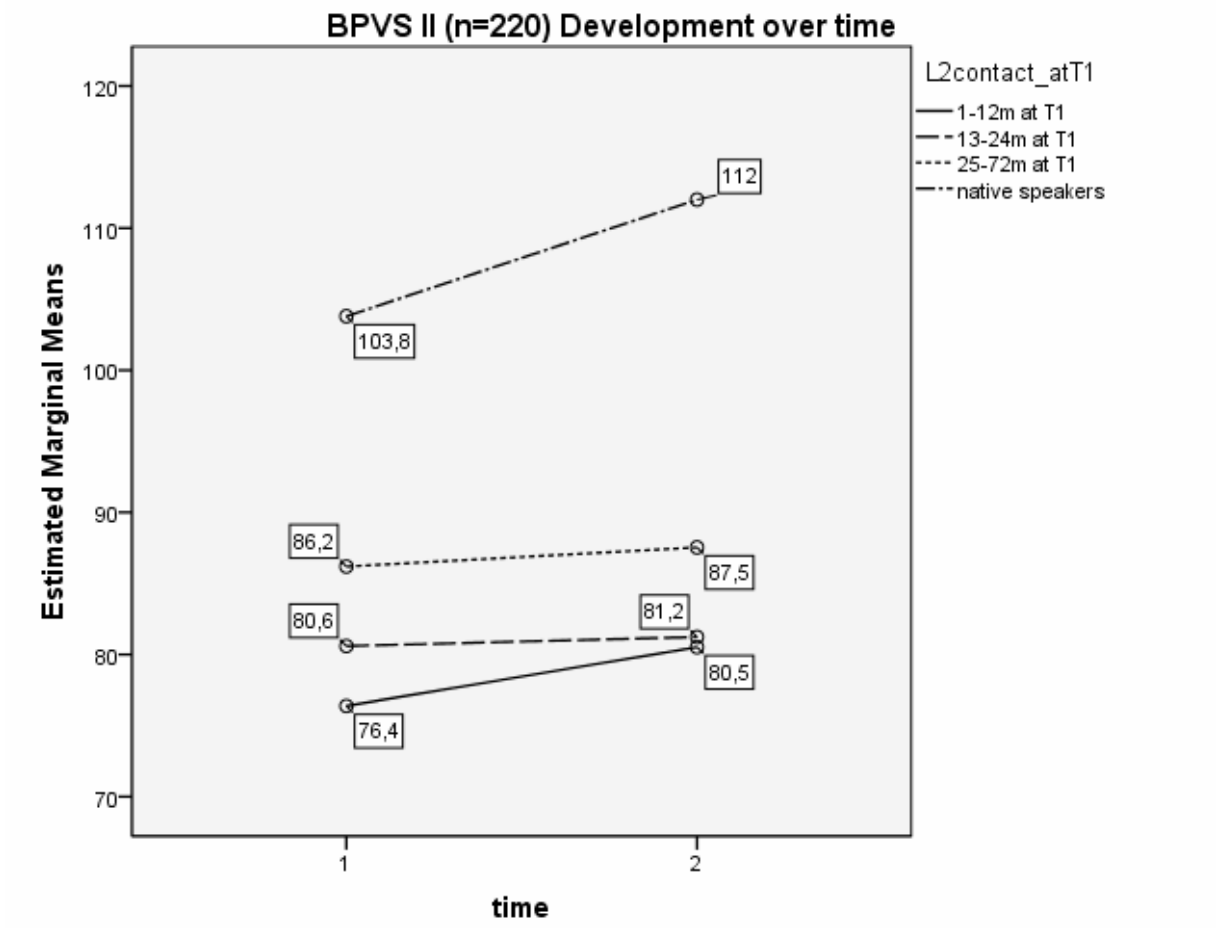

Fig. 4: BPVS II scores for three bilingual groups with different L2 contact time, as obtained at T1 and T2. The data of the monolingual English children ("native speakers") were added.

4.3 L2 input intensity

The measure of L2 contact as the total time a child has spent in a particular programme is obviously problematic as it does not communicate anything about the amount of L2 input that the child has really been exposed to. For this reason the attempt has been made to calculate the intensity of the input by especially taking the opening hours of the preschools, the number of hours both children and L2 teachers are present and the L2 preschool teacher-child ratio into consideration in order to arrive at a more realistic estimate of how much L2 input every individual child has actually had (for details see Weitz et al. in this volume). The resulting "input intensity factor" also has its shortcomings as it obviously calculates the potential rather than the real input, but it is arguably the closest we can currently get in the attempt to determine the children's L2 input. The 200 L2 children were subdivided into four groups, depending on the children's opportunities to access the L2. Group 1 (low, 0,2-0,49 , n = 50), group 2 (lower middle, 0,5-0,8, n = 53), group 3 (upper middle, 0,81-1,2, n = 57) and group 4 (high, > 1,21, n = 40).

Figure 5 presents four different input intensity groups (for details of these groups see Weitz et al., this volume).

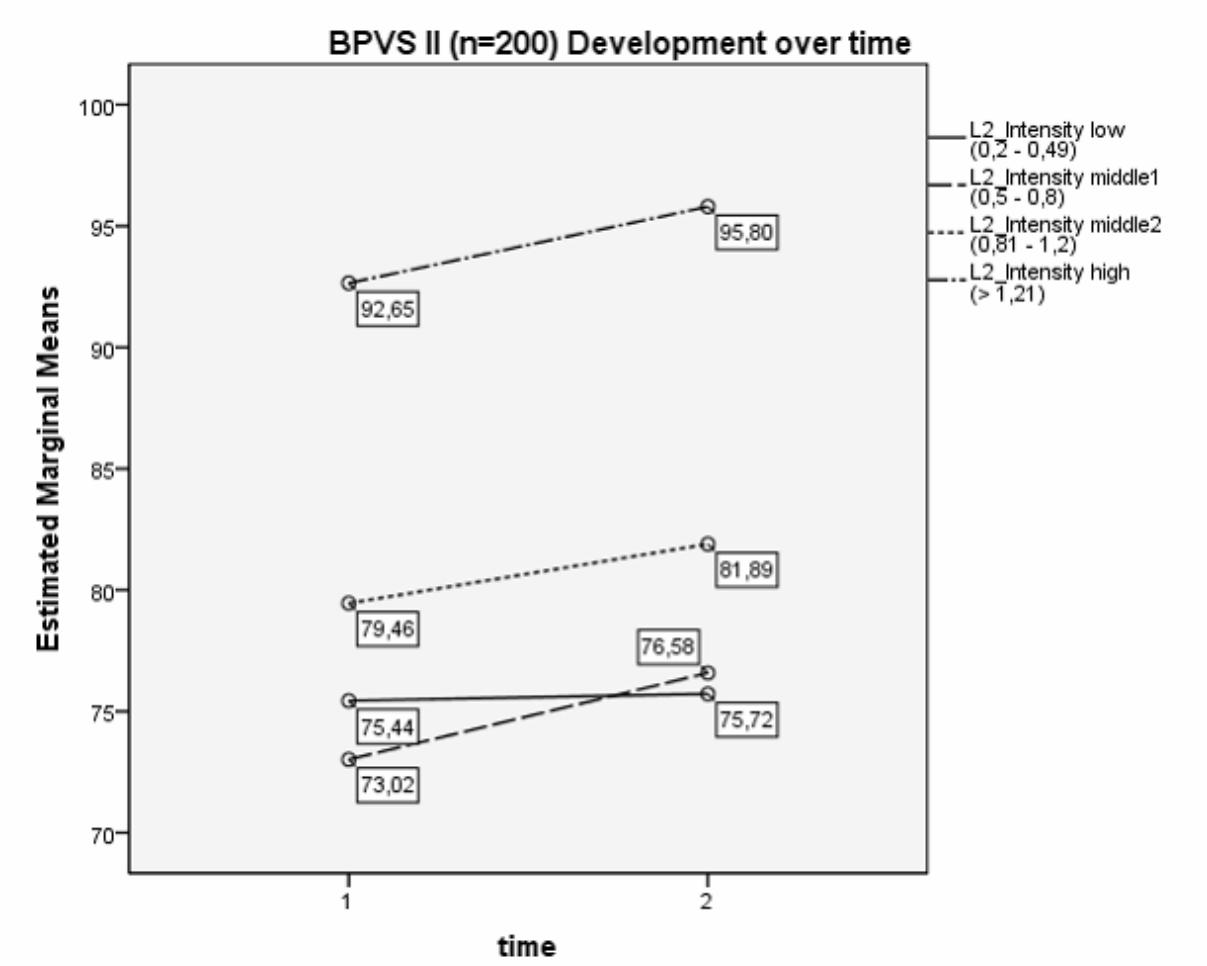

Fig. 5: BPVS II scores for four different input intensity groups as obtained at T1 and T2

For T1 the results for the high intensity group are significantly different from all three other groups at T1 ($p < 0.00$). However, the low and the two middle groups are not different from each other at T1. For T2 there is a significant difference between the low and the upper middle group ($p < 0.031$) and between the high group and all other groups ($p < 0.00$). Note that for the calculation of the input intensity factor the variable of L2 contact (as the total time a child has spent in a programme) had to be excluded.

4.4 Sex

Steinlen et al. (this volume) have pointed out that there are divergent findings in the literature with respect to the effect of the children's sex on their performance in comprehension tasks. Similar to the outcomes of the ELIAS Grammar Test, the boys seem to score lower than the girls at both T1 and T2 for their receptive vocabulary, taken L1

and L2 groups together, as presented in Figure 6. This difference, however, fails to reach the significance level for the L1 children.[11]

For the L2 children, the difference in the BPVS II scores between the boys and the girls is in fact significant at T1 but not at T2.[12] In contrast, the difference between the L1 boys and girls is not significant at either test time.[13] It has to be stressed here that girls and boys were in fact comparable to each other with respect to age and amount of L2 contact (see Steinlen et al., this volume).

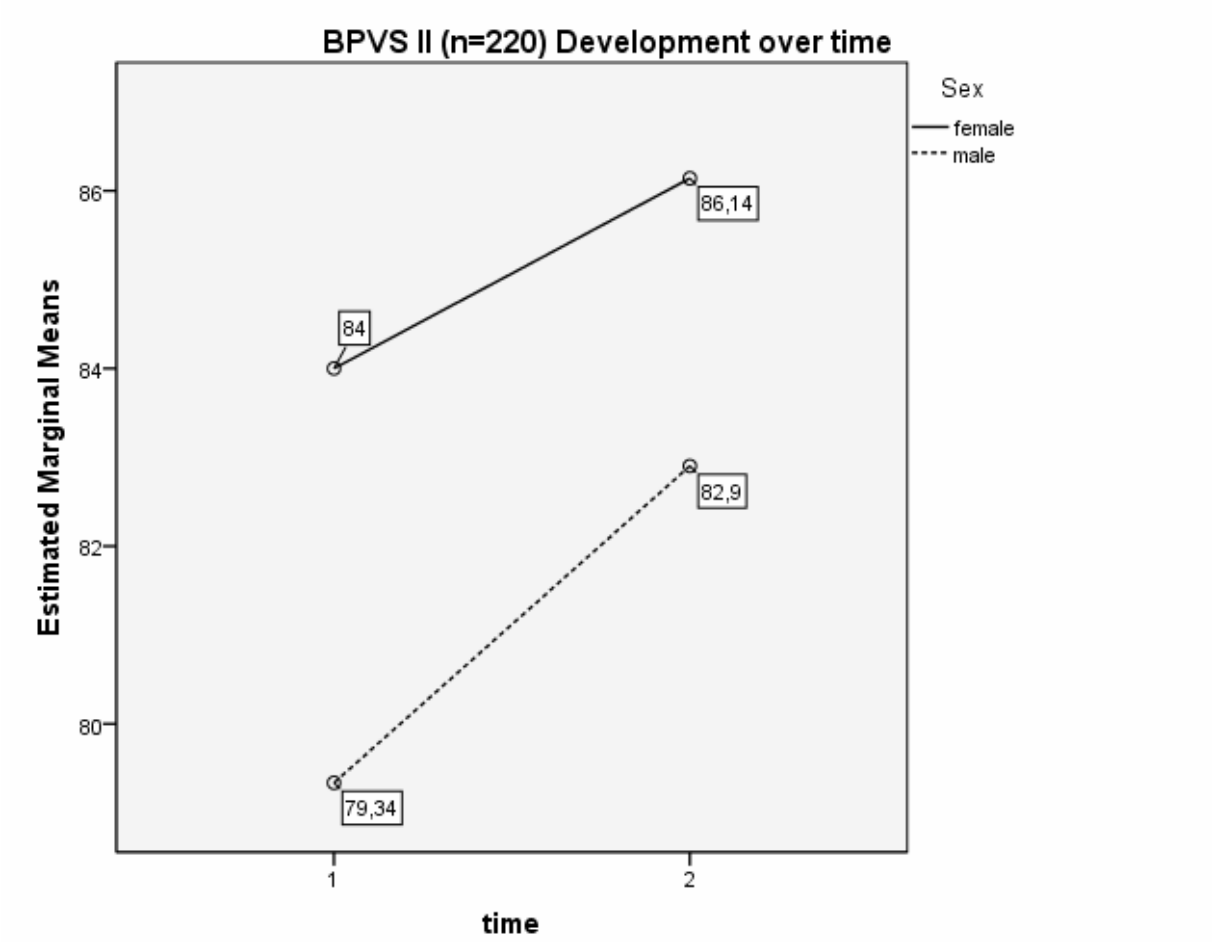

Fig. 6: BPVS II scores for both L1 and L2 children with regard to sex, as obtained at T1 and T2

4.5 Home language background

In the ELIAS project, children with a migration background are those whose parents were not born in the countries under scrutiny (i.e. Belgium, Germany, Sweden). Two

11 Tests of within-subjects contrasts showed a highly significant difference for time (F (9,896) = 894,866, p < 0.002) but not for the interaction between time and sex: time*sex, (F (0,618) = 55,893, p > 0.05).

12 T1 (F (4,140) = 939,143, p < 0.043), T2 (F (2,188) = 428,121, p > 0.05).

13 An ANOVA reveals no significant differences: T1 (F (0,160) > p 0.05), T2 (F (2,113) > p 0.05).

groups are distinguished here: 1. Children with a migration background whose home language is the ambient language (e.g. French in Belgium, German in Germany, Swedish in Sweden), 2. Children with a migration background whose home language is not the ambient language but the family's original L1 or an altogether different language from the family's L1 and the ambient language.

Out of the 200 children who completed the BPVS II twice, 63 had a migration background (31.5 %). Of these 63 children, 13.5 % had the ambient language as their home language (N = 27). For the remaining 18 % the home language is not the ambient language (N = 36).

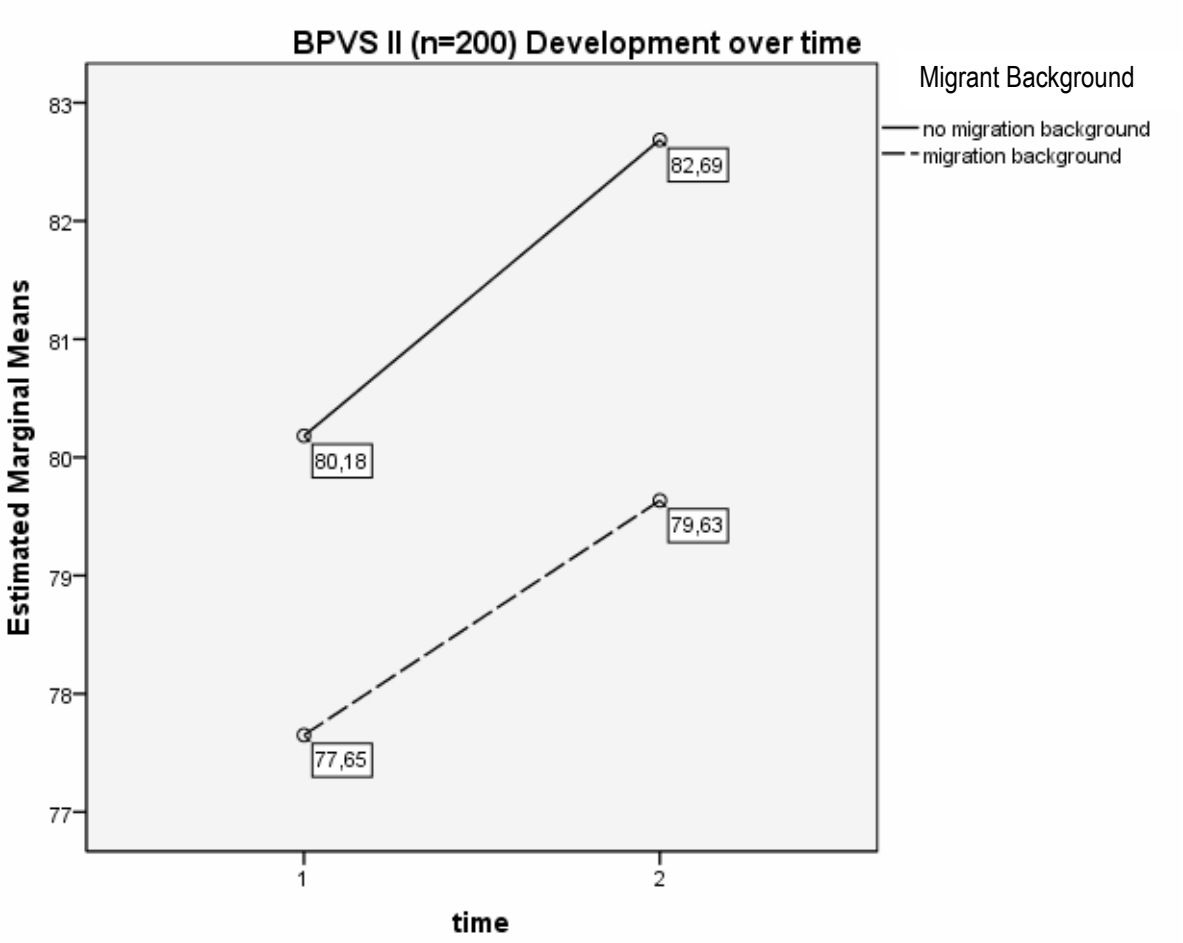

Fig. 7: BPVS II scores across all preschools, as obtained at T1 and T2, focus on migration background

Both children with and without migration background obtain significantly better results at T2 in comparison to T1.[14] However, although the L2 children without a migra-

14 Tests of within-subjects contrasts reveal a significant difference for time: Time (F (4,814), $p < 0.029$.

tion background seem to receive higher scores than those with a migration background, this difference is not significant.[15]

Figure 8 differentiates the scores of the two migration groups. In this constellation there is no significant improvement from T1 to T2 for the two migration groups.[16] In addition, there is no significant difference between the migration groups.[17]

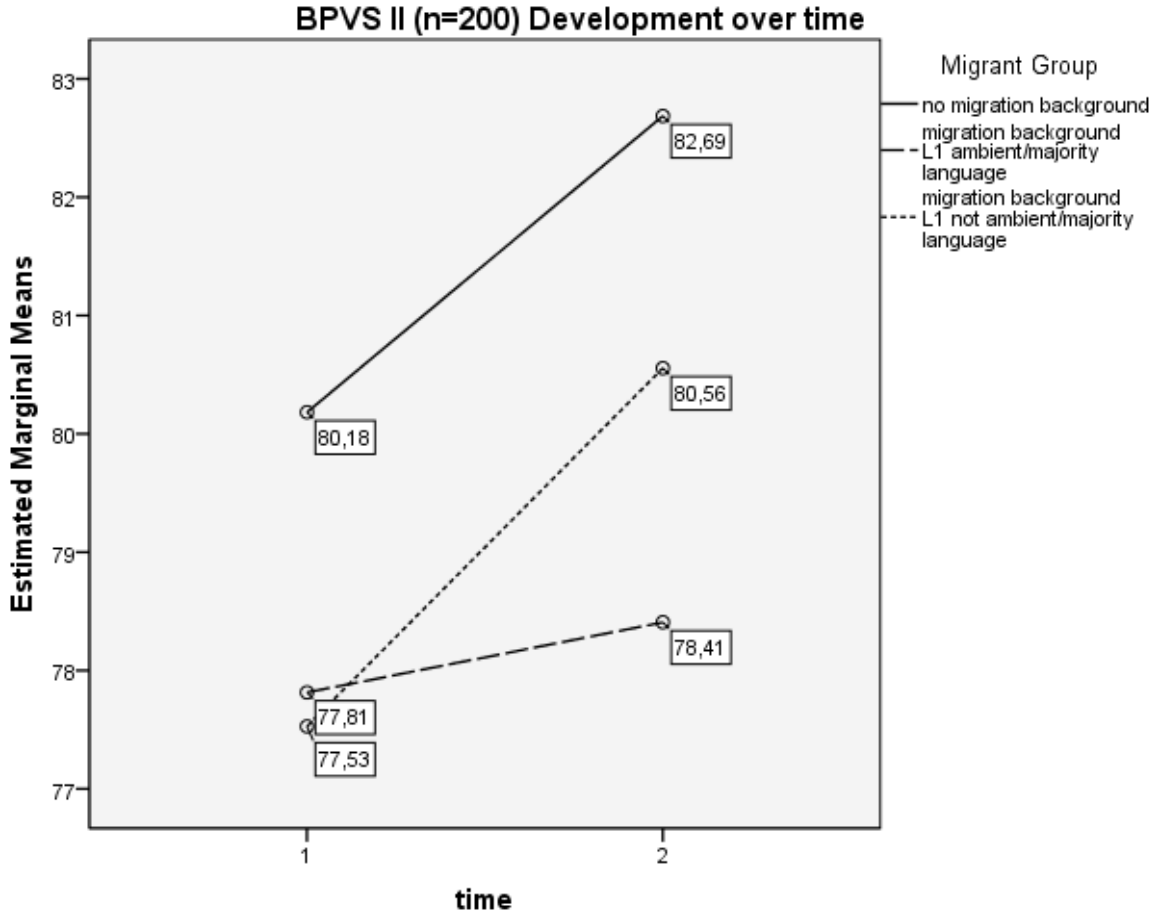

Fig. 8: BPVS II scores across all preschools, as obtained at T1 and T2, focus on migration background, distinguishing two migration groups

Despite the fact that the graphs appear to be different for the three groups compared in Figure 8, it does not make a significant difference in the development of their L2 receptive vocabulary whether children have a migration background or whether they speak the ambient language at home.

15 Tests of within-subjects contrasts reveal no significant difference for the interaction between time and migration background: Time*migration background: (F (0,065), $p > 0.05$.

16 Tests of within-subjects contrasts do not reveal a significant difference for time: Time (F (2,873), $p > 0.05$.

17 Tests of within-subjects contrasts show no significant difference for time: Time (F (0,285), $p > 0.5$.

5. Discussion

This study examined the development of L2 receptive vocabulary in children with different L1s (i.e. German, French and Swedish) who were exposed to the L2 English in a preschool context. The results suggest that children learn an L2 as early as preschool and steadily improve their receptive vocabulary. The study revealed significant differences for the children's L2 vocabulary at two test times.

The L2 contact and the L2 intensity results share one characteristic: Both measures reveal that contact and intensity only make a difference in receptive vocabulary knowledge after an extended period of time. Within the first year of L2 contact, children appear to build up a considerable receptive lexicon but then only gradually add to their vocabulary so that a significant improvement can only be stated for the highest contact group (25-72 months) in the programme. It is obvious that the contact time in terms of the total time a child has spent in a programme is not particularly revelatory as the actual exposure to the L2 may be rather scant, if e.g. English is only heard once or twice a week. The proposed "L2 input intensity factor" (see Weitz et al., this volume) avoids the shortcomings of the "L2 contact measure" by determining the potential time of exposure for the children of the different European preschools. A third measure complementing L2 contact and L2 intensity is the L2 input quality (see ibid.).

Two further results concern the sex of the children and a possible migration background. In line with the results of the other studies in this volume, girls and boys do not perform significantly differently in their acquisition of a receptive lexicon. It is true that the girls may have had an advantage at test time 1 but, more important, at test time 2 the boys' and the girls' results did not significantly differ. The comparison between children with and without a migration background did not produce any significant differences either. This is a vey encouraging result as it is often informally reported that children with a migration background are disadvantaged in a preschool setting in which yet another "new" language is introduced. It is perhaps even more surprising that even the children who do not speak the ambient language at home do not lag behind in L2 acquisition. It is these children who are reportedly likelier to be disadvantaged in learning contexts as neither their L1 (a minority language) nor their L2 (the ambient majority language) may be age adequate (Apeltauer 2004).

This study of the development of children's L2 receptive vocabulary knowledge within the ELIAS project is necessarily limited in scope. Due to the fact that the majority of the preschool children's L2 production is still erratic even after staying one year in a programme, it was not possible to test the children's productive lexical abilities. That is also why the contribution of this study to the general issues in lexical/vocabulary acquisition (see 2.) has to be rather modest:

1. Lexical principles

The *whole object assumption* is not explicitly tested with the BPVS II, however, both L1 and L2 children tacitly assume that the tested labels refer to the entire objects in the pictures rather than to parts or shapes of those objects.[18] The *taxonomic assumption* is not tested either but the BPVS II contains a large number of basic level terms (*cat*, *tractor*, *gate*, *cow*, *tortoise*, *penguin*) reflecting that children in both L1 and L2 acquisition first predominantly acquire and extend new labels on the basic level (Rohde 2005: 153, Witt 1990).

2. Vocabulary breadth vs. vocabulary depth

When compared to *the vocabulary knowledge scale* (VKS, see above under 2.2), step 3 in the VKS ("I have seen this word before …") corresponds most closely to the task of selecting one out of four pictures upon hearing a particular word in the BPVS. Thus, the BPVS can only test the breadth of learners' vocabulary as only core meanings have to be identified when mapping an L2 label to a picture and no deeper semantic knowledge of a word is tested.

3. The L2 mental lexicon

As mentioned above in 2.3, initially, L2 word associations are more strongly based on formal (phonological and/or morphological) similarities between L1 and L2 words than on semantic relations that hold between words (e.g. hyperonymy, synonymy, antonymy). While it is true that the BPVS II is not intended to elicit information on learners' mental lexicons, the children's responses may yet allow the conclusion that, left to their own devices, the children use phonological similarity plus the semantic information in the picture in order to identify object words. Upon hearing English words such as *cow* or *dancing* and seeing, amongst other possible choices, pictures of the animal and the activity, e.g. German L2 learners of English tend to notice the similarity between German *Kuh* and English *cow* (the initial plosive is similar and both words have a CV structure) or the phonological and morphological similarity between German *tanzen* and English *dancing*. These formal similarities prompt them to first establish (receptive) lexical entries for the two L2 words *cow* and *dancing*, following in fact a principle/an assumption akin to the *taxonomic assumption* which could be referred to as the "phonological similarity assumption" in order to establish a mental lexicon: Similar sounding words in two languages refer to the same object/activity.

4. Growth rates

Despite the conspicuous qualitative differences between the programmes tested in the ELIAS study, it has been shown that there is in fact a progress in the children's devel-

18 This does not seem to be true of a label such as "hand." Body parts, however, appear to play a special role in lexical acquisition and have "the status" of whole objects (Bloom 2000: 106, Rohde 2005: 151ff.).

opment of receptive vocabulary over time. This result is in line with the scant evidence from naturalistic L2 acquisition which indicates that at the onset of L2 acquisition there is a veritable vocabulary surge whereas growth rates take a dip as early as six months into the acquisition process. An early peak of growth rates and a henceforth slow acquisition of vocabulary may be due to an early satisfaction of children's communicative needs in the L2 and may go along with a possible fossilisation process. A comparison between these four children and the preschool children of the ELIAS study has to be treated with great caution (not least because we are comparing receptive with productive data), however, there seems to be a tendency for L2 lexical acquisition to be less straight forward than L1 lexical acquisition. More detailed studies in the preschools are clearly required to bear out such a speculation. The problem, however, is that all the studies within the ELIAS project have shown that it is very difficult to control for a number of variables related to both the individual children and the respective preschool programmes.

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Receptive L2 Grammar Knowledge Development in Bilingual Preschools[1]

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1. Introduction

The present chapter focuses on bilingual preschools in Germany, Sweden and Belgium which offer partial immersion programmes in English. The staff members are preschool teachers from the respective countries, but usually one preschool teacher is a native speaker of English or has near-native-like competences. The children from these bilingual preschools investigated in this study are all non-native speakers of English. The bilingual preschool teachers abide by the "one person-one language" principle (e.g. Ronjat 1913). The foreign language is used according to immersion principles, i.e., English is not taught as a subject but, rather, used as a medium for classroom communication and for teaching. In the initial stages of immersion education, when the children have no or only a very limited knowledge of their L2, the preschool teachers contextualise their use of English as much as possible as the children must rely on non-linguistic contextual cues to comprehend the L2 input directed at them. As the children's ambient language outside the preschool is not English (but German, Swedish or French), their L2 acquisition situation is not comparable to being exposed to English in a country where it is spoken as the dominant language or the first language (L1) for most of the population (see e.g. Rohde 2005).

Learning a foreign language entails developing many types of knowledge and mastering many different skills, e.g. phonetic, phonological, lexical, morphological, syntactic, discourse-pragmatic as well as sociolinguistic skills. The present chapter focuses on children's development of grammatical skills, more specifically morpho-syntactic skills. Although the learner's primary concern in the earliest stages of L2 acquisition may be on the acquisition of the lexicon (Hatch 1983; Singleton 1999), mastering the grammatical principles of the L2 is also crucial for efficient communication in the language (Klein & Perdue 1992).

Furthermore, the present chapter investigates children's development of receptive (rather than productive) grammatical knowledge of the L2, for both practical and theoretical reasons. It is generally assumed that during the very first stages of L2 acquisition under investigation here, learners' productive skills lag behind their receptive

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skills. In particular, child L2 learners have been shown to go first through a 'silent stage' during which they are not yet able to produce many utterances in their L2 although they may well already have acquired some 'tacit' knowledge of the language (Ellis 2008). This is also the case for the children in the bilingual preschools in the ELIAS project. These children typically produce very few English words and sentences (see e.g. Wode 2001, Rohde 2005). It was therefore deemed not feasible to analyse production L2 data, because these are still scarce. Instead, the focus of the present study is on preschoolers' grammatical comprehension abilities with respect to their L2 English. The ELIAS Grammar Test, which has been used in this study, is a picture pointing task. This testing format has been successfully used with children between three and seven years of age, often in the form of standardised measurement instruments, to assess grammatical comprehension (see Gerken & Shady 1996 for a review). The focus of this study is on the performance in the ELIAS Grammar Test by bilingual preschool children's as a function of L2 contact duration, L2 input intensity, sex and their home language background.

1.1 L2 contact duration and the level and rate of L2 development

It makes common sense to assume that the more and the longer the contact with the L2, the more foreign language learning will be fostered and the higher the levels of L2 proficiency attained. For the bilingual preschool context, this has been shown in several small-scale studies, which dealt with L2 pronunciation (e.g. Wode 2009), L2 lexicon (e.g. lexical strategies, Rohde 2005, or fast mapping, Rohde & Tiefenthal 2002) and L2 grammar comprehension (e.g. Steinlen 2008, Steinlen & Rogotzki 2009). At the same time, however, several studies on immersion education have also suggested that L2 proficiency does not necessarily increase with longer classroom contact with the L2. In fact, several aspects of L2 proficiency appear to develop *asymptotically*, with development gradually trailing off as it approaches a plateau or ceiling level, in spite of continued contact with the L2. In particular, grammatical abilities have been shown to prematurely 'fossilise' in immersion contexts at a below-native speaker level (Hammerly 1991, Swain 1985, Johnson & Swain 1997, Johnstone 2002). There are also more practical reasons to investigate if and how much L2 proficiency develops with increased L2 contact duration in these bilingual preschools. As mentioned earlier, L2 learning is typically a gradual and relatively slow process and parents, policy makers and teachers sometimes have unrealistic expectations as to the amount of progress that immersion pupils can make in the course of a school year. However, there is still a dearth of empirical information as to exactly how much progress is made within a given time period and what level of linguistic abilities may be expected at certain points in time in the course of immersion education. Therefore the English L2 abilities of the preschool children in the ELIAS project were measured twice at an interval of approximately 12 months in order to show in detail as to how these children proceed to

master certain grammatical phenomena[2] and what level of grammatical comprehension abilities may be expected at a certain point in time during the preschool period.

1.2 L2 intensity and the level and rate of L2 development

The level and rate of L2 development does not only depend on L2 contact duration (i.e. the length of L2) exposure, but also on the L2 input intensity: For example, in Curtain's (2000) study, three elementary school foreign language programmes in the USA were examined which differed with respect to time overall within the programme, the intensity (i.e. the number of classes per week, five-hour and three-hour classed were compared) and the time actually used in teaching and learning in class. For the factor "intensity," Curtain (2000) found that students in more intense programmes fared better than students in less intense programmes. Likewise, from her overview on early immersion models in Canada, Wesche (2001) concluded that an intensive dose of 'immersion' in a language is generally more effective for learning it than the same dose spread over a longer time (see also Genesee 1983, Lapkin et al. 1982).

In the ELIAS project, a closer look at the data also revealed that L2 contact duration (in months) may not account for all differences in L2 language test data: For example, although two children did not differ in terms of their L2 contact duration (and their L1 background and age), they obtained different test results. This difference may be attributed to the fact that these two children did not spend the same amount of hours/days in preschool: One child attended the preschool for only four hours a day, but the other child for six hours. Thus, the second child was exposed to the L2 English two more hours per day than the first child, amounting to approximately ten more hours a week, 40 hours a month, or 1440 hours in three years. This increase in L2 input intensity (in terms of the children's presence in preschool) may affect the children's L2 development. Furthermore, the number of L2 teachers in a preschool as well as their daily presence (in hours) may have had an effect on the children's L2 development: As Wippermann et al. (this volume) show, in one of the ELIAS preschools, there are three L2 teachers for 55 children. In another preschool, only one L2 teacher was employed, who took care of ninety children. It may be assumed that the children's L2 in the preschool with only one L2 teacher may develop slower than the children's L2 in a preschool with three L2 teachers. In such a preschool, the children will, for example, listen to conversations between two different native speakers and they will be exposed to inter-speaker variability in terms of intonation, vocabulary use, pronunciation and grammatical structures. Finally, preschools may also differ in terms of the L2 teachers' attendance time per week: In one preschool, the L2 teacher worked twelve hours a week, in another preschool, it was thirty hours. This, of course, may affect the

2 The term "phenomenon" is taken from Pienemann (1998: 18).

intensity of the L2 input which the children receive during their daily activities in preschool.

As mentioned above, for the L2 school context, "intensity" is usually indexed as the numbers of classes per week (e.g. Curtain 2000, Wesche 2001). However, for the bilingual preschool context, many more different variables need to be taken into consideration because the settings of preschools generally differ from schools. Therefore, a so-called "Input Intensity Score" was calculated which included factors such as L2 teachers' and children's attendance time in preschool per week, opening hours of the preschool, number of children in the institution (see Weitz et al., this volume, for further explanation of the ELIAS Input Intensity Score). This is the first time that the effect of L2 input intensity on preschoolers' L2 abilities will be assessed. As for the school context, it is expected that an increase in L2 intensity may positively affect children's L2 grammatical comprehension skills during their preschool period.

1.3 Sex

"Girls outperform boys" – this seems to be the general finding in many studies on L1 acquisition, be it before, in, or after preschool (see e.g. Huttenlocher et al. 1991, Schlichting & Spelberg 2003, Bornstein et al. 2004, Radeborg et al. 2006). For example, for L1 acquisition, Hyde & Linn's (1988) meta-analysis of 165 studies on verbal abilities of children between age 4 and 18 revealed a (small) advantage for girls. These findings are sometimes transferred to L2 acquisition, to the extent that some may wonder whether an early L2 learning experience like in preschool is equally suited for girls and for boys. The empirical picture for L2 acquisition is not clear, however. In Burstall's (1975) longitudinal study of some 6000 children who started L2 learning at age eight in English primary schools, female learners generally performed better than male learners. A possible explanation for the superiority of girls, according to Burstall (1975), is that they have more positive attitudes to learning an L2 than males. Other studies, however, have produced results suggesting that males are the better learners or that there is no difference. Boyle (1987) reported that the male students in his study performed better on two listening tasks. Bacon (1992) found no differences between the sexes in two authentic listening tasks. For L2 pronunciation, Piske et al. (2001) reported divergent findings concerning the influence of gender on the degree of L2 foreign accent and concluded that the results obtained for gender do not lead to any strong conclusions. Several studies on L2 acquisition the bilingual preschool context found that girls and boys performed equally well (e.g. Natorp 1975, Rohde & Tiefenthal 2002, Steinlen 2008, Steinlen & Rogotzki 2009, but see Schmid-Schönbein 1978). Similarly, the *German English Student Assessment International* (Deutsch Englisch Schülerleistungen International [DESI]; Klieme 2006) showed that when English is taught as a subject in school, girls performed better than boys for written production in English but not for oral speech production in English where boys actually outperformed girls. Clearly, the gender issue in L2 learning and L2 education has not been

resolved yet and therefore the present study aims to examine whether boys and girls differ in terms of their comprehension of English L2 grammar in a bilingual preschool context.

1.4 Home language background

To what extent is the effectiveness of early immersion education affected by the home language background of the child? Are immersion programmes at preschool equally suited for *majority language* pupils (i.e. children whose L1 is the official or dominant language of the wider out-of-preschool community) as for *minority language* pupils (i.e. children from family backgrounds where a different language is spoken than the official or dominant language of the wider community)? This is a controversial issue, particularly among policy-makers. There is a general consensus, at least among researchers, that for *majority language* children, immersion education leads to additive bilingualism, with high levels of L2 proficiency and native-like levels of monolingual L1 proficiency. There is still debate, however, about whether immersion education is equally beneficial and suited for *minority language* children, particularly minority language children from a so-called (im)migrant background. Migrant children in many Western countries have been shown to have difficulties acquiring the host nation's official language (which for them constitutes their de facto second language or L2).[3] For instance, Knapp (2006) distinguishes three groups of migrant children, namely migrant children with a good command of the L2, those with a poor command of the L2 and those with "concealed L2 problems" which become apparent later in school. Furthermore, research has found that some migrant children occupy unfavourable positions in the educational system of the host country and often achieve significantly lower overall scores than their majority language peers (cf. Biedinger 2010). What has been examined in less detail, however, is how these migrant children fare with respect to the learning of yet an additional foreign language at school such as English (referred to as these children's L3).

For the mainstream school context in Germany, for example, the results of DESI showed that minority language secondary school pupils who acquired German as a second language have fewer difficulties learning English and even attained higher levels of English-as-subject achievement than majority language pupils who grew up in monolingual German families (Klieme 2006). For younger children (in this case Turkish children learning English in German primary schools), only Elsner (2007) examined how minority language children fared with respect to their comprehension skills in English as foreign language classes in primary school. She reported that their English listening comprehension skills were considerably lower than those of their mono-

3 In preschool, the language of the host country and the new introduced foreign language English may, of course, not be the children's L2 and L3, but their L4 or L5, depending on the languages being used at home.

lingual peers. She concluded that 'multilingualism' does not necessarily lead to better results in English. She attributes this result to the fact that these Turkish children had deficits in their L2 German which in turn negatively affected their comprehension skills in English. In Canada, there are also convergent findings from immersion education. From her literature review, Hurd (1993) concluded that minority language children may benefit from early immersion programmes only as long as there is strong support for L1 development, because otherwise, such a programme could result in a subtractive bilingualism situation for minority language students (see also Dagenais & Day 1998, Swain and Lapkin 2005, Taylor 2006 for similar results). In general, the authors conclude that more research with a greater number of pupils is needed to examine in more detail the challenges and successes encountered by multilingual students. The sample of children participating in the ELIAS project includes 39 preschool children who speak at least one different language at home than the majority language. In addition to acquiring the ambient majority language of the wider community (i.e. their L2), these children are faced with the task of acquiring English (i.e. their L3) at the preschool. The project thus offers a unique possibility to further examine in some detail the important issue of the impact of the child's home language background on the development of the foreign immersion language in a bilingual preschool setting.

1.5 Receptive L2 grammar development

The development of receptive grammar knowledge has rarely been the focus of studies in SLA. By receptive grammar knowledge we mean the ability to process L2 utterances morpho-syntactically rather than the ability to semantically comprehend L2 utterances. In other words, receptive grammar knowledge here refers to the bottom-up processing of linguistic constructions in which attention to form and a detailed structural analysis are crucial (rather than merely top-down processing relying on prior knowledge and contextual cues; cf. Boland 1997; Gass & Selinker 2008).

It is generally assumed that receptive language development precedes productive acquisition, and that language comprehension constitutes the primary source for productive language knowledge (Steinberg 1995). Furthermore, SLA researchers have somewhat conveniently assumed that receptive and productive development in a second language are 'mirror images' which involve the same developmental stages and cognitive mechanisms (e.g. Pienemann 1998, 2007). However, recent studies of the relationship between receptive and productive knowledge in a first language yield a more complicated picture and suggest that the first two general assumptions may, in fact, not be entirely correct (Keenan & MacWhinney 1987; Smolensky 1996). Nor is there empirical evidence for the assumption that receptive grammar development in a L2 is characterised by the same developmental stages as have been found for productive L2 grammar development (see Ellis 2008 and Goldschneider & DeKeyser 2001 for reviews), or even that a relatively fixed developmental pattern can be found at all and, if so, whether this pattern is also universal across factors such as the learner's age or L1

background (Berthele et al., i. pr.; Tasseva-Kurktchieva 2008). This is an area which several reviewers have declared as still unexplored territory in SLA research, and one which represents a major challenge that future SLA research needs to respond to in order to construct a comprehensive theory of SLA (Ellis 2008; Doughty & Long 2005; Ortega 2009). Thus, one of the more theoretical objectives of the current study is to respond to this challenge by investigating the dynamics of receptive grammar development by young child L2 learners of English.

So far, only few studies have dealt with grammatical development in L2 comprehension: For example, Howell and et al. (2003) examined the grammatical development of EAL children in London and reported, not surprisingly, that EAL children performed lower than their monolingual peers. Furthermore, they noted that not all grammatical phenomena were comprehended equally well (see also Fraser et al. 1963, Lovell & Dixon 1967, Nurss & Day 1971, Bishop 1983 for similar observations for L1 comprehension). Unfortunately, there was little indication in the studies as to why this was the case. In small-scale studies on German children acquiring English in a preschool context, it was also reported that grammatical phenomena were not identified with the same degree of confidence (e.g. Burmeister & Steinlen 2008, Steinlen & Rogotzki 2009, Steinlen 2008, Steinlen i. pr.). Here, the authors argued that the use of some grammatical phenomena may be underrepresented in the input that the children receive. This large-scale study will explore in more detail whether the children attending bilingual preschools will comprehend grammatical phenomena equally well.

2. Method

2.1 Research Questions

In the following section, the results of this grammar test, which was conducted in ten preschools in four different European countries, will be presented. The following questions will be addressed:

1. What is the level of receptive L2 grammar knowledge of children in bilingual preschools at two points in time (T1 and T2) compared to the monolingual English preschool group?
2. What is the effect of L2 contact duration made in receptive L2 grammar knowledge by children in bilingual preschools from T1 to T2?
3. What is the impact of L2 intensity (exemplified as the ELIAS Input Intensity Score which consists of factors such as opening hours, ratio between L2 teacher/s and children, attendance time per day of children and L2 teacher/s) on receptive L2 grammar knowledge by children in bilingual preschools from T1 to T2?
4. What is the impact of the child's home language background in these bilingual preschools on their levels of receptive L2 grammar knowledge and on the amount of

progress they make from T1 to T2? Do minority language children reach similar levels of L2 grammar knowledge and make similar amounts of progress as majority language children?

5. What is the impact of sex on the amount of progress made in receptive L2 grammar knowledge by children in bilingual preschools from T1 to T2, compared to the monolingual English preschool group?
6. Are all grammatical L2 phenomena investigated mastered at the same level of proficiency and developed at the same rate from T1 to T2?

2.2 Procedure

This grammar task is a completely revised version of the *Reception of Syntax Test* (e.g. Au-Yeung et al. 2000, Howell et al. 2003) and of the *Kiel Picture Pointing Test* (Steinlen & Wettlaufer 2005). The aim of this test is to assess the preschoolers' development of their comprehension of English grammatical phenomena.

The children in all preschools were tested individually in a quiet room they were familiar with (see Crain & Thornton 1998 on the importance of a child-friendly environment during an experiment). First, the child looked at three pictures. The child then listened to a sentence that corresponded to one of the pictures. Responses were made by pointing to the picture which the child thought to be appropriate to the sentence. Before testing, the children were given two training items consisting of three pictures of different objects and an appropriate single word utterance to ensure they knew how to make the responses. The three pictures in each set differed in the following way. Two of these pictures contrasted only in the target grammatical dimension (e.g. absence/presence of the plural inflectional marker -s: cat/cats). The third picture was a distractor, i.e. it was semantically related to the other two pictures and lexically in most cases (in order to avoid that the children could exclude the picture when they have understood a certain lexical item in the prompt, see Rohde 2000, 2005). The distractor was used in order to ensure that the child understood the grammatical phenomenon required. If there are only two choices given without an additional unrelated choice (as in earlier studies e.g. Au-Yeung et al. 2000, Howell et al. 2003, Steinlen & Wettlaufer 2005), the possibility is excluded that both choices are rejected (Dunham & Dunham 1985).

The children were tested on nine grammatical phenomena (see Table 1 below). Most of the phenomena have been used in the *Reception of Syntax Test* (e.g. Au-Yeung et al. 2000, Howell et al. 2003) and in the *Kiel Picture Pointing Test* (Steinlen & Wettlaufer 2005). It is therefore possible to relate the results of the present study to previous findings. In total, there were 54 test items (9 grammatical phenomena x 3 picture pairs x 2 test presentations per picture set). The session did not take longer than fifteen minutes.

Abbreviation	Phenomenon	Example sentence
AGRc	Subject-verb agreement: copula verbs singular / plural	*the deer is white* *the deer are white*
AGRv	Subject-verb agreement: full verbs singular / plural	*the sheep eats* *the sheep eat*
GEN	Possessive case: absent / present	*the girl is kissing the boy* *the girl is kissing the boy's dog*
NEG	Sentences: affirmative / negative	*the boy is running* *the boy is not running*
PLU	Inflectional morpheme: +/- plural −s	*cat* *cats*
POSS	Possessive pronoun singular: masculine / feminine	*his cat* *her cat*
PROog	Personal pronoun singular (object) masculine / feminine	*the girl is kissing him* *the girl is kissing her*
PROsg	Personal pronoun singular (subject) masculine / feminine	*he is singing* *she is singing*
SVO	Word order	*the boy is touching the girl* *the girl is touching the boy*

Tab. 1: Nine grammatical phenomena were tested in the grammar comprehension task. The phenomena are listed alphabetically. Column 1 shows the abbreviations, column 2 explains each phenomenon, and column 3 provides example sentences ("prompts").

It has to be noted, though, that the grammar test does not exclusively test morpho-syntactic comprehension because the children need to know the words in the phrases and sentences as well in order to demonstrate their grammatical abilities (hence the use of distractors, see above). However, efforts were made to ensure that the children were able to choose the target picture if they understood the target grammatical phenomenon but not the lexical items (as both the picture with the opposing grammatical structure and the distractor showed the contrasting grammatical phenomena).

The children may have interpreted the phrases and sentences not only in terms of their morpho-syntactic properties but also in terms of their semantic roles in the sentence. In the example sentence *The girl is touching the boy* (tested phenomenon: SVO word order), the children may have assigned the first noun phrase (NP) as the agent (usually positioned first in the sentence) and the second NP as the patient (usually positioned second in the sentence). In this case, the position of the NPs in the sentence (e.g. de Villiers & de Villiers 1973, Chapman 1978) as well as their usual function as semantic roles may have been the clues that the children took in order to interpret the sentence. A disadvantage of this grammar test is, unfortunately, that it cannot clearly show whether the children used a semantic or a morpho-syntactic strategy to interpret such a sentence.

Cronbach alpha values varied from .79 (test time 1) to .81 (test time 2), indicating that the test used in this study can be considered as reliable. Since the ELIAS test has not been standardised (yet), norms for interpreting the scores are not available which is

why a benchmark group consisting of monolingual English children from England has been used.

2.3 Subjects

In 2009 and 2010, a total of 148 children (51% girls and 49% boys) from seven bilingual preschools in Germany, one in Sweden and one in Belgium took the ELIAS grammar comprehension test twice at an interval of 5 to 12 months. The children's age range was between 3 and 6 years (mean: 54.4 months, SD = 9.4 months) and they had been exposed to English between 1-42 months at the time of Test 1 (mean: 14.2 months, SD = 8.9 months). At the time of Test 2, the children were between 4-7 years old (mean: 63.8 months, SD = 10.2 months) and their contact time to English was between 10-51 months (mean: 24.2 months, SD = 8.6 months). It was often the case that the older the children were, the more L2 contact they had; the younger they were, the less L2 contact they had.[4] The children will be referred to as "L2 children," although in fact, for some of the children with a migration background, English may be the L3 or even the L4.

In addition, twenty children from a monolingual English background in a preschool in Hertfordshire, England (HS) also took the ELIAS Receptive Grammar Test twice. These monolingual English children served as a benchmark against which the performance of the bilingual preschool children could be compared. The benchmark children were of approximately the same age as the bilingual preschoolers. At the time of test 1, the monolingual English children were between 3-5 years old (mean: 52.9 months, SD = 9.3 months) and between 4-6 years old at the time of test 2 (mean: 59.4 months, SD = 9.6 months). This data will be analyzed in detail in Schelletter & Ramsey (this volume).

3. Results

In this section, the results will be presented to show how the scores differed from test 1 to test 2 (i.e. five to twelve months elapsed between test 1 and test 2). The focus will be on the nine preschools from Belgium, Germany and Sweden which offered a bilingual programme. Altogether, the data of 148 subjects were used, i.e. the data of 109 monolingual children (whose L1 is French German, or Swedish), and, for section 3.3 only, the data of 39 migrant children, who also attended a bilingual preschool. The data of 20 monolingual children from England serve as a benchmark. As this grammar test is a forced choice between three pictures, 33% represents chance level.

4 The results of a bivariate correlation analysis (Spearman's rho) showed a strong correlation between the children's age and their exposure to English (0.387, $p < 0.05$).

3.1 Development over time

As shown in Figure 1, the children received lower scores in Test 1 (50.2%, SD = 14.2) than in Test 2 (57.1%, SD = 16.2). This difference is significant, as statistical analyses showed.[5] That is, the more exposure to their L2 EN the children received, the better their comprehension of selected grammatical phenomena was. Interestingly, this development already starts at an average exposure to EN at 15.1 months because these children score above the chance level of 33.3%. The results clearly show a development in the L2 of the children who attend a bilingual preschool, although English is not the children's ambient language outside preschool. Similar results were obtained for the monolingual English control group. They obtained higher scores in test 2 than in test 1.[6]

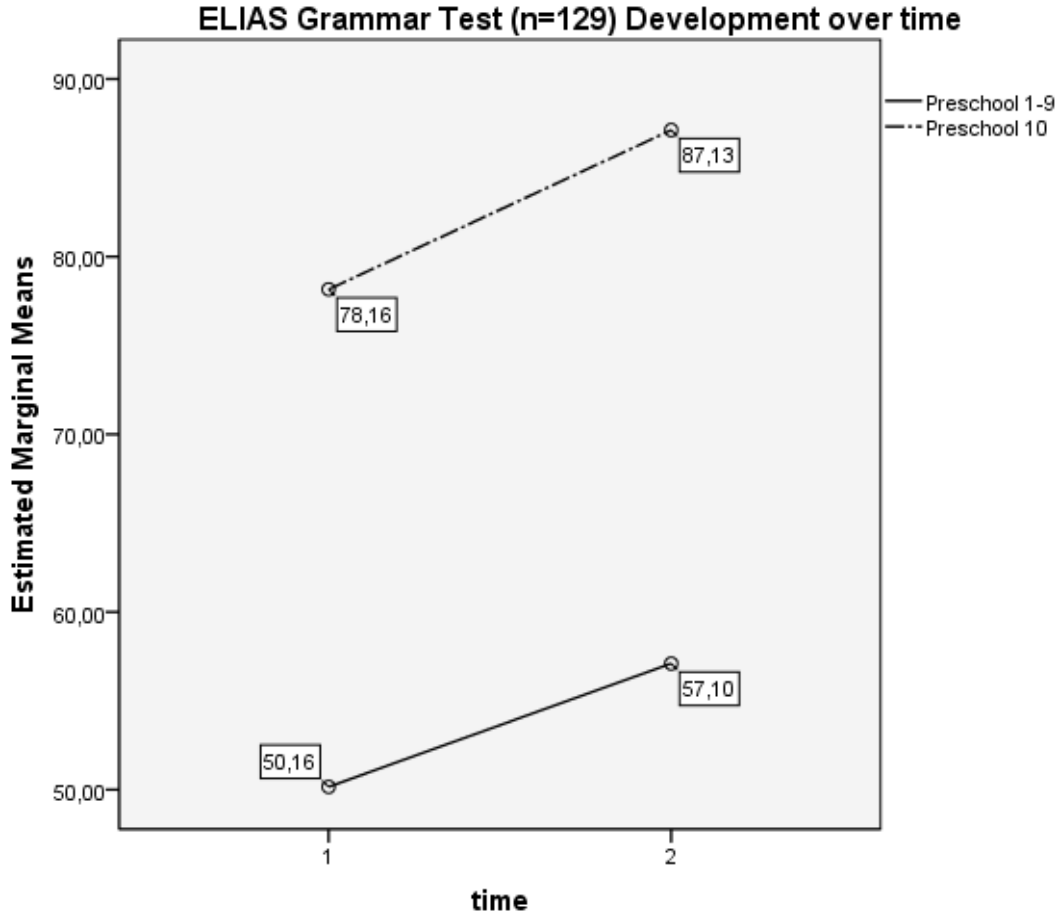

Fig. 1: Scores of the ELIAS Grammar Test for all bilingual preschools combined and for the monolingual English children, as obtained at test 1 and test 2. The data of the twenty monolingual English children ("native speakers") were added.

5 A repeated measure analysis for the bilingual preschoolers revealed significant differences for time (Time: $F(1, 108) = 48.599$, $p < 0.05$).

6 A repeated measure analysis for the monolingual preschoolers revealed significant differences for time (Time: $F(1, 19) = 9.339$, $p < 0.05$).

As illustrated in Figure 1, the monolingual English preschool group scored considerably higher than the bilingual preschool groups did and these differences were significant for both test points.[7] It is not surprising that the bilingual preschool group received lower scores in the ELIAS Grammar Test as their ambient language is not English.

3.2 L2 contact

How did the children's L2 contact affect the results of the grammar test? The 109 bilingual preschool children were subdivided into three groups, dependent on how much L2 contact they had at the time of test 1. Group 1 had 1-12 months of L2 contact (n = 69), group 2 had 13-24 months (n = 55) and group 3 had 25-62 months of L2 contact at the time of test 1 (n = 24). In addition, the results for the twenty monolingual English children were added. Figure 2 illustrates the results:

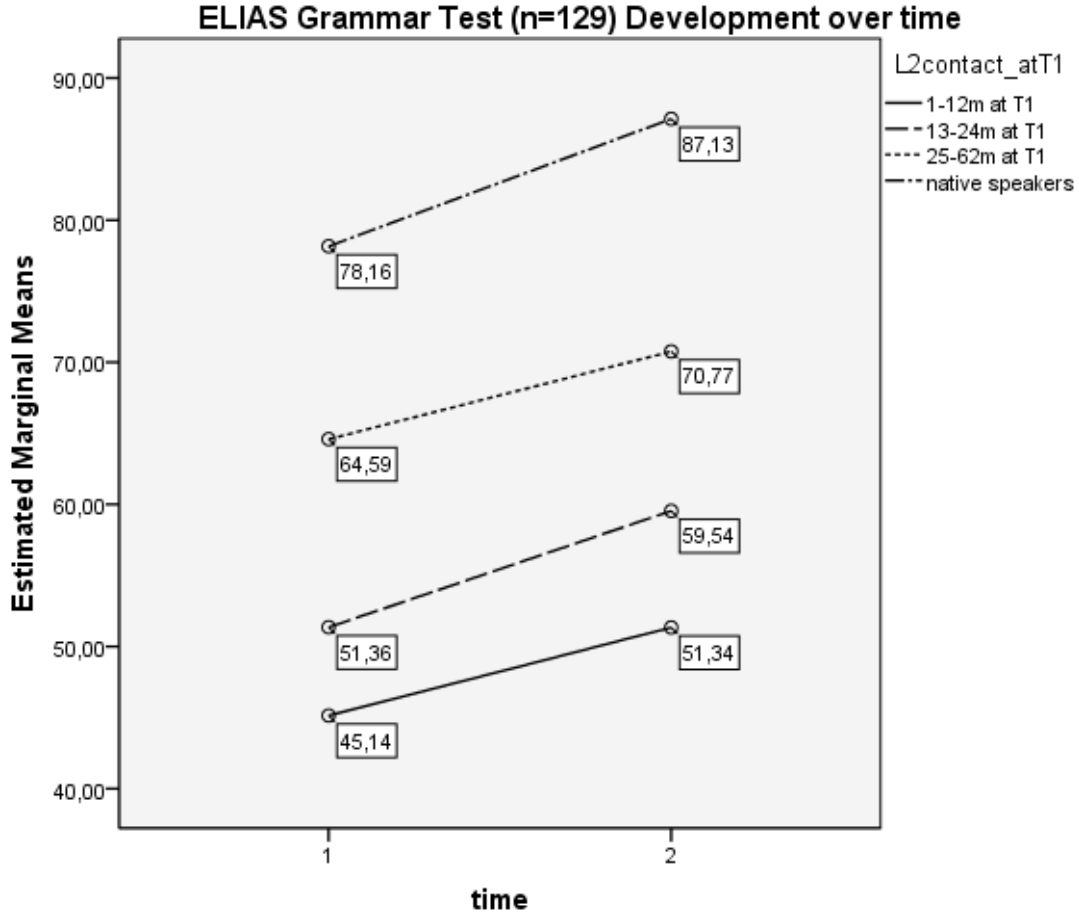

Fig. 2: Scores of the ELIAS Grammar Test for three bilingual groups with different L2 contact time, as obtained at test 1 and test 2. The data of the twenty monolingual English children ("native speakers") were added.

7 ANOVAs showed significant differences between the monolingual and the bilingual preschool group for Test 1 ($F(1, 128) = 69.852$, $p < 0.05$) and for Test 2 ($F(1, 128) = 65.635$, $p < 0.05$).

As statistical analyses showed, all three groups improved significantly from test 1 to test 2, independent of how low their L2 contact at test 1 was.[8] Pair-wise comparison for test time 1 and 2 also revealed that the results of the three groups differed significantly, i.e. the group with little L2 contact received lower scores than children with more L2 contact.[9]

Taking a developmental perspective, this figure shows that after their first year of L2 contact, children receive a grammar score of 45% (i.e. already above chance level), which increases up to approximately 71% at the end of their preschool period. Given the chance level of 33%, it becomes apparent that the children's L2 grammar development benefits and improves from the bilingual preschool programme at any given time.

How does the level of L2 grammar comprehension at the end of children's preschool time compare with the level of monolingual English children? In other words: Are these bilingual children almost as good as their monolingual peers? In the following, the results of group 3 (i.e. children whose L2 exposure exceeds three years at the time of test 2) are compared to the results which monolingual children attained at test 1 and test 2. Statistical analyses showed that the results of the monolingual children at test 1 (78%) still differed significantly from the results of group 3 at test 2 (71%). In addition, significant differences were found between the results of both groups when comparing the results at test 2 (71% vs. 87%).[10] Thus, the level of L2 receptive grammar resembles (but does not equal) the level of receptive grammar of monolingual English children at the age of 4;05 years, at least with respect to the tested categories.

3.3 L2 input intensity

L2 input intensity plays an important role in L2 development because not only the time of exposure but also the intensity of L2 exposure may positively affect the results of the ELIAS Grammar Test. As mentioned earlier, the ELIAS Input Intensity Score included factors such as L2 teachers' and children's attendance time in preschool per week, the opening hours of the preschool, and the number of children in the institution. In the following, the 109 bilingual preschool children were subdivided into four groups, dependent on the size of the ELIAS Input Intensity Score at the time of test 1. A high ELIAS Input Intensity Score would, for example, be found in a setting where

8 A repeated measure analysis showed significant differences for time (Time: $F(1,106) = 35.219$, $p < 0.05$) but not for the interaction (Time*L2 contact_T1: $F(2, 106) = 0.467$, $p > 0.05$).

9 Pair-wise comparisons (ANOVA) showed significant differences between the three groups at the time of test 1 ($F(3, 124) = 44.375$, $p < 0.05$) and test 2 ($F(3, 124) = 38.973$, $p < 0.05$), post-hoc tests revealed significant differences between all groups ($p < 0.05$ for all).

10 An ANOVA, comparing the values of L2 children at test 2 with the values of monolingual English children at test 1 did not show significant differences ($F(1, 42) = 3.877$, $p < 0.05$). Similarly, no significant difference was found between L2 children at test 2 and monolingual children at test 2 ($F(1, 42) = 22.663$, $p < 0.05$).

the preschool had long opening hours and employed more than one L2 teacher who worked full-time. The 109 L2 children were subdivided into four groups, depending on the ELIAS Input Intensity Score as calculated in Weitz et al., this volume: 36 children were in the low L2 intensity group, 20 children in the L2 middle intensity 1 group, 32 in the middle intensity 2 group and finally 21 children in the L2 high intensity group.

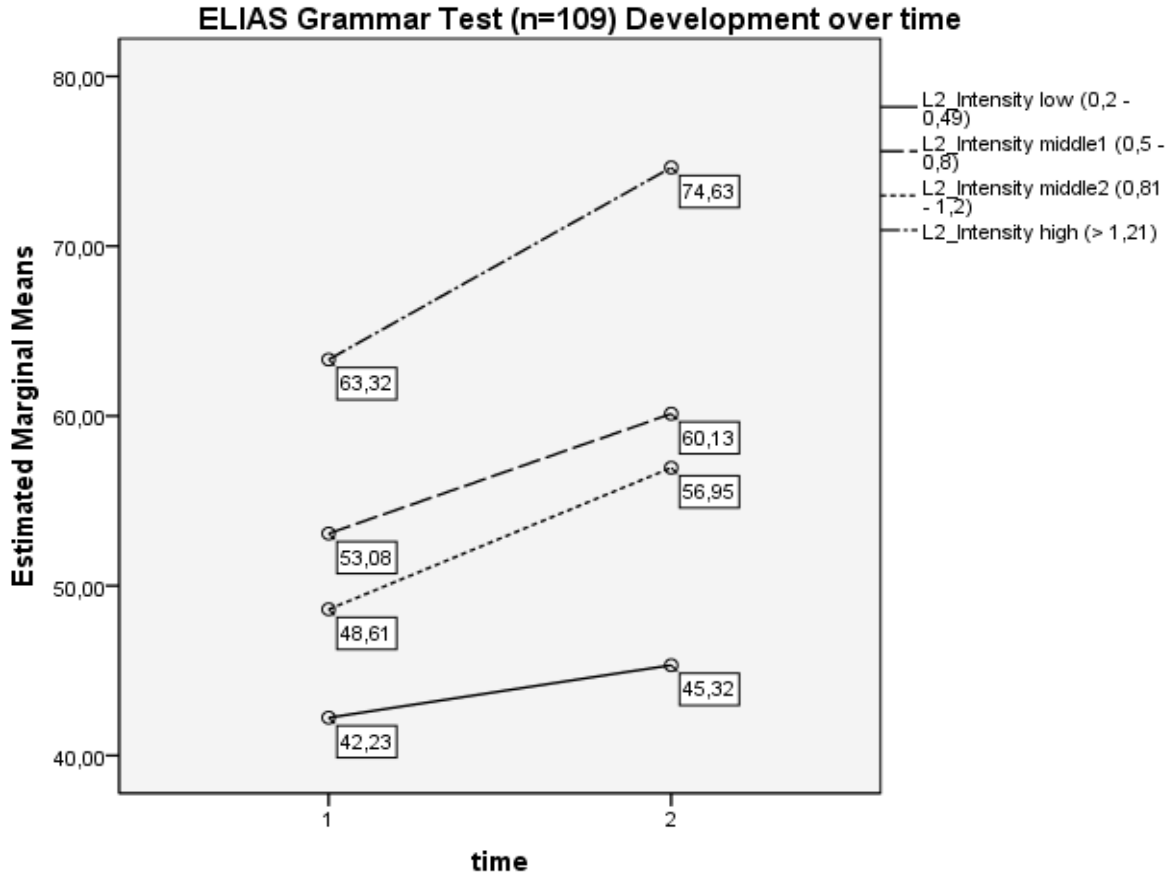

Fig. 3: Scores of the ELIAS Grammar Test for four bilingual groups with different L2 intensity, as obtained at test 1 and test 2

As statistical analyses showed, all four groups improved significantly from test 1 to test 2, independent of how low their L2 intensity was at test 1.[11] Pair-wise comparison for test time 1 and 2 also revealed that the results of the four groups differed significantly, i.e. the group with low L2 intensity received lower scores than children with high L2 intensity (except for the two L2 middle intensity groups).[12] This result indicates that L2 intensity (as indexed by L2 teachers' and children's attendance time in

11 A repeated measure analysis showed significant differences for time (Time: $F(1,105) = 55.743$, $p > 0.05$) and for the interaction (Time*L2 intensity_T1: $F(3, 105) = 3.275$, $p > 0.05$).

12 Pair-wise comparisons (ANOVA) showed significant differences between the four groups at the time of test 1 ($F(3, 164) = 13.646$, $p < 0.05$) and test 2 ($F(3, 164) = 24.641$, $p < 0.05$), post-hoc tests revealed significant differences between all groups ($p < 0.05$), except for the two L2 middle intensity groups ($p > 0.05$).

preschool per week, the opening hours of the preschool, and the number of children in the institution) may be an important predictor with respect to the grammatical performance of children in bilingual preschools.

3.4 Sex

In the literature, there are divergent findings with respect to the effect of the children's sex on their performance in comprehension tasks (e.g. Fraser et al. 1963, Lovell & Dixon 1967, Natorp 1975, Schmid-Schönbein 1978), so it is far from clear whether in foreign language tests, boys perform better than girls or vice versa. In the following, the results of the ELIAS Grammar Test will be used to explore this matter in more detail.

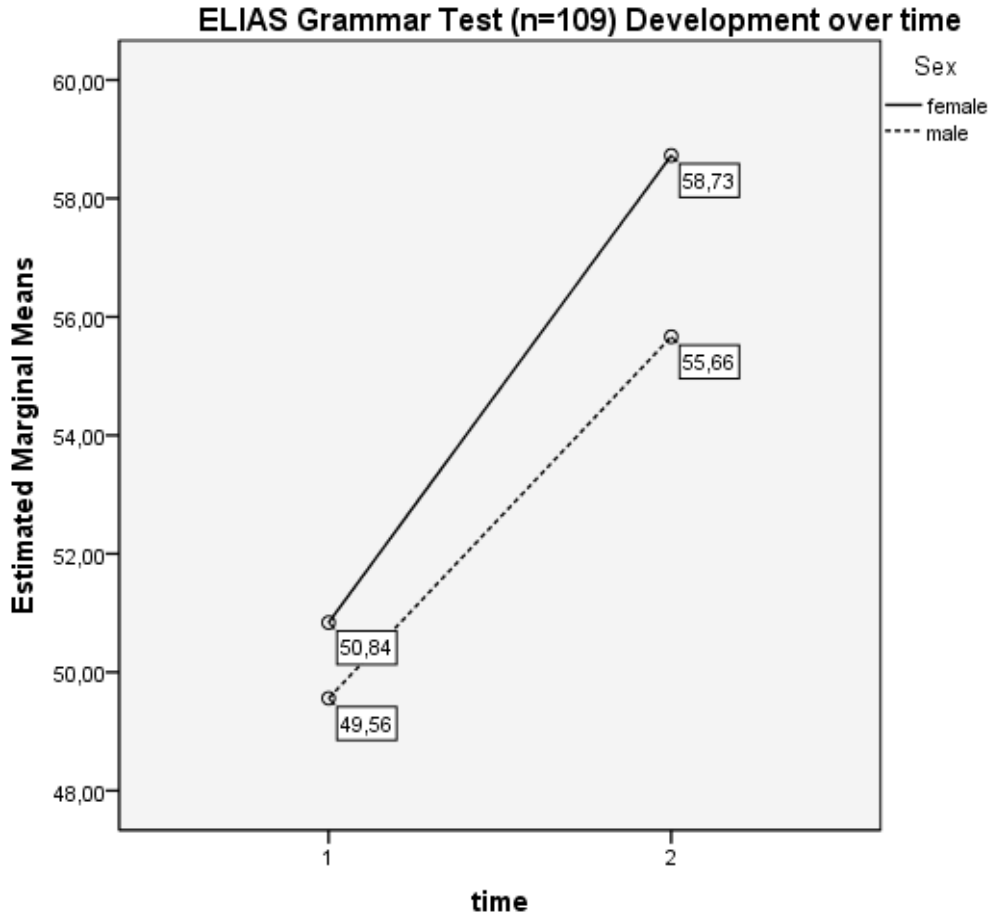

Fig. 4: Scores of the ELIAS Grammar Test for girls and boys across all bilingual preschools, as obtained at test 1 and test 2

Although Figure 4 may yield the impression that boys scored lower than girls at test 1 and test 2, the data of the 109 tested children (58 boys and 51 girls) showed that the

two groups showed no statistical differences in the scores at test 1 and test 2.[13] Furthermore, statistical analysis found the same rate of progress in their development of L2 grammatical phenomena over time.[14] The same analysis was applied to the data of the monolingual control group. Again, no differences between the sexes were noted.[15] These results indicate that sex as a variable does not significantly influence the results of the ELIAS Grammar Test, neither for L2 nor for L1 receptive grammatical development.

3.5 Migrant background

As mentioned earlier, in the ELIAS project, children with a migration background refer to children whose parents were not born in the countries under investigation (i.e. in Belgium, Germany, Sweden). Often but not always, the children's home language is not the official language of the host country.

In order to examine whether the variable migration background affected the results of the ELIAS Grammar Test, the data 148 children were used who completed the grammar test twice. Of these, 109 had a non-migrant and 39 had a migration background (i.e. 26%).

As Figure 5 clearly shows, the children with migration background received significantly different scores in test 2 as compared to test 1. That is, not only children without migration background, but also children with migration background achieved improvements with respect to their L2 grammatical receptive abilities. In addition, the grammatical development of children with migration background progressed at the same rate in comparison with their monolingual peer group.[16] It seems that children with migration background learn L2 receptive grammar at the same rate as children without migration background. Apparently, migration background is not a good indicator for predicting how well children will acquire certain grammatical phenomena in their L2 English.

13 An ANOVA for bilingual boys and girls showed no significant differences in test 1 ($F (1, 128) = 2.208$, $p > 0.05$) or in test 2 ($F (1, 128) = 2.442$, $p > 0.05$).

14 A repeated measure analysis for bilingual boys and girls did not reveal any differences for sex (Time*Sex: $F (1, 107) = 0.798$, $p > 0.05$), only for time (Time: $F (1, 109) = 44.110$, $p < 0.05$).

15 An ANOVA for monolingual boys and girls showed no significant differences in test 1 ($F (1, 19) = 0.406$, $p > 0.05$) or in test 2 ($F (1, 19) = 0.220$, $p > 0.05$). A repeated measure analysis for monolingual boys and girls did not reveal any differences for sex (Time*Sex: $F (1, 18) = 0.418$, $p > 0.05$), only for time (Time: $F (1, 18) = 9.470$, $p < 0.05$).

16 A repeated measure analysis for +/- migration background did not reveal any differences (Time*MigrantBackground: $F (1, 145) = 2.989$, $p > 0.05$), only for time (Time: $F (1, 145) = 79.683$, $p < 0.05$).

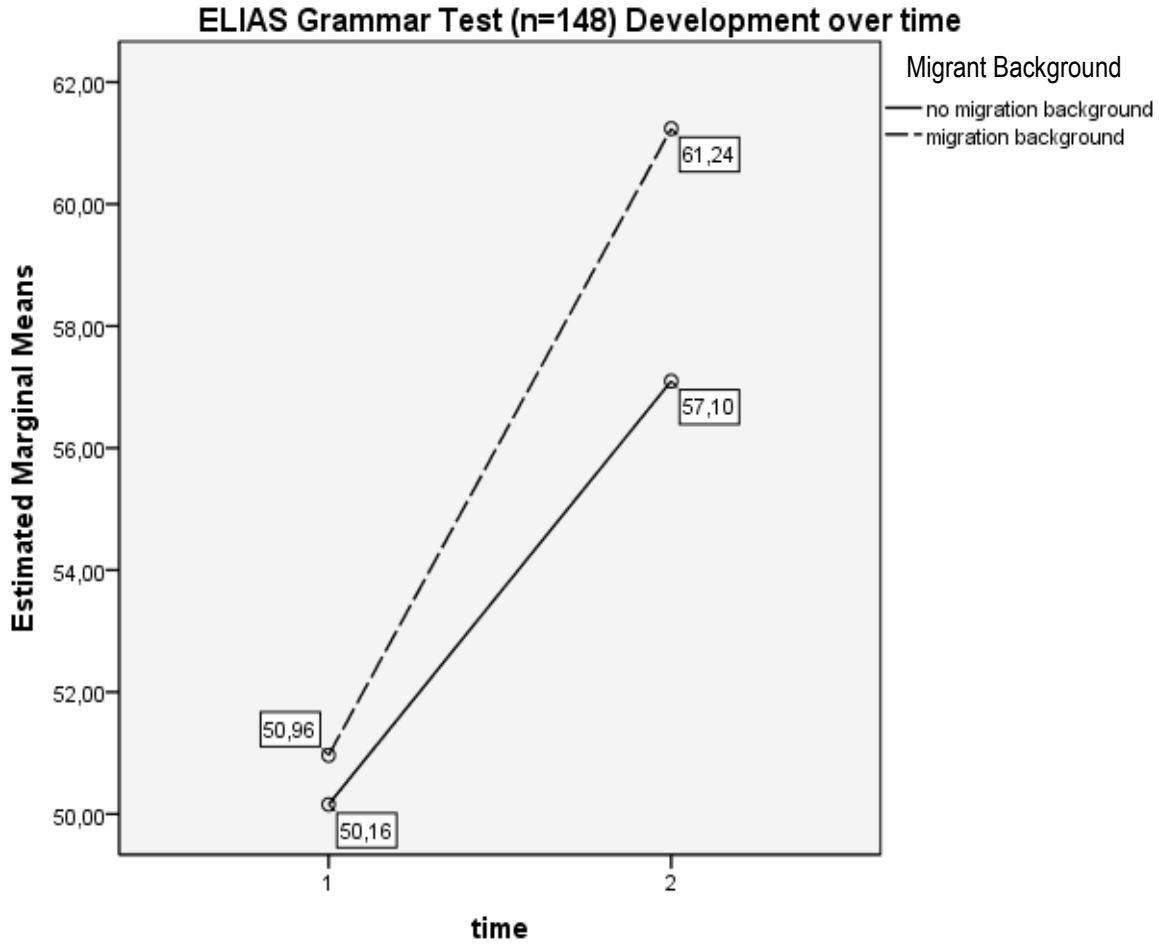

Fig. 5: Scores of the ELIAS Grammar Test across all preschools, as obtained at test 1 and test 2, focus on migration background

Children with a migration background can further be subdivided into children whose home language is the preschool's ambient language (e.g. French in Belgium, German in Germany, Swedish in Sweden, n = 17) and children with a migration background whose home language is not the ambient language but the family's original L1 or an altogether different language from the family's L1 and the ambient language, e.g. Russian, Turkish or Arabic (n = 22). Figure 6 differentiates the scores of the two migration groups. In this constellation there is no significant improvement from T1 to T2 when the three groups are taken together, furthermore there is no significant difference between the three groups.[17] This result indicates that the home language of migrant children does not affect the development of L2 receptive grammar in a preschool context.

17 A repeated measure analysis for +/- home language did not reveal any differences (Time* Home-Language: $F(2, 145) = 1.773$, $p > 0.05$), only for time (Time: $F(1,145) = 60.716$, $p < 0.05$).

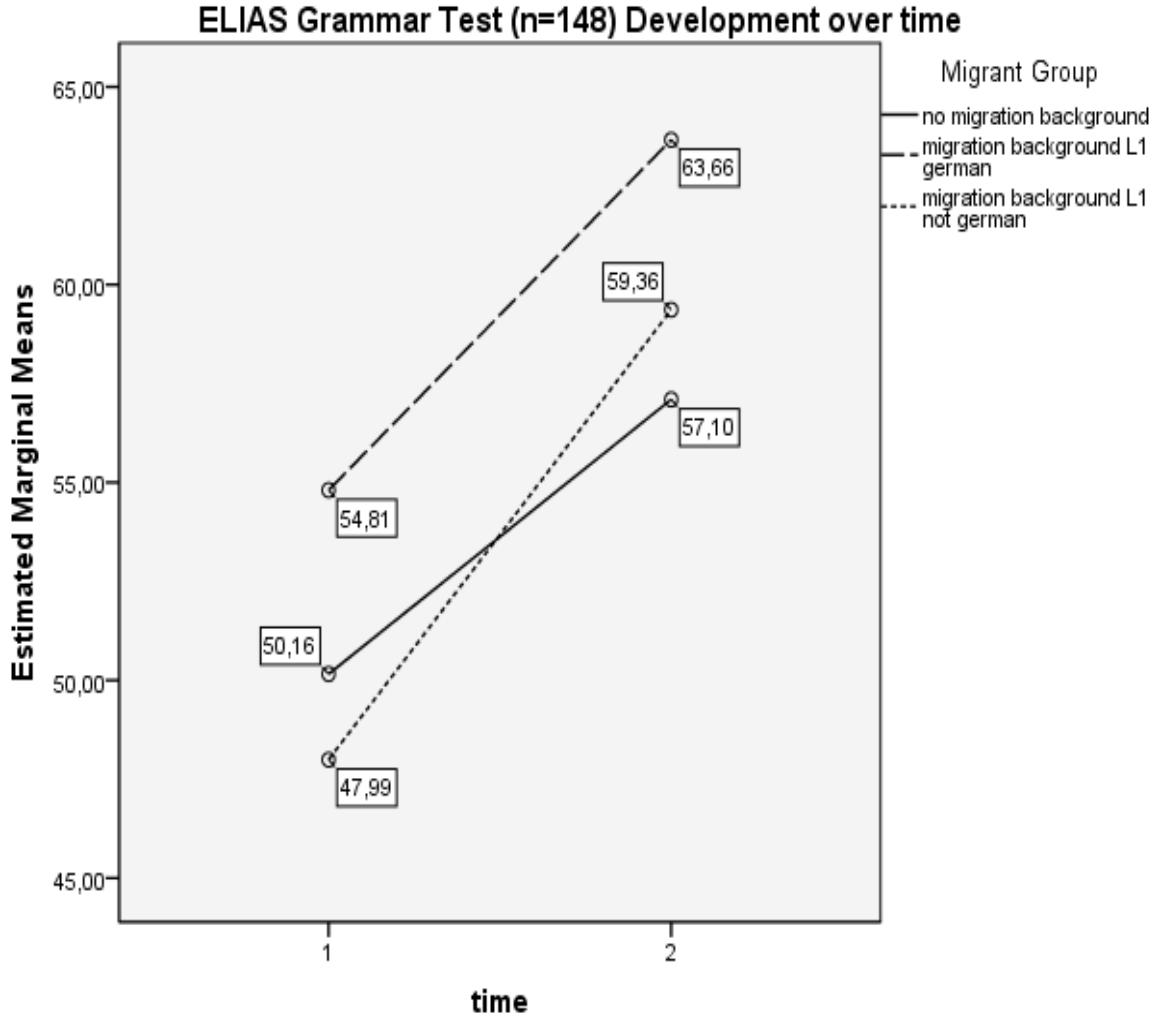

Fig. 6: Scores of the ELIAS Grammar Test across all preschools, as obtained at test 1 and test 2, focus on the home language of the children with migration background

3.6 Grammatical phenomena

Previous studies suggested that different grammatical phenomena were not comprehended equally well, be in L1 or in L2 acquisition (e.g. Fraser et al. 1963, Lovell & Dixon 1967; Nurss & Day 1971, Steinlen 2008, Steinlen & Rogotzki 2009). For example, the phenomenon *his/her* was identified less well than +/- plural -s (see Au-Yeung et al. 2000, Howell et al. 2003). Similar results were found in the present study when the data of the 109 non-migrant children are taken into consideration: Here it was also noted that the grammatical phenomena under investigation were not identified with the same degree of confidence.

First, as Figure 7 shows, not all grammatical phenomena were identified equally well.[18] For example, in test 1 and test 2, the bilingual children obtained the highest identification scores for NEG and SVO and the lowest scores for AGRv and AGRc. Looking at the grammatical morphemes, the morphemes for plural -s and for genitive -s were much better identified than the third person singular -s. It is also evident that, in general, all third person singular pronouns, be they common or possessive pronouns, in subject or object position, were not identified well by the bilingual preschoolers.

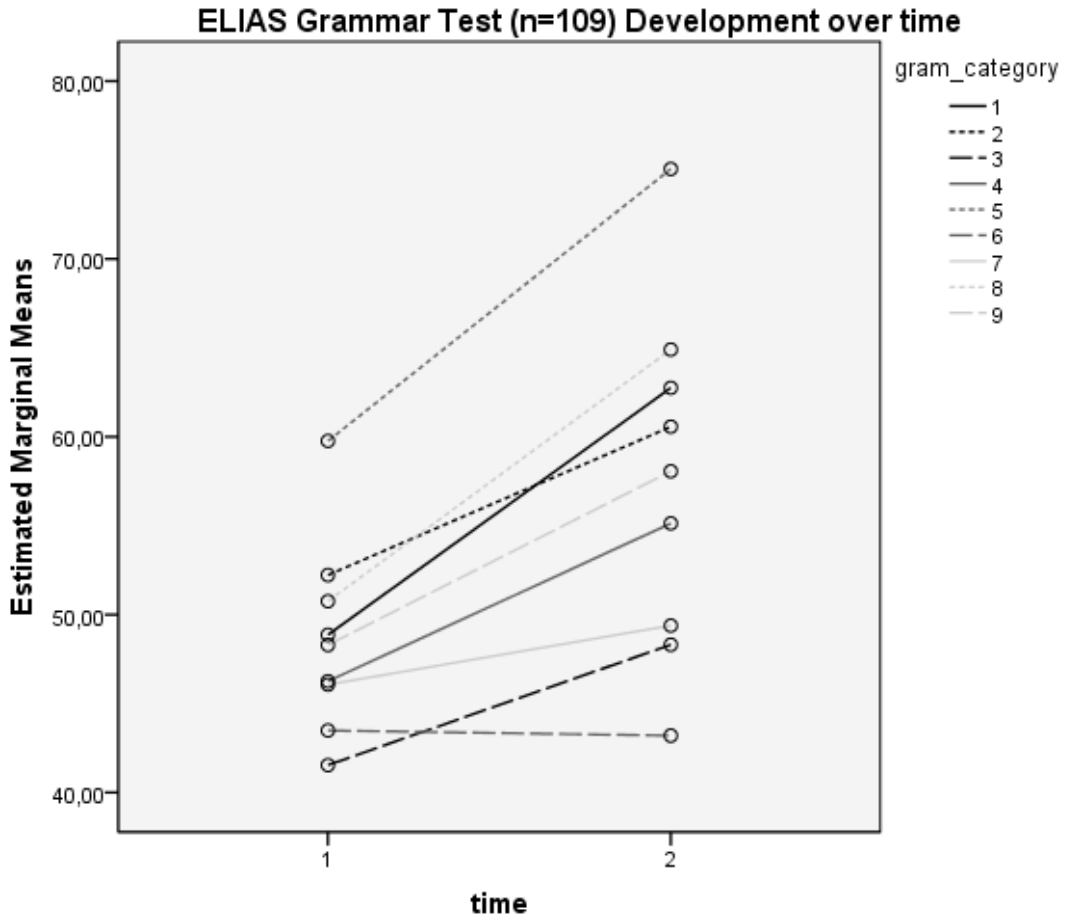

Fig. 7: Percentage of correct identification for nine grammatical phenomena, as obtained in Test 1, collapsed for the nine preschools. The phenomena are ordered as follows: 1 = SVO, 2 = PLU (−s), 3 = PROo, 4 = POSS, 5 = NEG, 6 = AGRv (−s), 7 = AGRc, 8 = GEN ('s), 9 = PROs. A score of six ("estimated marginal means") corresponds to a 100% correct identification rate.

18 ANOVAs for differences between grammatical phenomena as identified by bilingual preschoolers showed significant differences in test 1 ($F(8, 1323) = 7.842$, $p < 0.05$) and in test 2 ($F(8, 1323) = 27.737$, $p < 0.05$). Post-hoc tests for test 1 showed significant differences between NEG and SVO, PROo, POSS, AGRv, AGRc, GEN and PROs and between PLU and PROo and AGRv and between PROo and GEN ($p < 0.05$ for all) but not between the other phenomena ($p > 0.05$ for all). For test 2, post-hoc tests showed significant differences between NEG and SVO, PLU, PROo, POSS; between PROo and SVO, PLU, GEN, PROs; between AGRv and SVO, PLU, POSS, PROs and NEG; between AGRc and SVO, PLU, NEG; between GEN and POSS, NEG, AGRv and AGRc ($p < 0.05$ for all) but not between the other phenomena ($p > 0.05$ for all).

However, as Figure 7 also shows, the analyses revealed significant differences between the two test scores over time. That is, all grammatical phenomena were identified better at Test 2 than at Test 1 and these differences were significant, except for the grammatical phenomenon AGRv which did not improve over time.[19]

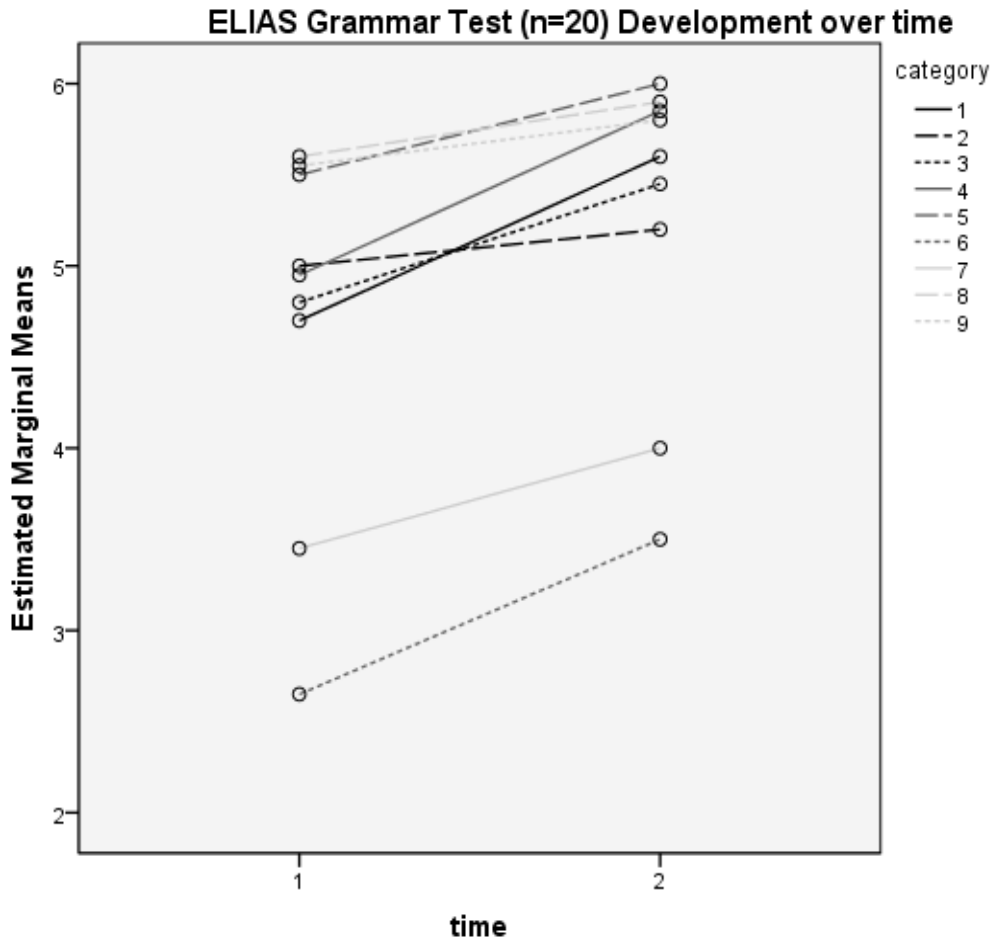

Fig. 8: Percentage of correct identification for nine grammatical phenomena, as obtained for both test times for the monolingual preschools. The phenomena are ordered as follows: 1 = SVO, 2 = PLU (−s), 3 = PROo, 4 = POSS, 5 = NEG, 6 = AGRv (−s), 7 = AGRc, 8 = GEN ('s), 9 = PROs. A score of six ("estimated marginal means") corresponds to a 100% correct identification rate.

Similar results were found for the monolingual English children. They also performed significantly better on NEG and SVO than on AGRv and AGRc.[20] The results in Fig-

19 A multivariate analysis for grammatical phenomena identified by bilingual preschoolers revealed significant differences for time (Time: $F (1, 108) = 97.703$, $p < 0.05$), for phenomena (Category: $F (8, 111) = 28.090$, $p < 0.05$) and for the interaction (Time*Category: $F (8, 111) = 97.703$, $p < 0.05$). Post-hoc tests comparing test 1 and test 2 showed significant differences for grammatical phenomena ($p < 0.05$ for all), but not for AGRv ($p > 0.05$).

20 ANOVAs for differences between grammatical phenomena as identified by monolingual English preschoolers showed significant differences in test 1 ($F (8, 171) = 17.798$, $p < 0.05$) and in test 2 ($F (8, 171) = 23.029$, $p < 0.05$). Post-hoc tests for test 1 showed significant differences between

ure 8 showed that the English monolingual children were close to ceiling on NEG, GEN and PROsg, yet their scores on AGRv and AGRc were significantly below those of the all the other categories. Furthermore, the monolingual English children also indicated that the mastery of grammatical phenomena is still under development during the preschool period, because the children identified all grammatical phenomena better in test 2 than in test 1, with the exception of AGRv.[21]

In sum, the results for L1 and L2 learners of English are similar in terms of the degree of difficulty of the grammatical phenomena and in terms of development over time. Needless to say, the monolingual English children attained higher scores at any time for all grammatical phenomena.

4. Discussion

The purpose of this study was to examine the development of grammatical comprehension abilities in children with different L1s (i.e. French, German and Swedish) who were exposed to the L2 English in a preschool context. The results clearly demonstrate that it is feasible to learn a second language as early as preschool, using immersion methods.

First, increased L2 contact duration (as measured in months) positively affected the results of the ELIAS Grammar Test. The children with longer contact duration to English performed significantly better than children who were less exposed to English. Thus, the children's ability to identify grammatical phenomena in a picture pointing task improved as a function of contact duration to the L2. In fact, when the children were subdivided into three groups (with respect to their L2 exposure to English), the children who had English in their preschool for more than three years performed almost as well as the monolingual English children (at least with respect to the grammatical phenomena tested). This result clearly demonstrates the feasibility of a bilingual programme in preschools which offer English as an L2 in an immersion context (cf. Wode 2001, Rohde & Tiefenthal 2002, Rohde 2005, Burmeister & Steinlen 2008, Steinlen 2008, Steinlen & Rogotzki 2009, Steinlen i. pr.).

Second, as L2 contact duration did not account for some variability in the data (especially in those cases where children were matched for L2 contact duration, L1 background and age but showed differences in the test scores), the ELIAS Input Intensity

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AGRv and SVO, PLU, PROo, POSS, NEG, GEN, PROs; between AGRc and SVO, PLU, PROo, POSS, NEG, GEN and PROs ($p < 0.05$ for all) but not between the other phenomena ($p > 0.05$ for all). For test 2, the post-hoc tests showed the same in/significant differences as in test 1.

21 A multivariate analysis for grammatical phenomena identified by monolingual English preschoolers revealed significant differences for time (Time: $F(1, 19) = 5.032$, $p < 0.05$), for category (Category: $F(8, 12) = 6.223$, $p < 0.05$) and for the interaction (Time*Category: $F(8, 12) = 5.497$, $p < 0.05$). Post-hoc tests comparing test 1 and test 2 showed significant differences for grammatical phenomena ($p < 0.05$ for all), except for AGRv ($p > 0.05$).

Score was designed, because in the literature so far, "intensity" was usually indexed as the number of school classes per week. As the preschool context differs from the school setting, more factors had to be taken into consideration, such as L2 teachers' and children's attendance time in preschool per week, opening hours of the preschool, and the number of children in the institution (see Weitz et al., this volume). The results clearly showed strong effects of L2 input intensity on the results of the ELIAS Grammar Test. In agreement with findings from the school immersion context (e.g. Curtain 2000, Wesche 2001, Spada & Lightbown 1989), L2 input intensity is apparently also an important factor for L2 learning in a preschool context, which, in addition to L2 contact duration, may account for differences in the children's performance in the ELIAS Grammar Test.

Third, this study yielded clear results with respect to the question whether the children's performance in comprehension tasks is affected by their sex. No significant differences were found between girls and boys in both tests, neither for the bilingual preschool groups nor for the monolingual control group. Unfortunately, many studies on L1 and EAL grammatical comprehension for preschoolers did not report on whether boys and girls performed differently (e.g. Fraser et al. 1963, Lovell & Dixon 1967, Au-Yeung et al. 2000, Howell et al. 2003). For L1 acquisition, it is often claimed that girls perform significantly better than boys (e.g. Huttenlocher et al. 1991, Schlichting & Spelberg 2003, Bornstein et al. 2004, Radeborg et al. 2006), which is usually accounted for in terms of behavioural factors, e.g. girls' identification with female caretakers as well as their greater adaptability. For L2 acquisition in a preschool context, Schmid-Schönbein (1978) likewise reported that girls performed better than boys, especially with respect to English listening comprehension, and suggested that either the teaching material was more motivating for girls or that the female teacher focused more on the girls than on the boys in her preschool class. However, other studies on foreign language learning in a preschool context did not confirm such a claim, e.g. studies on lexical acquisition (comprehension and production, e.g. Natorp 1975, Rohde & Tiefenthal 2002) or small-scale studies on L2 grammatical comprehension (Steinlen 2008, Steinlen & Rogotzki 2009, Steinlen i. pr.). We therefore suggest that under optimal conditions, the variable sex does not play a role in foreign language acquisition settings taking place in preschools.

Fourth, this study yielded interesting results with respect to migrant children's performance in the ELIAS Grammar Test: 26% of the children in the bilingual preschools of the ELIAS project had a migration background (i.e. whose parent/s live/s temporarily or permanently in a country where he or she was not born, as assessed by the parents' questionnaire).[22] This study is the first to examine the impact of home language background with respect to the development made in receptive L2 grammar knowledge by children in bilingual preschools over a period of ±12 months. The results showed that L2 receptive grammar of children with a migration background developed

22 Cf. ELIAS website (www.elias.bilikita.org)

the same way as L2 receptive grammar of their non-migrant peers did, i.e. their scores of the ELIAS Grammar Test differed as a function of L2 contact. For both tests, we did not find significant differences between children with or without migration background. This result is surprising, given that migrant children (especially minority language children) in German primary schools seemed to be less successful in foreign language learning than their non-migrant peers (see e.g. Elsner 2007). However, later in their school career, this disadvantage seems to disappear (see e.g. Klieme 2006, but see Stanat 2003). This finding was also confirmed for migrant children in Canadian immersion school settings: The longer these children lived in Canada, the smaller the gap in foreign language performance of monolingual vs. migrant children became, until it disappeared (e.g. McMullen 2004). But how can we then account for the positive performance of migrant preschoolers in the ELIAS Grammar Test? First, the foreign language in an immersion setting is not taught in a formal context (like the English subject in school) but it is used as a medium of communication. This approach seems to be very beneficial for migrant children who simply acquire the foreign language from the way it is being used (e.g. Taylor 1992). Second, at least with respect to Germany, the migrant children in the ELIAS project seemed to have a high command of their L2 German, as the results of a German language proficiency test showed (SETK 3-5, *Sprachentwicklungstest für drei- bis fünfjährige Kinder*, Grimm 2001, see Steinlen et al., this volume). As German and English are typologically closely related languages, it may be assumed that the migrant children's comprehension of English benefits from the acquisition of German (see also Bild and Swain 1989, Hurd 1993). It is likely that similar tendencies may be found for migrant children in Sweden but less so for migrant children in Belgium (as French and English are typologically less close). This needs to be explored in more detail in a further study, which should then also include information on the children's home language/s in order to provide a more complete picture of their language contexts and the development of all their languages. So far, it is unfortunately less than clear as to how the children's home language experiences may have affected the results of the ELIAS Grammar Test. Despite these shortcomings, this is the first study which examined the foreign language performance of migrant children in bilingual preschool programmes and which clearly demonstrated that migrant children may benefit from such an approach. One has to keep in mind, though, that these children may benefit from an early immersion programme as long as there is a strong support for L1 development, because otherwise, such a programme could result in a subtractive bilingualism situation for such preschoolers, as Canadian studies on immersion schools amply demonstrated (see e.g. Hurd (1993), Dagenais & Day (1998), Swain & Lapkin (2005), Taylor (2006)).

Fifth, in the ELIAS Grammar Test, children performed better on certain grammatical phenomena than on others. For example, in both tests, the grammatical phenomena SVO and NEG were better identified than AGR or PRO. Similar results were obtained in a study on L2 grammatical comprehension of Turkish and Cantonese EAL children in London (Howell et al. 2003) and in tests administered to monolingual English chil-

dren (Fraser et al. 1963, Lowell & Dixon 1967, Nurss & Day 1973, Au-Yeung et al. 2000, Howell et al. 2003). Apparently, some grammatical phenomena are easier to master than others, independent of the language acquisition setting. Unfortunately, these comprehension studies did not account for why these grammatical phenomena were not identified with the same degree of confidence. One possible explanation may be found in the input that the children received. For example, the L2 learners in the present study performed poorly on the gender distinction of third person singular pronouns, be they in common or possessive case, be they in subject or object position. Grammatically speaking, the use of nouns instead of pronouns is a strategy for reinforcing people's names (*Laura's cat* instead of *her cat*). In the literature, such substitutions are reported for 1st or 2nd person singular pronouns (e.g. Snow & Ferguson 1977, Snow 1986) but have not been mentioned with regard to 3rd singular pronouns. Therefore, a preliminary analysis of recorded interactions between the native English speakers and the children was conducted in a German preschool. It showed that the use of PRO and POSS with respect to 3rd person singular was underrepresented in the input, i.e., the native English speakers rather referred to a person's name instead of using a pronoun. This is one of the contextualisation strategies (see e.g. Baker 2000, Burmeister 2006, Steinlen 2008, Steinlen i. pr.) to ensure that children actually understand who the English speaker is referring to when talking about a third, often absent, person. Similar impressions were reported from other preschools of the ELIAS project. Based on these observations, it is not surprising that the preschoolers did not correctly distinguish between masculine and feminine personal and possessive pronouns.

How can we further account for the different identification rates of the grammatical phenomena? For example, the children were fairly confident with respect to the correct identification of NEG and SVO. NEG is a marker with a high perceptual salience because it usually receives some more stress than the ambient words in the sentence. Furthermore, NEG is frequent in the L2 input that the children receive, as reported from all preschools of the ELIAS project. In other studies on grammatical comprehension in L1 and L2 acquisition, a good command and early acquisition of negation particles was also reported (for L1 comprehension see e.g. Fraser et al. 1963, Nurss & Day 1973, Howell et al. 2003, for L2 comprehension see Steinlen 2008, Steinlen & Rogotzki 2009). With respect to SVO, the high identification rates may be explained by transfer from the children's L1 French, German and Swedish to the L2 English because this canonical word order is the same across the languages. Furthermore (as already mentioned earlier), the children may have interpreted the SVO sentences not only in terms of their morpho-syntactic properties, but also in terms of their semantic roles in the sentence. In the example sentence *The girl is touching the boy*, the children may have assigned the first noun phrase (NP) as the agent (usually positioned first in the sentence) and the second NP as the patient (usually positioned second in the sentence). In this case, the position of the NPs in the sentence (e.g. de Villiers & de Villiers 1973, Chapman 1978) as well as their usual function as semantic roles may have been the cues that the children took in order to interpret the sentence. All in all,

the children may have relied on three strategies to correctly interpret the sentences in the ELIAS Grammar Test, namely L1-L2 transfer, the position of the words in the sentence or their function in the sentence. Whatever strategy the children used, it cannot be inferred from the results. In a further study, we would want to examine what kind of strategies children depend on when faced with the identification of SVO sentences in their L2.

Finally, production models could be used to account for the different identification rates of the nine grammatical phenomena in the ELIAS Grammar Test. For example, L1 production studies showed that grammatical morphemes were acquired in a certain invariant order (e.g. Brown 1973, de Villiers & de Villiers, 1973). Similar results were obtained for L2 acquisition in naturalistic and tutored contexts (e.g., Dulay and Burt 1974, Larsen-Freeman 1975, see also Goldschneider & DeKeyser 2001 for a meta-analysis of twelve L2 studies). Although the ELIAS Grammar Test is a comprehension test, which does not account for the acquisition and emergence of grammatical morphemes, in terms of development, at least, the grammatical morphemes PLU -s and GEN 's in the ELIAS Grammar Test were indeed better identified than AGRv.

A more theoretical framework may also be used to account for the variability within the data. Processability Theory (henceforth PT, e.g. Pienemann 1998) is a cognitive account of developmental patterns in L2 grammar acquisition and predicts the course of development of L2 linguistic forms in production and comprehension across languages. According to PT, learners restructure their L2 knowledge systems in an order which they are capable of at their stage of development. That is to say, a learner cannot produce a particular language structure unless she has acquired the processing procedure (or computational routine) required to produce the linguistic structure. Acquiring a L2 thus 'includes the acquisition of the procedural skills needed for the processing of the language' (Pienemann, 2005). In contrast to other models, PT seems to be the most comprehensive framework on L2 acquisition because it accounts for developmental patterns in the acquisition of morphology and syntax, in both the L1 and the L2, for deviation from the developmental patterns, for differences with regard to rate of acquisition and ultimate attainment, and for L1 transfer, claiming that L1 transfer only occurs when the transferred grammatical item can be processed by means of the processing procedures already acquired by the L2 learner (cf. Ellis, 2008).

For the acquisition of grammatical phenomena (mentioned are only those which were used in the ELIAS Grammar Test), PT predicts that SVO, GEN 's and PLU -s emerge early (stage 2), followed by PROo (stage 3) and finally by AGRv (stage 5). Although the predictions of these stages of development derive from L2 production studies, similar results have been obtained in the ELIAS Grammar Test: SVO, GEN 's and PLU -s were identified considerably better than PROo or AGRv. Indeed, the identification of AGRv did not improve as a function of increased L2 contact which may be taken as a further indication that AGRv is difficult to process, just as PT suggests. It seems that the data of comprehension studies match well with the predictions of PT.

However, this is only a preliminary interpretation as to how the ELIAS comprehension data fit into PT (see Buyl 2010). Further research is needed to explore as to how comprehension data in general fit into PT, keeping in mind that there is not necessarily "(…) an isomorphism between production and comprehension grammars" (Larsen-Freeman 2002: 283).

What was not reported on in this chapter but what was evident in the statistical analyses, especially with respect to the standard deviations (see III.1), was the large degree of individual variation in the data of the ELIAS Grammar Test. Such a finding has been reported in many studies. For example, Paradis (2005) showed that English language learners were acquiring English at variable rates, which was evident from the sizable standard deviations and ranges in the accuracy scores in a grammatical morphology test. In addition, researchers looking at other aspects of early L2 development in preschool and first grade also reported substantial individual differences between children, even between those who began and continued to learn English in the same class (Tabors & Snow 1994; Wong Fillmore 1979). How can individual differences be explained? Among the many factors to be considered, personality traits may serve as one explanation (see Wong Fillmore 1979), e.g. whether a child is shy or more extrovert or whether a child seeks out the company of the English preschool teacher or not. It is therefore imperative to consider the child's biography, its character and its relationship to native and non-native speakers in the preschool context in order to adequately account for these individual variations (see also Burmeister & Steinlen 2008). In the ELIAS project, this is being accounted for by using observation sheets which capture the kind of interaction between the individual child and the English preschool teacher as well as the personal characteristics of each individual child. Within the ELIAS project, the effect of L2 input quantity and quality has been examined in great detail by using the IQOS (Input Quality Observation Scheme), a systematic observation checklist, and relating the findings to the children's L2 development (cf. Weitz et al., this volume).

Unfortunately, this study did not examine how the children's L1 (i.e. French, German and Swedish) affected the results of the ELIAS Grammar Test. A typological comparison is interesting in so far, as one could expect that children whose L1 and L2 are closely related (e.g. German-English and Swedish-English) have less difficulties with acquiring L2 structures in contrast to children whose L1 and L2 are not so closely related (e.g. French-English). From Canadian research of immersion school settings, it is evident that non-anglophone children whose L1 is a Romance language acquire French faster than children whose L1 is a non-Romance language (e.g. Bild and Swain, 1989). In order to receive a complete picture as to which variables affect the correct identification of pictures in the ELIAS Grammar Test, it is imperative to compare the results according to the monolingual children's L1 and to examine how important the typological relationship between L1 and L2 actually is.

Finally, the data of the ELIAS Grammar Test need to be examined with respect to the parents' questionnaires because these present more information on the children's home background. For example, the parents were asked to give information on their reading habits, their attitude towards the L2 English which is offered in the bilingual preschools or about their self-estimated level of wealth. Reading activities at home are important predictors for later academic success in school, as amply reported (e.g. Reynolds 1987). Furthermore, "(t)he level of development of children's mother tongue is a strong predictor of their second language development" (Cummins w/o year, see also Caccavale 2007). Furthermore, it has also been reported that a low socio-economic status of parents may have a negative effect on early foreign language learning (Edelenbos et al. 2006). Future studies within the ELIAS project will therefore examine whether such a background variable may also affect the results of the ELIAS Grammar Test. Finally, the parents' attitude to certain topics has also an effect on their children's behaviour. For example, there is an intimate relationship between parental expectations and the actual academic achievements of their children (e.g. Eccles et al. 1983, McGrath & Repetti 1995, 2000). From the preschool context, it is likewise known that children unconsciously follow their parents' attitudes and that a positive parental attitude positively affects the language learning progress (see e.g. Mushi 2000, López 2005).

In sum, the ELIAS Grammar Test is a useful tool which, for the first time, assessed the comprehension of English grammar by bilingual preschoolers in an immersion setting in three European countries. Undeniably, the children showed great success in foreign language learning in such a context, as compared to their monolingual peers in England. Moreover, it could be shown that such an immersion setting is also advantageous for migrant children whose L1 may not correspond to the official language of the host country. Finally, the study showed similarities between L1 and L2 acquisition, especially with respect to the comprehension of different grammatical phenomena, whose ease or difficulty of comprehension may depend on processing strategies that the learner has available at a certain point in time. It seems that the learning language abilities activated in preschool are the same as those activated in non-tutored second and in first language acquisition (see also Wode 2001).

The results of this study clearly showed that bilingual preschools with an immersion setting foster early foreign language learning. It is indispensable that more preschools offer such a bilingual programme and that primary and secondary schools follow lead in order to enable more European children to master their foreign languages at a functionally adequate level at the end of their school career (cf. Wode 2001).

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Lexical and Grammatical Comprehension in Monolingual and Bilingual Children

Christina Schelletter, Rachel Ramsey

1. Introduction

This chapter outlines the results of lexical and grammatical comprehension tests in preschool and school-age monolingual and bilingual children living in the UK. The tests used are the same as those in the project ELIAS (Early Language and Intercultural Acquisition), namely the British Picture Vocabulary Scale II (BPVS II, Dunn et al. 1997) and a grammar task that was developed from the *Kiel Picture Pointing Test* (Steinlen & Wettlaufer 2005) as part of the ELIAS project.

The ELIAS project aimed to capture the development of monolingual German children learning English at preschool in an immersion setting. Including a group of monolingual children in the two receptive tasks served the purpose that the results of the preschool children can be compared with monolingual comparison groups, which is particularly important for the Grammar task, where no information on monolingual performance is available. In addition, a group of children with a dominant German background living in the UK will also be considered in comparison to the monolingual English subjects. These children have been exposed to English for longer but also attend a preschool where both German and English are spoken by native speakers, hence the setting is similar to that of the immersion preschools in Germany.

The tasks used as part of the ELIAS project are receptive language tasks, hence they evaluate children's receptive lexical and grammatical skills. This is because the German children's language level is not yet advanced enough to include tests of their productive skills. For this reason, the receptive lexical and grammatical development in monolingual and bilingual children is outlined below. The aim of the chapter is to provide a background against which the German children acquiring English as a second language can be compared.

1.1 Lexical development in monolingual and bilingual children

The monolingual children have acquired English from birth and learnt the language in a natural setting. Receptive monolingual lexical development starts in the prelinguistic period and continues throughout preschool development. While the vocabulary spurt characterises productive development (Benedict 1979, Goldfield & Reznick 1990), Benedict also found evidence of a spurt in receptive development which occurred earlier than the productive spurt. Generally, receptive acquisition is in advance of productive skills (Steinberg 1995). Word learning in particular is guided by differ-

ent constraints (Markman et al. 2003) which facilitate acquisition. One of the constraints on word learning is the whole object constraint which specifies that a label that is heard applies to the object as a whole, rather than parts of it. Another constraint is mutual exclusivity. This specifies that an object only has one label and that children will reject labels for the same object. The third constraint is the taxonomic constraint which specifies that words are seen to refer to a group of objects that share common features. It is in this way that children can build up the meaning of words and develop word concepts (Markman et al. 2003).

Children who grow up with two languages simultaneously go through the same stages as monolingual children, except that they will need to build up a word store for two languages separately. Volterra & Taeschner (1978) assumed that bilingual children did initially not distinguish the two language systems and learnt them as one system (one system hypothesis). This was partly based on the observation that young bilingual children often use words from both languages in the same sentence. However, as bilingual children need to learn two different labels for the same objects, there is a conflict with the word learning constraints. There has been some discussion as to whether bilingual children accept cross-language synonyms (Pearson, Fernández & Oller, 1995, Quay, 1995) or "doublets" as they violate Clark's principle of contrast (Clark 1987) which states that children do not accept synonyms at an early stage of acquisition.

The fact is that bilingual children do use translation equivalents for the same object from quite early on (Au & Glusman 1990, Köppe 1997, Schelletter 2002) and a number of studies of bilingual language development have argued in favour of the bilingual child separating the languages from the start (de Houwer 1990, 1995, Meisel 1989, Paradis & Genesee 1996, Sinka & Schelletter 1998). Paradis & Genesee have argued that language mixing at the lexical level is the result of the child "borrowing" words from the other language. In addition, Schelletter (2002) found that bilingual children's word learning is facilitated by words that are similar in their form across languages (cognates).

Studies concerned with bilingual children's vocabulary skills have found that while bilingual toddlers are comparable to their peers in terms of their lexical development (Pearson et al. 1993), bilingual children perform below the level of monolingual children on standardised vocabulary tests of one of the languages (Hoff & Elledge 2005, Pearson & Fernández 1994,). The extent of bilingual children's word knowledge depends on the length and amount of exposure of each of the languages, a variable that is taken into account in the normed receptive vocabulary test for bilingual populations suggested by Gathercole et al. (2008).

The receptive vocabulary measure that is used here, the BPVS II, does have norms for monolingual English children as well as for children with English as an additional language (EAL), however, given that the bilingual children investigated here have had regular exposure to English as well as German, they are expected to score well above

the EAL norms. On the other hand, given that they have had more prolonged exposure to German than English, their lexical skills in English are expected to be below the monolingual English children. The monolingual children, on the other hand, are expected to score within the range expected for their age group. Furthermore, both groups are expected to show an improvement in their lexical skills when tested a second time.

1.2 Grammatical Development in monolingual and bilingual children

Monolingual children acquire the morpho-syntactic skills of their languages between 2 and 4 (Brown 1973). Simultaneously bilingual children follow a similar acquisition pattern for both languages (de Houwer 1995). However, with regard to grammar, the ability to produce sentences and inflections and the ability to make use of them in sentence interpretation does not necessarily seem to go together.

With regard to receptive grammatical skills, MacWhinney (2005) has described sentence processing in terms of 'cues', language forms that are evaluated in order to work out the structure and meaning of the sentence. Different cues in the sentences can be in competition with each other (The Competition Model, Mac Whinney & Bates 1989). Children initially attend to the strongest cue and acquire the adult pattern gradually. MacWhinney & Bates also make a distinction between 'local' and 'global' cues. Local cues are forms such as plural marking which can be evaluated locally. Agreement, on the other hand, is a global cue which requires processing of the noun as well as the verb in order to process the sentence correctly. Agreement is therefore a later acquired cue for sentence interpretation.

Different languages differ in the strength of the different cues. For example, in English, word order is a strong cue for sentence interpretation. In German, on the other hand, case marking is used to assign the thematic role to the nouns in the sentence. This has implications for sentence processing when considering speakers of both languages as well as bilingual subjects.

With regard to bilingual grammatical development, a lot of recent studies have focused on 'interface phenomena'. The idea is that at the interface between grammar and another language module, bilinguals encounter a conflict when the two languages involved have similar structures that are deployed in somewhat different ways. According to Sorace (2005) interface phenomena occur in both comprehension and production. For this reason, differences in sentence processing can be expected between monolingual German, monolingual English and German-English bilingual children. On the other hand, as agreement is a more complex cue, all children would be expected to score lower on agreement than other grammatical categories that can be processed as local cues.

To summarise, this chapter compares the receptive lexical and grammatical skills of monolingual and bilingual German-English preschool children aged 3-5. It is hypothesised that the bilingual children will score lower than the monolinguals in receptive

vocabulary, particularly as they had more exposure in their other language compared to English. We also expect the two groups to differ in the way they make use of different grammatical information to interpret sentences as the bilingual children have processed sentences in German as well as English and the two languages differ in terms of the strength of different sentence processing cues. We expect both groups to improve in their lexical and grammatical skills when tested the second time round.

2. Methodology

2.1 Subjects

Between March 2009 and May 2010, 60 children between the ages of 3 and 5 years were tested. Thirty children attended institutions in Hertfordshire (UK) that function monolingually in English. The remaining children attended a bilingual German-English nursery that is part of the German school in London. In the monolingual group there were 10 children at each of the age level 3, 4 and 5. There were 5 girls and 5 boys at each age level. The children were recruited from two preschools and an infant school. All of them were English monolinguals, however, some parents were native speakers of other languages. At the first set of tests the average age for the group is 53 months.

In the bilingual group, there were seven 3-year-olds (3 girls and 4 boys), twelve 4-year-olds (8 girls and 4 boys) and eleven 5-year-olds (3 girls and 8 boys). All children attended nursery groups where a native English and German speaker were present. The background of the children differs between those where German is the language spoken by the mother or both parents (German dominant) and others where English is the home language English dominant. Overall, there were 22 children who were German dominant and 8 children who were English dominant. The overall average age of the bilingual group is 56 months. The focus of the analysis in this chapter is between monolingual English and German dominant bilingual children, for this reason the English dominant bilingual children are not considered.

A second set of tests was delivered after the first set; the monolingual children were re-tested after about 7 months, and a subset of five German dominant bilingual children (4 girls and 1 boy) were re-tested after up to 12 months. At this second set of tests the mean age of the monolingual group was 59 months and 66 months in the bilingual group.

2.2 Procedure

2.2.1 BPVS II

The procedure is the same as described in Rohde (this volume). The children were tested individually in a quiet area of the classroom, or in a separate familiar room, by one experimenter. The two receptive tests were the British Picture Vocabulary Scale II

(BPVS II) and a grammar task that was developed as part of the ELIAS project. For the BPVS II, the examiner asked the child to point to the appropriate picture when given the respective prompt (e.g. "Show me baby"). In this prompt, it is important not to change any word endings or embed the items in a sentence, since this may provide extra information that the child is not supposed to obtain. To ensure the child understands the task, two training sets are shown to the child before starting with the first test item. If a child is either unwilling to answer a question or does not know the answer (although guessing is explicitly allowed), the item is counted as wrong and testing is continued with the next set card. Testing starts with the initial set, the basal set, for every child, and is discontinued after the set in which 8 or more incorrect answers have been given, the ceiling set.

The BPVS II offers comparative values that allow for a comparison to L1 speakers and EAL speakers. The following data explains how the scores were obtained. Succeeding these explanations, the results are presented.

2.2.2 Grammar Task

The procedure is the same as described in Steinlen et al. (this volume). The children were tested individually on two subsequent occasions in a quiet area of the classroom, or in a separate familiar room, by one experimenter. First, the child looked at three pictures which were presented to them. The child then listened to a sentence that corresponded to one of the pictures. Responses were made by touching the picture which the child thought to be appropriate for the sentence. Before testing, the children were given two training items consisting of three pictures of different objects and an appropriate single word utterance to ensure they knew how to make the responses. The three pictures in each set differed in the following way: two of these pictures contrasted only in the target grammatical dimension (e.g. absence/presence of the plural inflectional marker -s: cat/cats). The third picture was a distractor. The children were tested on nine grammatical phenomena (see Table 1 below). In total, there were 54 test items (9 grammatical phenomena x 3 picture pairs x 2 presentations per picture set). The session did not take longer than ten minutes.

As can be seen in Table 1, nine grammatical phenomena were tested in the grammar comprehension task. The phenomena are listed alphabetically. Column 1 shows the abbreviations; column 2 explains each phenomena and column 3 provides example sentences (prompts).

Abbreviation	Phenomenon	Example sentence
AGRc	Subject-verb agreement: copula verbs; singular/plural	*The deer is white* *The deer are white*
AGRv	Subject-verb agreement: full verbs; singular/plural	*The sheep eats* *The sheep eat*
GEN	Possessive case: absent/present	*The girl is kissing the boy* *The girl is kissing the boy's dog*
NEG	Sentences: affirmative/negative	*The boy is running* *The boy is not running*
PLU	Inflectional morpheme: +/- plural -s	*Cat* *Cats*
POSS	Possessive pronoun singular: Masculine/feminine	*His cat* *Her cat*
PROog	Personal pronoun singular (object): masculine/feminine	*The girl is kissing him* *The girl is kissing her*
PROsg	Personal pronoun singular (subject): masculine/feminine	*He is singing* *She is singing*
SVO	Word order	*The boy is touching the girl* *The girl is touching the boy*

Tab. 1: Structures tested in the grammar task

3. Results

3.1 BPVS, test time 1

The results of the first test for both groups is given below in Table 2. The table gives the raw scores as well as the monolingual English age equivalents in relation to the mean age at each age level.

Age Group	Monolinguals		Bilinguals (German dominant)	
	Raw Score	AEL1 (Age)	Raw Score	AEL1 (Age)
3	49.5	58 (43.3)	33.6	42 (45.8)
4	47.1	55.1 (51.0)	39.5	47.9 (55.8)
5	61	71.7 (64.4)	48.9	57.3 (63.4)
Total	52.5	61.6 (52.9)	41.1	49.5 (56)

Tab. 2: BPVS II, test time 1: Mean raw score and L1 Age Equivalents (AEL1) for monolinguals and bilinguals

Table 2 shows that for the first test, the monolingual children scored above their L1 age equivalent by about 8.7 months on average. This difference is higher in the 3-year-olds (14.7 months) and lower in the 4-year-olds (4.1 months), resulting in a higher mean raw score in the 3-year-olds compared to the 4-year-olds. For the bilingual children, there was a steady developmental increase in mean raw score by age. The bilinguals with a German dominant background show a score slightly below the L1 age equivalent. A 3 x 2 Anova with age groups and language background as factors shows that both age and language background are significant: For age groups, $F(2,51) = 7.4$, $p < 0.05$. For language background, $F(1,51) = 15$, $p < 0.05$. The results are summarised in Figure 1 below.

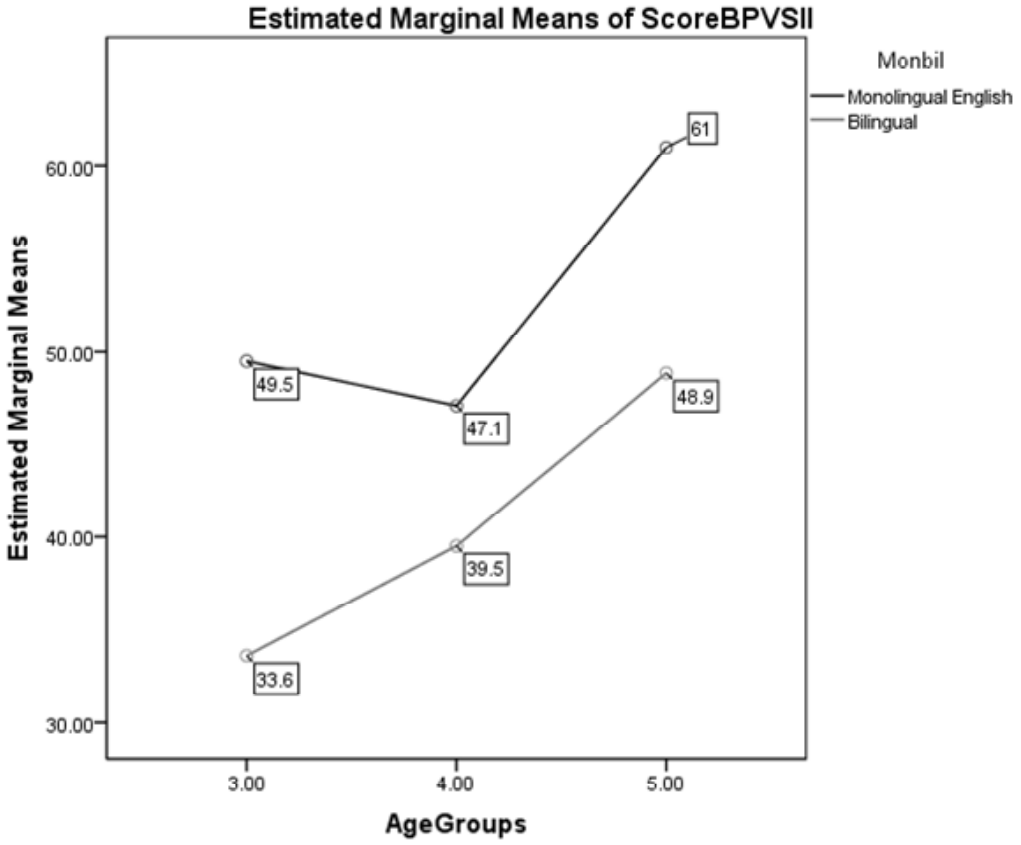

Fig. 1: BPVS II, test time 1: Raw scores by age group for both groups of children

There was no significant difference between the performance of the girls and boys in either sample.

As can be seen from Figure 2, the monolingual boys' average raw score (53.93) was slightly above the girls' average (51.13). For the bilingual group, the difference was more pronounced (45.09 for the boys and 37.18 for the girls). Within each age group, the differences were somewhat variable; the monolingual 3-year-old girls on average scored 52.6, 6.2 points higher than the 3-year-old boys' average of 46.4. In the four and 5-year-old monolinguals, the boys' average score was higher than the girls'; the 4-year-old boys had an average raw score of 51.2, which is higher than the girls' average score of 43. The 5-year-old monolingual boys had an average raw score of 64.2, slightly higher than the girls' average of 52.3. For the bilingual children, the difference between boys and girls is mainly due to the higher scores of the bilingual 5-year-old boys (53.0) as opposed to the 5-year-old girls (38.5). The differences between boys and girls were not significant.

Overall, there was a significant correlation between lexical comprehension and age across the group as a whole (r = .289, $p < 0.05$). This relationship also holds for both monolingual and bilingual groups separately. Individual children were found to skew the averages to some extent, such as a particular 3-year-old monolingual who had a raw score of 71. On the other hand, a bilingual 3-year-old boy had a raw score of just 14.

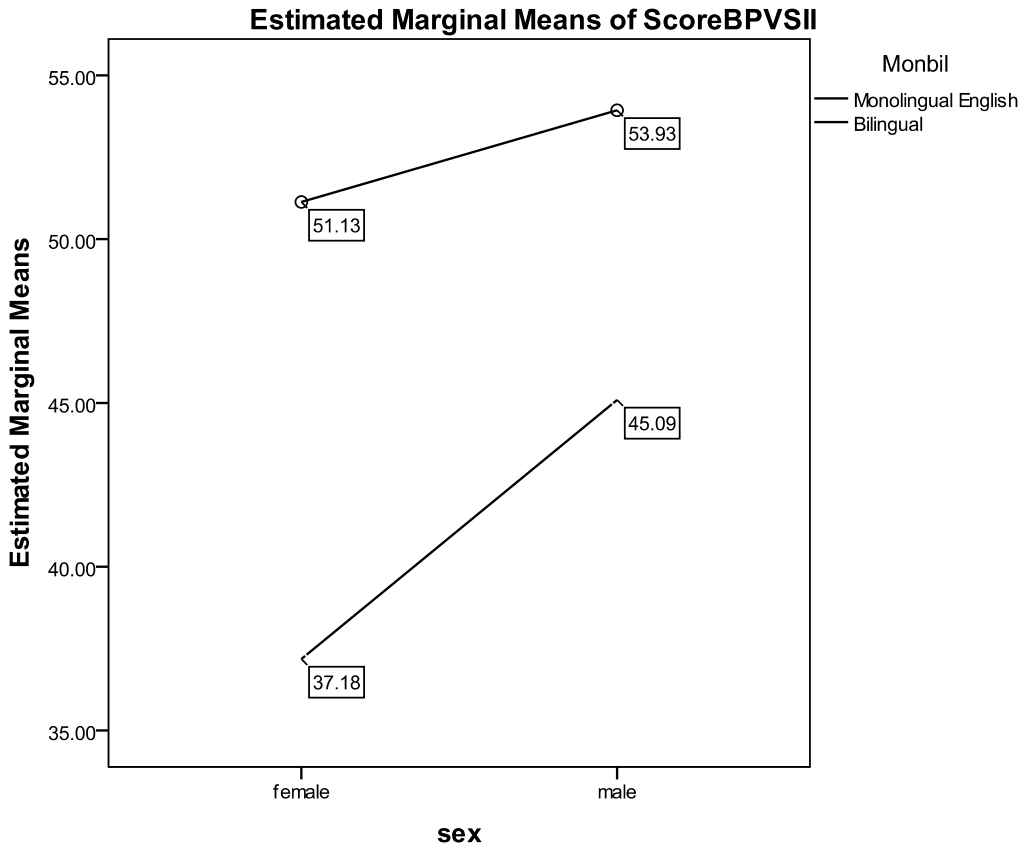

Fig. 2: BPVS II, test time 1: Raw scores by gender for both groups of children

The scores can also be compared with normative scores achieved by EAL speakers. The results are given in Table 3.

Age Group	Monolinguals			Bilinguals (German dominant)		
	Raw Score	AEL1	(Age)	Raw Score	AEL1	(Age)
3	49.5	74.4	(43.3)	33.6	57.2	(45.8)
4	47.1	72.5	(51.0)	39.5	61.8	(55.8)
5	61	87.8	(64.4)	48.9	73.9	(63.4)
Total	52.5	78.2	(53)	41.1	69.5	(56)

Tab. 3: BPVS II, test time 1: Mean raw score and EAL equivalents for monolinguals and bilinguals

All of the monolingual children had scores which are expected of much older EAL children. The monolingual group as a whole was 25 months ahead of the EAL norms. Within the 3-year-olds, the average difference was 31.1 months, in the 4-year-olds it was 21.5 months, and in the 5-year-olds it was 23.4 months.

The bilingual children also had EAL equivalents which are above their chronological age. Overall, they are 13.5 months ahead of the EAL norms. Across the age groups the difference is 11.4 months for the 3-year-olds, 6 months for the 4-year-olds and 10.5 months for the 5-year-olds.

The results of this round of testing indicate that there can be a significant deviation from the L1 normative scores offered by the BPVS II in even a sample size as large as

this. On the whole, most of the children in the monolingual group and some children in the bilingual group performed at a level expected of older monolingual children. As such, the monolingual children, whose results will be used for comparison with L2 speakers, have generally set a very high benchmark.

3.2 BPVS II, test times 1 and 2

This section considers the results of the monolingual group and 6 members of the bilingual group from two presentations of the tests, with each presentation being separated by an average period of 7 months in the monolingual group and up to 12 months in the bilingual group. In the bilingual group there were five 4-year-old girls and one 5-year-old boy. While the results of the second round of testing will be compared with those of the first, comparisons for the bilingual group's results will be made – and should be understood – with caution, owing to the differences in group size and gender ratios.

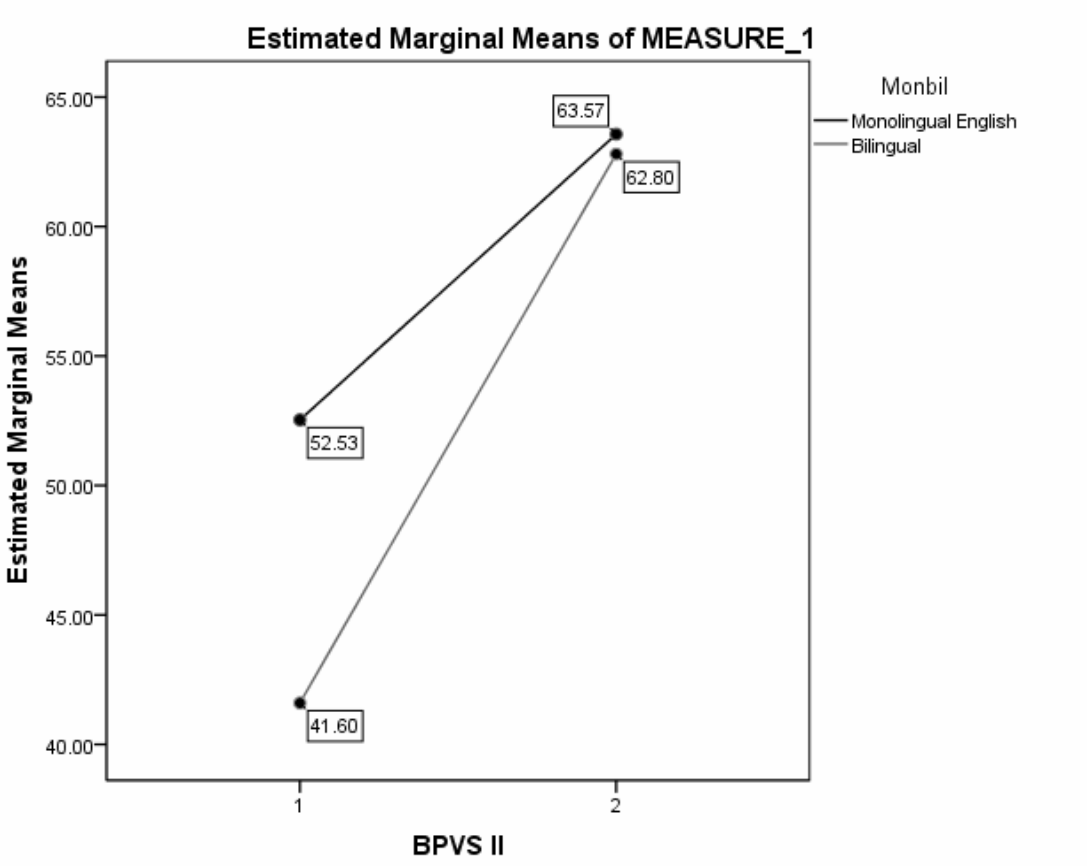

Fig. 3: BPVS II raw scores for test 1 and test 2 for monolinguals and bilinguals

In the monolingual group, the average raw score for the first test time was 52.53. As would be expected, after a lapse of on average 7 months, the average score had increased to 63.57. At the same time, the L1 age equivalent rose from 61.6 months to 74.4 months, which is more than the age increase of the children.

The bilingual children were re-tested after 10-12 months. Their average raw score rose from 41.6 to 62.8 and their L1 age equivalent increased from 50 months to 74.4 months, again, this increase is larger than the age increase of the children.

Children's performances in both tests were compared using a repeated measures Anova. This showed that $F(1, 34) = 36.6$, $p < 0.05$. Hence the increase in lexical knowledge is significant. Looking at the different monolingual age groups separately, the data indicate that the pattern of growth is relatively similar in each group; on average the 3-year-olds improved by 10 points after the 7 month lapse, the 4-year-olds by 11 points, and the 5-year-olds by 13 points. Given that the BPVS II set cards test increasingly complex and, crucially, abstract vocabulary as the test progresses, the slightly more improved scores in the eldest children indicate that the children's abstract receptive vocabulary improves in this 7 month gap. This growth of abstract vocabulary thus facilitates progression to a higher raw score.

The results for the monolingual children allow some interesting conclusions. As would be expected, the children's scores improve significantly after a delay of 7 months, indicating that this period sees a considerable growth in vocabulary in all three age groups. During this period, it is proposed that the older children's abstract vocabulary develops, allowing them to progress to stages of the test which test increasingly abstract concepts. In both rounds of the test, most of the children achieved a score higher than is expected for their age group. In the second round, it became clear that their achievements had become significantly more advanced. A similar pattern was observed in the differences between the children's age and their EAL-equivalent age.

3.3 Grammar Task I

These results relate to the first two presentations of the test given to the entire group. The results for the monolingual and bilingual children are given in Table 4 by structure below:

Abbreviation	**Monolinguals**				**Bilinguals (German dominant)**			
	3	**4**	**5**	**Total**	**3**	**4**	**5**	**Total**
AGRc	61.7	56.7	70.0	**62.8**	63.3	61.7	60.4	**61.8**
AGRv	43.3	50.0	58.3	**50.5**	50.0	56.7	54.2	**53.6**
GEN	93.3	85.0	96.7	**91.7**	73.3	90.0	93.8	**85.7**
NEG	93.3	90.0	100.0	**94.4**	93.3	91.7	100	**95**
PLU	73.3	83.3	96.7	**84.4**	60.0	91.7	85.4	**79.0**
POSS	73.3	80.0	100.0	**84.4**	70.0	83.3	77.1	**76.8**
PROog	76.7	78.3	88.3	**81.1**	56.7	80.0	85.4	**74.0**
PROsg	88.3	91.7	98.3	**92.8**	63.3	85.0	79.2	**75.8**
SVO	76.7	78.3	85.0	**80**	76.7	78.3	85.4	**67.0**
Total	**75.6**	**77.0**	**88.1**	**80.3**	**67.4**	**79.8**	**82.0**	**77.7**

Tab. 4: Percent of correct responses in Grammar Task I for both monolinguals and bilinguals

The table shows that both groups score similarly overall in terms of their percentage of correct responses. However, it is clear the children did not identify the grammatical phenomena equally well. Each phenomenon was tested six times in total in the first round, but no phenomenon was correctly identified on every occasion by every child. The best scores for the monolingual group were those obtained for PROsg (identified on average 5. times out of 6) and NEG (5.7 times); the worst was obtained for AGRv (2.9 times). The nouns which the verbs must agree with in this phenomenon were chosen to be irregular in their plural form so that the children had to attend to the ending of the verb being tested to provide the correct response. The bilingual children scored higher on agreement compared to the monolingual children and similarly on negation, yet they did not reach the scores that the monolinguals obtained on pronouns.

There are developmental differences in both monolinguals and bilinguals such that children achieve a higher score as they get older. The monolinguals achieved higher scores than the bilingual group, except for the 4-year-olds, where the bilinguals had higher scores than the monolinguals. The groups differed according to the categories tested. Comprehension of pronouns was weaker in the bilingual group, such that the 3-year-old monolingual children scored 22.5% above the bilingual 3-year-olds. On the other hand, the bilingual children scored higher on subject-verb agreement. A 3 x 2 Anova with age group and language background as factors shows that only age group is a significant single factor: $F(2,51) = 5.7$, $p < 0.05$. The results are summarised in Figure 4 below:

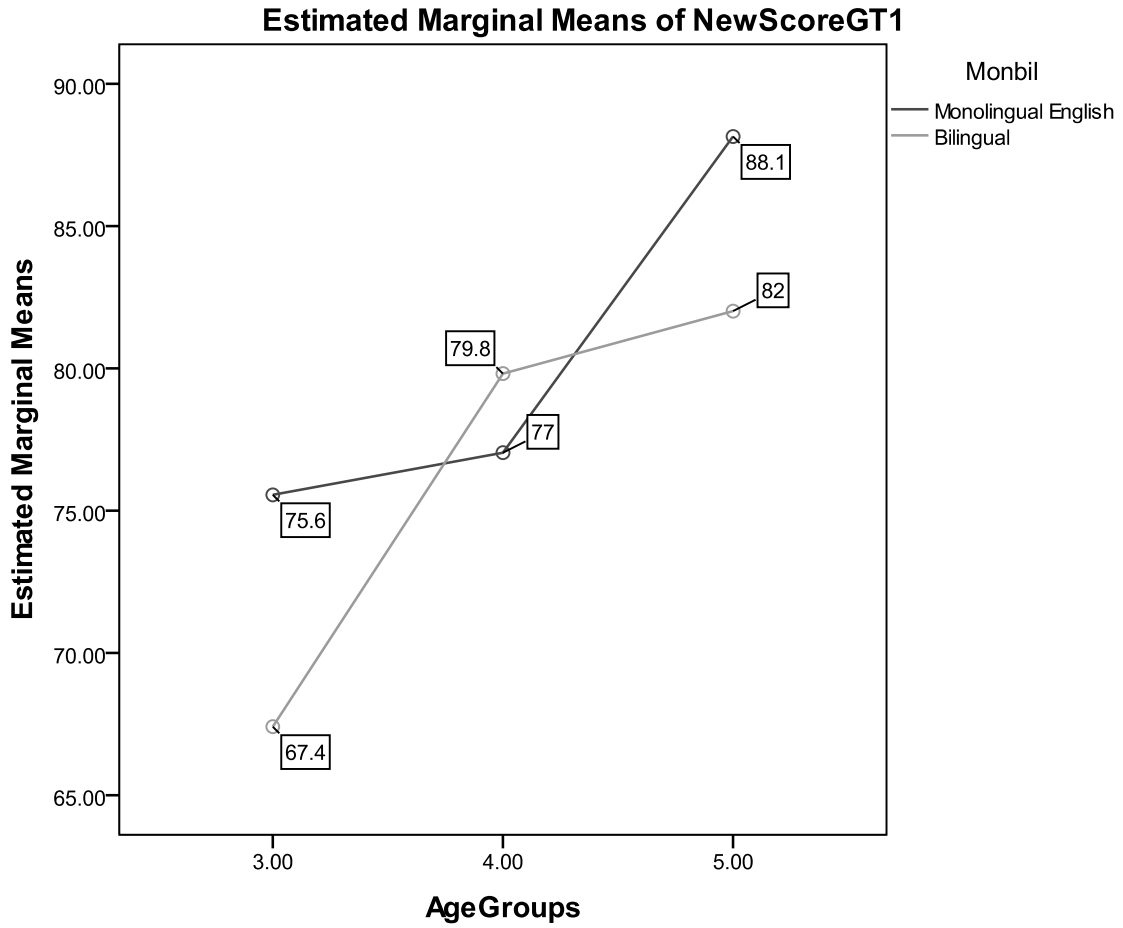

Fig. 4: Percentage of correct responses by age groups and language background in the Grammar Task I

The figure shows that the monolinguals and bilinguals follow different developmental patterns. The bilinguals start at a lower level (67.4) but show a sharp increase from 3 to 4, whereas the monolinguals stay at a similar level and then show an increase from 4 to 5. Overall, the results show that the receptive grammar task is a tool that is able to capture development in monolingual children in this age group.

Gender again was not a significant factor. The percentage of correct responses was quite similar for all age levels. For the 3-year-olds, girls had a slightly higher percentage of correct responses; however, in the other age groups the boys were more correct. The results are summarised in Figure 5 below.

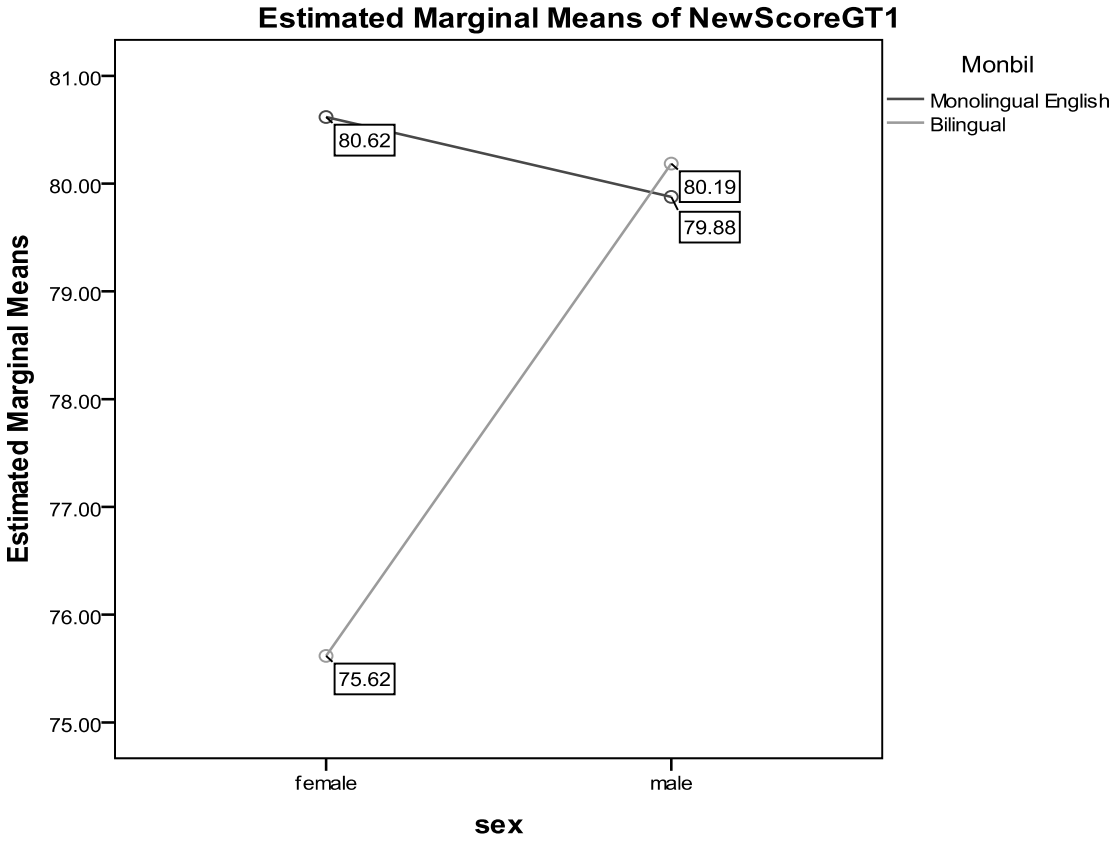

Fig. 5: Percentage of correct responses by age groups and gender in the Grammar Task I

As would be expected, across the whole group (n = 52) there was a significant positive correlation between the children's age and grammar score ($r = 0.458$, $p < 0.05$). A statistical analysis of the results also supports the conclusion that there is a significant correlation between scores for the grammar test and the BPVS II, that is, the results indicate that the more words a child understands, the better his or her performance will be in the grammar test. Across the whole group, the correlation between the scores for the grammar test and BPVS was $r = 0.548$, $p = 0.05$.

In conclusion, the scores of this first round of tests indicate that, as one would expect, there is a positive and significant correlation between the age of the child and the success with which he or she identifies grammatical phenomenon. There is a clear relationship between lexical and grammatical development in the age range tested; that is, during this period, a child's vocabulary has developed to an extent comparable with his or her grammatical knowledge. Certain phenomena seem to be identified with more success than others; in the age range tested, the weakest phenomenon wa that which tested subject-verb agreement using full verbs, and subject-verb agreement using copula verbs was only slightly better.

3.4 Grammar Task, test times 1 and 2

This section considers the results of twenty members of the monolingual group and five members of the bilingual group, based on a repeated administration of both parts after an average period of 7 months for the monolinguals and up to 12 months for the bilinguals. The monolingual group consisted of eight 3-year-olds (3 boys, 5 girls), seven 4-year-olds (3 boys, 4 girls) and five 5-year-olds (2 boys, 3 girls). The bilingual group consisted of four 4-year-olds (all girls) and one 5-year-old boy). While the results of the second round of testing will be compared with those of the first, these comparisons will be made – and should be understood – with caution, owing to the differences in group size and gender ratios. The results are summarised in Figure 6 below.

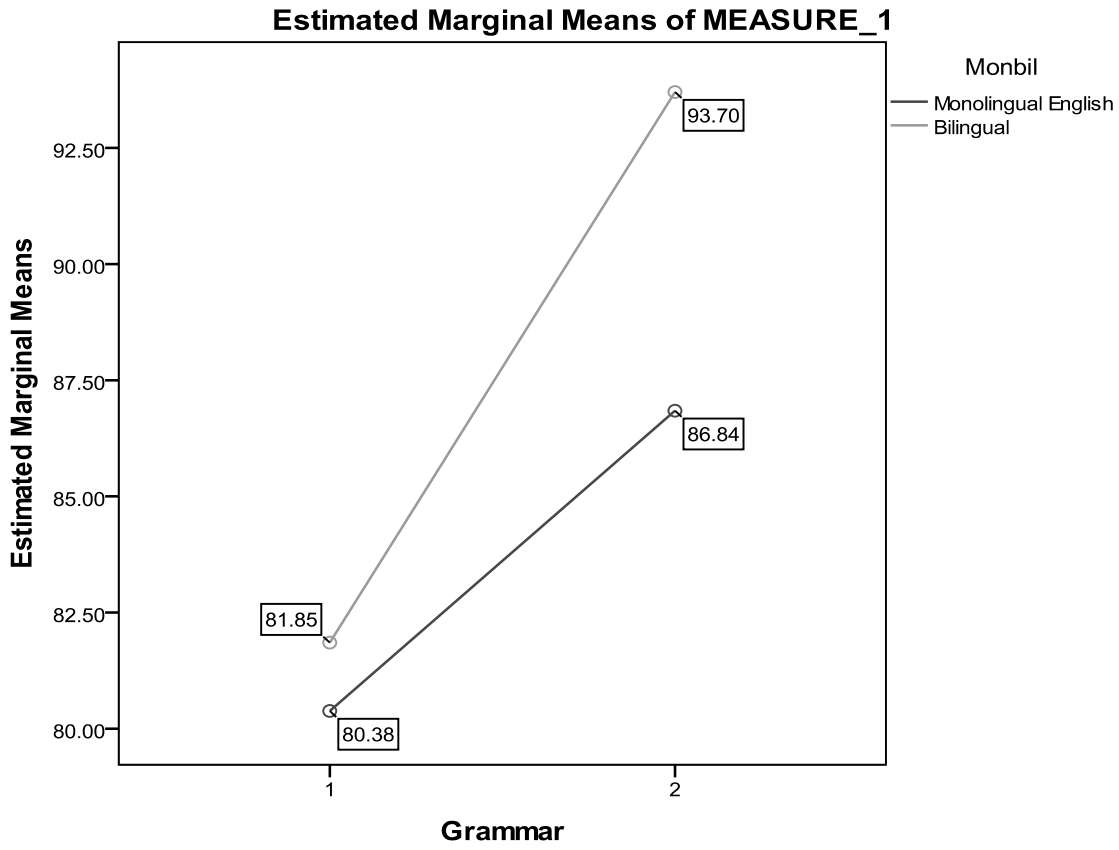

Fig. 6: Grammar Task raw scores for test 1 and test 2 for monolinguals and bilinguals

Figure 6 shows that both groups have improved their overall performance. For the monolingual children, the average difference was 6.46%, for the bilingual children it was 11.85%. The bilingual children improved by a higher rate, yet their second test took place later compared with the monolingual children.

The above results show that between these tests, the children's ability to correctly identify a selection of grammatical phenomena generally increased. However, it should be observed that while most of the group's scores increased in the second grammar test,

the scores of five of the children decreased. Nevertheless, the increase between both grammar tasks was significant. A repeated measures Anova showed that
$F(1,34) = 11.906$, $p < 0.05$.

Looking across the different categories, the success rate of each increased in the second round. NEG was the phenomenon most often correctly identified, with every child correctly identifying the phenomenon each time it was tested. GEN, which had previously scored 5.5 out of 6, was correctly identified on average 5.9 times out of 6 in the second round. While it remained the least successfully identified phenomenon, the children's understanding of AGRv did seem to improve somewhat, and the average score increased to 3.5 out of 6.

4. Discussion

The chapter has investigated the receptive lexical and grammatical skills of monolingual English and bilingual German-English preschool children aged 3-5. It was found that the monolingual children scored slightly above their age norms and that the bilingual children's scored were significantly lower than those of the monolinguals. On the other hand, the bilinguals were well above the EAL norms of the BPVS II. This finding is in line with previous studies (Pearson & Fernández 1994, Hoff & Elledge 2005) that have found a similar difference between monolingual and bilingual children. At the same time, it was found that the English lexical skills of both groups are improving over time, therefore it is conceivable that the bilingual children will catch up with the monolinguals eventually, depending on their further amount of exposure. It will be interesting to examine the lexical productive skills of both groups to see whether the difference in lexical skills is even more evident, as would be expected.

Regarding grammatical skills, there was no overall significant difference between monolingual and bilingual children in the grammar task, though the monolinguals achieved a higher score than the bilinguals. There were differences in the individual categories tested though, such that the bilinguals scored lower on comprehension of pronouns in particular. Both groups were quite low on agreement (the bilinguals scored slightly above the monolinguals in this category) which confirms MacWhinney's (2005) assertion that global cues such as agreement are acquired later than other cues. Both groups show a significant increase in their receptive grammar skills between the first and the second test. This shows that the grammar task is a useful tool which captures the development of grammar skills in this age group for both, monolingual and bilingual children. Further work needs to relate these findings to children's productive grammar skills in order to determine further the relationship between comprehension and production.

5. Conclusion

Monolingual English children were included in the receptive tasks carried out as part of the ELIAS project in order to obtain a measure of comparison for the German preschool L2 learners of English. The fact that differences were found in the results between different age groups as well as the monolinguals and a group of preschool German-English bilingual children living in England confirms that the tests are able to capture developmental trends as well as differences between monolinguals, bilinguals and second language learners. Further analyses, particularly with regard to the different categories of the grammar task, would need to show more specifically in what respects the non-native speakers show slower development and in what areas prior knowledge of another language facilitates acquisition.

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SETK 3-5: A Developmental Language Test on German for 3-to-5-Year-Old Children[1]

Anja K. Steinlen, Katharina Neils, Thorsten Piske, Christian Trumpp

1. Introduction

Since the 1960s, immersion programmes have been in operation in the French speaking areas of Canada, in which English children are sent to schools where all or a majority of lessons are taught in French (e.g. Lambert & Tucker 1972). Although these programmes have been shown to be very successful in terms of academic and L2 achievement (see e.g. Wesche 2002 for an overview), a frequently asked question by parents is the following: "What about English language skills? Will they suffer if my child attends a French immersion class?" (Canadian Parents for French 2006). A similar question is often asked by German parents of those children who attend a bilingual German-English preschool: "Will the German language skills of my child suffer because the native English teachers in our preschool exclusively use English?"

For an immersion school setting, this question has already been answered: Many studies have shown that the children's L1 does not suffer, at least with respect to their L1 reading and writing skills or with respect to their cognitive development (see e.g. Genesee 1987; Turnbull et al. 2001, Zaunbauer et al. 2005, Zaunbauer & Möller 2006, 2007, 2010). However, such an assessment of skills in the L1 has not yet been conducted in bilingual preschools. The aim of this study is, therefore, to examine whether the children's L1 German is affected by the use of English in bilingual preschools in Germany.

A range of tests for assessing German L1 achievement are available, but only a few of them are standardised. Examples include the *Kindersprachtest für das Vorschulalter* (KISTE, Language Test for Preschoolers, Häuser et al. 1994), the *Heidelberger Sprachentwicklungstest* (HSET, The Heidelberg Language Development Test, Grimm & Schöler 2001) and the *Sprachentwicklungstest für drei- bis fünfjährige Kinder* (SETK 3-5, Language Development Test for Children Aged 3-5 Years, Grimm, 2001). The latter, the SETK 3-5 (Grimm et al. 2001), was used in the ELIAS project. It was chosen over the other tests because it has a standardised measure of language abilities that is appropriate for German children from 3 to 5 years of age, that is, it includes the age range of German preschoolers from 3.00 until 5.11 years. The SETK 3-5 has originally been designed to identify and diagnose children at risk for language impair-

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ment as early as possible. As explained in more detail below, the SETK 3-5 relates language production and comprehension to phonological working memory. According to Fried (2004), the SETK 3-5 is currently the most appropriate tool for analysing children's L1 German skills because it is less time consuming than KISTE or HSET and it can also be administered by persons other than language test experts. In the ELIAS project, however, the SETK 3-5 was administered by speech therapists.

When children in Germany start preschool (in most cases at the age of 3), their L1 German skills are usually already well developed. They can pronounce almost all sounds of the German sound system, although they may still have problems with certain sound combinations. In terms of morphology, preschoolers may already use regular noun and verb forms, but they still often overgeneralise irregular forms. Their lexicon is further extended on a daily basis, and they learn how to interact with others in a pragmatically appropriate way (see e.g. Haug-Schnabel & Bensel 2005). By the end of preschool at age 6, the children can generally apply most of the German syntactic rules in a target-like manner, they hardly overgeneralise morphological forms, their vocabulary continues to grow at a rate of three to six new words per day and their pragmatic-communicative skills are generally well developed (e.g. Tracy 2000, Siebert-Ott 2001).

Apart from diagnostics in speech therapy (e.g. Möller et al. 2008, Rosenfeld et al. 2008), the SETK 3-5 has also been used in other contexts. For instance, the Federal State of Baden-Württemberg is currently using the SETK 3-5 as a screening instrument for children aged 4.5 whose German language abilities seem to be delayed (Jacobs 2009). Moreover, the SETK 3-5 has been used to explore the relationship between music and language (Sallat 2009, Jentschke et al. 2008), to compare sensory motor inhibition in clinical and normal preschoolers (Chasiotis et al. 2006), and in comparisons with other language tests which also assess the development of German (e.g. Vogt 2003, Fried 2006). However, the present study is the first one that uses the SETK 3-5 to longitudinally explore whether German preschoolers' L1 German is affected by the use of English in bilingual preschool immersion programmes.

Two additional aspects will also be explored in the study, namely the effects of sex and home language background. As regards sex, we examine whether the L1 German skills of preschool boys and girls differ and if so, to what extent. A well-known stereotype purports that girls are more successful than boys in acquiring their L1. For instance, Bornstein et al. (2004) found that girls older than age five consistently outperformed boys on multiple specific and general measures of language achievement. For German, Blossfeld et al. (2009) reported that the German skills of preschool girls were better developed than those of their male peers. However, the empirical evidence for the supposed advantage for girls is not consistent. A meta-analysis of several hundred studies examining girls and boys from ages 4-18 found that alleged advantages of girls were either slight or non-existing (Hyde & Linn 1988). For the preschool context, Grimm et al. (2001) reported that the results of the norm group of the SETK 3-5 indi-

cated no sex-related differences in the acquisition of the L1 German (see also Kretschmann 2004). In her detailed review on the effects of sex on language, Klann-Delius (2005) concluded that empirical studies did not conclusively support the notion that the L1 acquisition process proceeds faster or more successful in girls than in boys. In this study, the gender issue is further investigated, in part because this question has not been examined in an acquisition setting where preschoolers not only further develop their L1 skills, but also simultaneously acquire an L2 (in this case English).

In addition, this chapter will also examine whether the children's home language background has an effect on their German skills as assessed by the SETK 3-5. To this end this study will assess whether the acquisition of German by migrant children is affected by the fact that these children attend a bilingual preschool and are exposed to yet another language (English) than the ambient language of the host community (German) and their home language (e.g. Turkish, Arabic, Russian, etc.). It may be hypothesised that children whose home language or L1 is not German will show deficits in the acquisition of German because, due to their exposure to English, these migrant children may not receive enough German input.

In 2009, about 57% of all children in Germany below the age of six attended a preschool or another child-care institution and roughly 25% of these children have a migrant background, i.e. one or both of their parents come from another country than Germany (Böttcher et al. 2010: 158). Little research is available in Germany on how these migrant children perform in preschool (see Biedinger 2010). Nevertheless, a few studies suggest the existence of early ethnic educational inequality among preschool children in Germany. For instance, as early as preschool, migrant children appear to lag behind in terms of general proficiency in German or in the ability to express themselves verbally (Feinstein 2003; Schöler et al. 2004). Biedinger (2010) reported that in terms of their cognitive development, Turkish children are at a disadvantage as soon as they start preschool. She found a strong correlation between children's educational outcomes, their socio-economic backgrounds and their parents' attitude towards school achievements. The results of Becker's (2010) study on the German vocabulary skills of Turkish preschoolers indicated that the time spent in preschool has an influence on the development of German vocabulary by 3-5-year-old children. However, the development of migrant children's German (their L2) may even slow down in the last year of preschool, as Penner (2005) reported. In other words, it is not always or necessarily the case that (second) language development is promoted in early bilingual contexts, especially in those contexts that are described by Baker (2001: 195) as submersion contexts, i.e. in contexts in which "the minority student will be taught all day in the majority language typically alongside fluent speakers of the majority language." According to Baker (2001: 196), language minority children in submersion contexts often "have little or no idea what the teacher is saying" and their teachers often lack the kind of training that would enable them to accommodate these children. Such observations have also been made in Germany by Penner (2005) and Kaltenbacher & Klages

(2007), who reported that many children from migrant backgrounds only take part a little in communication in preschool.

After preschool, migrant children may further be disadvantaged. Surveys show that, when they start primary school, children from migrant backgrounds have a much poorer command of their L2 German than children whose L1 is German. For instance, between 70% to over 90% of children from migrant backgrounds perform below average or are deemed to be 'at risk' (Penner 2005). These worrisomely high values apply to various areas of language such as vocabulary, morphology, syntax and pragmatics. Other studies have shown that migrant children may also have very poor auditory skills and phonological awareness (e.g. Penner 2005, Grimm et al. 2004, Schöler et al. 2004 and see Knapp 2006 for a detailed review).

Although there has been much speculation about whether the bi- or multilingualism of children from migrant backgrounds hinders or helps language acquisition, it is now generally recognised that the success or failure at school of children who grow up speaking two or more languages outside (pre)school depends mainly on the circumstances in which the languages are learned, such as the social background, parents' level of education and aspirations, and the language support offered (e.g. Apeltauer 2004; Siebert-Ott 2001, Biedinger 2010, see Knapp 2006 for a review). Thus, based on the literature, it might be expected that children with a migrant background receive lower scores on the German test SETK 3-5 compared to children with a monolingual German background.

In sum, the focus of this study is on the German skills of children who attend a bilingual preschool. To our knowledge, it is the first study that examines whether the L1 skills of preschoolers develop in an age-appropriate way although their ambient language in preschool is not only German but also English. In addition, this study investigates to what extent the German skills of preschoolers in a German-English bilingual programme are affected by the variables migrant background and sex.

2. Method

2.1 Research Questions

In the following section, the results of the SETK 3-5, which was administered in seven preschools in Germany, will be presented. The following questions are addressed:

1. What is the level of German L1 proficiency by children in bilingual preschools at two points in time (T1 and T2) in comparison to German monolingual children who attend a monolingual German preschool?
2. What is the amount of progress made in the L1 German by children in bilingual preschools from T1 to T2, compared to the monolingual German preschool children?

3. What is the impact of sex on level of German L1 proficiency by children in bilingual preschools? Do boys and girls in bilingual preschools attain different levels of German L1 proficiency at T1 and T2? Do boys and girls make different amounts of progress in their L1 from T1 to T2?
4. What is the impact of the child's home language background in these bilingual preschools on their levels of the L1 German and on the amount of progress they make from T1 to T2? Do migrant children reach similar levels of German proficiency and progress similar to German monolingual children?

2.2 Procedure

The SETK 3-5 (Grimm et al. 2001) is a standardised and norm-referenced instrument which examines the language proficiency of German-speaking preschool children. This battery has been standardised on a group of 495 German-speaking children between 3;0 and 5;11 years of age and has been found to have high validity and reliability (with Cronbach's Alpha between .62 and .89). The test consists of two different test versions depending on the age of the children (a version for 3-year-olds and a version for 4- and 5-year-olds). In particular, it assesses the domains of linguistic understanding, production, and memory.

Linguistic understanding is measured by the subtest *understanding of sentences*, for linguistic production there is the test *formation of morphological rules* and linguistic memory is measured by *phonological working memory for non-words*. The subtest *understanding of sentences* measures the ability to comprehend sentences of varying complexity. Here, the children are instructed as follows (exemplary item 1): "Here, I have brought some things for you." (Experimenter arranges a teddy bear, a smaller and a bigger pencil, a white ball and a smaller yellow ball in a fixed order). "Can you tell me what this is?" After the child has named the object, the experimenter says: "Show me: The yellow ball rolls away because you have hit it with the white ball."

The subtest *Formation of morphological rules scale* measures the ability to build the plural form. Here, the following instructions are used: "I have some pictures here. I would like to show them to you. They are pictures of animals and of other things. I will always tell you what *one* of these things is called and you tell me what *several* of these things are called, that is, what *more than one* of them is called. Look, here is *one* car. . . . Here, there are even *more*. So, here are three . . . [cars]."

The subtest *Phonological working memory for non-words scale* measures the ability to pronounce non-words. A sample instruction would be: "Now I would like to play a game of words with you. I will tell you some funny words you have never heard before. Listen closely to me and then repeat these words. Let's try this first. Listen, I will say the first word now: "Maluk" . . . Now it's your turn!"

Testing took place in a quiet room at the child's preschool and lasted between 15 and 30 minutes per child.

2.3 Subjects

In 2009 and 2010, 83 children (45 girls and 38 boys) from seven bilingual preschools in Germany completed the SETK 3-5 twice at an interval of between six to twelve months. The age range of the children was between 3-5 years at the time of test 1 (mean = 52.3 months, SD = 6.0 months). At the time of Test 2, the children were between 4-5 years old (mean: 59.7 months, SD = 5.9 months). Of the 83 children, 12 children had a migrant background. Their home languages were Arabic, Cantonese, Croatian, Estonian, Hebrew, Russian, or Turkish.

3. Results

In this section, the results of the SETK 3-5 will be presented. Section 3.1 will examine how the results of the monolingual children visiting bilingual preschools will relate to the scores of the norm groups (i.e. the standardised values). Section 3.1 will also report on how the German skills developed over time. Possible effects of sex will be examined in section 3.2. The results presented in sections 3.1 and 3.2 are restricted to those of the 71 monolingual German children. In section 3.3, the results of the twelve migrant children will be added as the focus here is on the children's home language and its effect on the results of the SETK 3-5.

In the following, the normalised-distributed data of the population were statistically analysed using ANOVAS and repeated measurements. The T-values relate to norm values (mean = 50, SD = 10). These values may be interpreted as follows: Children with a T-value between 40 and 60 score average, children with a T-value of 60+ score above average; children with a T-value below 40 below average. T-values are interpreted as an approximation to an actual score (see Grimm et al. 2001).

3.1 General results

How did the children's scores of the SETK 3-5 develop over time? As shown in Figure 1, the children received lower T-values in Test 1 (50.5) than in Test 2 (51.8). This difference is significant, as an ANOVA showed.[2] Not unexpectedly, the results improved as a function of the children's age and their exposure to their L1 German.

2 A repeated measure analysis for the bilingual preschoolers revealed significant differences for time (Time: $F(1, 70) = 5.229$, $p < 0.05$).

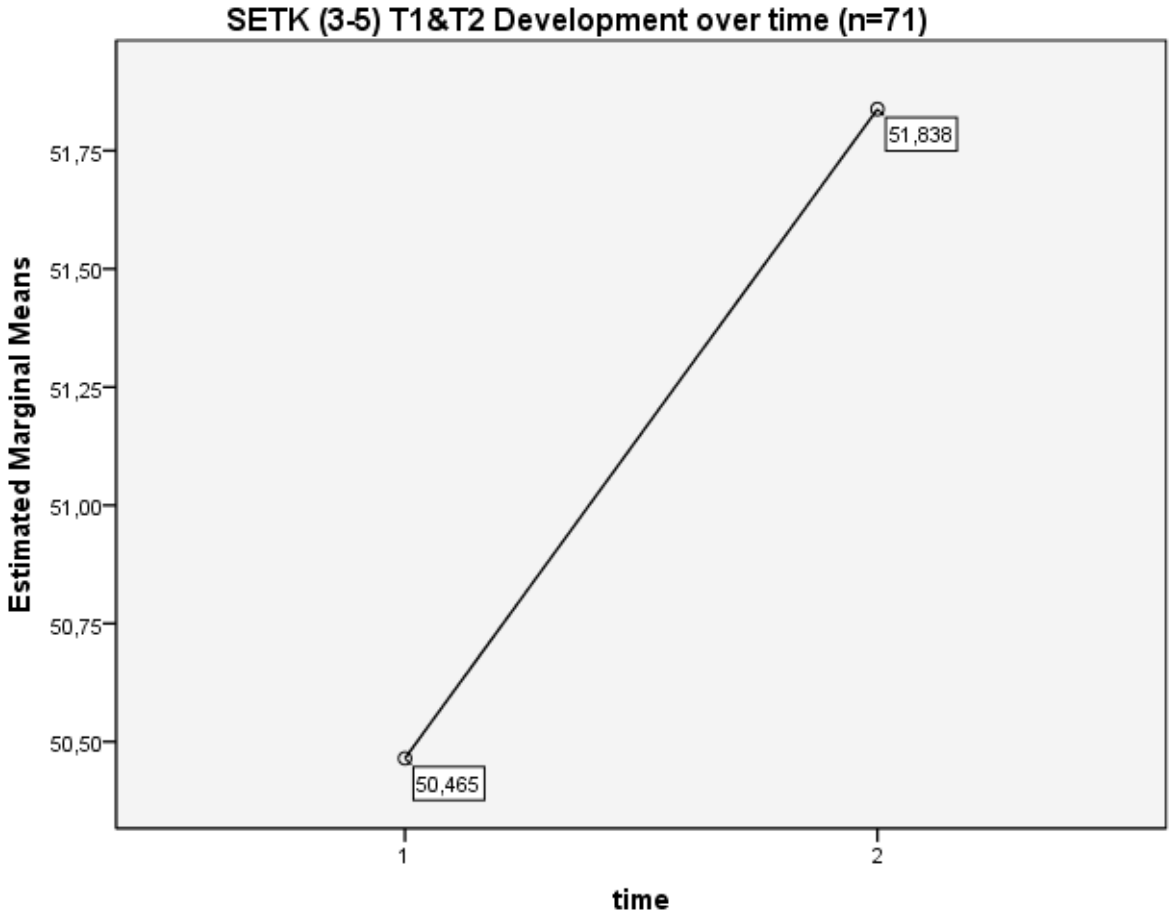

Fig. 1: Development of SETK 3-5 scores from T1 to T2

The T-value of 50.5 for test 1 indicates that the monolingual German children in bilingual preschools score within the range of their peers in monolingual German preschools. The value for test 2 (T = 51.8) even slightly exceeds the norm value. These results demonstrate that the L1 German skills of monolingual German children are not negatively affected by the exposure to L2 English in bilingual preschools.

3.2 Sex

It was further examined whether the children's sex would affect the development of preschool children's German L1 skills. The sample consisted of 38 girls and 33 boys, who were retested after 6-12 months.

As Figure 2 shows, the difference between boys and girls is not statistically significant.[3] Neither at test 1 nor at test 2 did boys and girls score differently on the German

3 A repeated measure analysis showed significant differences for time (Time: $F(1, 69) = 5.654$, $p < 0.05$) but not for the interaction (Time*Sex: $F(1, 69) = 1.557$, $p > 0.05$).

test.[4] It follows that the development of the L1 German as assessed by the SETK 3-5 was not affected by the children's sex: boys and girls did not differ in their development of their L1 German.

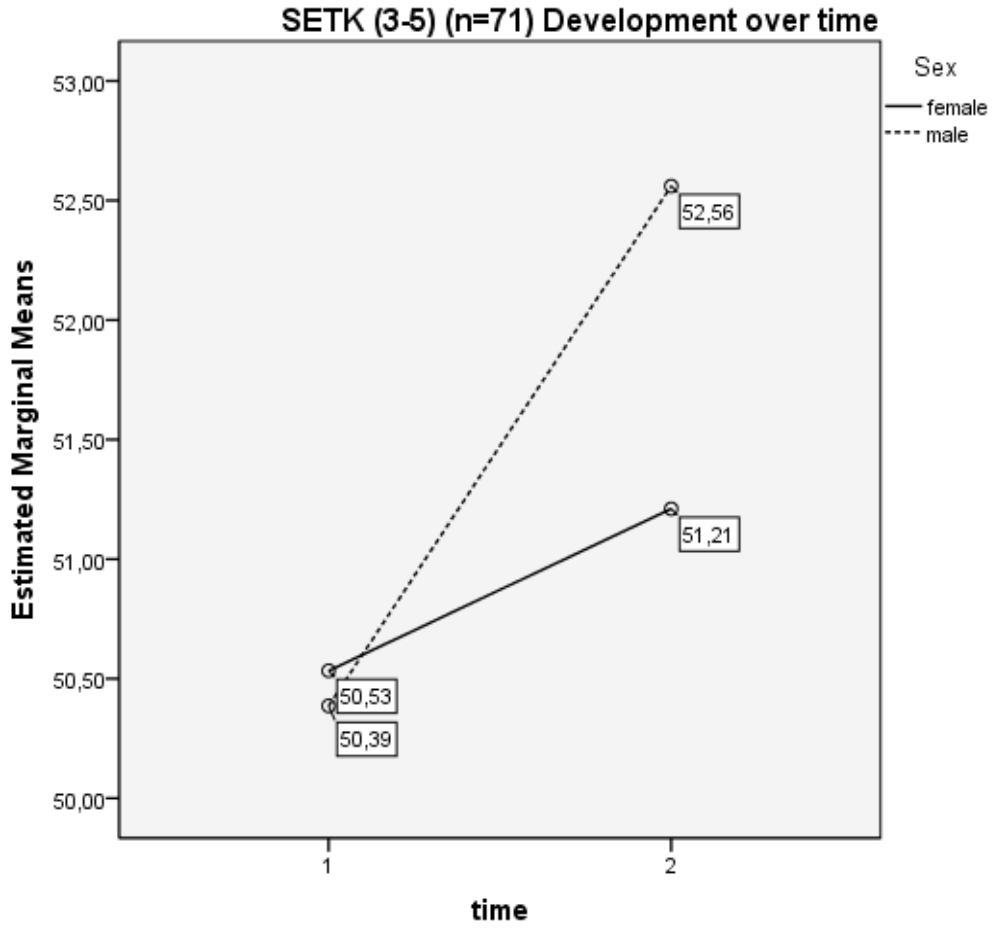

Fig. 2: L1 German development over time (as assessed by the SETK 3-5) with focus on sex differences

3.3 Migration background

How did the children with a migrant background fare in their German development as compared to monolingual German peers? Altogether, in this study, 12 children had a migration background, 71 did not. The children with a migrant background came from five preschools in Germany; their L1's were Arabic, Cantonese, Croatian, Estonian, Hebrew, Russian, or Turkish. It is important to note in this context that the group of migrant children in this study is small, so that the following results may only be interpreted as preliminary at the best.

4 ANOVAs showed no significant differences between boys and girls for Test 1 ($F (1, 69) = 0.005$, $p > 0.05$) and for Test 2 ($F (1, 69) = 0.421$, $p > 0.05$).

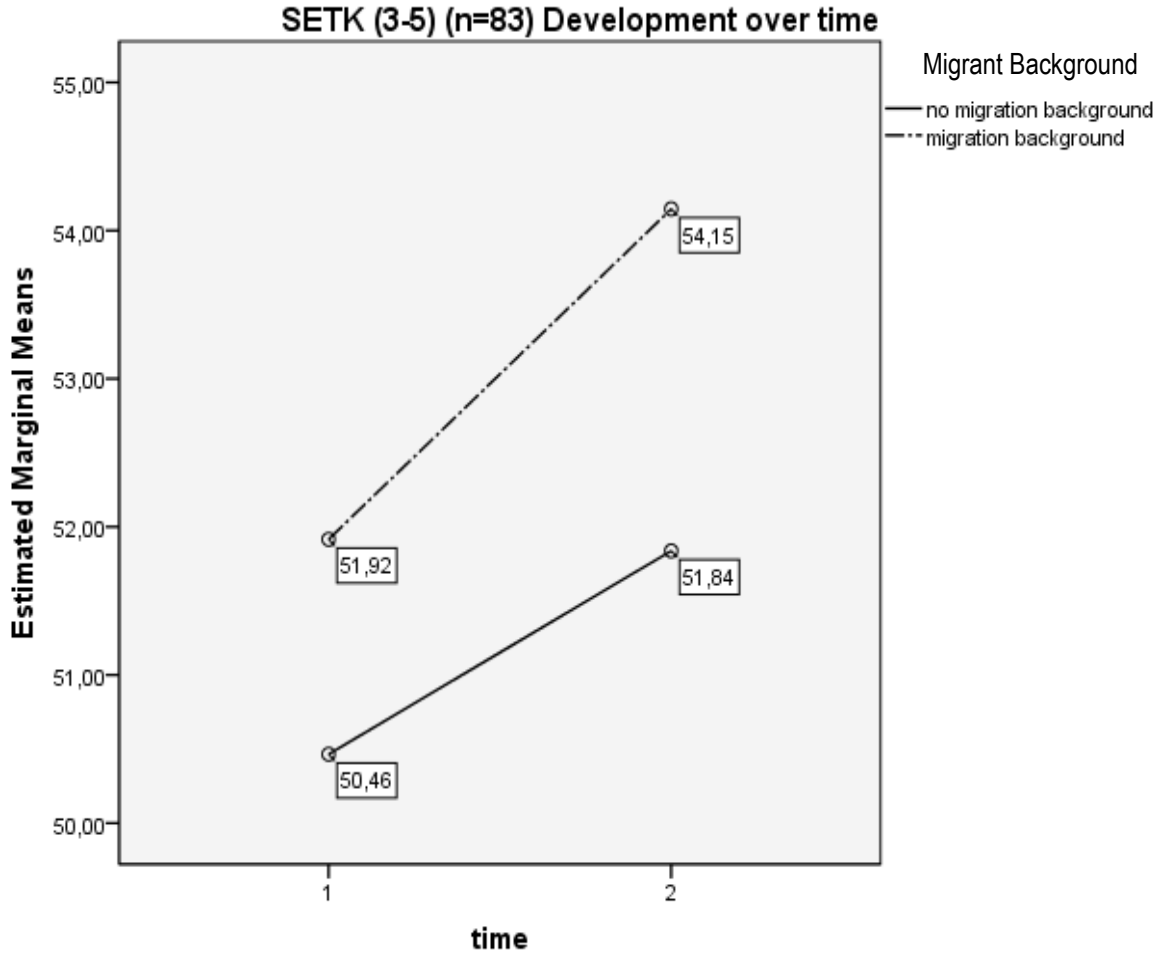

Fig. 3: L1 German development over time (as assessed by the SETK 3-5) with focus on migration background.

As Figure 3 shows, the rate of progress of children with a migration background did not differ from the progress rate of children without migration background. Both groups improved significantly over time.[5] Furthermore, monolingual children and migrant children did not show significant differences in their scores at test 1 or 2.[6] In comparison with the norm group, the migrant children scored even slightly above standard norm values. They obtained a T-value of 51.9 on test 1 and a T-value of 54.2 on test 2. Although these results are preliminary, they indicate that the acquisition of German by migrant children in a bilingual preschool need not be impeded.

5 A repeated measure analysis showed significant differences for time (Time: $F(1, 81) = 5.410$, $p < 0.05$) but not for the interaction (Time*Migrant Background: $F(1, 81) = 0.306$, $p > 0.05$).

6 ANOVAs did not show any significant differences between migrant children and non-migrant children for Test 1 ($F(1, 81) = 0.250$, $p > 0.05$) and for Test 2 ($F(1, 81) = 0.720$, $p > 0.05$).

4. Discussion

The German language test SETK 3-5 was administered to 71 monolingual children in seven bilingual German-English preschools in Germany. The results of the test showed that the children's scores on the SETK 3-5 in all bilingual preschools were average or slightly above average, as compared to the norm group. Furthermore, the children in the bilingual preschools showed an age-appropriate development with respect to their L1 German skills. Similar findings were reported from the primary and secondary school context, at least with respect to the children's development in L1 reading and writing (see e.g. Genesee 1987; Turnbull et al. 2001 for Canada, and Zaunbauer et al. 2005, Zaunbauer & Möller 2006, 2007 for Germany). Based on these data we tentatively conclude that the acquisition of the L1 is not hindered by the early introduction of the L2. In fact, the longer the children attended a bilingual preschool, the better their L1 German skills became, as this longitudinal study also showed. After +/- 12 months, the children were even slightly above age-appropriate norms. Thus, the question stated above, i.e. "Do the L1 skills of my child suffer when he or she attends a bilingual preschool?" may be answered with "no," at least with respect to the language skills assessed by the SETK 3-5.

How can the positive results of the SETK 3-5 be explained? One important variable which has been found to influence children's performance refers to the children's family background, in particular their parents' socio-economic and educational situation. Many studies have demonstrated the intimate relationship between parental expectations and the academic achievements of their children (e.g. Eccles et al. 1983, McGrath & Repetti 2000). From the preschool context, it is also known that children unconsciously follow their parents' attitudes and that a positive parental attitude positively affects the language learning progress (see e.g. Mushi 2000, López 2005). Likewise, Biedinger (2009) showed that the family background and the investment of parents in their children's home environment improve the developmental score of the children and may account for ethnic differences between German and Turkish preschoolers. Unfortunately, in this study, it was not possible to correlate the parents' educational and socio-economic background with the results of the SETK 3-5 test because of lack of adequate data. However, as Wippermann et al. (this volume) show, the various preschools in the ELIAS project were all situated in areas with different socio-economic backgrounds. In other words, it was not the case that only children from higher middle-class background attended the bilingual preschools examined here; a wide range of socio-economic backgrounds are represented in the sample. More studies are evidently needed which examine parental variables in more detail to better account for differences or similarities between preschoolers and their performance in language tests.

Another factor which also positively affects children's L1 skills are so-called literacy precursors, including reading habits in the home. For instance, studies have demonstrated that children who are exposed to books from an early age show better achieve-

ments in school in terms of their oral competence, knowledge of the alphabet, phonological awareness and reading comprehension (e.g. Reynolds 1997). In addition, early experience with different forms of literacy (reading, story-telling and writing) positively affects children's language acquisition development, their language competency and their knowledge about language (e.g. Apeltauer 2004, Kuyumcu 2006). In a further study, therefore, the results of a questionnaire of the ELIAS project, which requested parental information on reading habits at home, will be related to the children's performance in the SETK 3-5. It is expected that this follow-up study will demonstrate a strong correlation between these two factors.

The results of this study also show that the children's sex does not influence their performance on the SETK 3-5 test as boys and girls in the bilingual preschools performed equally well. This result is interesting insofar as it is often pointed out that boys exhibit more often a delay in language acquisition than girls (see e.g. Bornstein et al. 2004). In the bilingual preschools of this study, such effects were not observed. This finding agrees with several other studies which found no significant differences between boys and girls in L1 acquisition, at least with respect to 'no risk' children (e.g. Tomblin 1997). Similarly, Grimm et al. (2001) did not find any sex-related differences in the acquisition of the L1 German by the SETK 3-5 norm group. We may thus conclude that the bilingual preschool context, i.e. the acquisition context under investigation here, does not evoke L1 related differences between boys and girls.

In addition, one focus of this study was whether the children's home language background had an effect on their German skills. Based on the literature, it was examined whether children with a migrant background would obtain lower scores in the SETK 3-5 than monolingual German children because their L1 skills were less developed than those of their monolingual peers (e.g. Penner 2005, Kaltenbacher & Klages 2007, Knapp 2006, Schöler et al. 2004). Second, it was speculated that the reduced amount of German input (due to the fact that the preschool staff also consisted of teachers who only spoke English) would result in lower SETK scores by children with a migrant background because the amount of input has been shown to play an important role for the acquisition of German in a German preschool (e.g. Becker 2010). Surprisingly, the results of this study showed that this was not the case. The progress rates of children with a migrant background did not differ significantly from the progress rate of children without migration background and both groups improved significantly over time. Several factors may account for this unanticipated finding.

First, it is important to note that the group of migrant children examined in this study is very small. Therefore, the results are only preliminary. Further studies examining a larger number of subjects are needed to verify the results of this pilot study in more detail. In addition, the 12 migrant children investigated here came from five different preschools in Germany. It cannot be ruled out that in these particular preschools, all variables which contribute to successful foreign language learning were available, e.g. sufficient German input (Chilla et al. 2010, Tracy 2000), parental support (e.g. Apel-

tauer 2004, 2007, Biedinger 2009, Kuyumcu 2006), long preschool attendance (see also Becker 2010), maintaining and fostering the children's L1 (e.g. Apeltauer 2004, 2007), and preschool staff that is adequately trained in order to provide appropriate language support (see Knapp 2006 for a detailed discussion).

Nevertheless, the positive results of the SETK 3-5 are encouraging and point to many important factors that may have helped the migrant children to develop their German language skills. First, the migrant children's progress may be attributed to increased contextualised input (Chilla et al. 2010, Tracy 2000). Experience has shown that staff in bilingual preschools are particularly sensitive to language acquisition processes and therefore consciously "immerse" their children to high-quality and high-quantity input, be it in the children's L1 or L2 (see Weitz et al., this volume, for a discussion of L2 input). Thus, the migrant children in bilingual preschools do not necessarily receive reduced German input. Unfortunately, such a claim is very difficult to quantify. It is important to point out, though, that the German input that these migrant children receive at preschool, no matter how attuned to their needs, cannot possibly compensate for the fact that they do not receive German input in their homes. In a further study, therefore, not only the L2 input, but also the quality and the quantity of L1 input that the children are exposed to in a bilingual preschool should to be taken into consideration in order to appropriately analyse the German skills of migrant children.

It is possible that the migrant children's German skills were positively affected by the strongly contextualised input children in bilingual preschools are typically exposed to (e.g. Chilla et al. 2010, Wesche 2002). In order to help children in bilingual preschools to understand utterances in both the new language English and German, preschool teachers usually contextualise the language they use by employing visual aids, real-life objects, by engaging children in motivating activities etc. (see e.g. Snow 1990). One can speculate that just like the strongly contextualised English input appears to have helped the children in the bilingual preschools in Germany to show measurable progress in their comprehension of English, strongly contextualised German input also appears to have helped especially the migrant children to show measurable progress in German. Other authors (e.g. Bialystok 1988) have also suggested that depending on the context in which children learn more than one language early bilingualism may result in a better understanding of linguistic structure or increased metalinguistic awareness and that this increased metalinguistic awareness positively affects the acquisition of all the languages they learn.

In sum, the children in bilingual preschools obtained scores on the SETK 3-5 which were average or slightly above average. However, there are many other questions that need to be addressed in other studies: For example, the SETK 3-5 was only applied twice to the preschoolers of the ELIAS project. In order to obtain a fuller picture of the development of German of these preschoolers, the SETK 3-5 would ideally have to be administered from the beginning to the end of their preschool time. Such a procedure could then verify whether Penner's (2005) observation is correct, namely that second

language learning by migrant children may even slow down in the last year of preschool. Furthermore, such a study could show how the different areas of German language skills as assessed by the subtests of the SETK 3-5 (i.e. understanding of sentences, encoding of semantic relations, formation of morphological rules and phonological working memory for non-words) develop over the preschool period. For example, many studies demonstrated a strong correlation between phonological working memory and lexical and syntactic skills in L1 acquisition (e.g. Adams & Gathercole 1995, Baddeley et al. 1998, Hasselhorn & Körner 1997). One may ask whether such a correlation also holds true for a language learning setting where preschoolers are exposed to more than one language. So far, no study has examined this question.

Finally, it is yet not clear whether the results of the SETK 3-5 may affect the outcomes of the L2 tests (i.e. the BPVS and the ELIAS Grammar Test). For example, for the school context, Sparks et al. (2006) found that foreign language learning builds on native language skills; that is, an individual's skill in the native language components (i.e. phonological/orthographic, syntactic, and semantic) serves as the foundation for successful foreign learning. Dufva and Voeten (1999) also reported that foreign language learning depends on well-developed native language literacy skills and phonological working memory. A relationship between native language phonological memory and L2 grammar and lexical skills have been found in studies by Service & Kohonen (1995), Cheung (1996) and Masoura & Gathercole 2005 (on L2 vocabulary) and by French & O'Brien (2008) (on L2 grammar). Based on such findings, it could be hypothesised that, for example, the scores of the SETK 3-5 subtest on *Phonological working memory* would correlate with the scores on L2 lexical and grammatical comprehension. In other words, the better a child's memory, the better his or her receptive foreign language grammar and lexicon skills. Unfortunately, such relationships have not been explored yet, neither for preschoolers, nor for bilingual settings nor for L2 comprehension skills.

In conclusion, the objective of this study was to assess the children's knowledge of German, using a standardised and normalised test battery, i.e. the SETK 3-5 (Grimm et al. 2001). This language test was administered to 83 children in seven German preschools, which offered a foreign language (English) according to immersion principles. Although parents of children in such bilingual preschools often worry about the development of their children's L1, the results of the SETK 3-5 indicate that the children's L1 German is not negatively affected by the use of English and develops, indeed, age-appropriately. Thus, foreign language acquisition in a preschool context may well be an asset with respect to the development of the children's L1 German. It is, therefore, feasible to introduce an L2 in a preschool context, without being detrimental for the children's L1.

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Intercultural Encounters in Bilingual Preschools[1]

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1. Introduction

Although one may safely assume that intercultural issues have been a part of human history ever since cultural contact happened on a sizeable level, 20th century developments in Europe and the world have provided a major impetus for devoting specific attention to matters of intercultural contact. With advances in transportation and communication technologies, distances between people of different national and cultural backgrounds have been significantly shortened. Similarly, political developments of various types have helped create new international economic interdependencies, transnational corporations, and culturally diverse workforces, all of which have brought people of different origins into closer contact with one another. The ongoing process of European unification requires an intensified cooperation of the member states, and the phenomenon generally labelled "globalisation" has led to an increased exchange of products and workers. Moreover, it appears that the issues of migration and the problems of refugees resulting from wars, deteriorating living conditions in some areas of the world, and the problems of the planet's ecology can only be addressed in a context of an international cooperation. All of these developments make it either necessary or desirable for a steadily growing number of people to be able to interact and communicate in societies that become increasingly multicultural. As Larry A. Samovar claimed in his widely used textbook on intercultural communication: "It would not be an overstatement to assert that the ability to successfully engage in intercultural communication may be one of the most important skills you will ever develop" (Samovar, et al. 2006: v).

In this context, individuals, communities, institutions, and states see themselves confronted with challenges that require new policies and strategies for human interaction and for political decision-making. Convinced that fruitful and successful communication across cultural boundaries requires specific forms of knowledge and a repertoire of appropriate strategies, scholars from various academic disciplines have studied the determinants and the processes that govern intercultural interaction. Their research efforts have supplied educational institutions throughout the world with the knowledge

1 This study would not have been possible without the tremendous help from members of the ELIAS team who were responsible for data collection in the various preschools, notably Aafke Buyl, Maria Büllesfeld, Jutta Daszenies, Anna Flyman Mattsson, Lena Gotthardt, Sylvia Luft, Svenja Pahl, Annelie Schober, Marion Salentin, Anja Steinlen, Ramona Thierer, Shannon Thomas and Martina Weitz. Special thanks are due to the preschools' staff who opened their doors and provided help throughout the duration of the project.

necessary for the development and implementation of training programmes to create or enhance the skills of their citizens. For obvious reasons, schools have also begun to introduce intercultural learning into their curricula. Once the relevance of the concept has been fully understood, it seems only natural to expand the scope of such activities into the early learning phases and sensitise young children to the specifics of intercultural encounters. After all, small children also live in a world in which their next-door neighbour may speak with an unfamiliar (foreign) accent and their playmates in the neighbourhood or in their preschool may just have arrived from another country.

Since child care has developed into a means "for nurturing children's physical, social, emotional, and cognitive development" (New & Cochran 2007: 110) and has thus increasingly incorporated measures to provide children with early learning opportunities, introducing children to intercultural situations at an early age seems the next logical step to take.

As a matter of fact, preschools and other child care centres, networks, or programmes may be particularly useful in achieving positive effects in the context of intercultural activities since they are a nexus of rich and complex social and linguistic interactions in the communities they serve (Burns 2009: 27f.). If such institutions feature specific educational frameworks, such as language immersion programmes, the learning effects may enhance each other's effectiveness. With their exposure to a second (foreign) language, children do not only acquire a skill that may turn out to be useful in their future careers. Learning another language will also enable them to access and relate to a cultural reality that differs from their habitual world view. In engaging in a new language, "speakers are enacting sociocultural phenomena; in acquiring language, children acquire culture" (Buttjes & Byram 1991: 18).

This chapter will first give a theoretical overview on intercultural communication at preschool age. It will then introduce the study carried out in the framework of the ELIAS project and describe the method used to collect and analyse the data, and the study's research questions and expectations. Subsequently, categories of intercultural competence identified in the data corpus are introduced and defined. In the discussion, each of these categories is exemplified with samples from the corpus. The chapter concludes with a summary of the most important findings of the study.

2. Children and Intercultural Competence

2.1 Languages as manifestations of different cultures

In a setting in which children are embedded in a multilingual environment where native speakers represent their cultures by way of the language(s) they speak, children will find themselves exposed to a broader variety of behavioural models and cultural stimuli than in a monolingual context. This is not to say that a monolingual environment would automatically be a site of cultural homogeneity. Based on the notion that

the term "culture" in the widest sense may refer to "a whole way of life" (Williams 2001: 56), children would also have to learn how to interact with varieties of culture that differ from their own immediate context. The distinctions here might perhaps be based on class, gender or regional categories. While it would, no doubt, be interesting to include these and perhaps other aspects in a discussion of intercultural encounters, there are limits to what can be achieved within the thematic framework chosen here. Therefore, in the interest of keeping the focus to a manageable scope, this paper adopts a pragmatic approach also chosen by other researchers and uses the term "culture" "to connote the more traditional anthropological dimensions often related to race, ethnicity, and nationality, rather than other dimensions of social difference included in some definitions, such as organisational or institutional characteristics, age, socioeconomic status, sexuality, gender, or disability definitions" (Stone 2006: 366).

In a bilingual preschool working under the premise of an immersion programme (cf. Wode, volume II), intercultural contact would above all refer to the interaction between individuals whose cultural difference is manifested by the fact that they speak different languages. Since it is a common assumption that different languages generally imply different national backgrounds with their distinctive national cultures, the sense of cultural difference would be based on national, ethnic or racial characteristics. While there are doubtless other features that could be used to distinguish between people, these categories are exceedingly powerful and act, in the words of psychologist Gordon Allport, as "labels of primary potency" that overshadow" all finer discriminations that we might otherwise perceive" (1979: 179).

Seen from this perspective, members of a given nation, conceived of in the sense of Benedict Anderson's "imagined community," share a common set of specific rules, rituals, symbols, and myths (Anderson 1983). These specific features constitute the basis for a world view that may contrast with that of other national groups and thus may become a stumbling block for communication across cultural boundaries.

2.2 The term "intercultural competence"

Communicative obstacles based on this type of cultural difference have been noticed on various levels in the world of adults, most notably perhaps in the sphere of politics and the economy. Consequently, the research undertaken to remedy the problems arising from an insufficient ability to interact with members of other (national) cultures has so far been tailored mainly to the needs of adults. A survey of the academic literature reveals that, even after years of research, "intercultural competence" remains a complex topic, comprising many unsolved questions and controversial issues (Deardorff 2008: 17). For one thing, the relevant literature uses a variety of expressions to designate the phenomenon and the skills associated with it. The abundance of competing terms found in the scholarly discussion has been noted and commented upon by several researchers and includes expressions such as "cross-cultural adjustment,"

cross-cultural adaptation," "intercultural understanding," "intercultural literacy" and intercultural sensitivity" (Wiseman 2002). Despite this diversity in definitions and descriptions, Wiseman reported a growing consensus regarding the concept and identified "knowledge, motivation, and skills to interact effectively and appropriately with members of different cultures" as the three main features which have come to be accepted as main components of "intercultural communication competence" (2002: 208).

These criteria are best reflected in Michael Byram's model (1997) which, in the course of the past decade, has repeatedly served as a point of reference in the discussion of intercultural competence in the European context. Moreover, he is noted for his work regarding the implementation of intercultural competence in EFL classrooms. His research is of special importance to European teachers because it constitutes the basis for the concepts formulated in the Common European Framework (Council of Europe 2001). Byram sees "intercultural communicative competence" as a unit of culture-related knowledge, skills, and specific attitudes, combined with linguistic, sociolinguistic and discourse competences. What he regards as factual knowledge refers to "social groups and their products and practices in one's own and in one's interlocutor's country, and of the general processes of societal and individual interaction" (Byram 1997: 51). He specifies a set of features in which the concept is embedded and which are relevant to an appropriate understanding and assessment. (A) Attitudes: To achieve intercultural competence, an individual needs curiosity, openness and a readiness to question the assumptions and values of a culture – those of an unfamiliar culture and those of their own cultural environment. In terms of developmental objectives, it requires a willingness to seek out or take up opportunities to engage with otherness in a relationship of equality. It also presupposes an interest in discovering alternatives to the familiar interpretations of phenomena both in one's own and in other cultures. (B) Knowledge: Becoming culturally competent requires a factual knowledge about social groups, their world view, and their products and practices – in one's own country and in that of the interlocutor. The objectives here are to understand the historical and contemporary relationships between the two countries involved as well as the causes and processes of misunderstanding between them. Of equal importance is the knowledge of the processes of social interaction and the processes and institutions of socialisation in one's own and the interlocutor's country. (C) Skills: Interpretive skills: Since factual knowledge and information derived from observation are rarely unambiguous, an individual needs the ability to interpret an event (or a document) from another culture, to explain it and relate it to similar events (or documents) in his or her own culture. In this context, it becomes important to identify ethnocentric perspectives and, perhaps, to explain their origins. Similarly, individuals finding themselves in an intercultural encounter should develop sensitivity for misunderstandings and instances of unsuccessful interaction. To remedy such problems, individuals need to be able to mediate between conflicting interpretations of actions, events and phenomena. Skills of discovery and interaction: Successful intercultural competence also depends on the ability to acquire new knowledge about another culture and its practices, and on the ability to

apply this knowledge, the attendant attitudes and skills in actual communication and interaction. Developmental objectives here would be to become competent in identifying similar and dissimilar processes of interaction. Furthermore, the individual should gain expertise in locating and using institutions which facilitate contact with other countries and cultures.

Byram's model also includes critical cultural awareness, i.e. the ability "to evaluate critically and on the basis of explicit criteria perspectives, practices and products in one's own and other cultures and countries" (1997: 101). In this context, individuals are expected to identify explicit or implicit values (in actions, events, or documents). Critical cultural awareness also enables members of a given culture to become, whenever necessary, mediators in intercultural exchanges and defuse moments of crisis by negotiating solutions that are mutually acceptable to the representatives of the cultures involved. Equipped with this set of intercultural skills and knowledge, he claims, individuals find themselves in a much better position to navigate the challenges of intercultural contact.

2.3 ICC at preschool age

Just like adults, young children may also find themselves in situations brought about by environment increasingly marked by cultural diversity. One such context is provided by immersion programmes in bilingual preschools where children come into close contact with people who speak a language they cannot understand. They may initially experience a sense of insecurity and disorientation, and show responses that range from fear and rejection to curiosity and interest. Soon enough, however, they will begin to devise strategies that enable them to operate appropriately in such an environment.

Chances are that their feeling of alienation will be tempered by the intervention of an adult who might explain the communicative difficulties with reference to the fact that people from other countries speak, for instance, a different language. This context helps children to understand that they belong to a specific group (e.g. "Germans") with characteristic features that are not necessarily shared by members of other groups (e.g. "Russians"). The response to otherness based on national or ethnic origin would thus appear to be a category which is introduced to them as meaningful in the context of their early education. Depending on the principles that guide their educational environment, children would also learn how to overcome the hurdles that might at first hamper interaction with members of other cultural groups. If Byram's model provides a sufficient description of the skills needed to master intercultural encounters, one would have to assume that the components he identifies are also observable in situations involving young children. In view of Byram's comprehensive model one might wonder whether a child can actually master such a set of complex and relatively sophisticated skills. Close observation of intercultural contact among children in the pre-

schools of the ELIAS study reveals that such is indeed possible, and that the seeming ability gap is less a matter of principle than one of degree.

Children are known for their inquisitiveness and curiosity which provide a great starting point for learning and making their own discoveries. If those elements in Byram's definition that presuppose advanced cognitive skills raise doubts about the applicability of the concept to young children, it might be well to remember that knowledge acquisition does not always require conscious involvement. A number of studies have demonstrated that nonconscious learning, a process independent of age, ability, motivation and other factors, "is not only possible, but absolutely unavoidable" (Pitman et al. 1989: 30).

With regard to other crucial aspects of cross-cultural interaction research on early childhood psychology has also shown that the behavioural repertoire of young children is indeed broad enough to allow for a successful mastery of intercultural situations. An important starting point for any kind of interaction to happen is the willingness to engage in interpersonal contact (cf. also Byram 1997). In this context, it is important to note that there is a biological basis for interaction since human beings are inherently cooperative:

> Children as young as 18 months old are willing and able to help other persons to achieve their goals; even when they do not know that person [. . .] This requires both an understanding of others' goals as an altruistic motivation to help [. . .] (van Hoogdalem, et al. 2008: 1656)

Similarly important for the development and application of intercultural competence are empathy and an ability for role-taking. Research has shown that both are in fact possible for young children. In his description of four developmental levels, Hoffman (1984, 2000) suggested "that the rudiments of role-taking competence in familiar, highly motivating natural settings may be present in some children by the age of 2 years or earlier" (Hoffman 1984: 110; see also Hoffman 2000: 64).

Hoffman also regards empathy as a biologically anchored response which is visible even in the very early stages of childhood development when children start to comfort their distressed peers. Between the ages of five and eight, children "start to feel empathy for another's experience beyond the immediate situation, in the context of a larger pattern of life experience" (Kristjánsson 2004: 297).

It is similarly relevant to know that children develop ethnic and racial concepts and attitudes:

> Goodman (1964) and Porter (1971) have stated that children develop an awareness of ethnic and cultural difference by age 3 or 4. Young children are aware of the more obvious ethnic cues, such as language utilization. Between ages 4 and 8, children develop an ethnic orientation (Goodman, 1964); clearer explanations of why they select one social group over another (Porter, 1971); a consolidation of group concepts (Katz, 1976); and curiosity about other groups (Aboud & Mitchell, 1977). (Canino & Spurlock 2000: 10)

However, opinions in this matter are not uncontested. Robinson concluded from her survey of the relevant literature that "a large number of preschool and school-age children in a variety of nations" shows no "ethnic bias in beliefs, peer preferences, interac-

tion, and relationships, and explicit acceptance of racial and ethnic differences" (Robinson et al. 2001: 79).

At the same time, having concepts related to ethnicity and race probably do not reflect a reliable knowledge base on the part of a child. In an article from 2003, Barrett and colleagues draw attention to Piaget's & Weil's claim (1951) that due to their specific developmental stage "up to 5 years of age, children often have very little knowledge of their nations and national groups, and may even be unable to state the name of their own country" (Barrett et al. 2003: 193). It is only between the ages of seven and eleven that geographic units such as town, city and country become meaningful notions (Nugent 1994: 28).

In this seemingly contradictory situation, Drew Nesdale proposed a "social identity development theory" (SIDT, Nesdale, 1999, 2004) in which he suggested that, with regard to the formation of ethnic attitudes, children go through a sequence of developmental phases. The process begins with an undifferentiated phase during which children, at the age of two to three years old, do not recognise traditional racial cues (i.e., skin colour, accent) as meaningful. It is not until the age of three that children, in response to witnessing an older person's verbal labelling of an ethnic out-group member (a point on which Nesdale insists), begin to identify and accurately distinguish between skin colour hues. Nesdale calls this phase, which is particularly visible among those who reside in multiracial environments, "emergence of ethnic awareness." According to Nesdale this phase is followed by a stage in which children between four or five years of age become capable of ethnic self-identification. During this time, children focus on and exhibit a preference for their own in-group, without necessarily showing dislike for the out-group (Nesdale et al. 2005: 191f.).

This research survey establishes that young children, although frequently portrayed as egocentric, are capable of role-taking and empathy and can thus take on another person's perspective (Shonkoff & Phillips 2000: 147-148). In this way, they can be assumed to possess or develop the skills necessary for successful intercultural interaction. Based on an investigation conducted in the context of the international research project ELIAS, the following section will provide insights into the ways in which behavioural strategies and techniques manifest themselves in the context of children's intercultural interaction in bilingual preschools.

3. Intercultural aspects in the context of bilingual immersion programmes: ELIAS

Funded with financial support from the European Commission in the context of its Comenius Programme, the ELIAS project (2008-2010) was carried out by a team of researchers from Belgium, England, Germany and Sweden. Using ethnographic participant observation and standardised qualitative and quantitative assessments in the settings of nine bilingual preschools in different countries, ELIAS monitored the de-

velopment of young children's first and second language (English) acquisition and studied the behavioural patterns discernable in situations of intercultural contact. The project's goal was to shed further light on the effectiveness of the bilingual preschool concept and to document the children's learning progress.

3.1 Setting: Preschools and children

Out of a total of eleven preschools, nine institutions offered English as a second language using the immersion method, the most successful language teaching method worldwide, in which children ideally spend at least 50% of their daily routines in close contact with native speakers of English (Wode 2009: 18). Two preschools were located in England and served as comparison groups for the language acquisition data. No data on intercultural behaviour was elicited there.

The number of children per preschool varied between 15 and 90; the average group size was 17. The age range was between 36 and 72 months. The percentage of children with a migrant background (L1 not the ambient or majority language) ranged from 6.7% to 18.2%. All preschools employed native speakers of English (from a variety of countries including Great Britain, USA, Canada, Australia, Malaysia, Trinidad and Tobago) to provide naturalistic language input. The children came from various family backgrounds, covering a wide range of the social spectrum.

3.2 Method

3.2.1 Research approach

Since intercultural situations at the preschool level have so far not been extensively studied, there is little research to draw on. In view of the complex nature of such an endeavour and in the absence of an established research routine, the research team decided to pursue its own work with a pronounced descriptive dimension and chose an ethnographic approach because it promises the best results for the specific conditions that obtain in the context of preschools:

> Ethnography is an effective method for studying young children because many features of their interactions and cultures are produced and shared in the present and cannot easily be obtained by way of reflective interviews or surveys. (Corsaro 2005: 50)

From the outset of the project, participant observers took part in the daily preschool routines once a week, which gave them access to the groups and enabled them to carry out intensive observation for a period of two years. As Corsaro (2005: 50) points out, the value of this kind of prolonged observation is

> that the ethnographer discovers what daily life is like for members of the group – their physical and institutional settings, their daily routines, their beliefs and values, and the linguistic and other semiotic systems that mediate all these contexts and activities.

The participant observers (PO) were native speakers of the majority language but fluent in the preschool's L2 (English) and only used English in the interaction with the children. This form of intensive contact established a solid basis for a thorough understanding of the children's behaviour in their preschool environment.

Initially, the POs were encouraged to pay attention to the widest possible spectrum of interactions to avoid being limited by too narrow a conception of what might actually constitute an instance of intercultural behaviour. In accordance with this project's underlying understanding of "intercultural," the focus was kept on incidents involving contact between individuals distinguished by their first-language (and implicitly national or ethnic) background. This phase led to a better understanding of the constellations in which "intercultural incidents," defined as "a bounded unit or a sequence of behaviour" (Pitman et al. 1989: 74), happened and resulted in the formulation of more specific research questions to concentrate more precisely on relevant forms of interaction. For more detailed information on the research method used see Gerlich (2010).

3.2.2 Research questions and hypotheses

The observations and experiences accumulated during the project's pilot phase led to specific research questions:

1. Can intercultural competence be observed and described in the context of bilingual preschools?
2. What are the situations in which intercultural competence becomes visible?
3. What forms of intercultural behaviour do the children exhibit, i.e. what are the indicators for intercultural competence in children aged 3-6 in bilingual preschools?
4. Does continued exposure to situations involving contact with other cultures and their representatives lead to a change in these children's behaviour?

Additional questions, such as "How can changes in intercultural behaviour be explained?" or "How can intercultural competence be fostered in child-care environments?" could not be addressed in the limited time frame of ELIAS project, but they remain important issues in further research on the topic.

The observations made during the project's initial phase prompted the team to formulate the following set of hypotheses and expectations:

1. Intercultural competence of children aged 3-6 can be observed in bilingual preschools, and can be described in terms of certain categories of behaviour.
2. Children's intercultural competence becomes visible in situations in bilingual preschools in which children encounter a person, child or adult, from a different cultural background.
3. Forms of behaviour which indicate the children's intercultural competence in bilingual preschools include specific attitudes, knowledge and skills.
4. Children do undergo a change in their continued exposure to intercultural situa-

tions in bilingual preschools: They will negotiate situations of cultural contact with increasing competence and with a growing self-confidence.

3.2.3 Elicitation tools

In order to substantiate and systematise these assumptions, the field notes of the pilot observation of the first project stage (2008-2009) were compiled, analysed, and ultimately shaped into a field guide, an observational tool to allow for systematic data collection in the second observation phase (2009-2010). Like other instruments of this type, it was designed "for the study of complex situations and processes. It serves as a basic checklist, assisting the field worker in paying attention to as many details as humanly possible" (Pitman et al. 1989: 66). The creation of a new observational tool was deemed necessary because existing methods for the assessment of intercultural competence are designed for use with older age groups (for an overview and an evaluation of different approaches and research tools see Sinicrope et al. 2007). Table 1 shows the first draft of the ELIAS Field Guide as established after the end of the first observation phase.

Please describe any situations you have observed with children in your preschool which contain intercultural aspects. You may use your own intuition of what you judge as "intercultural." Describe the behaviour and/or utterance/s of the child, its age and its sex. Please state whether the situation occurred early on in the relationship of the person/s involved or not. We would also like to know if the behaviour you observed is typical of the child, i.e. whether you observed it frequently, or not. Feel free to comment on every aspect that you deem important.					
Child	**Age Months**	**Sex m/f**	**Situation**	**Early Encounter?**	**Typical Behaviour?**

Tab. 1: First version of the ELIAS Field Guide (Observation Phase I)

With the help of this guide, the individual observers compiled a corpus with the intercultural incidents in their respective preschools. The resulting material was individually analysed and subsequently sorted into overarching categories (Kersten et al. 2009), a process which permitted a refinement of the existing field guide into a more detailed and fine-grained observation sheet (Table 2):

No.	**Date**	**Time**	**Situation**				**Interaction**	**Comments**	**Early encounter**	**Typical behaviour**	**Child ID**	**Age**	**Sex**	**Languages**
	dd.mm.yyyy	start-end	code	location	activity materials	surrounding persons	relate actions / utterances / reactions / describe mood / emotions / atmosphere	clarifying, interpreting situation, implied values	scale 1-4	scale 1-4		month	m/f	

Tab. 2: Final version of the ELIAS Field Guide (Observation Phase II)

For this final version of the data collection tool detailed guidelines were developed which provided specific explanations for each category listed in the columns (cf. Appendix). The instructions clarified that the field guide provides a uniform approach for the documentation of "interactions between preschool children and other persons with a different cultural background and/or with a focus on intercultural issues, with as many details as possible." "Other persons" are defined as "other children, teachers, parents, or adults present in the preschool," and an individual with a "different cultural background" is defined as a "person who/whose families come from a different country and/or speak a different language at home."

In the field guide, observers are instructed to record a situation immediately after it occurred, and, if possible, to quote from dialogues or to paraphrase them closely. They are also asked to "document situation, action / utterance of the child in focus and reactions of all persons involved in one meaningful incident" and to "document as many different children and age groups as possible; [and to] put a special emphasis on observing new children and their transition into the group" (cf. Appendix).

The resulting data were coded according to the specific situation from which they originated. These situations included breakfast, morning circle, free play, guided task, i.e. specific topics prepared by the teacher (e.g. science corner, drawing, crafting, etc.), outside (i.e. outdoor activities), and "other."

An extra column in the modified observation sheet gave observers space for additional commentaries that might, if necessary, provide further contextual information to an outside reader. It was also deemed helpful to supply information on whether the observed behaviour occurred in an early encounter between the individuals involved, and whether it was a recurrent, and therefore typical, reaction of a particular child. These specifications were meant to serve as indicators of the developmental changes a child goes through in the course of a longer time period and might provide pointers for a follow-up longitudinal study which takes into account a developmental perspective. In these two categories, a Likert scale was used to rate the phenomenon. In the first instance, the scale ranged from "1: very few encounters" to "4: many encounters," in the second one, the options ran from "1: exceptional" to "4: very frequently."

The final version of the ELIAS ICC Field Guide was put into use in the last phase of observation which began in January 2010 and ended five months later. Afterwards, the second data sets from the different preschools were consolidated into one integrated set and returned to the researchers for coding, analysis and commentary. Subsequently, the coded results were discussed and, in the case of disagreement, resolved by discussion and revised. The categories which emerged from this inductive process were then related to categories found in other studies on interculturality (Auernheimer 2005; Bennett and Bennett 2004; Byram et al. 2001; Byram 1997; Erll & Gymnich 2007; Kühlmann & Stahl 1998; Prechtl & Lund 2007; Witte 2009) and ultimately shaped into a grid that covers the extent of relevant data collected during the lifetime of the ELIAS project. The main division into the superordinate categories of Attitude,

Knowledge and Skills has been adapted from Byram (1997: 34). Section 4.2.1 provides an overview of the categories.

3.3 Additional considerations on the research method

Throughout the work conducted in the context of the ELIAS project, observers and researchers struggled with the problem of how appropriate and applicable ideas about "intercultural issues" are for preschool children. Does it make sense to assume that the idea of "difference" based on the notion of cultural, ethnic or national origin actually matters to three- to six-years olds? Was there really something to be observed or did the research project simply create its own object by projecting constructions of otherness that are meaningful in an adult world onto young children's behaviour? In the given context, researchers were aware of the risk of alerting children to the differences they expected to find if they used certain methods of data elicitation, such as interview questions. In such a case, children's reactions may be caused or changed by the researcher's intervention, and their responses may say more about what they thought they were expected to say or do than about their "authentic" behaviour. For the researcher, then, it is impossible to disentangle original attitude from the influence of the intervention. Since the influence of the chosen method on the results is not only a problem in ethnographic research, but of research in general (Quine 1953, Schumann 1984, Jordan 2004, Popper 1959, 1963, 1972), there is no way to avoid it other than by adopting a reflexive approach which "posits a provisional self-understanding . . . and construes its research objects as inextricable from the specific nature" of its work (Weinberg 2006: 98).

In practical matters, the ELIAS project rejected the idea of interviewing children on their attitudes towards other children with a different background since it proved impossible to formulate a set of questions which was age-appropriate and not suggestive in a way that would reify differences between the children in first place. Consequently, the project chose an approach which avoids as much as possible any kind of biased or suggestive questions limited itself to a descriptive approach instead. The data set only includes situations in which a PO observes and documents the children's spontaneous behaviour in their interactions without drawing attention to their specific research interest.

While such a procedure may reduce the danger of unduly influencing the children's reactions, it cannot solve the dilemmas inherent in ethnographic observation and interpretation. As has been pointed out earlier, "intercultural competence" is a fuzzy concept to begin with, but regardless of its specific definitional variety it rests on the notion that there are significant differences between members of cultural groups and that these differences are a potential source for conflict. With such a concept in mind – even if only subconsciously – observers might be in danger of focusing specifically on moments of crisis, ignore situations of harmonious and successful, i.e. uneventful and

unmarked interaction, and thus reinforce the notion that encounters between children of different cultural backgrounds are indeed mainly characterised by discord whereas in reality there may be just as many (or more) conflicts between children sharing the same origin.

Practical experience in the course of the project has shown that POs at first felt slightly lost in their task to observe and record "intercultural" behaviour. As a result, some of them put an almost exclusive focus on language use whereas others also included other forms of contact between children from different backgrounds. Initially, many observers complained that not a lot of intercultural activity occurred at their preschools and so they felt that there was nothing worthwhile to report because all interactions appeared "normal" to them. This complaint is a good illustration of the underlying problem: Based on their initial expectations, their focus was directed to something out of the ordinary, and thereby to the exception rather than the rule. If the interaction among children, or between children and teachers from different cultural backgrounds, does not arouse the attention of POs or teachers, and if, as was the case in all preschools, the interactions were "positive" in the sense that communication and mutual activities were successful, harmonious and conflict-free, this means that cultural difference, in these situations, did not present a major obstacle for young children. It may even hint at the fact that they possess a certain degree of intercultural competence (see below).

At the same time it is also important to realise that participant observation in a preschool is a very demanding task, especially when such institutions provide a lot of time outside of formalised situations. First of all, the presence of the participant observer in the preschool represents a change in the system (Flick 1998: 158). Secondly, nobody is able to perceive a situation in its entirety (let alone objectively, cf. Kant 1787); the observed information is shaped by selective attention to specific features of the situation. In a setting in which a group of children and adults talk in two languages while engaging in different activities over a stretch of several minutes it is impossible for POs to capture all details of the ongoing interactions (Diehm, et al. 2010: 84, Pitman, et al. 1989: 66). The only way in which such a mass of information can be handled is by selective attention, which does involve the risk that relevant information might be lost.

The process of collecting data was followed by data organisation and interpretation, two steps that are also subject to the biases of the individuals involved. Whenever possible, POs recorded their observations immediately after the event. These notes were reconstructed from memory and include, even under the best of circumstances, only a fraction of the details from the witnessed episode. Finally, the group of analysing researchers (for practical reasons not all nine POs participated in the analysis) reviewed the data, reconstructed the situations based on the descriptions provided by the POs and proceeded with data interpretation.

In sum, the whole process of data collection and interpretation passes at least through three selective filters which potentially influence the results: the selective attention of

the observers on the details of the situation (1), which are again reduced when condensed to a written form in their field notes (2), and the internal reconstruction of the reported situation in the reader/researcher who understands and shapes it according to his or her own intuitions and preconceptions (3).

Being aware of the complications involved in the research process, the ELIAS team took steps to minimise the effects of the difficulties inherent in the research situation. One important measure was to design the field guide in such a way as to make possible a fairly exact description of the setting in which the situation occurred. In this way, the observers were given a common starting point regarding the various factors that might become relevant in their work. More specifically, the field guide included extra space for the POs to add relevant facts they deemed especially important for an adequate interpretation of the scene. They were also encouraged to supply their own interpretations so as to enhance the ultimate appropriateness of the final interpretations produced by the analysers. Finally, the data underwent multiple rounds of analysis conducted by at least two, in one phase three, independent researchers. Questionable interpretations were discussed, unresolved cases were excluded from the analysis, and whenever necessary, the individual POs who had collected the data were contacted for further clarification.

All these measures were taken to allow that the collected data and the interpretive suggestions derived from it, whilst preliminary and descriptive, can serve as an initial insight into intercultural situations in bilingual preschools. No attempt has been made to derive quantitative statements from the data. At present, there is no intention to draw any conclusions about a single child's intercultural competence or to relate the performance of different children in different preschool settings to one another. It is hoped, however, that this project may have laid some groundwork for future studies which might expand the current focus and refine its methodological strategies.

4. Data

4.1 Data analysis

In the course of the project, a total of 150 situational observations were collected. Out of these, 149 were usable for further research and 131 were suitable for categorisation. This set of data was separated into two groups according to the time of data collection (observation phases I and II). 50 categorised data sets out of the total of 131 were collected with the help of the initial field guide; 81 sets originated from observations recorded using the revised field guide. Observations were collected in nine of the eleven participating preschools. The examples, recorded in various settings of preschool context, cover intercultural incidents involving more than seventy children and about thirty adults, 22 of them preschool teachers.

The data were compiled in a database and coded. Names of teachers and children were replaced by two-digit identification numbers to guarantee anonymity. All observed situations were numbered according to the preschool identification number, the year and the number of observation (e.g., situation 5-09-15 is the fifteenth observation in the year 2009 in preschool 5). Then, each situation was coded and commented on by several researchers. Subsequently, comments and codes were discussed and categories were rephrased. Disagreement was solved by discussion. This process was repeated several times. Categories were first derived inductively from the data, and subsequently compared with categories used in other studies on intercultural communication (Kersten et al. 2009). In a last stage of analysis, the categories established to describe the data set were defined in a combination and adaptation of both, the definitions of the existing categories as well as the specific requirements of the preschool context. These categories are displayed in the following paragraph.

4.2 Results and discussion

4.2.1 Categories of intercultural encounters in bilingual preschools

A variety of terms have been used by different authors to describe the complex phenomenon of intercultural competence (Auernheimer 2005; Bennett and Bennett 2004; Byram et al. 2001; Byram 1997; Erll & Gymnich 2007; Kühlmann & Stahl 1998; Prechtl & Lund 2007; Witte 2009). In a first step, these terms were ordered according to the threefold division of the superordinate categories of Attitude, Knowledge and Skills used by Byram (1997: 34) and Erl & Gymnich (2007: 7), which was found to be the most basic one and comparable in various sources (for more detailed information see Gerlich 2010). The data do not allow formulating stages or levels. Most of the descriptions of competence demand a kind of "Can Do" statement (compare BMBF 2007: 154; Council of Europe 2001: 25), a statement describing the existing feature(s) of the competence. Nevertheless, observation reveals several instances of behaviour that could be related to the term "competence" in a "Can't Do (yet)" statement. Therefore, each main category can be completed with it's Can't Do counterpart, for example "knowledge" and "lack of knowledge," "tolerance" and "lack of tolerance," and so forth. It has to be stated, however, that not all counterparts were present in the current data set. Bennett (2004) and Witte (2009) do not describe the features of the competence, but the baseline of development, characterised mainly by lack of contact. The category denial / ignorance based on their models has to be seen separately from the threefold division of competence components. The following sections provided an overview of the categories used for data coding.

A Attitudes

In accordance with Byram's proposition, the ELIAS framework limits itself to "attitudes towards people who are perceived as different in respect of the cultural meanings, beliefs and behaviours they exhibit, which are implicit in their interaction with

interlocutors from their own social group or others" (Byram 1997: 34). The subcategories classified under attitudes comprise reactions which may either facilitate or impede successful communication (Table 3). Inhibitors of intercultural communication were placed into the two subcategories: "fear / rejection" and "judgmental statement." Byram identifies curiosity, openness, readiness to suspend disbelief and judgment with respect to others' meanings, beliefs and behaviours as "precondition for successful intercultural interaction" (Byram 1997: 34). In the bilingual preschools, instances displaying behaviour of this type have been grouped as "tolerance / acceptance," "interest," "motivated for language" and "motivated for contact," "Hesitation" was added as a subcategory to cover situations in which no clear orientation towards openness or rejection could be detected.

Category	Definition
fear / rejection	children cry, flinch, avoid contact, yell or show other signs of discomfort when exposed to manifestations of cultural difference; children refuse contact with certain persons, languages, objects or actions related to another culture
judgmental statement	children utter phrases which express disrespect for or negative assumptions about another culture; children laugh about utterances, actions, beliefs or habits of persons from a different culture in a disrespectful way
tolerance / acceptance	children show openness or a welcoming reaction toward persons, objects and actions from a different culture; children respect rules of an intercultural situation
hesitation	children seem to avoid or seem cautious or shy towards persons from a different cultural background, their actions or objects associated with them, but they do not show signs of rejection
regret	children express sadness or disappointment about certain conditions associated with an intercultural situation
interest	children appear curious or want to gain knowledge about other persons, objects and actions that are connected to a different culture
no interest	children appear disinterested in displayed objects, themes or other newly introduced features
motivation for contact	children appear eager to become involved or to be in contact with L2 teachers or with children from different cultural backgrounds
motivation for language	children appear willing to learn the L2 spoken in preschool context or other languages; children show appreciation for language skills

Tab. 3: Definitions of ELIAS Categories for Attitudes

B Knowledge

Knowledge plays an important role in intercultural encounters because, as "relational knowledge," information about other countries is "acquired within socialisation in one's own social groups and often presented in contrast to the significant characteristics of one's own national group and identity (Byram 1997: 36). Byram distinguishes between knowledge about the specifics of social groups and their cultures in a person's home country and their equivalents elsewhere on the one hand ("declarative knowl-

edge"), and knowledge about the processes of interaction on the other ("procedural knowledge").

Since the preschool environment does not offer any extensive or systematic formal education about other countries and their people, the children's knowledge is based on informal socialisation in the form of information provided and stories told in the family, the preschool, or the neighbourhood. Often such stories are marked by stereotypes and prejudice (Byram 1997: 36). This knowledge may be supplemented and modified by practical experiences individual children make but the children's cognitive abilities at this age limit the level of sophistication that can be expected with regard to their critical self-awareness, let alone with regard to Byram's "meta-linguistic knowledge" or "meta-communication." Due to these constraints, the factor "knowledge" does not contain a category for this dimension of intercultural competence. It does, however, include "factual knowledge of culture" which subsumes a child's knowledge of his or her own and/or another culture together with any kind of world-knowledge the children have acquired so far. As an important prerequisite of successful intercultural communication, "language knowledge" is listed separately in the survey grid. The category "lack of knowledge" was introduced to document those situations which indicated that the children had no appropriate frame of reference for their interaction. Table 4 gives an overview of the study's knowledge categories and their definitions.

Category	Definition
factual knowledge	children utter, reproduce, or recount facts relating to national or ethnic culture, identity, habits, rules, etc.
language knowledge	children utter, reproduce, recount words or phrases in a language which is not their L1; or in their L1, if L1 is not the majority language nor the target L2 of the preschool
lack of knowledge	children appear to have a deficit in factual knowledge on culture-related issues or language knowledge; this does not necessarily include a negative connotation or interpretation
meta-linguistic knowledge / meta-communication	children utter assumptions or factual knowledge about language, language construction, or communication; children talk about different languages and/or about communication strategies

Tab. 4: Definitions of ELIAS Categories for Knowledge

C Skills and Abilities

The third factor in Byram's (1997) model, skills and abilities, by its nature strongly depends on the level of an individual's cognitive development. Since the skills of "interpreting and relating" (p. 52), which also strongly depend on a person's knowledge, and "critical cultural awareness" (p. 53) are advanced skills, they will be rare to find in preschool children. Being able to interpret, to explain, and to relate events experienced in the context of an intercultural encounter requires a degree of sophistication that young children simply do not possess. Byram's description of the skills of "discovery and interaction" (p. 52f.) likewise include complex intellectual operations that are beyond what can be expected of preschoolers. However, this is not to say that this part of

Byram's model cannot be adapted to the age level under consideration. Boiled down to their essence, several of the abilities listed in Byram's model can be found in young children's behaviour and can therefore be incorporated into the observational framework. Some aspects of the skills of "discovery and interaction" (the ability to acquire new knowledge of a culture and to transfer it to real-time communication and interaction) are so fundamental to human contact that they must be considered a basic ingredient of human interaction. Similarly, skills needed to reduce uncertainty and anxiety when confronted with unusual circumstances are also very relevant for the development of young children. Therefore, it should not come as a surprise to learn that children do indeed manage, more or less successfully, to "tolerate ambiguity, to deal effectively with situations even when there is little objective information present and outcomes are difficult to predict," "to empathise, involving cognitive, affective and communication components," "to adapt, especially adapting behaviour to the expectations of others" and "to make accurate predictions and explanations of others' behaviour" (ibid., p. 16). These considerations have made it possible to create a set of categories to describe such skills as were observed in the course of the project (Table 5).

Category	Definition
verbal communication strategy	children use verbal utterances to react to or interact with their chosen interlocutor/s from another culture, for example by choosing the adequate language, or by adapting their own language to the interlocutor's abilities
nonverbal communication strategy	children use mime and body language to react to or interact with their interlocutor/s
lack of communication strategy	children appear to lack a verbal or nonverbal strategy to interact with their interlocutor/s, which results in unsuccessful communication
negative strategy of communication	children use a successful strategy of communication to fulfil their intention, but the children's intention is to stop communication rather than to enhance it, e.g. by excluding other children
skill of discovery	children use a successful strategy to acquire knowledge or gather information, for example by asking questions
deduction / transfer	children combine factual and/or unconscious knowledge to establish interrelations between facts of which they had previously been unaware
mediation / translation	children use a successful strategy to solve a misunderstanding or a dysfunction in communication between individuals of different cultural background, for example by mediating, translating or explaining
guidance	children successfully use a strategy to include another individual from a different cultural background into a group, an activity, or to introduce him or her to certain knowledge; this strategy is not restricted to dysfunctional communication, and it usually includes other strategies, such as the skill to mediate and translate

Tab. 5: Definitions of ELIAS Categories for Skills

4.2.2 Category analysis

This section describes the results of the ELIAS data interpretation. Each category is explained and illustrated by examples. The examples are taken from the data set, but in most cases reduced in length and adapted to readability, for the convenience of the

reader. It has to be noted that, due to the complexity of the situations observed, in most cases there were several categories which pertained to one situation. This is intuitively clear as, for instance, a certain skill of intercultural competence usually also involves a certain attitude towards the other person, etc. As the data samples frequently include more than one person, several attitudes and instances of knowledge or skills can be identified simultaneously in one situation. For this reason, and the observation effects described in section 3.3, a quantitative analysis of the data would not yield valid results. Frequency measures were given, however, to make possible a rough comparison between situations which the observers noted very frequently, and those which were observed only in exceptional cases.

A Attitudes

Fear / rejection

The category "fear and rejection" was applied twelve times; eight of these situations were described as early encounter. Those early encounter situations are characterised by crying and the rejection of the new person or situation. For example:

> **Situation 8-09-04:**
> The boy often cried when there was no German teacher around. [detail from data sample]
>
> **Situation 9-09-03:**
> A child expressed fear and started crying when a school child from Ghana with dark skin entered the group room.
>
> **Comment:**
> It was not possible to calm the child within the situation. After the dark-skinned girl had left the room, visibly shaken, I talked with the child about the situation. We thought about how skin colours may be different, and why. The next day, we visited the school child and played together. Both children interacted without fear or signs of insecurity. [translated and shortened excerpt of data sample]

In other situations (not identified as an early encounter) children reject playmates in the context of their interactions. Sometimes children excluded playmates by switching to a language they assumed the others would not understand (Sit. 2-10-02, 7-10-14). Most of these reactions are of short duration, and occur either directly in the situation or were described as a behaviour a child showed when he or she met another person from a different background for the first time. Some children show an immediate negative reaction towards unexpected change of language or of persons near them, but in general this rejection is not maintained over a longer period of time.

Judgmental statements

The category "judgmental statement" was assigned eight times and refers to a variety of children's behaviour. Children show a negative attitude towards others, but not as an immediate emotional reaction, but in a more conscious way. One group of the situations can be linked to language and sounds which were apparently amusing to the children because they were unknown or sounded distinctively different from what they were used to (Sit. 1-10-07, 3-09-04, 5-09-02). Other examples refer to instances in

which some children reacted derisively to a perceived difference. Examples of this would be the expression of disgust about the unfamiliar food of another child (Sit. 9-10-28), or of ridicule at the sight of a teacher's characteristic handwriting style (Sit. 1-09-04). Whenever laughter occurs, it is difficult to decide whether it is a sign of amusement (non-judgmental) or an indication of ridicule. Hence, the categorisation is based on the comments and impressions supplied by the POs who described a situation as judgmental or not. Three examples were judged as being directed against an individual and his or her abilities or physical appearance. Those examples are Sit. 9-10-17 (ridiculing a boy for not understanding German even after several repetitions of a German phrase) and Sit. 9-09-04 and 5-09-01 (each referring to the child's skin colour) both of which qualify as malicious or abusive statements:

Situation 9-09-04:
You don't belong here, you look like an ape. [translated detail from data sample]

Situation 5-09-01:
There is a new girl in the preschool, her skin colour is dark. One girl utters in the morning circle (in German): "In former times, negroes weren't even allowed to walk in through the same door." The educator tells her that it had not been like this in Germany and that, thanks to God, these times are long over. [translated detail from data sample]

The observation data provide no clues as to whether such phrases are imitations of statements the children have heard at home or elsewhere, or if they reflect their own experience or opinion. The method of data collection does not allow any conclusions to be drawn on this issue. Although such display of prejudice and ridicule does occur in bilingual preschools, it is important to add that situations like these were extremely rare, not only in the recorded data set, but also in the general experience of observers and staff.

Tolerance / Acceptance

Many different situations were sorted into the category "tolerance / acceptance." These attitudes were expressed in encounters with "the other" and occurred most often in interactions with fellow children with a migrant background (18 out of 35 examples) and with L2 teachers (10 out of 35 examples). In five instances, children reacted with patience, tolerance or acceptance when their interlocutors failed to understand them. The two examples below show a particular matter-of-fact attitude towards individuals with dark skin and have been interpreted by the POs as an expression of acceptance:

Situation 8-09-20:
Child (3 years old) states happily: "If I eat so many blackberries, I will get a dark skin just like teacher 81." [translated and summarised from data sample]

Situation 8-10-10:
On the way to the forest visit, while the group stood at the tram stop, an African woman crossed the street and Child 08-13 says in English "She have colour like teacher 81!" [detail from data sample]

Looking at the larger picture, participant observers agreed that an inclusive and co-operative behaviour between members of the host culture and those of the minority groups was the rule rather than the exception. Tolerance and acceptance seemed to be

widespread in the bilingual preschools that were monitored in the course of the project. Such a statement does indeed deserve attention, since their quiet nature makes harmonious interaction and successful communication much easier to overlook than situations of tension and distress. In this light, it is tempting to conclude that the effects deriving from cultural difference seem to play a lesser role than is generally assumed.

Hesitation

The category "hesitation," assigned eleven times to the data, describes a state of uncertainty in which children appear shy or unwilling to join an activity or to engage in contact with others although they do not show visible signs of fear or rejection, such as in the two following examples.

> **Situation 1-10-10:**
> Teacher 1E and I (participant observer) had been asking the children questions about their language background. Several children freely talked about their home languages. Other children were more reluctant. For example, 01-66 told us that he speaks Italian at home but when asked if he could say something in Italian he said that he 'did not feel like it'. [detail from data sample]

> **Situation 9-10-27:**
> Inside the room it was dark, only two little fancy lamps gave a gloomy light. On the table were eight different bowls with different things only to feel with hands. The children were told a spooky story about the different things they could feel in the bowls. From the ceiling hung a fisher net full of bats made of cloth. The room was frequented by many children who liked the scary atmosphere. 09-49 also came in. The day before, he just had a look but had not come in. He smiled to 93 (L1) took her by the hand and led her to the bowls. He had a look at the bowls together with 93 (L1) and afterwards played with the bats. He spent about 15 minutes in the room, sometimes talking (in Hebrew?) to 93 (L1).

> **Comment:**
> 09-49 seems to need time for observation. It also seems that he already understands a lot of what is going on at the Kinderhaus. Although he still seeks close contact with his special teacher he starts loosening this relationship. Because he cannot speak either German or English, he has to use nonverbal channels for communication, that is body contact with hands. [situation from data set; bold print: detail pertaining to category]

Regret

In some instances, POs recorded a sense of disappointment or sorrow, a behaviour fundamentally distinct from the other attitudes listed here. All three situations in this category derive from the fact that one member of the interaction does not have (or, in the case of the L2 teachers, is not supposed to use) the language proficiency to master the situation at hand. When confronted with the fact that their teachers only speak one language, some children express regret that they cannot communicate in what might be that person's preferred language. In another instance, a child was disappointed that a favourite L2 teacher could not read a book to her because it was written in German:

> **Situation 8-10-09:**
> Child 08-13 wanted 83 to read a book. She went through a few books and asked if they were in English or in German. She settled on a book, but was sad. When asked why she was sad she replied that L2 teacher 83 didn't know German, so she couldn't read the book. [detail from data sample]

Interest

In the context of this study, the focus of this category is on interest toward intercultural matters. The category "interest" has been assigned 28 times. Interest was most frequently expressed toward the subjects of communication, such as interest in the topic of the morning circle, in specific materials or in particular books that showed signs of originating from another cultural context (Sit. 8-10-13, 9-10-01 or 7-10-15).

> **Situation 7-10-15:**
> Child 07-33 is sorting cards and asks "Are these Swedish?" and says "These are French" [detail from data sample]

The children also show interest in the home countries of their L2 teachers as well as in other countries in general (Sit. 8-09-21, 1-10-06; 9-09-05).

> **Situation 1-10-06:**
> 01-43 to teacher 1E: "Can you show Bali on the map of the world?" (01-43 runs to the back of the class where there is a large world map on which the teacher has indicated the location of the Anglophone countries,) 01-40 (who is of Slovak/African origin): "And Slovakia?" A conversation follows in which 1E asks 01-43 why he wants to know where Bali is. 01-43 explains that he is going on holiday there. 01-44 then wants to know where Morocco is (because he is of Moroccan origin). After some further discussion about why they are interested in these countries, 01-43 finally wants to know where Haiti is situated on the world map. The atmosphere is relaxed, the teacher (1E) shows a genuine interest in the children's questions and the children enthusiastically talk about why they want to know the location of these countries. The other children listen, but do not mingle in the conversation, and the teacher (1E) makes no attempts to involve the rest of them in this discussion. [shortened and adapted situation from data sample]

This can be interpreted as an important prerequisite for the acquisition of intercultural competence: an active interest may pave the way for an increase of knowledge about other cultures and their specifics and may ultimately build a basis for skills dealing with them.

No interest

This category has been included in the analysis to account for those observations in which children did not pay attention to what might have become an intercultural incident for them. POs recorded situations in which one child, or more, did not respond to the subject of the conversation or did not react to a culturally salient feature of the interaction. Such lack of attention obviously reduces the chance that the children might gather relevant information about that subject or from getting involved with the other person. However, only two incidents of "no interest" were observed.

> **Situation 1-09-05:**
> In the first year of primary school, the teacher told the children that I (participant observer) also speak Dutch, and asked me to translate into Dutch some of the English words they were practicing at the moment. The children themselves did not ask me about this later, however, nor did they show any particular interest in the Dutch words. [detail from data sample]

Motivation for language

In their reports, POs describe situations in which children clearly seek out opportunities to create or prolong an intercultural incident. These observations have been di-

vided into two different types: "motivation for language" and "motivation for contact." In the situations categorised as "motivation for language," children show an eagerness to learn language(s), or they share their knowledge about language. The category has been assigned 32 times. In many situations children chose to communicate in their L2 even though they were free to speak to their interlocutors in their own native language.

Situation 2-10-04:
It is child 02-4's turn to choose a song. Teacher 11 hands her the songbook and helps her choose a song. 02-4 makes the choice for a song that can be either sung in German or English (about colours: "Green green green are all my clothes, green green green is everything I have"), so teacher 11 asks her if she wants the song sung in "German or English." 02-4 replies "in 11." [translated detail form data sample]

In this situation the child obviously favours the L2, and chooses the foreign language for the song. She fails to name the language and, interestingly, substitutes L2 teacher's name for it.

Situation 8-10-03:
L1 teacher 8S told the PO in German she will be a pirate's bride for carnival. The PO (L2) smiled but did not speak. Hereupon child 08-02 turned to her and started explaining the term "pirate's bride" in English. To do this, he used his hands forming a boat saying: "… it's ... mhmm boat, BOAT... but the people on the boat" (he is using his fingers to show people walking on the boat) "... it's pirates" [long explanation by child] PO finally says: "Oh, a pirate's bride – cool," and he says, smiling, "Yes, and that 8S for Fasching." After that he turned happily to 8S and exclaims excitedly "Ich hab' es ihr erklärt! Ich hab' es ihr erklärt" [I've explained it to her!]. [shortened and translated situation from data sample]

Here, the boy shows a strong motivation to use English, and also a visible satisfaction with his own ability to explain something in English. Situations like these show that the bilingual environment stimulates the children and encourages language use even when the task at hand constitutes a challenge that might have been intimidating. Many of the observations collected in the context of the ELIAS project testify to the fact that children actively seek to use the new language in contact with the L2 teachers and thus appear strongly motivated to use and enhance their foreign language skills.

Motivation for contact

It has been widely observed in the ELIAS project that children are highly motivated to interact with either an L2 teacher (who would only speak English to them) or with a child who, because of its linguistic background, might not be able to speak the majority's L1 as well as other children. The category "motivation for contact" not only comprises majority children; it also includes the motivation of new children with a migration background and a different L1 for contact with the group or the teachers.

Situation 7-10-08:
The L2 French teacher talks to a French-speaking girl who had joined the preschool on this day. Children 07-01 and 07-15 come in and interrupt and say "bonjour" to the girl. [adapted detail from data sample]

This example shows how the preschool children actively welcome a new child. Assuming that the new child would not be able to interact in German, they choose to address her in her own language to establish contact even in their first encounter.

Situation 8-10-11:
While H. [a Malaysian adult] was visiting the preschool, child 08-13 asks 8K in which language she should speak to him. [detail from data sample]

Here is another example to show how a child is eager to get into contact with a visitor from a different cultural background. Since there are 40 different situations which fall into this category, it can be stated that the children's openness and motivation about contact is an attitude that occurred more frequently in the preschools than other reactions. This supports the assumption that young children who are used to intercultural encounters frequently display an open, integrative attitude toward people from cultural and linguistic backgrounds other than their own.

B Knowledge

Factual knowledge

"Factual knowledge" concerning cultures (specific customs and habits) and issues regarding intercultural encounters is easy to observe and was, maybe for that very reason, recorded frequently in the course of the observation period. 38 instances from the data were identified as displays of fact-oriented cultural knowledge. At the same time, it is worth remembering that this is obviously not a full record of everything the children know about culture, and that no attempt has been made in this context to evaluate whether what a child knew was actually correct. The point was simply to record incidents in which children made reference to specific facts that they thought were relevant or useful in a given situation. Not surprisingly, language and language abilities are an important recurring topic, but children also speak of other topics, such as events relating to preschool life: children know the general rules of the bilingual preschool, they know the words and melody of foreign-language songs, and they know things that were subject of morning circles or other activities (animals, countries, sports, matters connected to their own home):

Situation 1-10-04:
Child 01-44 to me (French): "This is a pig! At my home, we don't eat pork. And no alcohol either! We are Muslims."

Comment:
Atmosphere: relaxed, 01-44 likes to talk a lot about his home. [detail from data sample]

It has to be stressed, however, that the data do not present a complete picture of the children's culture-specific knowledge. The data collected in the sample represents factual knowledge which the children produced spontaneously; there was no attempt to elicit the full range or the accuracy of that knowledge. The data shows that children do have a specific knowledge of various matters related to culture, and it is our assumption that this is a kind of knowledge which is not found to an equal degree in children outside of bilingual preschools.

Language knowledge

Since the presence of a foreign language is such a conspicuous element in the daily operation of a bilingual preschool, and one that tends to contrast so vividly with the usual monolingual environment, it comes as no surprise that using the new language and speaking about issues that are related to it, is a commonly observed feature. The context of the bilingual preschools provides many situations in which children are required or have the opportunity to use their L2, English, as it is the target language in all preschools. Whenever they do so, they display "language knowledge" and implicitly indicate that they are in possession of an essential key to intercultural communication competence. Many of the documented situations (the total of which was 57) include either the child's use of the L2 acquired in the preschool, or of the child's L1 if it was not the majority's L1. Once again, it is important to remember that language knowledge could only be recorded if the child actually produced words or sentences in the foreign language. Whenever this happened, the situation was identified as an instance of language knowledge, because the children actively communicated in English, or at least made an attempt to do so. Examples illustrating children bringing in their own L1, for example Portuguese or Arabic, are Sit. 1-10-03, 1-10-10, or 9-09-06.

Situation 9-09-06:
A child is painting with watercolors and says in German: "This is red, in Portuguese it is vermeilho." [translated detail from data sample]

Frequently children speak English, or strive to speak English, exemplified in the following situation with a Swedish child.

Situation 7-10-04:
The child code-mixes when she speaks to the teacher: "We can do a saga with them," "I have också one," "He had också," "I have also one." [shortened detail from data sample]

These descriptions show how intensely the presence of a second language in a bilingual environment draws attention to itself and stimulates the children into using an alternative to the forms of communication that dominate in their normal world of everday life.

Lack of knowledge

This category lists 32 situations in which POs noticed that insufficient language proficiency prevented a successful communicative interaction. This happened when children did not understand the teacher, or lacked the necessary vocabulary to respond in English or the majority's L1. Lack of language knowledge can be a specifically frustrating obstacle in intercultural contacts when children want to communicate but cannot find a way to do this because they lack the required words. There were also a few examples for the lack of factual knowledge, for example children who did not know the name of a certain country, or did not have a proper awareness of distances and time. However, these examples were less important for communicative interaction.

Situation 8-09-21:
"Why are you going to your home in 'city 08'? You are living in Malaysia." [detail from data sample]

Other examples for lack of factual knowledge, which had a negative effect on the encounter, are situations in which children did not know about different skin or hair colours.

Situation 9-10-23:
Child 09-52 told her father that the children in the preschool almost all colour their hair. There were children with brown hair, reddish hair and blond hair. She says her favorite hair colour was natural white blond like her friend's hair and she wanted to colour her hair to look like child 09-16's hair.

Comment:
Child 09-52 comes from Oman and was used to seeing children with black hair like her own. She apparently thought other colours can only be achieved by dying a person's hair. [adapted detail from data sample]

This particular kind of ignorance may seem somewhat amusing to adults but, in certain circumstances, lack of knowledge may lead to rejection, as in Sit. 9-09-03, when a child started crying upon the entrance of an African girl because she had never seen a person with dark skin before.

Another instance of lack of knowledge with the potential to lead to a sensitive situation was reported with respect to terms for a different nationality. Here, the comment explicitly excludes a derogatory connotation. This example shows how difficult it may be to disentangle children's actual attitudes and "knowledge" from stereotypes they are exposed to in their environment.

Situation 9-10-26:
93 (L1) wanted to start the German language practice. All children were sitting on the red rug. The door was still open. In the wardrobe were 3 students talking with another teacher in German. One of the students looked Asian. Some children asked 93 (L1) about the students. 93 (L1) answered: "They are students and they have an interest in the bilingual concept of the Kinderhaus." 09-53 said: "Einer von denen ist ein Japse!" ["One of them is Japanese" (uses derogative term "Japse" in German)] 93(L1) answered: "Nein, wir sagen nicht Japse. Menschen aus Japan heißen Japaner." ["No, we don't say Japse. People from Japan are called Japanese.] 09-53 answered: "Das stimmt nicht, das heißt Japse." ["That is not true, they are called Japse.] 93 (L1) talked about the correct form for naming people from other countries, Americans, British, using male and female forms and relating them to the children's relatives.

Comment:
The children did not know the correct form in German for people from other countries. 09-53 war really convinced that "Japse" is the correct form. [shortened and adapted sample from data set]

Meta-linguistic knowledge / meta-communication

The data show that children talk about language quite frequently (30 situations) which might be a direct result of the bilingual preschools' focus on language; but it might also be a result of the children's cognitive devolvement. They discuss, for example, which language is spoken by whom, how to use language, and their own language abilities.

Situation 5-09-06:
"Ich hab ne andre Sprache, drum kann ich dich nicht verstehen."
["I have a different language, this is why I cannot understand you."] [detail from data sample]

Situation 7-10-12:
The children tell me which languages they know. 07-33 says in Swedish: "I know Persian, it's hard but not for me." 07-45 says in Swedish: "I speak Swedish, French and English very well." 07-31 says in Swedish "I only know two languages, Swedish and English, but 07-46 knows Romanian."

Comment:
Knowing languages has a high status among the children. Interesting how they see their own language skills. 07-45 only knows a few words in English. 07-31 doesn't seem to think that Swedish and English is good enough (she actually knows Finnish as well) but is more impressed that 07-46 speaks Romanian. [adapted from data sample]

C Skills and Abilities

Verbal communication strategy

Children show a variety of "verbal communication strategies" (41 situations). Most of these occurrences (13) were recorded when children adapted their speech to the language of an interlocutor whom they knew as a speaker of another language. More surprisingly, perhaps there were also situations in which children switched to another language when they received no response to their first attempt to communicate with another person.

Situation 8-09-16:
Child 08-13 wanted to know if the birthday girl, who was Polish, had blown out her candles, or if the wind had done it. Child 08-13 first asked in German, and when child 08-04 did not reply child 08-13 tried the same question in English. [detail from data sample]

Children use verbal strategies also to model the use of correct language or behaviour to other children (Sit. 9-10-20) to encourage or to negotiate solutions (Sit. 9-10-09).

Situation 9-10-20:
93 (L1) shows 10 different photos to the group. 09-49 remembered 6 words in German. 09-52 talked to 09-49 [in majority language]: "I count (counts the cards … and shows her friend how to count to 5), just do it with me, 1, 2, 3." 09-49 counts with her … (they continue playing cards, 09-52 showing 09-49 how to play)

Comment:
09-52 understands German very well. For her, the game is easy to play. Maybe she can understand 09-49's trouble with the language very well, because when she came to the Kinderhaus she also couldn't speak one word in German. Her actions are very initiative and concrete and give orientation to 09-49. [translated and adapted detail from data sample]

Code-mixing, the use of elements from two languages in the same utterance, is a very frequent phenomenon in all of the preschools. There is a great likelihood that it is used to fill the gaps in the child's foreign language lexicon, although current research emphasises that there are multiple explanations that can account for the phenomenon (Genesee & Nicoladis 2009: 332). It is important to note, however, that code-mixing is an active, creative process that illustrates the resourcefulness of young language learners (ibid. p. 337).

The data collected in the context of the ELIAS project show that children learn to use a variety of verbal communication strategies, and that choosing the appropriate language

is an important part of this process. There can be no doubt that the bilingual context of the preschools provides many opportunities for this kind of language use and can therefore be regarded as a crucial element in the development of intercultural sensitivity.

Nonverbal communication strategy

In addition to their verbal communication, the children observed in the ELIAS preschools also use a variety of nonverbal communication strategies (14 examples). Every communicative act is accompanied by a set of nonverbal elements. The data show situations in which children used a remarkable number of gestures to underline and possibly clarify their verbal utterances in order to transport meaning (Sit. 8-10-01). Most observations refer to situations in which the children communicated exclusively by nonverbal strategies. This includes the children's capacity to learn from observations, to imitate or to repeat the behaviour displayed by others.

Situation 9-10-12:
Child shows agreement by smiling. [translation of an excerpt of data sample]

Situation 9-10-08:
09-40 is sitting on the yellow rug. Teacher 96 (L1) starts to sing a German Christmas song. 09-40 looks to teachers 95 and 92; she observes them with a high degree of concentration (without breaking the eye contact) and tries to do the lip movements. When she notices that the two do not sing the song (they don't move their lips), she turns and observes 96 (L1) instead. She starts doing the right lip movements and claps her hands during the refrain, like all the other children.

Comment:
09-40 has noticed that 95 and 92 were not able to sing the German song. She was able to read that from their lip movements. So she looked around until she found a German-speaking teacher (whom she could imitate). [translated and adapted data sample]

For the children in the ELIAS preschools, the use of gestures, movements, body language and other forms of nonverbal communication is a natural part of their daily interactions. It occurs frequently and is, in most cases, accompanied by an open attitude and a positive atmosphere (9-10-21). With reference to the insights provided by current research studies it is worth pointing out that the use of nonverbal strategies should not be regarded as a compensation for a child's limited ability to express herself. Since children do not abandon nonverbal strategies as they learn to talk, gesturing must be seen as a phenomenon that is inseparately connected with the language-learning process (Mayberry & Nicoladis 2000: 194). In addition to this, it is important to know that children in immersion preschools are exposed to a more intensive use of nonverbal communication and gesturing than their peers in traditional institutions. These strategies constitute an essential pedagogical tool that establishes the basis on which children are able to operate in a foreign-language context in the first place (cf. Weitz et al., this volume).

Lack of communication strategy

The category "lack of communication strategy" was applied to those situations in which no communication was possible because the interlocutors were unable to find a way to connect with each other either verbally or otherwise. In two of the six situations, for instance, a girl with Polish as an L1 fell silent and answered neither in English nor in German (neither of which she knew well enough) nor in Polish when she was addressed. In this case, her lack of foreign language skills and her inability to find an alternative way to communicate, probably reinforced by a fair amount of shyness, prevented her from taking part in the activity. Another example is Sit. 4-09-04.

Situation 4-09-04:
While playing cards (UNO) I (L2 PO) wanted a girl – who knew how to play the game (about 6 years old) – to explain the rules to (and help) a younger girl who sat next to her. I used gestures and as much contextualisation as I could think of when I told her so, but she could still not understand what I was aiming at. She seemed very upset and angry when she raised her voice and said "Ich weiß nicht, was das heißt! Ich verstehe dich nicht!" ("I don't know what that means! I don't understand you!"). [detail from data sample]

This child was so frustrated in her unsuccessful attempt to understand what was asked of her that she actually shouted at PO. This was interpreted as an inability to deal with a situation that could not be solved by the standard repertoire available to the child. She was obviously unable to imagine and apply an alternative way to solve conflicts or to handle ambiguity. Overall, there were only few observations that recorded such a lack of communication strategies.

Negative strategy of exclusion

This category was introduced to account for the rare occasions in which children found themselves in a situation which called for interactive and cooperative behaviour but in which they decided to use their exclusive linguistic skills to prevent other children from participating in the verbal exchange. If this behaviour was indeed intended to prevent others from participating in the conversation, it would have to be regarded as a conscious and strategically successful application of linguistic knowledge. Since it runs counter the goals of intercultural behaviour and prevents intercultural communication from happening, it was coded as a negative communication strategy. Out of all observations made in the observation period, only two instances fall into this category.

Situation 2-10-02:
Children 02-19 and 02-20 (Polish as L1, twins) play with 02-22, 02-24 and 02-25. The twins decide that they do not want to play with 02-25 anymore (because he supposedly broke the rules that 02-19 and 02-20 just made up as they went along), so 02-19 and 02-20 continue their game in Polish, their native language, excluding not only 02-25, but also the other children. 02-24 notes "stop speaking 02-19 and 02-20 (uses first names of 02-19 and 02-20) language." [adapted detail from data sample]

Situation 7-10-14:
Child 07-15 says to child 07-33: "We can speak Iranian now."

Comment:
07-15 and 07-33 know Persian and use this to isolate themselves from 07-01. [adapted detail from data sample]

Skill of discovery

In the context of the ELIAS study, the category "skill of discovery" describes activities which show that children gather information out of their own accord for the purpose of enlarging their knowledge (28 examples). Included here are situations in which a child looked at a book of her own choice, or asked an interlocutor from a different cultural background how things are done in that person's culture. The range of options available to young children is obviously limited at this developmental stage but many observations showed that preschool children do begin to experiment with information-finding strategies even though they mostly lack the ability to read, they still use books in their leisure time, as example 8-10-09 shows. The majority of the observations subsumed in this category concern questions asked by the children to gather information on certain topics that interested them. The children asked about words they did not know (3-09-02), or about other facts they were interested in. One example for such a topic is the language(s) spoken by others, as can be seen in:

> **Situation 9-10-31:**
> Child 09-21 heard child 09-49 and his mother talking to each other in Hebrew. She asked teacher 96: "What kind of language is this?" "They are speaking Hebrew!" "Where is Hebrew spoken?" "In Israel!" "In Israel! There is war in Israel!" "Yes, that's true, there is war in Israel." [detail from data sample]

Additional topics are the L2 that the children want to learn, or countries that the children want to know more about (8-09-17). Another strategy to gather knowledge is close observation of ongoing activities, which was recorded in 9 situations. This type of behaviour provides children with a basis for imitative or observational learning, a complex process which involves looking to others for clues about appropriate behaviour (Kail & Cavanaugh 2007: 13).

> **Situation 9-10-39:**
> All the children and teacher 93 (L1) wanted to play the sound memory. 93 told the children how to play. She always asked: "Sind die Geräusche gleich oder verschieden?" [Are the sounds the same, or different?] Child 09-40 was observing the situation without saying anything. She looked to 93 and to the other children. Then she started smiling, joining the game. When it was time to end the game she didn't want to. [detail form data sample]

Children, adolescents and adults learn about the world by observation. One could argue that especially young children are very good at gathering information: They are used to having to ask what things are called, or how things are done. Children need this ability to learn about their worlds, and they use it when it comes to learn about someone else's world as well. The relatively high number of observations (28) in the data can be cited in support of this view.

Deduction / transfer

Situations showing that children draw their own conclusions by connecting elements of their knowledge or that they build on previous experience in an attempt to find solutions to given problems have been placed into this category. In one example (8-09-02), from a total of 19 instances, a boy deduced that a person who only spoke English to

the group would only read books written in that language and therefore approached her with a request to read to him from an English book.

Situation 8-09-02:
Child asked in German: "Can you read this book to me? I think it is even in English" [detail from data sample]

In Example 8-10-06, a boy obviously concluded that his L2 teacher (who pretended to know only English) must be able to understand German because he witnessed her acting upon a request in German without further questioning. Children also concluded that somebody who speaks a different language must originally have come from a different country (1-10-01).

The next example illustrates how a child projects what he thinks he knows to a situation that seems to demand an explanation:

Situation 8-10-13:
A group of children is at the zoo, observing and learning about stick bugs. Each child is invited to put one of the insects onto his or her hand. One insect tries to escape from teacher 11's hand whereupon child 08-21 explains in a serious manner (in German): "Maybe she is afraid of you because you have dark skin" [adapted detail from data sample].

The boy speculated that the animal might be afraid of dark skin when it refused to sit on the hand of the Malaysian L2 teacher (11). Asked to comment about this event, the teacher reported that the boy had been afraid of her when he first came to the preschool. With this background information, it seems likely that the insect became a canvas onto which the child projected his own experience. What matters here is not whether the child's explanations or logical deduction is accurate or not but that the boy established a connection between an event (the scared stick bug) and a reason for the animal's behaviour. In the boy's mind, a person's dark skin seems to be a plausible enough explanation for the fear that supposedly manifested itself in the insect's attempt to avoid being touched by human hands. It appears to be an indication that the perception of physical difference may lead young children to make assumptions about the individuals showing features that differ from the observing child's internalised norms. Although the episode recorded here represents a single observation, it is worth mentioning that studies with young children have found "a bias against dark skin colours" (Katz & Kofkin 1997: 59). It has to be noted in this respect, however, that child 08-21 has overcome his fear of teacher 11 within a very short time, and is now especially fond of her.

Translation / mediation

In the context of intercultural communication, the ability to translate and to mediate between different cultural spheres must be regarded as a very advanced skill. A child who acts as a translator or a mediator for another person without being asked to do so, shows more than linguistic knowledge

To assume the role of a translator or mediator, a child has to realise that another person is in need of assistance. For this to happen, she or he has to possess a certain degree of

empathy and has to have the ability to see things from another person's perspective. The complexity of the issue is visible in the interconnection of the various aspects and skills involved: Starting from an understanding of the dilemma another individual experiences, the child needs to realise that he or she is actually in a position to intervene on the other person's behalf. Children who find themselves in such a situation must also be willing to do so, perhaps spurred on by an altruistic motivation, especially if they are not directly involved in the situation. Finally, to provide helpful assistance in an intercultural situation, the acting child must be able to draw on her or his linguistic competence which constitutes the practical basis for a translation and a successful mediation of (cultural) meaning. Situations that meet these criteria were identified ten times in the data set.

Situation 8-08-15:
When a new child tried to go outside before her group, teacher 12 tried to explain that she had to stay and only bigger children were going out. She seemed confused, so child 08-06 said, "Du bleibst hier mit den Bienenkindern!" ["You stay here with the bee-hive group"] [detail from data sample]

Situation 8-10-01:
All children were sitting on their beds; in the free space in front of them, 8S (L1) had put several fairy tale pictures on the ground. Children were called one by one to choose one of them, and identify the story. 08-04 was chosen second. 8S asked her in German to choose a picture. 08-08 and 08-13 immediately translated for 08-04 into English, and they also repeated what 8S said in German using a lot of gestures, which 8S hadn't done as much. 08-04 stayed sitting instead of going around as she was asked to, and just chose a picture that lay in front of her.

Comment:
08-13 and 08-08 seem to know that 08-04 does not speak German (she is of Polish origin), 08-13 is very confident and knows when she can help. [adapted situation from data set]

Guidance

Providing guidance for another individual is a skill similarly complex as that of translating and mediating. While generally closely connected to the previous category, providing guidance involves an ability to help or to lead another person. Children do this by moving beyond a relatively close translation: They explain, motivate or model in order to include others in an ongoing activity or to put them in a position that they can share in particular knowledge. For this reason, this category also comprises skills that go beyond verbal communication strategies, because in the case of guidance the strategy is aimed at yet another goal. The category was applied seven times in the data set.

Comment 9-10-25:
09-10 is a gifted child with a close affinity to languages. She is interested in translating and comparing words and structures. She likes to speak English, her pronunciation is very good. She also likes to talk about languages, especially with 93 (L1). Her phonological sensitivity is extraordinary, as well as her memory: She likes to sing Czech songs with 93 (L1) and always corrects 93 (L1)'s inappropriate articulation with great pleasure and competent learning instructions, e.g.: "You have to do it like this: The sound has to be more in the back of your mouth and your tongue has to be rolled." Interactions with her are always very interesting and instructive. [adapted from data set]

This comment shows how intricately the different categories are entwined. The abilities described in 9-10-25 show an unexpectedly great amount of metalinguistic knowledge

(and was coded as such), yet in this comment it is combined with the ability to use this knowledge to guide another person, in this case with regard to her L2 pronunciation.

Situation 9-10-21:
09-49 is jumping on the mattress. 93 (L1): "09-08, do you know that 09-49 only knows very little German?" 09-08: "Yes!" 93 (L1): "Who told you?" 09-08: "Nobody." 09-08 pulls at 09-49's sleeve to indicate that he should go off the mattress. Then she jumps on the mattress and lets herself fall. 09-49 observes her and imitates her movements. 09-08 keeps ongoing eye contact with him and observes what he is doing. (They go on playing, 09-08 models movements for 09-49 and helps him imitating them. Both laugh and keep eye contact. 09-49 speaks in Hebrew from time to time and goes on laughing, playing with 09-08 and imitating what she does.) 09-08 pushes 09-49 for fun and invites him to do the same. He does, and both laugh.

Comment:
09-08 and 09-49 were really in contact with each other, mutually observing the other. 09-08 shows great sensitivity in talking to 09-49, her German was fitting to 09-49s level of understanding. The combination of action and talking helped 09-49 a lot to find into a play, together with 09-08. Although the children don't remember with whom they talked about 09-49's difficulties communicating in German, 09-08 did a great job adapting her speech to 09-49 level of understanding. The atmosphere was really relaxed and funny. For the first time I saw 09-49 really relaxed. [translated and adapted situation from data set]

The readiness of child 09-08 to help child 09-49 and to explain how to do things makes it possible for the two children to play together although they share neither language nor culture. Her understanding of his difficulties, the adaptation of her language and the combination of different modelling strategies go far beyond simple verbal communication skills and show true guidance skills to integrate a child from a different culture into her own activities.

4.3 Discussion: The Study Outcome

The concept of intercultural communication competence was originally developed in a context that involved adult actors engaged in intercultural encounters that took place in professional settings. The conditions and rules that obtain in such interactions are governed by factors that imply the full range of conscious and deliberate behaviour of which grown-up individuals are capable. Since the developmental stage of young children limits the sophistication with which they can engage in such contacts, questions regarding intercultural interaction at preschool age have so far received only limited attention in previous research. This study set out to begin an initial inquiry into the field to investigate on the basis of ethnographic observation whether or not components of what has been termed "intercultural competence" can be discovered in bilingual preschool settings.

As the preceding sections have shown, it can be said that children actively engage in intercultural encounters and recognise them as such. Issues such as different languages, different places of origins or skin colour attract children's attention and prompt them to explore and negotiate the situations in which they arise. In the majority of the cases in which this happened the children in this project mastered the multilingual,

intercultural environment very well. On many occasions, they exhibited positive attitudes, knowledge about their own and other cultures, and skills with the help of which they solved problems arising in intercultural communication. An open and positive attitude towards cultural difference was found not only with regard to adult L2 teachers (who hold a position of authority) but also in contact situations between children and their peers from migrant backgrounds.

Given this generally positive climate it seems only logical that instances of negative behaviour (excluding, ridiculing, insulting others on the basis of their cultural difference) are a rare exception in the data set. There is no evidence that children would generally reject foreign language teachers or children from a different cultural background. Attending a bilingual preschool where exposure to different cultures and languages is a daily occurrence seems in no way to subject children to a condition in which they might feel scared, intimidated or uncomfortable. Children who did show initial reservations, fear or signs of rejection in early encounters with members from other cultural groups abandoned such behaviour as their involvement in intercultural situations intensified (cf. Thomas et al., this volume). All POs reported that the atmosphere in their respective preschools was friendly and accepting.

Children growing up in the framework of a bilingual preschool find themselves in an environment which sends important signals to everybody who comes in touch with it: Becoming accustomed to the fact that people speak different languages and experiencing that it is possible and not at all exceptional to learn other languages supports positive attitudes towards multilingualism and has the potential to sensitise young children to the benefits that issue from a varied linguistic competence. It may also help create an atmosphere in which children and students who speak an L1 that differs from the majority language come to be seen as an enrichment to life in schools and preschools rather than a problem.

Attitudes	**#**	**Knowledge**	**#**	**Skills**	**#**
fear / rejection	12	factual knowledge	38	verbal communication strategy	41
judgmental statement	8	language knowledge	57	nonverbal communication strategy	14
tolerance / acceptance	35	lack of knowledge	32	lack of communication strategy	2
hesitation	11	meta-linguistic knowledge / meta-communication	30	negative strategy of exclusion	2
regret	3			skill of discovery	28
interest	28			deduction / transfer	19
no interest	2			translation / mediation	10
motivation for language	32			guidance	7
motivation for contact	40				

Tab. 6: Categories used to describe intercultural competence in the context of the ELIAS project

The positive results that have been reported with regard to intercultural interaction by POs in nine preschools in Germany, Sweden and Belgium present a snapshot of a complex phenomenon. They provide a preliminary description of the ways in which young children approach situations involving intercultural encounters. The categories established to organise the range of the reactions observed in the context of the ELIAS project (as summarised in Table 6) can be read parallel to the models that have been designed for the discussion and analysis of intercultural behaviour in adolescents and adults and may thus prove to be a productive basis for further investigations into the subject of intercultural competence in young children.

5. Conclusion

It is generally agreed that intercultural communicative competence is a key competence for the future and should therefore be fostered by educational institutions. Exposure to a different language in a bilingual immersion preschool, and by extension, to a different culture (embedded in the linguistic and other behaviour of the teachers), places young children in a unique developmental environment.

Observations collected in the context of the ELIAS project have provided a basis for the assumption that an intensive contact with members of a (national/ethnic) culture other than their own, confronts children with the necessity of adapting themselves to a previously unknown form of interaction and provides opportunities for the formation of behavioural strategies and patterns that enable them to navigate and negotiate intercultural encounters with confidence and competence. As they grow up they may discover that their early experiences and successes in a multilingual and multicultural environment have given them an important tool to master the challenges of a world increasingly shaped by the transformative processes of internationalisation.

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Appendix: A ELIAS Field Guide: ICC Interactions in Bilingual Preschools

Name of Researcher/s	Name of Preschool	L2 Teachers (IDs and Language Background)	

For Guidelines on Categories see Sheet 2

Description of Interaction											Child Data Insert more ID columns if necessary			
No.	**Date** dd.mm.yy	**Time** Start-End xx:xx-xx:xx	**Situation** Code	Location	Activity and Materials	Surrounding Persons	**Interaction** Relate Actions / Utterances / Reactions Describe Mood / Emotions / Atmosphere	**Comments** Clarifying, Interpreting Situation, Implied Values	**Early Encounter** Scale 1-4	**Typical Behavior** Scale 1-4	**Child ID** of Child 1 in Focus	**Age** Months	**Sex** m/f	**Language** cf. parent quest. L1/Other

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B Guidelines for Observation Categories

Purpose

- to document interactions between preschool children and other persons with a different cultural background and/or with a focus on intercultural issues, with as many details as possible
- "other persons" refers to other children, teachers, parents, or other adult present in the preschool
- for the purpose of these observation guidelines, we define a different cultural background as person who/whose families come from a different country and/or speak a different language at home
- the focus of the documentation is on any kind of observed interaction that reveal attitudes, knowledge, or skills (even if no obvious reference to an intercultural issue or topic is made)

Documentation

- immediately after the observed event
- dialogues are quoted or closely paraphrased
- document situation, action / utterance of the child in focus and reactions of all persons involved in one meaningful incident
- document as many different children and age groups as possible; put a special emphasis on observing new children and their transition into the group
- you should take extensive notes during the event; write them up afterwards, giving as many details as possible

No.

- number of observed incidents (continuous) including preschool code; example: MD001, MD002

Date, Time

- insert the date of the observation and the time and duration of the interaction, such as e.g.: 12.03.09, 10:10-10:45

Situation – Code

- Situation – Code (cf. IQOS): 1. Breakfast, 2. Morning circle, 3. Free Play, 4. Guided Task, i.e. specific topics prepared by the teacher (e.g. science corner, drawing, crafting, etc.), 5. Outside, 6. Other

Situation – Location

- describe where the incident takes place; note changes of place during the incident and any information about the location that is important for the interpretation of the event

Situation – Activity and Materials

- focuses on what the surrounding group is doing (not necessarily what the learner is doing); topics of discussion; other sources of information for the child, including materials and objects used

Situation – Surrounding Persons

- name the number and characteristics of the other persons present during the event; describe, if necessary, why and in what way their presence might have influenced the event,

e.g. through specific personal relations to the child in focus; include information about teacher background (country, language); if there are no IDs for some persons present, use a different anonymisation or description
- teacher IDs need to differentiate between L1 and L2 teachers; i.e. between teachers who speak the surrounding majority language (L1) with the children, or the preschools second language (L2)

Interaction
- document actions, utterances and responses from all persons involved
- include emotional state and atmosphere among the children (tension, humor, relaxed, etc.), posture, mimics or gestures
- if these may influence the child's behavior, include previous activities or statements, information on age, sex, status and role of persons to whom child relates directly or indirectly
- interactions and responses do not need to be directly or overtly expressed: "no response" should be regarded as a kind of response as well
- use English for all utterances, but indicate in brackets which language is used; if the translation is ambiguous, insert original utterance with English translation; record what you don't understand, questions etc.
- for dialogue, do not use continuous text; start each turn in a new line

Comments
- comment on general characteristics important to the understanding of the event (e.g. linguistic ability, critical personal relationships involved, clothes, grooming, etc.)
- insert information on children's language background and competence
- describe the child's intention the way you understand it; give reasons for this interpretation
- note anything that will help interpret the event (e.g. things that have happened since the last incident recorded)
- comment on the usual way this group does the activity recorded

Early Encounter
- in a 1-4 Likert scale, note whether the child in focus is well acquainted with the other person or has had only a few encounters with him or her so far (1: very few encounters; 4: many encounters)

Typical Behavior
- in a 1-4 Likert scale, note whether the observed incident is exceptional for this child, or whether similar behavior has been frequently observed before (1: exceptional, 4: very frequently)
- if you have no information about this, leave blank

Child Data
- insert ID codes of all children in focus in the incident; if more than three children are involved actively in the incident, insert columns (all other persons present see "Surrounding Persons"), never use names
- insert age of the child in months, sex, and language background (this data may be taken from the ELIAS parent questionnaire)

(adapted from Pitman et al. 1989: 74f.)

Green Immersion

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1. Introduction

This chapter summarises research undertaken in one of the ELIAS preschools,[1] the Zoo-Kindergarten in Magdeburg. In the zoo preschool, the children are not only immersed in the foreign language English (L2) through daily contact to native-speaker preschool teachers, but also learn about environmental topics in the L2. Environmental education in an immersion context has been labelled 'Green Immersion' by the ELIAS team (Kersten & Perret 2008). In the following, the rationales for environmental education and the theoretical background for Green Immersion are laid out. Then, from sections 4 onwards, the Green Immersion research study with its results is described.

2. Environmental education

What is 'environmental education,' 'education for sustainable development,' or 'environmental action competence'? Where did these ideas and themes come from and why are they so important in today's educational system? Over the last 100 years the world's population has grown from roughly 1.6 billion people to almost 6.6 billion people. As populations increase, there is an increase in the use of resources, both renewable and non-renewable, and a demand on governments, and individuals, to provide for the growing populations. As non-renewable resources began to exhibit depletion, and as populations began to exceed sustainability, a global shift in thinking began to occur. World populations were encouraged to think globally instead of locally; regarding environmental sustainability and the impact of the world's populations inter-assisting. Corresponding to this change, a heavier emphasis was also placed on the individual to begin thinking globally and to wonder how an individual's every-day activities could affect someone else's on the other side of the world. Measures were slowly being taken to further the future of the world and the earth, and environmental education began to solidify.

Global intergovernmental conferences took place discussing environmental topics, mainly in the last thirty years. These conferences affixed the role of environmental education, both formally and informally. Consciousness arose in world leaders regarding the future of the world's environmental resources. Laws were put into place to guide and support the changes that were taking place around the world; consequences

1 The German terminology is in fact 'kindergarten.' However, for clarification purposes 'preschool' is used throughout this paper.

for environmental negligence. Global leaders began to recommend changes at not only the local level of environmental sustainability, but also at the national and international levels of environmental sustainability.[2] As for the European Union, environmental education has been an important topic in developing policies for political action plans and science teaching since the 1980's.

Along with the goals being set for governmental and public policies, educational goals for the inclusion of increasing environmental awareness began to be firmly established within formal educational institutions. On the larger scale, governments were creating recommendations for the implementation of environmental education into the school systems.[3] There was a need for future citizens to be educated on how to cope with and positively affect the environmental crises, since those future citizens would be the most highly impacted. With this new direction in education there was also the need for properly trained teachers to implement these educational changes. Resulting workshops and teaching institutions were provided in order to 'train the trainer'; providing educators with the resources they would need to properly educate students.[4] Environmental education, redefined as Education for Sustainable Development (ESD), became a multidisciplinary approach, based on issues in the fields of ecology, economy, culture and sociology (Earth Summit Conference 1992). ESD varied in particulars from country to country, but the underlying theme was the same: providing individuals with awareness of their role in the environment, and with the knowledge and desire to create an environment sustainable for future generations (Breiting et al. 1999).

As ESD developed, models emerged to help define and understand the process of an individual's progress as they learned about the environment, models which help provide knowledge for the educators in order to facilitate learning (Unterbrunner 2006). Some models, such as the model developed by Berck and Klee (1992), focused on the development of children's attitudes and interests as they progressed from experiencing nature to action competence. A model developed by Klautke and Köhler (1991) emphasised the (bio-) ethical issues in their stages of ESD development. A model which depicted and individual's environmental growth as they encountered nature, as well as took the use of language into account as they progressed through environmental education was created by Janßen (1988).

As knowledge about the future of the environment increased, so did the seriousness of future environmental problems. Many individuals developed feelings of inadequacy or complacency when faced with these serious problems, which is known as "ecopho-

2 Cf. UNEP website (2010) regarding the UN conference in Sweden (1972): see link "Action Taken by the Conference"

3 Cf. the Final Report on Intergovernmental Conference on Environmental Education (1978)

4 Ruth Wilson (1995) held a conference for early childhood educators of environmental education; Monroe et al (2007) developed a framework for environmental educators.

bia."[5] The governments of the world were asking their citizens to consider the environment in their everyday lives in order to minimise their impact on the environment, but the citizens began to see the environmental concerns as bigger than they were, as outside their ability to solve. ESD shifted its emphasis slightly, from being reactive to environmental problems to being proactive in solving environmental problems. ESD began creating individuals who were able to be positive participants in environmental crises; ESD created individuals with 'Action Competence.'[6] ESD moved towards creating individuals who understood the environmental crises and were provided with the correct tools, whether they be emotional or physical, to positively impact the environmental future.

The ultimate goal of ESD is to enable children and young adults, as actants of future societies, to deal with the complex interrelationship between economy, ecology and development (Haan 2009). In order for ESD to be most effective it should begin in the early stages of childhood,[7] before prejudices have been created, such as "ecophobia." Educating young children about sustainable living provides them with the opportunity to experience nature and the environment, and to establish a lifelong awareness of environmental needs. Children are the world's hope for an environmentally sustainable future; therefore, providing scientifically sound ESD can offer children the correct tools to work towards fulfilling that role. As mentioned, ecophobia is a concern and conceivably it may be the combination of early education and sound ESD which might minimise, or even nullify, the undesirable reaction of ecophobia.

As with ESD, second language learning can also be more beneficial when introduced in the early stages of childhood. The most successful approach to second language learning in early childhood is immersion (Genesee 1987, Wesche 2002).[8] In immersion, the second language (L2) is not taught in a systematic way but acquired like the first language. The L2 is the medium in regular preschool activities and school subjects. The teacher uses the L2 in a highly contextualised way so that the children can infer the meaning from the situation.

The zoo preschool in Magdeburg, Germany, combines early childhood ESD and second language acquisition in their preschool programme. The children at the zoo preschool are presented with environmentally themed learning activities conducted entirely in their second language. As already mentioned in the 'Introduction', this method of education has been labelled "Green Immersion" (GI) by the ELIAS project. The

5 David Sobel (as cited in Haskin 1999) defined 'ecophobia' as a "callused or fearful attitude towards nature" resulting from improper environmental education.

6 Cf. Breiting et al. (1999: 44) regarding characteristics of individuals with action competence.

7 Wilson (1995) discusses the importance of educating individuals early in childhood.

8 Unlike other language education methods, immersion learning is as natural as when a child learns his or her mother-tongue. Also, see chapter on language immersion methods within this publication.

study depicted in this paper followed the children in the GI programme over a period of 19 months.

3. Green immersion at the preschool level: theoretical background

Most ESD approaches are grounded in years of research conducted by experts concerned with current and rising environmental issues. Like scientific disciplines, ESD has grown through the years, and now includes the education for comprehending the interconnectivity of a world-wide environment. ESD is now a highly diverse, multidisciplinary science, and as a result, the demands ESD places on educators sometimes exceed their abilities. More opportunities are being provided for educators to learn how to become more effective as environmental educators. In conjunction with the expanding discipline of ESD, the target audience is also expanding. Not only are students and adults being challenged with assuming the responsibility of positive environmental impact, but (pre-) elementary children, too, are a focal point for ESD. This early childhood ESD is valuable for helping individuals prepare for environmental sustainability. Currently, ESD's goals are to educate individuals on how to become positive participants in resolving environmental issues and to prepare those individuals for participation in identifying and negating rising environmental issues. Educators and professionals aim to foster an 'Action Competence' attitude in the learners, hoping that this attitude will urge individuals to respond to world-wide environmental issues with problem-solving and comprehension skills.

Over the years studies have emerged regarding environmental sustainability. Some studies looked at the importance of environmental education and laid out methods which aided the direction of environmental education.[9] Other studies highlighted areas of environmental concern, such as the "Limits to Growth" (Meadows et al. 1972). This study brought about many controversial discussions; however, it provided a statistical outlook at the future of the environment and challenged the thinking of many people.[10]

Studies were not the only building blocks for the development of environmental education. Multi-governmental conferences were being held, such as the UN conference in Stockholm in 1972, and the UNESCO conference which took place in Tbilisi in 1977. Both conferences were monumental in their decisions aiding the growth of environmental accountability and environmental education. The UN conference in Stockholm was pivotal for the realisation of worldwide accountability and worldwide environmental cooperation; "The protection and improvement of the human environment is a major issue which affects the well-being of peoples and economic development throughout the world; it is the urgent desire of the peoples of the whole world and the

9 Venton (2008), Levang (2007), Kyoto Protocol (1997), and Corvalan et al. (2005) all discuss the impact and direction of environmental education.

10 Turner (2008) in a response to the "Limits to Growth," re-evaluated the study's results thirty years later using actual global data within collected within that thirty year period.

duty of all Governments" (UNEP 2010).[11] The UNESCO conference was very important for the development of environmental education in schools and institutions. It provided recommendations, well-known as "41 Recommendations for Tiflis," which were implemented by governments around the world in guiding scholastic environmental education (Final Report: UNESCO Intergovernmental Conference on Environmental Education, Tbilisi 1977).

With the integration of environmental education into the classroom came the methodological questions, e.g. of how to effectively teach students about the environment and how to avoid causing a negative response in students. "Environmental education did not originate from one discipline, but rather [it is] a product of a co-evolutionary process within science, public awareness of environmental issues, and educational ideas" (Haskin 1999). Since not all educators have the knowledge of, or the time for, learning and then implementing all of these concepts in their programmes, workshops were conducted to equip educators with necessary scientific contacts, environmental teaching materials and the theoretical basis for effectively teaching environmental education.[12] With the knowledge and materials in place, educators also need an understanding of how "to motivate students into action without terrifying them into inaction" (Haskin 1999). Individual with skills of 'Action Competence' are positive participants in the environmental crises, not only on a global scale, but also on a local scale.

Today, environmental education has to be in line with the approaches and the goals of education for sustainable development (ESD). Topics of ESD also should be relevant to today's environmental issues, such as animal conservation, preservations of habitats, desertification, deforestation, air pollution, water, and soil (WAZA 2005). ESD must account for a world with numerous problems and must educate students accordingly. In order for ESD to be most effective it should begin in the early stages of childhood, before prejudices have been created.[13]

Along with an increase in world-wide environmental education, there is also an increase in world-wide multilingualism. Many institutions, including preschools, stress bi- or multilingualism and approach the education of language acquisition with the immersion method (for an overview, see Wode 2009). In these same institutions, some form of environmental education is part of the curriculum. In particular, preschools have the ability to play an important role in incorporating both language acquisition and environmental education in the early stages of childhood. However, ESD based programmes in a bilingual preschool should take into account how language comes into play with activities undertaken to promote environmental learning; that is ESD in

11 Cf. UNEP website (2010): link "Declaration of the United Nations Conference on the Human Environment"

12 Wilson (1995) and Stokes (2001) also developed strategies for environmental education in the formal education systems of the European Union.

13 As pointed out previously education may be more effective when conducted in the early stages of childhood, as supported through the research by Wilson (1995).

a bilingual preschool has to be based on the principles of immersion education. This is important because although children in a bilingual preschool might not need language to experience nature, language becomes very important during the ensuing stages with regard to describing and explaining nature and expressing environmental ideas (see section 5.3 below). One principle of language immersion stresses the importance of 'negotiation of meaning' in (classroom) interactions between the children and the second language educator or the children amongst each other.[14] This principle is also important for ESD, in that the complexity of the environmental topics and materials should not be outside the child's ability to negotiate the environmental meaning.

In the context of a bilingual preschool, verbal interaction is truly bilingual, since the children use their mother tongue or insert single L2 words in their utterances (code mixing) and the native speaker uses only the target language. In such bilingual interactions, language acquisition takes place because the communication partners have to make an effort to understand the other and to make themselves understood. In order to promote content learning (here ESD), it is important to allow the children to verbalise their feelings with regard to certain environmental issues. Since the children are not able to express themselves in the L2, the educators should encourage the children to use their mother tongue. A learner's first-language response to the environmental activity, which was undertaken in the L2, demonstrates understanding, both of the subject matter and the language. Also, this response may reflect the degree of environmental empathy reached by the learner. In the situation of bilingual ESD, it is important for educators to adopt a learner-centred perspective. It may be useful for the educators to have a good command of the children's mother tongue, so they can understand the children's utterances and react appropriately.

4. Green immersion research questions

Based on the history and importance of ESD and immersion, the goals for the research study of Green Immersion (GI) in the zoo preschool were broken down into three categories. The first category concerned the educational goals of the children. They were: for the children in the project to expand their knowledge of ESD (animals and environment), for them to eventually apply that knowledge on a personal level of awareness, for the education programme to minimise/neutralise fearful inaction or complacency in the children through providing the building blocks for action competence, and to integrate second language acquisition and ESD in an effective way. The second category focused on the goals for research: to observe the most beneficial teaching methods for the zoo preschool children, and to observe if there is a difference in GI knowledge acquisition between girls and boys or younger and older children. The final category emphasised the goals for the educational materials: the materials

14 Long (1996) describes 'negotiation of meaning' as when a native speaker and a non-native speaker work around the unknown language in order to create understanding.

should be relevant for modern ESD issues and be readily available for public use, and for the educational material to be such that it engages the children in the zoo preschool.

The overall research question this study asked was: How, and to what extent, do the children in the zoo preschool learn through the teaching of GI? The expected outcome of this question was: When the children in the zoo preschool are provided with appropriate ESD they should exhibit a development and expansion of environmental sensitivity.

5. Structure of the Research Study

Green Immersion (GI) is an environmental education programme that assists children in their understanding of environmental topics, by presenting the children with a weekly, two-part activity, taught all in English, the children's foreign language (L2). The study began in October 2008 with the onset of the GI programme, which began as a single-level bi-weekly activity in which all children participated. The GI unit consisted of an in-class activity which was a 'preparation' time for the children, and then followed with a corresponding practical activity on a later day in the week in the Magdeburg Zoo, nearby park, or in the zoo preschool.

The GI programme and study continued weekly in the same manner until February 2009 when the activity was split into a two-level programme, one level for the older children and one level for the younger children. A similar educational method was continued in that both levels still had a preparatory session followed by a corresponding practical session. The programme still continues in this manner; however, the study with the two levels was finished in May 2010.

5.1 Subjects

The study began with observing 15 children during their participation in the GI sessions. Over the course of the study, five children moved out of the study and the programme, and 18 children entered the programme bringing the current group size to 28 participants. The research study observed 24 children over a period of 6-20 months, depending upon their date of entry into the programme. The age range of the observed children at the end of the study varied between 38-82 months. The length of GI exposure in the observed children varied between 5-21 months, depending on their date of entry into the programme. The length of English exposure of the observed children varied between 5-70 months (see Table 1).

Child ID (anonymous number of child)	Sex (1=female, 2=male)	Entry into programme (dd.mm.yy)	Length of GI exposure by end of study (months)	Observed child Y/N	Date of birth (dd.mm.yy)
MD-001	1	01.08.08	21	Y	18.05.05
MD-002	2	24.08.08	21	Y	29.05.04
MD-003	2	01.04.09	14	Y	20.05.05
MD-004	1	15.11.08	18	Y	23.08.04
MD-005	1	02.03.09	15	Y	27.07.04
MD-006	2	04.08.08	21	Y	03.08.05
MD-007	1	01.09.08	20	Y	09.09.05
MD-008	1	02.03.09	15	Y	27.07.04
MD-009	2	01.09.08	20	Y	13.07.05
MD-010	2	01.08.08	21	Y	16.03.06
MD-011	1	01.11.08	19	Y	26.05.05
MD-013	1	01.08.08	21	Y	23.09.03
MD-014	1	01.08.08	21	Y	03.08.03
MD-015	1	01.08.08	21	Y	02.11.04
MD-016	1	01.03.09	15	Y	08.05.06
MD-017	2	01.01.09	17	Y	19.03.06
MD-018	1	01.08.08	21	Y	19.01.06
MD-022	2	05.08.09	10	Y	23.10.04
MD-025	2	01.09.09	9	Y	29.09.06
MD-026	1	01.11.09	7	Y	09.11.06
MD-027	2	01.11.09	7	Y	09.11.06
MD-028	1	01.01.10	5	N	23.04.07
MD-029	1	01.11.09	7	Y	21.02.07
MD-030	1	01.12.09	6	Y	15.09.06
MD-031	1	01.01.10	5	Y	31.03.07
MD-032	1	01.02.10	4	N	16.05.07
MD-033	1	01.03.10	3	N	12.02.07
MD-034	2	01.06.10	0	N	18.05.07

Tab. 1: Zoo preschool child information regarding sex, GI exposure, observation and date of birth

In the beginning of the study the observations on the children were recorded through educator notes during various GI sessions. The observations were qualitative in nature and were recorded by three of the preschool educators. They covered a total of six individual months in the time period of October 2008 to November 2009. The observations focused mainly on language growth and the effectiveness of the materials used and the themes explored in the GI sessions.

5.2 Pilot assessment

Five months into the research study, in February 2009, a pilot assessment was conducted to evaluate the effectiveness of the materials. It was derived from a previously planned GI activity and was intended as an assessment for understanding the zoo preschool children's comprehension of GI materials and the effectiveness of the teaching method. The pilot assessment was conducted over a three week timeframe and con-

sisted of four stages. In the first week a pre-test was administered to eight children over a period of two days. In the second week an educator taught a GI session using the material used in the pre-test, which was during the normal preschool's morning circle on one day of the week. In the final week the post-test was administered to four children. Immediately following the post-test, an extended post-test was administered to the same four children (see Tables 2 and 3 below).

The extended post-test used different pictures to construct a similar theme of the pilot assessment. Both the post- and extended post-test took place in a period of one day.

Child ID (anonymous number of child)	Age of child at time of assessment (months)	GI exposure at time of assessment (months)
MD-002	57	6
MD-019	64	6
MD-006	42	6
MD-007	41	5
MD-014	66	6
MD-012	50	6
MD-020	39	6
MD-017	35	2

Tab. 2: Child information of the participants regarding age and GI exposure in the pre-test of the pilot assessment

Child ID (anonymous number of child)	Age of child at time of assessment (months)	GI exposure at time of assessment (months)
MD-002	57	6
MD-014	66	6
MD-006	42	6
MD-019	64	6

Tab. 3: Child information of the participants regarding age and GI exposure in the post- and extended post-test of the pilot assessment

The topic of the pilot assessment was 'The Food Chain' and the following were the materials used in the pilot assessment:

Materials for the pre-test

- a laminated mat (60cm x 30cm) with 3 'hook and loop' fasteners arranged in a left to right arch with directional arrows between each fastener
- 6 laminated flash cards (7.5cm x 12.5cm) with corresponding 'hook and loop' fasteners on the back
    - the flash cards drawings were: fox, rabbit, plant, mushroom, spaghetti, elephant

Materials for the post-test

- a laminated mat (60cm x 30cm) with 3 'hook and loop' fasteners arranged in a left to right arch with directional arrows between each fastener
- 6 laminated flash cards (7.5cm x 12.5cm) with corresponding 'hook and loop' fasteners on the back
    - the flash cards drawings were: fox, rabbit, plant, mushroom, spaghetti, elephant

Materials for the extended post-test

- a laminated mat (60cm x 30cm) with 3 'hook and loop' fasteners arranged in a left to right arch with directional arrows between each fastener
- 6 laminated flash cards (7.5cm x 12.5cm) with corresponding 'hook and loop' fasteners on the back
    - the flash cards drawings were: tree, deer, mountain lion, dirt, butterfly, whale

The task for the children was the same procedure for all three tests. Individually the children were taken into a quiet room with the observer and the German educator. The children were shown all six cards and were asked if they knew what each card depicted; clarification was provided if they did not understand. The children were then asked to choose three cards from the group and use those three to create a food chain. They were then asked to order the cards in what they determined as a food chain, by connecting the 'hook and loop' fasteners on the cards to the laminated mat. The intended order of cards for the pre- and post-test, from left to right was: plant, rabbit, fox. The intended order of cards for the extended post-test was: tree, deer, mountain lion.

In order to eliminate the possibility of second language interference, the German educator conducted all three tests in German. The GI session was conducted, as per normal, in the L2.

The reason for choosing the original three food chain drawings, grass-rabbit-fox, was because the drawings were part of the original module. The elephant and whale drawings were chosen, because they were easily identifiable animals and the carnivores intended for the food chains were not associated with either the elephant or the whale (within their respective food chain combinations; i.e. a fox does not eat an elephant). The spaghetti was chosen, because it was a well-known human food item and not an animal food item. Two 'hard' distractor drawings were chosen, the mushroom and dirt, because they force the children to contemplate the accuracy of their final choices. The butterfly was a last minute choice, because the initial drawing was determined to be potentially anxiety inducing (spider).

5.3 Research instruments

Following a project workshop in July 2009 an observation checklist was developed to complement the qualitative field notes with more quantitative data (Figure 1).

This checklist observed both group and individual growth, through the various levels of GI learning, from the Emotional Level to Action Competence. The levels of GI learning were based on a model developed by Janßen (1988) which described an individual progressing through six levels as they encountered nature (see Figure 2 below).

ELIAS Green Immersion learning
(Draft Version Nov. 09)

Name of Researcher/s	Child ID	L2 Teacher

Description of General Preschool Setting

Birthday	Sex (m\f)	Observer

For Guidelines on Categories see Sheet 1

Description of Interaction

Date\Time dd\mm\yy	Situation			GI level progression	Engagement Scale				Notes Child's actions\ utterances\attitude	Notes Observers interpretations
	Location	Activity	Materials		1	2	3	4		
				EL						
				DL						
				RL						
				UL						
				EA						
				AC						
0					0	0	0	0		
				EL						
				DL						
				RL						
				UL						
				EA						
				AC						
0					0	0	0	0		

Summary of Progression

GI levels	Average of engagement
EL	#DIV/0!
DL	#DIV/0!
RL	#DIV/0!
UL	#DIV/0!
EA	#DIV/0!
AC	#DIV/0!

Sum of highest engagement
0

Sum of lowest engagement
0

Fig. 1: Blank sample of GI checklist[15]

The model was adapted during the July 2009 conference on the basis of the qualitative field notes from the observers to fully appreciate the subtleties of GI. The six adapted levels of GI learning are the 'Emotional Level', the 'Describing Level', the 'Repetition Level', the 'Understanding Level', the 'Environmental Awareness Level' and 'Action Competence.' The checklist was also created to observe each level as to the degree of participation/engagement in the group or the individual, on a scale of 1 to 4; with having a score of 1 as an indication of a lower degree of participation/engagement as compared to a score of 4.[16] Each level of GI learning had set goals and indications which helped to sort the observer's observations of the children's progression into more uniform results. The observations collected using this checklist covered a period of five months from January 2010 to May 2010.

15 For a larger version, see Appendix.

16 The degree of participation/engagement was very subjective to the individual and the observer's interpretations of that particular individual.

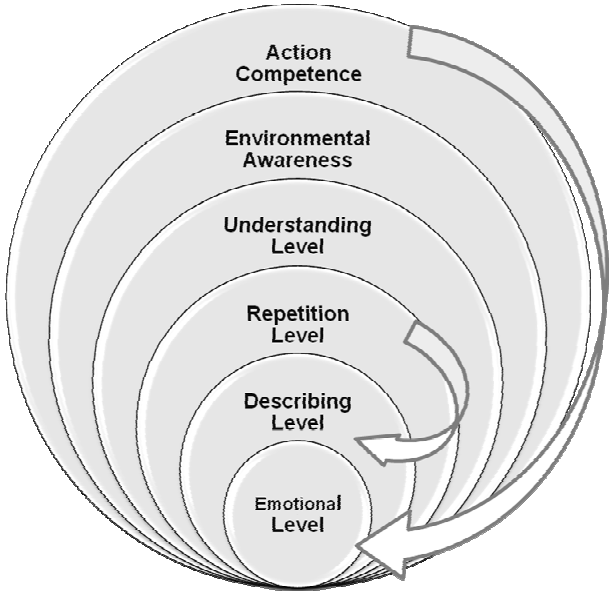


Fig. 2: Levels of Encountering Nature (based on Janßen 1988: 6, "Ebenen der Naturbegegnung"; modified and translated by the authors)

The definition or goal of the 'Emotional Level' (EL) was for the children to acknowledge the nature/environment presented to them during an activity. The indications of participation at this level were that the child's body language was 'open', facing the activity and not shying or turning away, that the child actively watched the activity, and that the attention span of the child extended longer than normal throughout the activity. The latter indication was very dependent on the child's personality which was taken into account during the observations. At this level of GI learning a record of a high degree of participation was when the child showed physical signs of positive excitement, but not over-stimulation; i.e. hand clapping, broad smiling, mimicking educator's gestures, eye contact with educator, etc.

The goal of the 'Describing Level' (DL) was for the child to use their own words to describe the nature/environment; the description did not have to be accurate and could be in either the first language (L1) or the second language (L2). The indication of participation for this level was that the child used words to describe the nature/environment presented to them. A high degree of participation was recorded when a child offered a large variety of descriptions, using language without being prompted by the educator.

The 'Repetition Level' (RL) goal was to have the child repeat back the accurate information about the nature/environment, in either L1 or L2. The indications of participation at this level, in order of degree, were: that the child repeated back/parroted the new L2 words in the L2; the child repeated back the new L2 words in the L1; the child repeated back the new L2 words and environmental concepts in the L2; the child repeated back the new L2 words and environmental concepts in the L1. Both the 'Describing Level' and the 'Repetition Level' were cyclic between themselves, and the child cycled between these two levels as much as needed until understanding was ob-

tained. A similar cycling is seen in Janßen's original model between his highest level, 'Action Competence' and the first level, 'Experiencing Nature'. This cycle indicates that environmental education is an on-going process which allows for an individual to repeat the various levels, bringing about a deeper appreciation for the environment. A high degree of participation was recorded for the 'Repetition Level' when a child repeated back majority, or all, of the new language and information in their L1, suggesting that the child followed the topic of the session with ease.

The 'Understanding Level' (UL) goal was for the child to cognitively discover the connections between the nature/environment presented in the GI session to corresponding global natural/environmental themes. There were two indications of participation for this level; one was that the child recognised and spoke about the GI topics outside of the preschool setting, and the other was that the child exhibited an accurate, broader understanding of the GI theme during the GI session. A high degree of participation was recorded at this level when a child understood the environmental connections without being directed by the educator and was able to use language to properly convey their thoughts, either in the L1 or in the L2 (L2 being rated as slightly higher).

The 'Environmental Awareness Level' (EA) goal was for the children to apply their cognition of their natural/environmental knowledge and understanding on a personal level of environmental conscientiousness. A high degree of participation at this level was when children took it upon themselves to be personally accountable for positively impacting the environment. An example of a child reaching EA would be when a child has participated in a GI activity concerning soil and the positive impact composting has on soil. Then that child decides to build his or her own compost pile and routinely adds compositing ingredients to maintain their compost pile, ultimately knowing they are positively impacting the creation of good soil.

The goal for the final level, 'Action Competence' (AC), was for the child to exercise his or her environmental conscientiousness by applying that conscientiousness on a societal scale to guide and direct others to positively impact the environment. Indications of participation at this level of GI learning was that the child showed positive leadership on a group scale for solving environmental problems; their environmental actions have moved outside their own personal sphere and are being applied to others.

The model by Janßen (1988) was used as a basis for the Green Immersion model. It is similar to the GI model in that both models have six levels of engagement. Janßen's model was used as a basis because this model, unlike other models, accounted for the use of language during environmental acquisition. One other slight difference between the Janßen model and the Green Immersion model is that the Janßen model indicates a repetition of the environmental growth process, from Action Competence back to Experiencing Nature; however, the Green Immersion model has one more repetition, or cyclic progression, between the Describing and Repetition Levels.

6. Results

During the first few weeks of the study the children were observed to exhibit adverse reactions to English as well as to the corresponding GI activities.[17]

> **Quote 1**: [Child 9] still speaks completely in L1. Today though [he] remained seated in morning circle while English conversation was being taught informally, [as] soon as the formal lesson of English was taught [he] backed out of the group and refused to participate...

> **Quote 2**: [...] 1st week of L2 teacher integration:
> During the first few days the children were uncommonly distant. They preferred their native tongue and avoided in depth interaction with English speakers.
> About 95% of the children's speech was in L1.
> Only when there was a song or game they knew well did any of the children engage in L2 exploration.
> By the end of the week some of the children were more open with the L2 teachers and they seemed to respond to questions and interact more with the teachers.
> Even still the interaction was always a little strained and superseded by German.

> **Quote 3**: 2nd week of L2 teacher integration:
> The children presented a slight challenge since they were still a little distant and the issue of authority was not established with the L2 teachers and the children.

The months following the initial month showed a steady increase in interest of both English as a second language and GI. The length of the children's attention, while participating in the GI sessions, increased during these months.

> **Quote 4**: [...] Chimpanzee lesson, Observation on November 4, 2009:
> [It was observed] that for some of the children they have begun to associate the English word with the object completely.
> Instead of thinking of the object in German they think of the object only in English. I.e.: the code-mixing in "Wo ist die rock?"
> Today the children seemed happier to learn English. They had fun with the lesson and they seemed like they were eager for something more to happen.
> Time was spent afterwards individually with the children. An L2 teacher spent time with a small group of students looking at the chimps and watching the chimp's reaction to human interaction.
> The children are beginning to listen more to the L2 teacher's instructions. [...] Overall the children are beginning to want to please the L2 teachers and to excel in their L2 acquisition.

> **Quote 5**: [...] Chimpanzee module November 2008
> In a one on one English conversation with [she] about what the chimps were doing [she] was observed to understand that on Tuesday [she] and the other students also looked for hidden food in containers. [Then this child] also made the deduction that while [children] used a spoon, fork, and fingers to get the food out, the chimpanzees used a stick and their hands.
> In a similar one on one English conversation with [another child] it was observed that [he] understood that the chimpanzees were using the stick to eat with. [The educator] told [him] about the stick and tried to point it out. It took [him] a second to figure out what [the educator] was saying, but [the child] was patient and tried to understand. Once [he] understood what [the educator] was talking about [he] began to make the connection of the chimp using a stick to eat with.
> i.e. [he] reinforced [the] conversation by doing the actions of eating and putting "a stick" in a log.

During the summer months of 2009 the children, the older ones especially, began to show more of an inclination to and higher understanding of environmental topics.

17 All quotations were changed to exclude names.

> **Quote 6**: [...]
> September 22/09: Today [an] exoskeleton of [a] tarantula, shed the previous night, [was brought to the preschool]. The children were all extremely interested. Some of the more nervous children were anxious from the beginning, but still participated in the exploration. In a very short while the nervous children participated with ease.
> September 22/09 continued: The GI exploration was looking at what can be composted. The children were all very interested, and even though the exploration was a little yucky, they were still all engaged. A year ago, very few of the children would have been interested in either something scary or dirty. A year ago the children would have left the circle or shied away.

In February 2009 a pilot assessment was conducted. The quantitative results are shown in Figure 3, to help determine children's understanding during the GI session as well as to help determine how materials affect children's learning attitudes and how the materials affect understanding.

> **Quote 7**: Pilot Assessment February 2009
> ...the children seem to forget the arrows on the mat and just concentrated on the card content...they didn't necessarily understand there was an order
> [...] some of the younger children had problems lining up the [hook and loop fasteners] on the mat and cards [...]
> the three eldest children understood the idea of the three flash cards connecting to form a pattern [...] chose the three correct cards but placed them in the wrong order.

The results from the pilot assessment used in this research project are illustrated in Figure 3 below. In the pre-test a correct flash card was chosen 46% of the time by the eight children who participated in the assessment. In the post-test a correct flash card was chosen 92% of the time by the four children who participated. The same four children who participated in the post-test went on to choose a correct flash card 75% of the time in the extended post-test.

In January 2010, the newly developed checklist was used to record the children's progress through GI learning.[18] When illustrating the children's progression through the levels of GI learning in a categorisation of length of GI exposure by the end of the study, the children's progression can be observed in Table 4 below.

18 See section 5.3 of this chapter.

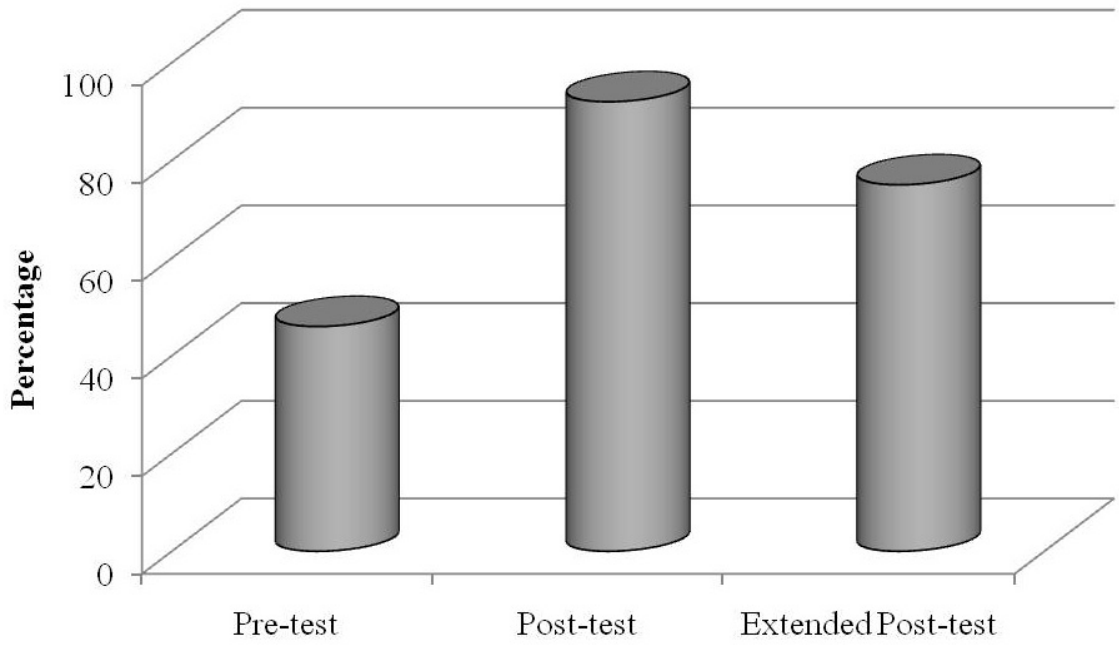


Fig. 3: Percentage of correct card usage in all three pilot assessment scenarios

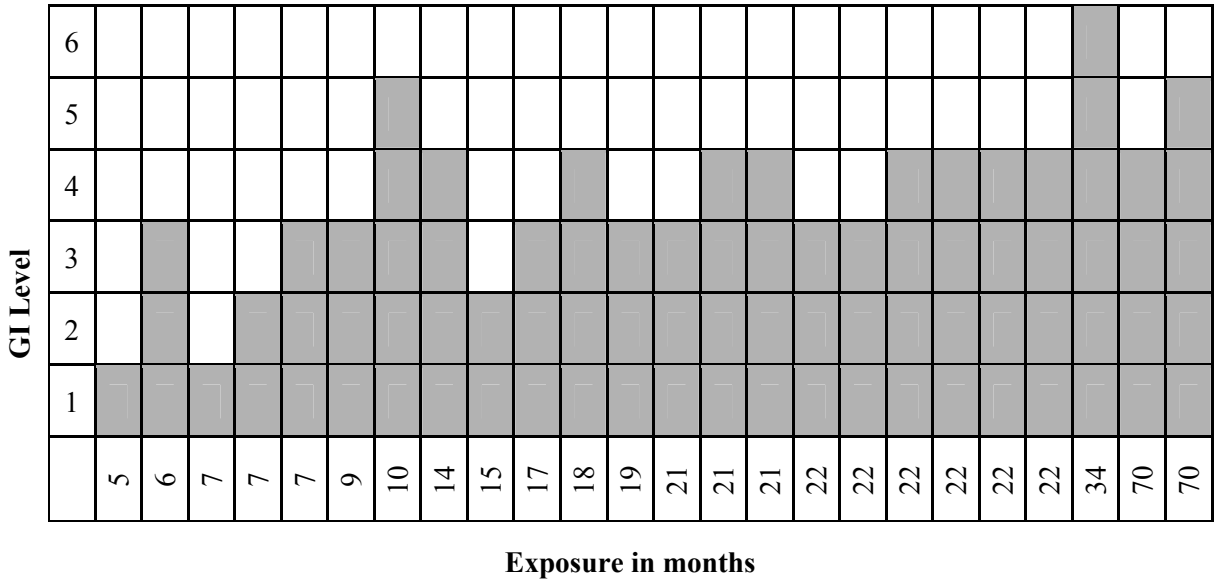
As seen in Table 4, there is a steady increase in GI level progression corresponding with increasing GI exposure; however, the table does depict some anomalies. One child with ten months of GI exposure and one child with 15 months of GI exposure depicted a higher level progression than the children in their similar GI exposure ranges. One child with 22 months of GI exposure showed a higher level progression than the other seven children with the same GI time of exposure. Alternatively, one child with 15 months of GI exposure showed a lower level progression than those in a similar GI exposure range.

GI Level																							
6																							
5																							
4																							
3																							
2																							
1																							
	5	6	7	7	7	9	10	14	15	15	15	17	18	19	21	21	22	22	22	22	22	22	22

Exposure in months

Tab. 4: The children's (n = 24) progression through GI over a 5-month period, detailing the progression in consideration of their exposure to GI

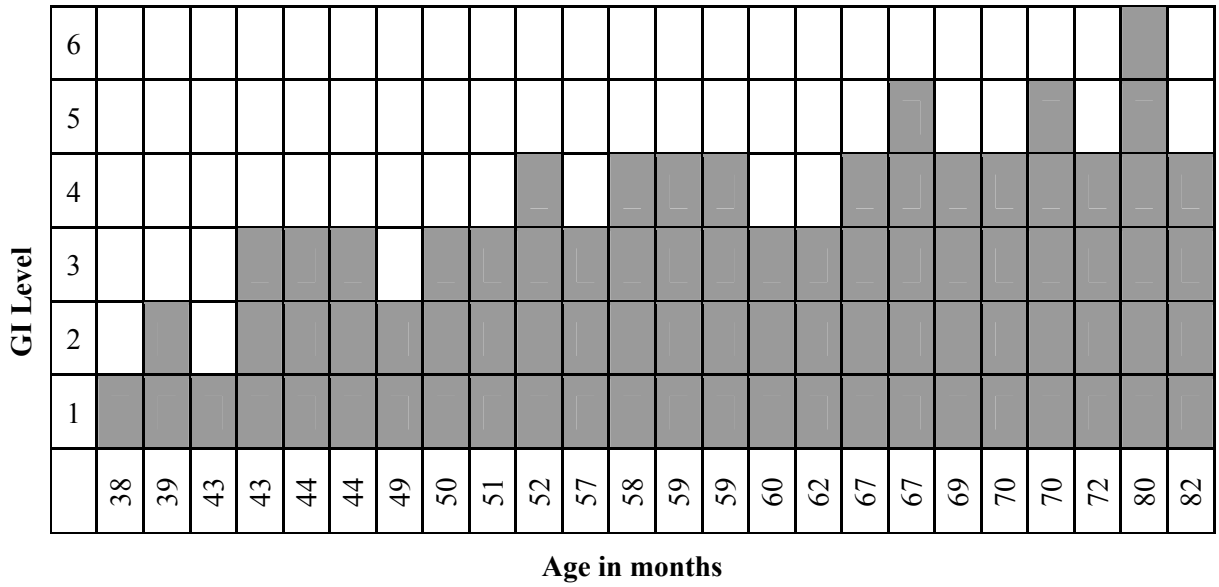
Below in Table 5 is an illustration of the progression of the data obtained from the checklist when considering the length of English exposure. This table shows that those children with the most English exposure (n = 70 months) progressed into the last three levels of GI; however, one child with 34 months of English exposure showed progression through to the highest level of GI learning. Also, one child with ten months of English exposure showed further progression than a child with 70 months of English exposure. Finally, one child with 15 months of English exposure showed progression to level 2, whereas the children with a similar English exposure showed progression into levels 3 and 4.



Tab. 5: The children's (n = 24) progression through GI learning over a 5-month period when considering their exposure to English

Finally for individual evaluations, when considering a child's progression through GI learning and illustrating it through age, a very steady increase can be seen; Table 6 illustrates this increase.

Even though the data expose a steady increase in GI level progression with age, a few anomalies are exposed as well. One interesting anomaly illustrated shows one child, who was 43 months at the end of the study, progressing to the first level of GI learning, whereas other children in either the same or very similar age range consistently progressing to the third level of GI learning. In addition, the child at 60 months and the child at 62 months of age showed progression to the third level only, while children only a few months younger show progression to the fourth level.



Tab. 6: The 24 observed children's progression through GI learning when considering their age

Figure 4 below is an illustration of the degree of participation, this time categorised into four age ranges of children. All age ranges of children show an average degree of participation in the first three levels of GI learning. In the fourth level of GI learning, the youngest group of children shows no degree of participation, and all the other age groups show a decline in their average degree of participation. In the fifth level of GI learning, only the two eldest groups of children show a degree of participation, with again a decline in the average degree. The final level of GI learning depicts only the oldest group of children as participating. In this figure, it can also be observed that at the first level of GI learning, the elder three age groups of children participate in the various GI activities at a high degree and the youngest group of children participate at a moderate-to-high degree. In the second level of GI learning, the eldest group of children remain at a high average degree of participation, where as the other three age groups decline. In the third and fourth levels of GI learning, the oldest group of children maintain the average degree of participation with almost the same degree of participation, 2.8 and 2.9 respectively. In the fifth level of GI learning, the eldest group of children shows a decrease in the degree of participation, from a 2.9 average to a 1.00 average, but maintain that degree in the final level of GI learning.

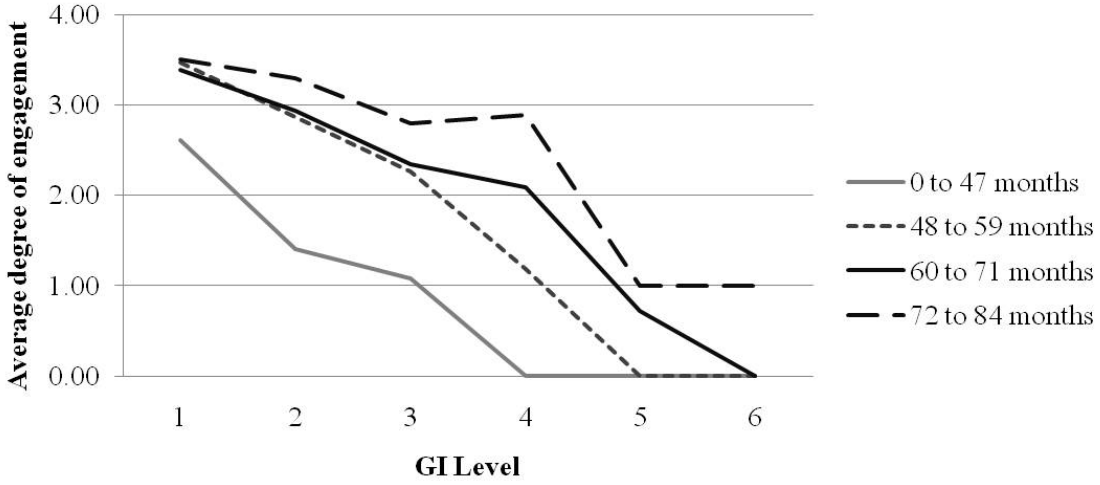


Fig. 4: The average degree of engagement in the GI activities for four age ranges of the children (n = 24) over a 5-month period; with the number of children per age group from youngest group to oldest: n = 6, n = 8, n = 7, n = 3

The checklist used to record the level progression of the children was also used to record the degree at which the observed child participated in a GI activity at each level of GI learning. The scale of degree was from 1 to 4, with 1 being the lowest degree of participation and 4 being a high degree of participation. As Figure 5 illustrates, the highest degree of participation for both boys and girls was in the first level of GI learning. There is a steady decline in degree of participation in both boys and girls as the level of GI learning increases. In the first two levels of GI learning, both boys and girls show a very similar average degree of participation. In the third and fourth level of GI learning, boys show a higher degree of participation. However, in the final two levels of GI learning, girls are illustrated as having a higher degree of participation, with only the girls showing any participation in the final level of GI learning.

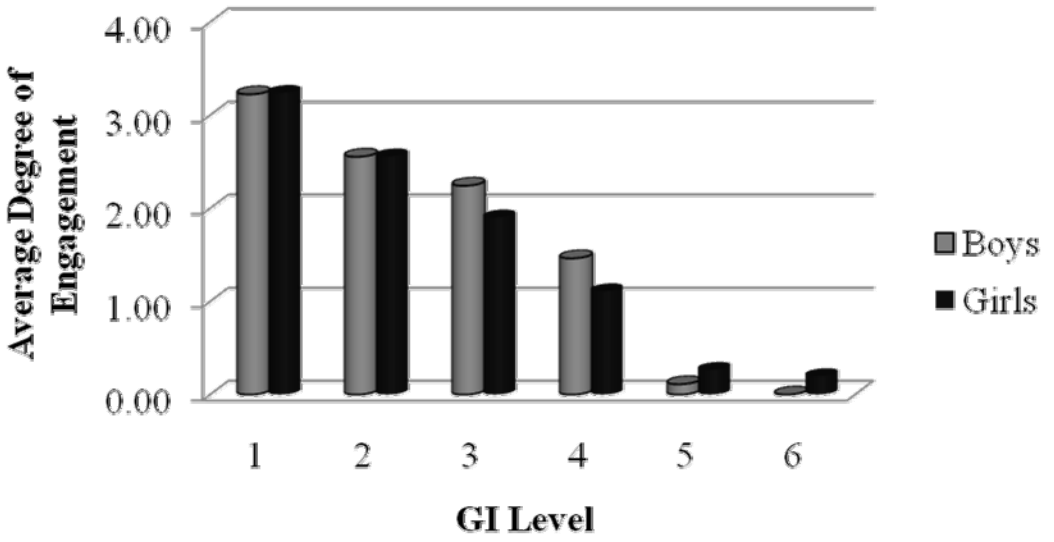


Fig. 5: The average degree of engagement of the children (n = 24) over a 5-month period, categorised into group of boys (n = 9) and girls (n = 13)

When illustrating the data by grouping it into boys and girls according to age, interesting results are shown. Figure 6 below shows an increase in level progression of highest level observed over the four age ranges of girls. This figure also illustrates a small level variance between the highest level observed and the lowest level observed in three of the age groups. However, the age group of children between 60 and 71 months of age shows a very large variance between the highest level observed and the lowest level observed. A score of '0' portrays no engagement and/or progression observed in a child.

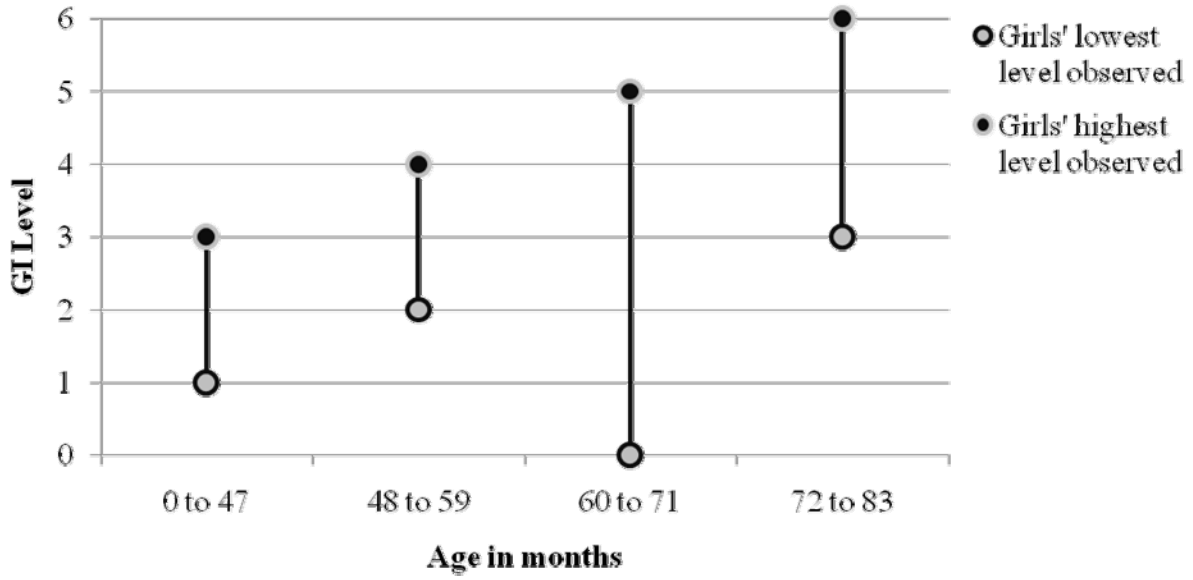


Fig. 6: Lowest to highest GI level progression observed over a 5-month period in four age ranges of girls (n = 13); with numbers per group from youngest to oldest age range: n = 4, n = 3, n = 5, n = 2

Figure 7 below shows a corresponding increase in highest level progression with age. There is a deviation of the increasing progression in the oldest age group, where the highest level of progression is illustrated as to the fourth level of GI learning, one level lower than the previous age group. The variance of lowest to highest level progression is small in three of the age groups; however those children in the 48 to 59 month age range are illustrated to have a high variance in the lowest to highest level progression observed. A score of '0' portrays no engagement and/or progression observed in a child.

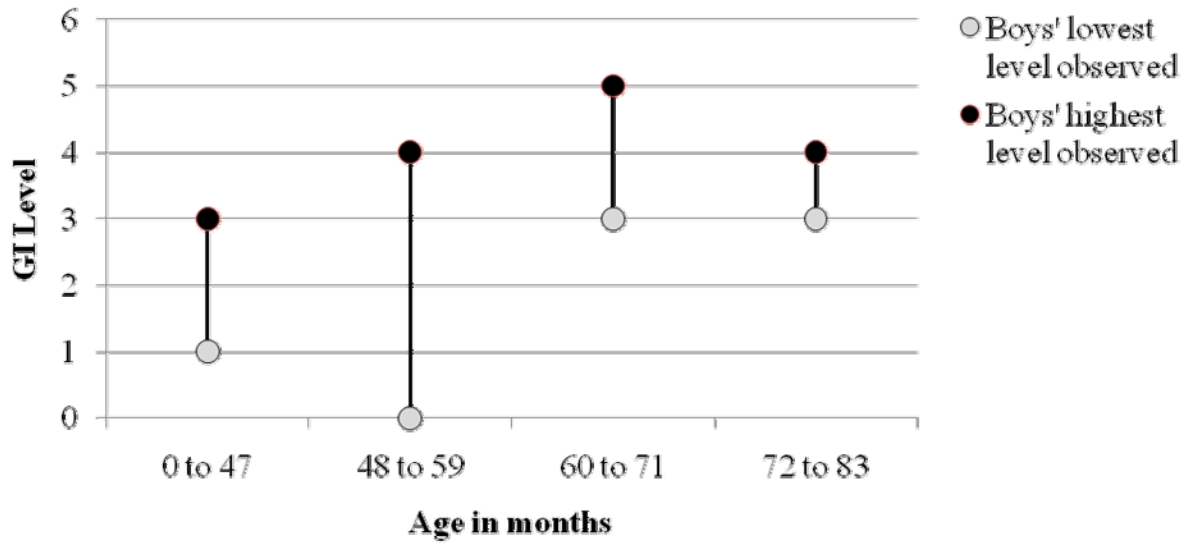


Fig. 7: Lowest to highest GI level progression observed over a 5-month period in four age ranges of boys (n = 9); with numbers per age range from youngest to oldest as: n = 2, n = 5, n = 1, n = 1

The checklist was not only used to obtain data on the children, but was also used as a tool for interpreting the effectiveness of the materials used in the various sessions of GI. Figure 8 is an illustration of the top three categories of materials used in the various sessions. The information for this figure was obtained by separating both group and individual observations into categories of materials used when the observations were collected. Then those categories of materials were again broken down at each level of GI learning and the average degree of participation was determined. The categories of 'Photos' and 'Real Objects' are illustrated as stimulating the children at the same degree of participation, 3.5, in the first level of GI learning. At that same level the material category 'Combination' is illustrated as having a slightly higher degree average. This pattern of results in all three categories shows a little variation in GI levels two and three. However, in the fourth level of GI learning the 'Combination' category drops in average degree and both 'Photos' and 'Real Objects' increase, being both higher than the 'Combination' category and higher than the previous GI level. In the final two levels of GI learning only the 'Combination' category is illustrated as stimulating the children at some degree of participation. The various materials used throughout the study time of GI were: observances of inanimate or animate objects, interacting with inanimate or animate objects, conducting experiments and investigations, photos of nature or animals, naturalistic drawings, games regarding animals, songs, PowerPoint presentations, videos and environmental worksheets. The study distinguished between photos and drawings because the drawings used were more simplistic and intended for clarification when language was a hindrance, whereas photos were a little more detailed and depicted the naturalistic themes/objects in their real state (i.e. correct colouring, location, etc.).

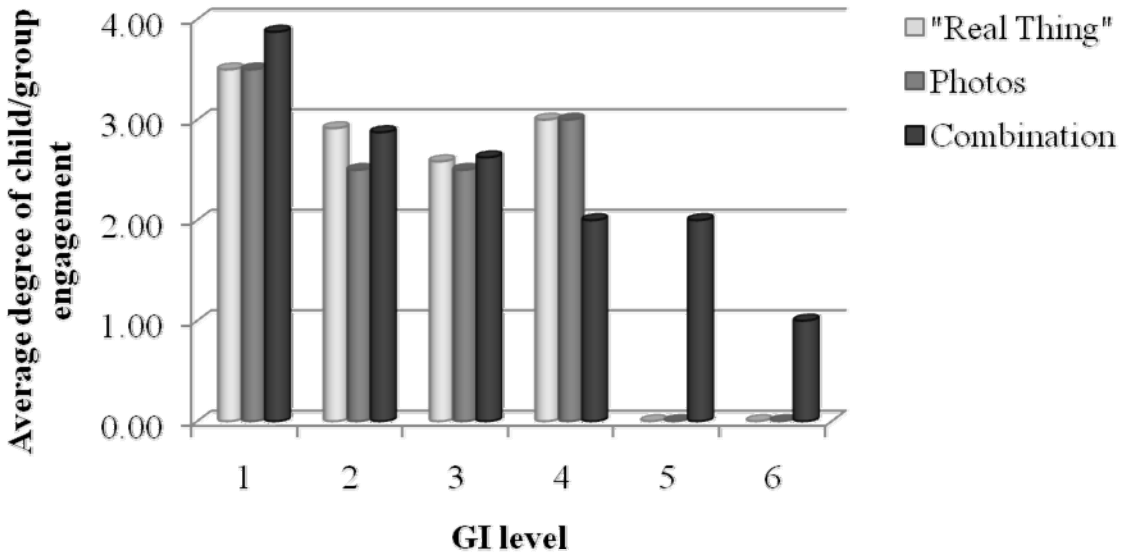


Fig. 8: Effectiveness of materials used over a 5-month observational period of GI learning

7. Discussion

7.1 Results concerning the goals of the study

The study conducted on the GI programme in the zoo preschool showed that the children in the programme did comprehend and learn about various environmental topics. The results also show that the children did in fact progress through the levels of GI learning; even into the higher levels. The educational goals for this study were also reached, in that the children in the preschool showed an increased appreciation for naturalistic/environmental themes, without exhibiting a fear of inadequacy. Furthermore, the research goals for this study were fulfilled in that the researchers determined no clear difference in learning ability between girls and boys, as can be seen in Figure 5. However, there was a difference in level progression between younger and older children, as seen in Figures 4, 6, and 7 and Tables 4, 5, and 6. Finally, the results from this study also showed that the materials used throughout the GI programme have an impact on the children's understanding and progression through GI learning, as seen in the results from the pilot assessment and Figure 8. During this study, it was also determined which GI teaching materials encouraged a positive effect in the children's learning and growth.

7.2 Limitations to the GI study

Even though this study unveils interesting trends in a child's GI learning ability, an unfortunate drawback with this study was the small size of the study group and the length of time in which they were observed. With these limitations, it could not be determined if there is a direct correlation of age, exposure, personality, and other factors

to GI growth. The children from the preschool provided an indication on the trends which might be seen but it would be necessary to observe a larger group with a similar research structure. What was not a factor in this study was the role urbanisation has on the child's ability to progress through GI. Within this study group, there was a mix of children coming from small towns and larger cities; however, there were no rural children represented in this study. Since GI depicts more naturalistic themes, would the rural child progress at a faster rate, and a higher degree, than an urbanised child? Also, the children observed in this study were only observed over a two year period, and all that while in the same preschool setting. Over a longer period of time it could be determined that if the greater impact of age on the children's GI growth would be less significant, if not nullified after a certain age or certain period of exposure to GI learning. Finally, this study did not have a fair representation of children with parents who show strong 'Action Competence'. Therefore, it cannot determine if a child living a lifestyle surrounded by environmental awareness would be more apt to progressing through the levels of GI than a child in a less environmentally-stressed lifestyle.

7.3 Interpretation of the qualitative results from the beginning of the study

During the first weeks of the GI programme and the study project, it was very interesting to observe that some children in the programme displayed unfavourable behaviours towards the L2, English, and consequently towards GI. Some children ignored the English conversations. One child, for example, left the activity only when the L2 was focused on and returned when the activity focused on the L1. These attitudes and reactions could perhaps have been a result of various factors, such as intercultural/language anxiety, personal anxiety resulting from a new person/activity, and anxiety with new surroundings (i.e. new preschool). For many of the children this was their first time in a preschool setting, as well as an intercultural/foreign language setting. Therefore, these children who exhibited adverse behaviours towards English could have been coping with their own fears of the unknown (compare Gerlich et al., this volume).

Unfortunately, these forms of adverse behaviours do have an impact on the children's GI learning abilities, as has become obvious in the qualitative observations. The base of GI learning is to emotionally experience the nature presented; both actions of ignoring and physically withdrawing may remove, or greatly hinder, the child's ability to effectively experience the nature.

A goal for the GI programme was that, "throughout the child's experience with environmental learning [it is desired for] the children to become positive role-players in an environmentally conscious world" (Thomas 2009). The educators knew that in order to begin realising this goal a change needed to occur, in either the educational method or the educational materials. In order for the children to overcome the adverse behaviours

and begin experiencing nature a positive relationship between both the educators and the child, and the child and the GI activity, needed to be established. Even though zoo visits and animal interactions were entertaining for the children and would make it easy to heighten a child's interest in the activity, without an educator/child relationship the richness of GI could not be realised.

As a result of this need the educators began thinking of sessions which used contextualised materials, which helped to remove one of the children's possible fears, that is, the fear of not understanding the language. With a highly contextualised session those children who reacted adversely because of not understanding were then able to follow the session more easily.[19] Also, as per most normal situations, once a child gets used to an adult a personal connection between the child and the adult is more easily established and a bond of trust begins to form. Contextualising the sessions and the child-adult bonding aided in increasing the children's interest in English and GI. It also must be acknowledged that, "experiences with animals and plants can engage children in a very special way" (Thomas 2009), which also makes it much easier for a child to see something interesting in the educator who teaches these activities, aiding greatly in building a relationship between educator and child.

In the months following the beginning weeks, there was a steady increase in the children's use of English and their interest, and even anticipation, of the GI sessions. This increase in English use as well as interest is noted in the Quotes 4-6 of the previous section. This increase was very positive to note, in that the changes to the GI programme were profitable and therefore appropriate for this group of children. What was once hesitation and fear became enjoyable and the children exhibited signs of being more engaged in the GI sessions. With the gap caused by the children's initial adversity being overcome, 'negotiation of meaning' (Long 1996) was observed to increase. Instead of ignoring the English conversations on environmental topics, the children began to listen and patiently work towards understanding the English conversations. Quote 5 illustrates this negotiation.

> It took [the child] a second to figure out what [the educator] was saying, but [the child] was patient and tried to understand. Once [he] understood what [the educator] was talking about [he] began to make the connection of the chimp using a stick to eat with [,] by doing the actions of eating and putting "a stick" in a log.

Within this quote the observed child shows an increase in attention span, an increase in interest and then a physical gesture of understanding. The increase in attention span indicated that the child was beginning to engage emotionally in the GI session, as per the goals and guidelines of GI learning at the Emotional Level.[20] The increase in interest correlates with the increase in attention span. When children are interested in something, they tend to pay attention for a longer period of time. The physical gesture of the child, imitating eating with a 'stick', was important as an indication of a higher degree

19 See also Snow 1990

20 Cf. see GI checklist, Figure 1

of emotional engagement. Not only did the child listen for a longer period of time, but the child also wanted to show that he or she understood what the topic was and wanted to convey that understanding to the educator. The child was becoming an active participant in the GI activity, which is exactly the desired behaviour of the children in the beginning of GI learning.

7.4 Pilot Assessment

After the first few months of GI in the zoo preschool a pilot assessment was created and applied to determine if the children were indeed following the GI sessions. The results are discussed below, but more importantly, the pilot assessment helped to identify how the materials affected the learning of the children. The observations of the data (see Quote 7, section 6) also illuminated the positive or negative effects the materials had on the children's comprehension.

As seen in Figure 3 (see above), there is an increase in correct-card usage between the pre-test and post-test, which can indicate that the content of the materials enabled the children to remember at least the theme of the GI session. This positive indication supports the supposition that the materials used were engaging and interesting for the children, which may assist the children's progression through the level of GI. However, the layout of the materials impacted the children in interesting ways. As seen in Quote 7 above, there was a difference in reaction to the layout of the materials used when comparing the younger and older children. Throughout the pre-test, [21] when the youngest children were tested, they were unable to connect the small hook and loop fasteners, simply because they are still developing their fine motor skills, whereas the older children had no problems matching the fasteners. Also, during the pre-test a couple of younger children were so concentrated on matching the fasteners that they passed on the flash card they initially chose in favour for another which might 'match' better; instead of looking at the content of the card and choosing from that. This interpretation of the pilot assessment emphasises the need for age-appropriate materials. The same material which would occupy and engage an older child might distract a younger child from the object of the session. Therefore, when creating GI activities an educator should account for the age of the children participating.

Stemming from the pilot assessment was the creation of two types of materials for the GI sessions. One type of materials was created for the younger children, appropriate for toddlers who were still developing their physical skills as well as their problem solving abilities. The second type of materials was created along the same theme as for the younger children, yet was more challenging in both physicality (such as a child having more confident fine-motor skills) and mentality and thus better suited for the

21 The post- and extended post-test included the four older children only; therefore, the pre-test is illustrated here so both groups of children were included.

older children. With the creation of two types of materials the children had more opportunities for becoming active participants in their learning.

7.5 The impact of actively learning and age on a child's progression through GI

This active participation in the GI sessions is important for the child's growth through GI learning; for the child's environmental cognition. In Bandura's (1999) paper "Social Cognitive Theory of Personality," he describes a variation in consciousness:

> There is an important difference between being conscious of the experiences one is undergoing, and consciously producing given experiences. [...] The purposive accessing and deliberative processing of information to fashion efficacious courses of action represent the functional consciousness. (Bandura 1999: 3)

The more actively a child participates during the GI sessions and outside the preschool, the more potential for growth through GI learning is assumed. Instead of remaining a passive bystander, an active child benefits from the practical experience of engaging consciously in the GI session. Hence, the changes seen in the observed children becoming active participants was a base for the supposition that they would progress through the levels of GI.

Not only does the child hear the language and information from the educator, as well as the other children, but the active participant also experiences the session with other senses as well; seeing, smelling, touching, and tasting. A child learning with all of his or her senses can solidify that experience (Wilson 1995, Breiting et al. 2009). With a higher degree of active participation at the 'Emotional Level', the child has more to describe and talk about, which leads to the next levels of GI learning.

Active participation, or active learning in a child helps to establish new connections and a new understanding of environmental topics. Previous prejudices can hinder that child in his or her GI growth; however, being actively involved in an activity can help a child overcome those prejudices. Quote 6 above accentuates the benefits of actively participating. After one year of being active participants in the GI programme, the children were observed to participate very well in a potentially fearful session. Throughout the year previous to the recorded observation, the children were exposed to situations which encouraged interest in and lessened the fear of 'gross' aspects of the environment. The children participated in many different GI sessions which covered a large variety of topics, all of which began building a stable foundation for dismantling former environmental prejudices (see below) and establishing a scaffolding of environmental understanding. Spiders can be considered as a 'high-stimulus' interaction; dealing with compost material can as well produce adverse effects in the participant. However, the children observed and exemplified in Quote 6 showed high interest in both activities. Throughout the previous year, the children were active participants in the own GI growth; therefore, when they were faced with a 'high-stimulus' session, the

children had the understanding and competence to overcome previously established prejudices and participate in a session which manifested positive environmental attitudes in the children.

Active participation is needed for GI growth; however, not all children are active participants in the way of natural personality. Tables 4-6 above illustrate the variance in level progression between the youngest/least exposed child and the oldest/more exposed child. When comparing the extreme ends in each table, there is a relationship between GI growth and age and exposure can be seen. However, these three tables also illustrate dips and spikes in the recorded observations of children between the two extremes. These dips and spikes help to illustrate that GI level progression depends upon more than age and exposure; it may also depend upon a child's attitude towards actively participating and the child's personality. Of course there are other factors which affect the children's progression through the levels of GI learning. Based on the observations, it can be assumed that attendance consistency could be a factor, also mental acuity, persistence of knowledge acquisition, in parents and children, rural or urban living, etc.; however, these factors were not focused on during this study.

Growth through Green Immersion asks that a child becomes more active with each increase of GI levels. The 'activity' can be seen in the beginning of GI learning as basic engagement in a GI session, next verbalising about that session and finally outwardly expressing their participation in GI learning. As an example of a child with a tendency of being a passive observer is child 016. She often chose to watch an activity or quietly listen to the discussion. Throughout the observed GI sessions the educational observer perceived her passive participation in the GI sessions. Interestingly, the observations collected regarding this child indicated that she did not progress past the first two levels of GI. When comparing this child with other children in a similar age range or exposure range, this child has the lower GI growth recorded. In contrast an example of a child with a more active learning behaviour is child 013. The observations recorded from this child show that in all three tables, when comparing her to other children within a similar age and exposure range, she reached a higher level of GI progression. Both of these examples illustrate the effect active participation had on their GI growth. It may be inferred from this illustrations that encouraging a child to be an active participant in throughout GI learning may assist that child their progression through GI.

Shifting direction slightly, another interesting aspect was interpreted from the observations when considering the children in groups according to age. Figure 5 above portrays the diversity in degree of participation in four age groups of preschool children. This figure clearly portrays the ability of the older children to participate at a higher degree and progress further through the levels of GI. There is one small inconsistency in the first level of GI between the middle age groups, with the younger group being slightly higher in their average degree; however this inconsistency is minimal. It is arguable that the older the child, the higher possession of cognitive abilities which help them to understand the environmental topic and then the problem-solving abilities

which aid in applying their environmental abilities on a personal and societal level; both of which are the centre of GI.

Continuing to look at the degree of participation of the children during the GI sessions, Figure 6 above grouped the children by sex. The data from these results indicated that there were no major differences in degree of participation between the sexes, which suggest that the sex of a child does not have a sizeable impact on the child's GI progression. After the second level of GI, the boys do participate with a slightly higher degree than the girls; still, the girls progress into the last level of GI and the boys progress until the second last level of GI. However, it has to be kept in mind that these numbers are too small to be taken as a representation for a larger group of children.

When considering the ability of boys and girls grouped separately into four age ranges, neither do Figures 7 and 8 depict a difference in the highest level progressed between the sexes; the one exception was in the oldest group of children, where there was a variance between the boys' highest level progression to GI level 4 and the girls' highest level progression to GI level 6. Yet, within the test group there was only one boy in the eldest age group and two girls in the eldest age group; in the other age groups the boys had more representations. Also, in both groups of sexes there was one child who did not engage at all during one GI session, hence the score of '0' in Figures 6 and 7. The male child who did not engage was grouped in the 48-59 age group and the female child was in the 60-71 age group. Interestingly, the instances where the girl and boy did not engage and progress at all were observed to be the same GI session. In that same session, all the girls and boys participated at a lower degree than average. As a simple query into what the results would be without including this particular session in the final average totals, a mock graph was constructed. It was intriguing to observe that both sexes showed identical lowest and highest level progression until the final age group of children, when that particular session was omitted. In the eldest group of children, where the girls maintained their range of levels and the boys were observed to always progress to the fourth level of GI learning. These results support the point that sex may not have a high impact on the children's ability to progress through GI learning.

When looking at Tables 4-6 and interpreting the illustrations, it could be determined that the age of a child has an impact on the ability to progress through the levels of GI. While Tables 4 and 5 show an increase in level progression when there is an increase in exposure, both tables exhibit a substantial deviation in successive increase in a group of children ranged centre of the data. This deviation suggests that there is a factor, or factors, which hinder or assist in child level progression. If the child's progression through the levels of GI coordinates with their exposure, either in English or GI, then the rise in level progression would correspond successively with increased exposure; however, fluctuations can be seen in level progression located in the middle columns of the data. These fluctuations may suggest something else has more of an effect on level progression than exposure. To elucidate, there are three instances where the

child was observed to increase at least two levels further than children within a one month range in Tables 4 and 5. Moreover, there are two instances where the children were observed to progress two levels less than the children in the same exposure range. On the other hand these substantial deviations were not as extensive when considering age as a factor. Table 6 above illustrates one instance where the child was observed to progress two levels less than those children in a similar age range. Also, there is one instance where a child exhibited a two level progression past the progression of an older child. Other than these two instances, the progression through GI is sequential to the increase in a child's age. While inter-individual variation can surely be explained by a variety of personal factors, it has to be point out that the number of the observed children would need to be increased considerable in order to come to a statistically relevant conclusion. One tendency which becomes evident from an interpretation of all three tables is, however, that although a child's exposure to either English or GI impacts the ability to progress through GI, the age of a child seems to have more of a substantial impact on a child's ability to progress into the higher levels of GI.

A child of three does learn differently than a child of six, which would account for the results and variances in Tables 4 and 5. A child who is three years old is at an earlier neurological developmental stage than a child of six (Fox 2009). A three-year old and a six-year old may progress in GI to the same level when something simple is presented to them. However, when presented with a GI topic which requires more complex thinking the three-year old might not be mentally ready to continue past the level of emotionally engaging in GI. This neurological difference between a toddler and an older child might account for the variations seen in Tables 4 and 5, and might support the steadier increase through the ages in Table 6. However, since this study focused on environmental education and its materials, the interpretations regarding neurological development would need to be further explored before becoming a concrete conclusion.

7.6 Strong emotional responses and their impact on GI growth

Just as active participation and age can have an influence on a child's growth through the levels of GI (see previous section), so strong feelings may have an impact on a child's progression through the GI levels. By virtue of the GI learning process beginning with emotionally engaging in an environmental activity or topic, the strength of a child's emotional response may propel or hinder their growth through GI. Naturally, a positive emotional feeling leads to a higher interest in a topic/activity and eagerness to engage a topic/activity; therefore, a child would tend to enter and progress through GI learning easier. On the other hand, when there are negative emotional responses present a child may not be as willing to emotionally engage an environmental topic; therefore, hindering their progress through GI. In the instances of strong negative emotional reactions/feelings, GI needs to provide sound and safe education so as to establish a situation for a positive learning environment.

An example of a strong negative feeling towards an environmental topic would be:

> **Quote 1/15:** One boy, when he was new to the kindergarten, was scared of spiders. He was so scared that he would not even go into the toilet if a spider was there. His reaction would be to cry. He was terrified of spiders [...] (Strunz 2010).

This example illustrates that the negative emotional response to an environmental topic, such as spiders, would initially impede the child from entering into the first stage of GI learning, the 'Emotional Level'. If the GI activities, or educational methods, were to be such that the child is forced to engage in a topic, even though the child is negatively engaging, then the GI learning would be based on an adverse foundation.

An example of a strong negative emotional response during a GI session, not particularly associated with an environmental topic, may be seen in Quotes 1 and 2 of the previous 'Results' section. Resulting from the unique nature of GI, the intermixing of language and environmental education, GI learning must consider the emotional responses to both the environment and language. As summarised throughout section 7.3, GI is intended to provide a positive learning environment which should logically lead to positive growth through GI. Therefore, when an educational situation provides a learning activity which encourages both positive language responses and positive environmental responses, the progression through GI learning should easier for the child. However, as seen in both of these examples a strong negative emotional response to a GI session leads to difficulties in encouraging growth through the GI learning process.

A task of GI would be to first disassemble these strong negative emotions and second to establish a new environmental understanding. Even though this process sounds to be a simple 'two-step' process, disassembling strong negative feelings towards an environmental topic can prove to take a long time. As seen in Quote 6, positive emotional responses will occur if GI succeeds in its task of establishing a new appreciation for an environmental topic. To support this establishment of appreciating the environment, the child described in Strunz's (2010) quote above was part of the group of children participating in the activity from Quote 6. The child entered into the GI programme with an intense negative feeling of spiders, yet throughout the 19-month GI observational period, the child was encouraged to participate in various GI sessions which provided positive learning situations. These learning situations ultimately led to the child's appreciation for this particular environmental topic.

7.7 Materials

Moving away from the focus of the children and onto the materials used during the GI sessions, interesting points were ascertained regarding the material used in the preschool. The same checklist which was developed to trace the children's progress through GI was also developed to observe the effect of materials used on the children.

As pointed out previously in this chapter, learning with all five senses, sight, sound, taste, touch and smell, may help to enrich a child's learning experience and may create

a deeper meaning of the topic explored. It can be reasoned that the combination of materials has more learning impact for the simple fact that a combination of materials supports learning with a positive variety of learning stimuli. While photos and 'real objects' help to provide children with realistic examples of the environment or nature, the use of either photos or 'real objects' only provide a simple aspect of the GI topic to which children can relate. The photos help to engage a child visually and can exemplify a variety of different environmental aspects; however, a photo cannot provide stimulation for scent, touch, sound or taste. Words can be used to describe those senses, but what about the child that cannot understand the words, or does not have the ability to use words; the use of photos only can provide a hindrance for children such as those. In contrast to 'photos', the use of 'real objects' can be over-stimulating for some children and may disengage them and stop the progression through GI. Over-stimulating a learning child may cause the child to become so excited that the entire purpose of the session is missed; or it may be that 'real objects' stimulate a strong negative emotional response which can block the initial positive emotional engagement. Likewise, using only 'real objects' may support a child's GI progression to a certain extent and then that support could be exhausted. To make the larger environmental connections required in the latter stages of GI, something more may be needed to stimulate deeper thinking regarding that particular GI topic. Granted, an individual can connect deeply with and even become conscious of the environment when the 'real objects' are used. However, if the child is young or the GI topic is very new, deeper thinking can prove to be difficult since there may be no basis for reference and therefore no connection to that particular topic. When the combination of materials is used there are more possibilities for the children to engage with and begin their growth of GI learning. If a child is over-stimulated during an interaction with the 'real thing,' that child can still engage and have the opportunity to progress with other materials used in that session. Furthermore, a combination of materials which encourages personal reflection and personal participation can aid a child in their progression through GI learning. The combination of materials provides a learning environment which supports growth with a number of senses and thought provoking materials, yet the combination of materials also provides a learning environment which provides an 'escape' from materials which might be over stimulating for a particular child.

One GI session which was discussed earlier in this chapter (see section 7.5) consisted of the situation where it was observed that a female and male child did not engage in a particular GI session. The previous discussion also queried further into the effects of omitting that particular session from the final average total (for further detail see section7.5). Furthermore, when interpreting the results of the materials used during the GI sessions, this one session was again considered. In this instance the session was analysed by questioning if the materials used were a factor which caused the female and male child to choose not to engage in that particular activity. The GI checklist was examined and it was determined from the notes regarding that session that the material used in that session was simple animal observation. In that session there was no educa-

tional material used, and the observation of the animal was in a viewing area where the animal could not readily be seen. Using the data collected in the GI checklist, all of the children recorded and observed during that particular session were evaluated as to their degree of engagement. It was intriguing to observe that all of the children recorded for that particular session scored lower than their average. This is one selective example of how the educational materials used during a GI session may impact the degree of engagement of the children.

An interesting spike occurred at level four in both the photos category and 'real objects' category. After reviewing the checklist again and looking for trends between the data and the materials, a few possible interpretations were considered. However, resulting from the size of this study and the length of the study, no certain explanations could be determined. Further research is highly recommended to determine why this instance occurs at the 'Understanding Level' when using photos or 'real objects'.

To combine the previous interpretations regarding child growth through GI and the effectiveness of materials, there can be a limit to how many combinations of materials should be used in one GI session. The whole purpose of GI is to present the children with a child-friendly learning environment which helps them to establish the ability to become a person of action competence in environmental issues. Therefore, a programme which considers the present environmental issues and the capabilities of the children, then includes educational material appropriate for the situation, will fulfil the purpose of Green Immersion.

8. Conclusion

Children are not born with the innate skills for being a person of 'Action Competence' regarding the environment and nature. Just like learning how to tie shoes, eat or speak, learning how to be a person of 'Action Competence' also takes time to build the necessary skills. Children with 'Action Competence' do not become so without guidance along the way. Whether parents exemplify their love of animals and/or the environment to their children, or school educators provide their students with the same example, it is much easier for a child to become an individual of 'Action Competence' when they see it in everyday life. For those young children with parents or educators who provide surroundings fit to nourish growth in 'Action Competence', their future of being positive participants in a world of environmental issues is more stable and certain. By starting at a young age, these children acquire 'Action Competence' as a way of life instead of practicing theories. Having children in an early childhood environmental programme helps them to create connections which might be missed if environmental learning happens at a later stage in life (Wilson 1995). Just as the saying goes, "It's hard to teach an old dog new tricks," so can an older individual find it harder to change their lifestyle in order to become a positive participant in an environmental world; the same could be applied to older children.

Part of proper environmental education is to encourage conversation about the environmental topics. Not only should children 'walk the walk' of being environmentally aware, but children should also have the ability to 'talk the talk' as action competent individuals. Five of the six levels in Green Immersion (GI) are based on language communication; therefore, encouraging children to be talkers about the environment will aid their growth into 'Action Competence'. Taking this approach one step further, a child should be encouraged to participate as they grow in 'Action Competence', learn with all five senses. This method of education also helps to stir up questions regarding the environmental topic. Something learned through touch and smell, instead of just sight, helps that child to connect more and perhaps more deeply process their environmental understanding.

Another reason for beginning to educate children early in their understanding of being a positive environmental participant is because this early education provides the child with a head-start and the confidence to participate during the years of their formal education. In a quote from Akey's (2006) paper "School context, Student attitudes and behaviour, and academic achievement" she states; "[...] the influence of educational context on engagement is partially mediated by psychological beliefs about competence and control." The paper continues on to illustrate that children engage more in their learning, thereby having the ability for greater achievement, when the student feels adequate to the task; self-motivated (Akey 2006). Environmental education for sustainable development can be a daunting subject for any student; meeting the needs of a very complex, interconnected discipline can leave students at any age unmotivated and frightened into inaction. Therefore, early environmental education provides children with the ability to enter into their formal education with motivation and excitement: ensuring the children of tomorrow will be prepared and eager for creating an environment of sustainability.

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Appendix
GI Checklist

ELIAS Green Immersion learning
(Draft Version Nov. 09)

Name of Researcher/s | **Child ID** | **L2 Teacher**

Description of General Preschool Setting

Birthday	Sex (m\f)	Observer

For Guidelines on Categories see Sheet 1

Description of Interaction

Date\Time dd\mm\yy	Situation: Location	Situation: Activity	Situation: Materials	GI level progression	Engagement Scale 1	2	3	4	Notes Child's actions\ utterances\attitude	Notes Observers interpretations
				EL						
				DL						
				RL						
				UL						
				EA						
				AC						
0					0	0	0	0		
				EL						
				DL						
				RL						
				UL						
				EA						
				AC						
0					0	0	0	0		

Summary of Progression

GI levels	Average of engagement
EL	#DIV/0!
DL	#DIV/0!
RL	#DIV/0!
UL	#DIV/0!
EA	#DIV/0!
AC	#DIV/0!

Sum of highest engagement	
0	

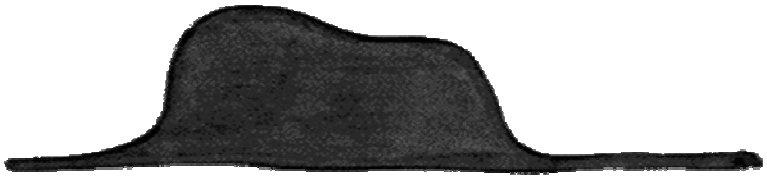
Sum of lowest engagement	
0	

Animal-Supported Environmental Education in a German-English Zoo Preschool

Inge A. Strunz, Shannon Thomas

1. Introduction

When I was six years old, I saw a wonderful picture in a book. The picture was of a huge python which was devouring its prey. Here is a copy of the picture.
The caption in the book said; "The boa devours its entire prey whole. As a result, the boa may remain still for up to six months in order to fully digest its prey."
I thought a lot about this caption and picture [...] and then completed my first coloured pencil drawing; my drawing number 1.
This is how it looked:



I showed everyone my new masterpiece and asked them if my drawing frightened them. They answered me, "Why should we be scared of a hat?"
However, my drawing was not of a hat, my drawing was of a huge python that had eaten an elephant.[1]

As Antoine de Saint Exupéry described a child's fascination with the animal world in the book 'The Little Prince'; likewise, the children of today share the same fascination. It is from this fascination and corresponding contact with animals that children can be motivated to learn something about animals.

Over the last decades there has been a dwindling of young people's interest in nature. Numerous investigations (Brämer 1998, Hammann 2010, Hollstein 2002) have shown that children's knowledge of biodiversity has decreased, and with it their concern for the environment (cf. World Vision child study in 2007). Therefore, it is the responsibility of environmental and zoo educators to counteract these trends. Environmental educators must provide the building blocks for re-establishing a child's environmental sensitivity to nature and animal conservation. This sensitivity is needed in children, because many animals are facing extinction. With an increase in environmental education "the loss of planet biodiversity can be stopped, only if we confront this knowledge depletion." (Academy for Nature and Environmental Conservation, Baden-Württem-

1 Taken from "Der kleine Prinz" by Antoine de Saint-Exupéry (1999, translation by the authors).

Fig. 1: A morning circle with a boa constrictor in the *Zoo-Kindergarten*, Magdeburg

berg, 2010) The impact of this need has led to a partial implementation of environmental education for sustainable development (cf. the Brochure from the programme Transfer-21: 8f.) in elementary schools. The earlier children learn how they are responsible for their actions regarding nature and the environmental, the longer they will preserve this role in themselves.

Situated in Magdeburg's Vogelgesang Park, the zoo preschool brings children in contact with animals. An important goal of the educators in the preschool is to awake the children's interest in their natural environment and "life knowledge," as well to have children actively engage in environmental, naturalistic and animal conservation. The zoo educators make is possible for the preschool children to have personal contact (safely) with the animals from the zoo: primates, insects, reptiles, amphibians, etc.

These animal-supported activities in the zoo preschool are innovative in their contribution to environmental education. As a result, these activities were the focus of the research study. In fact, environmental education for sustainable development is a global concern; therefore, data such as this study assists in establishing early education programmes.

In addition, the aim of this research study was to generate criteria for the creation of learning-conductive educational situations which support early learning while using the medium of animals.

2. Method

The significance and the effectiveness of animal-supported work was analysed and described within this study, in which the parents' considerations of their children's participation were considered. The criterion for the interviewed parents was that they had to have a child attending the preschool for a minimum of six months. The parents were interviewed with a standardised questionnaire. This questionnaire provided the basics of age, gender of the child, etc. It also enquired into whether or not the family had an animal in the household. The principle aim of the questionnaire was to determine the children's reactions to the animal-supported education; i.e. the influence and impact these activities had on the children (Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit 2009: 25ff., Vernooij & Schneider 2008: 110f.).

Altogether there were 11 families which answered from the 19 questioned. The answers were obtained regarding 6 of the girls and 5 of the boys attending the preschool. Of the 11 responses, 7 were from the Cat House group of children, the five to six year olds. The remaining four responses were from the younger group of children at four years of age.

Child ID	**Sex**	**Date of Birth**	
Insert anonymous number of child (preschool, number)	1: female 2: male	dd.mm.yyyy	Day of entry to preschool
MD-001	1	18.05.2005	01.08.08
MD-002	2	29.05.2004	24.08.08
MD-003	2	20.05.2005	01.04.09
MD-004	1	23.08.2004	15.11.08
MD-005	1	27.07.2004	02.03.09
MD-006	2	03.08.2005	04.08.08
MD-007	1	09.09.2005	01.09.08
MD-008	1	27.07.2004	02.03.09
MD-009	2	13.07.2005	01.09.08
MD-010	2	16.03.2006	01.08.08
MD-011	1	26.05.2005	01.11.08
MD-013	1	23.09.2003	01.08.08
MD-014	1	03.08.2003	01.08.08
MD-015	1	02.11.2004	01.08.08
MD-016	1	08.05.2006	01.03.09
MD-017	2	19.03.2006	01.01.09
MD-018	1	19.01.2006	01.08.08
MD-021	1	23.10.2004	01.08.09
MD-022	2	26.09.2006	05.08.09

Tab. 1: Total number of children, n = 19 (12 girls and 6 boys); Cat House Group: n = 13 (group of 5 to 6 year-olds, white cells), Bee Hive Group: n = 6 (group of 3 to 4-year-olds, grey cells)

Moreover, the study conducted structured telephone interviews with the educators of the zoo preschool to determine the point of view of the educators concerning the animal-supported activities and the children's growth and development throughout the programme. All of the interviews were transcribed according to Mayring ([7]2000), an interpretive analysis method (cf. Bortz & Döring [2]1995: 307).

3. Results

3.1 Attitudes regarding household pets

Below is a partial representation, detailing that in most households (7 of 11), at the time of questioning, there was no household pet present.

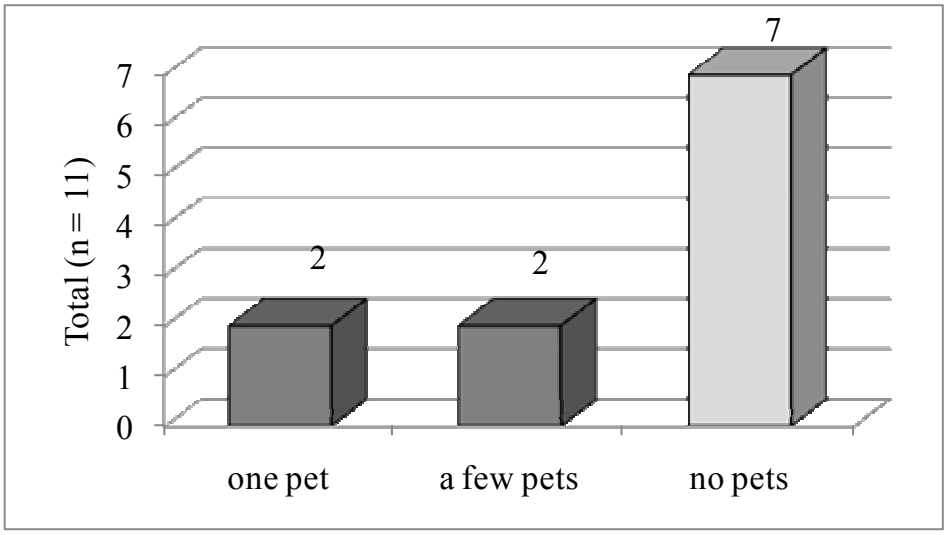


Fig. 2: Number of families with household pets

Perhaps because of the lack of animals in the home, many of the interviewed parents (n = 8) expressed a wish for their child to grow up with the possibilities of gaining animal knowledge through the visits to the zoo in the zoo preschool. As one of the parents put it: "Only those who know animals can respect animals!"

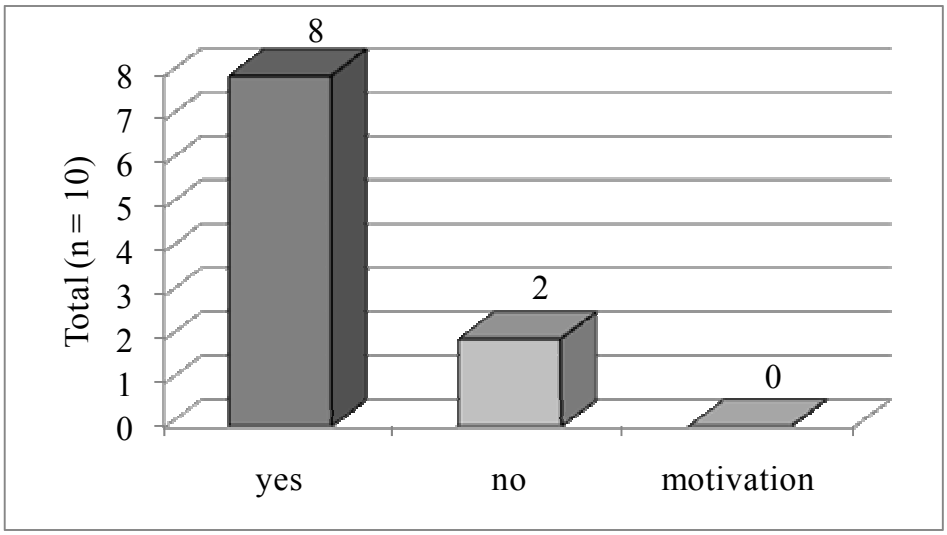


Fig. 3: "It is important to me that my child attends a preschool in which animals play a predominant role."

3.2 Subjective account of animals

Studies have shown that, by three years of age, there is a decided decrease in a child's fear of unknown animals (Gebhard 1994). Around the age of four years, children exhibit an active interest in animals, particularly if these encounters elicit predominately positive emotions (Berck [2]2001, Vernooij & Schneider 2001). Gradually, a child's

wish to be in contact with animals grows; to play with an animal, to touch an animal (Zemanek 1992). The surveyed parents confirm this growth, as seen in the following graphic:

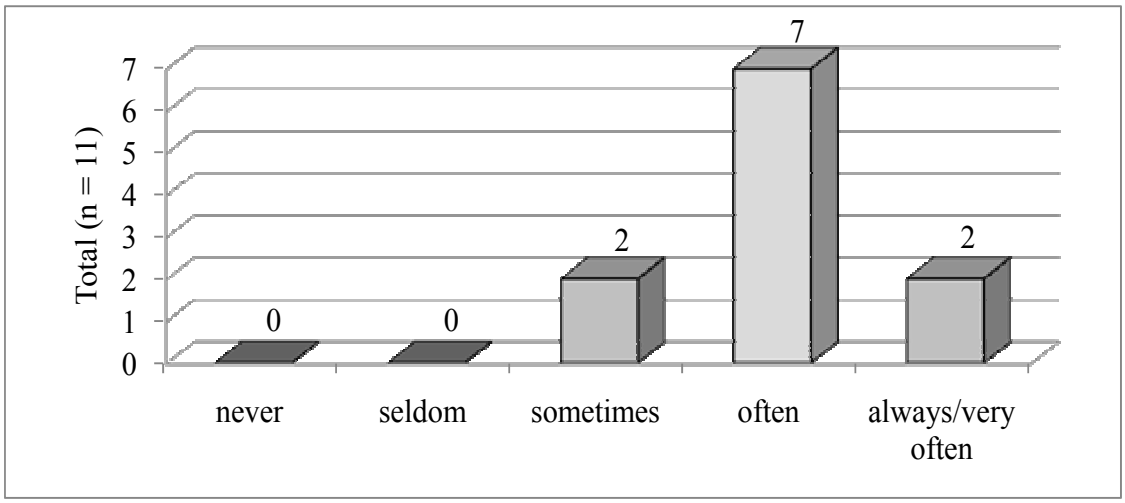


Fig. 4: "My child seeks contact with animals."

Shown above, the majority (n = 7) indicate that their son or daughter often enjoys animal contact in the zoo:

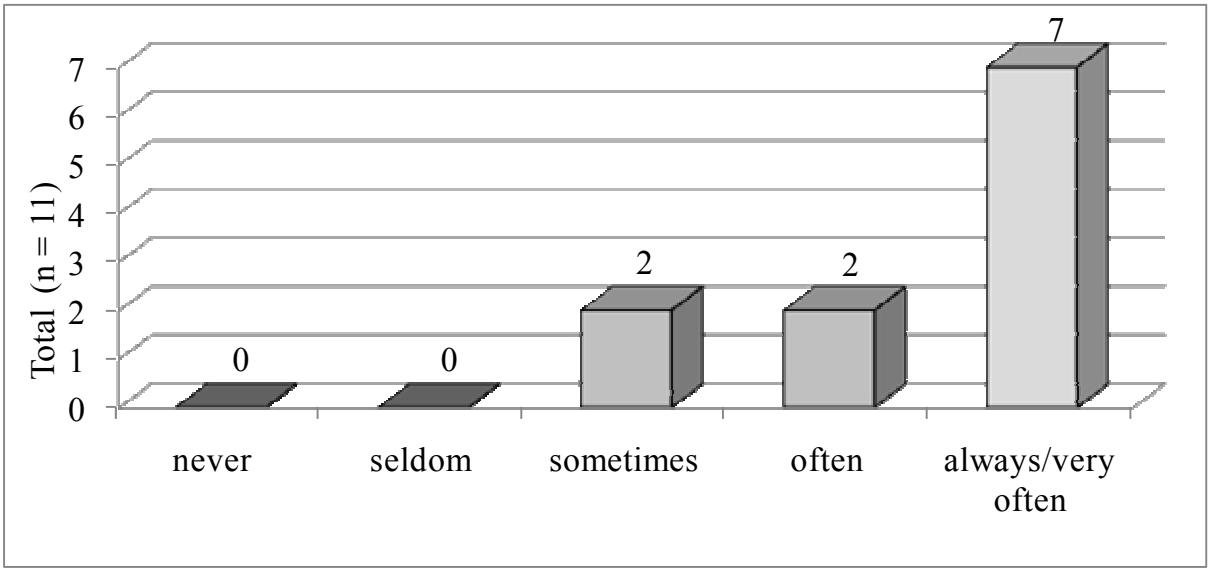


Fig. 5: "My child enjoys interacting with the animals in the zoo."

However, animals can also produce a negative reaction (i.e.: fear, disgust, etc.) in an individual (Gebauer & Nobuyuki 2005). Such was revealed with the children in the preschool, concerning the differences between girls and boys and their first contact with animals. For example, when encountering a harmless squirrel or a small spider some children already exhibit panic. Below is such a situation:

Quote 1/15: One boy, when he was new to the preschool was scared of spiders. He was so scared that he would not even go into the toilet if a spider was there. His reaction would be to cry. He was terrified of spiders. Now, we can bring out a tarantula and he is fine, because he has learned about what a spider is and his fear is gone.

3.3 Child's respect for nature

In addition to cultural interpretation patterns, the children's individual values towards the contemporary world are formed on the basis of their biographical experiences (Gebauer & Nobuyuki 2005, Hüther 2005). According to Gebauer & Nobuyuki (2005) basing a nature concept on a negative experience, or on a learning sphere poor in execution and poor in formation, can also affect the attitudes of children. Similarly, the personality of a child affects the attitude of the child; such as, if the child is more or less interested in animals and plants, or if the child has had a successful animal interaction. These attitude differences between children can be seen in the examples below:

Quote 1/24: I think most of the children are similar. Those that differ can be seen as having a different personality. [...] If the child is quiet, then he or she tends to be quiet around animals, and perhaps they don't like to touch animals. Also, they might not like to play. They are just very quiet. But, if the child is outgoing, then they play with animals more; they enjoy the activities. Outgoing children engage with animals a lot more and so, yeah, some of it depends on the personality and not always the cultural or the social setting.

Quote 3/9: ... We have one or two children in the preschool where I know the parents are sensitive, and that noticeably transfers to the child. As an example, when two particular children encounter a spider or a worm they do not want it close to them; this, of course, is rather the exception. Most of the children have no reservations, and those who do, have so because it is through the influence of the parents' behaviour at home. When looking at both the parents and the children it can be realised that the children copy the parents.

3.4 Emotion and cognition

It is the responsibility of zoo educators to reduce the unjustified fears towards the "bad" animals; for instance, the negative attitudes towards animals with a reputation of being slimy or gross (eg. snakes). By teaching age-appropriate information regarding these animals and their lifestyle, these fears towards the "bad" animals can be diminished. Through the use of close (safe) contact with animals, children can modify their existing negative attitudes and behaviour patterns. A consequence of a programme following this criterion can be a cognitive revaluation, which enables and renews behaviour patterns.

The integration of animals in early-childhood environmental education (or 'education for sustainable development')[2] becomes an important tool in the education of a child's

2 Hauenschild & Bolscho ([3]2009: 23f) see the development of environmental education over time as the basis for today's concept of "Education for Sustainable Development."

respect for nature. This tool enables children to experience their natural and social environment in a subjective and emotionally rich sense (Langenhorst 2005).

> Experiences with animals and plants can engage children in a very special way. To hear a gibbon sing or watch a garden grow can elicit strong emotional ties that last a lifetime (Children's House e.V. 2009).

Additionally, the results from the research group Thomas et al. (this volume) support the concept of direct natural encounters which effectively open an emotional passage into learning. This support and the data obtained can be an essential motivational factor for continued learning in the area of environmental education.

The girls and boys at the zoo learn about a multitude of domestic and exotic animals, and experience these activities with their full senses; with their head, their heart and their hands. The children involved in this programme profit in the long-term from the natural education concept this preschool envisions. It is the close relationship of emotion and cognition (cf. Spitzer & Herschkowitz, n.d.) which counteracts the irrelevance of mankind and the natural world, and motivates mankind to live in balance with nature – between man and his natural sphere. Winkel (1995: 14) describes this as follows:

> [...] the behaviour of a person is dependent upon only a fraction of his knowledge. [It] concerns the values, norms, conscience, ethics, and morality of the respective person. Of course the person also develops not without knowledge, but in action and forbearance. In protection and preservation, everybody is steered rather by feelings than from the head; how one once illustrated, from the heart, instead of as from the mind [Winkel 1995: 14, translation is mine].

3.5 Animals as the 'co-educator'

The disposition of a person is fixed in the development of that person, and a connection to the animal world can build upon that disposition, and can be emotionally appealing to that person (Olbrich 2003, Wilson 1984). According to Meves & Illies (1981), a "[...] normal consequence of a person's ability to love and connect"[3] is fixed in their development. A trusted relationship established between child and animal (e.g., feeding goats in the petting zoo) can encourage endurance, calmness and patience in a child. Whereas, children who participate in hasty and inconsiderate animal interactions can experience a time of antagonistic interactions, instead of the positive experiences which are essential for growth. Also, animals can play the role of a "co-educator," since they require that a child contemplates, empathises with and is careful around the animal (Meves & Illies 1981, Pollack 2009). These attitudes are what the educators in the Bee Hive and the Cat House emphasise in the children towards the animals. The following diagram describes this:

3 Beetz (2003) sees a possible explanation for the construction of human-animal relations in a person's ability to form relationships.

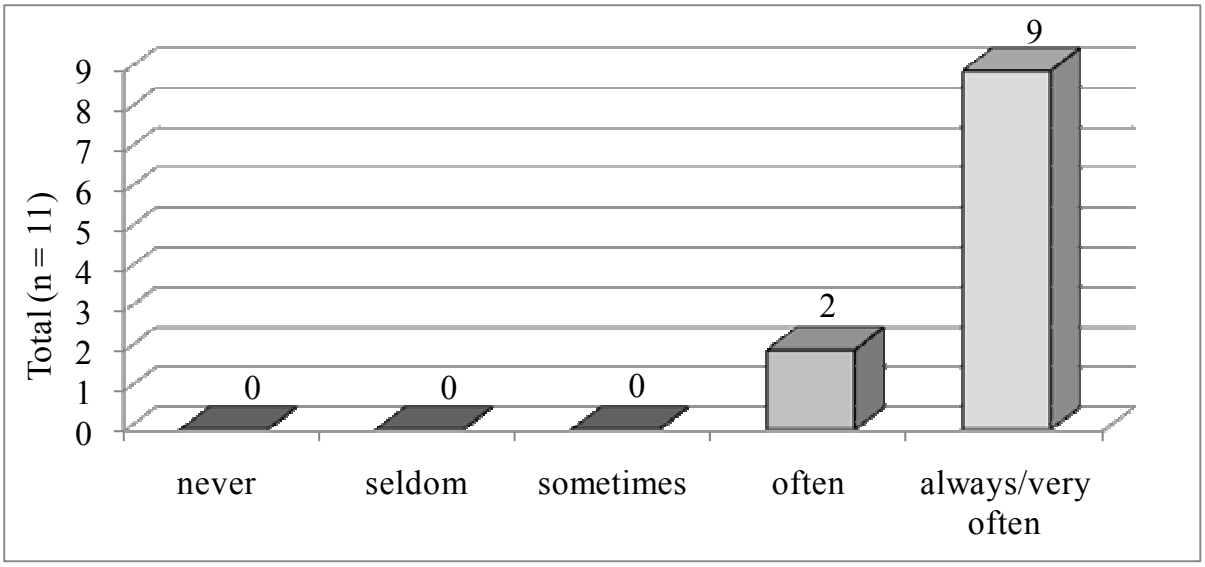


Fig. 6: "In the preschool, my child is motivated to be considerate (respectful) towards animals."

3.6 Child's respect for animals

Frequent visits to a variety of animals in the zoo, as well as conducting "in-class" animal-related activities, make it possible for the children in the preschool to gain new animal knowledge and build a relationship with "their animals." One of the interview partners who took part in the survey describes this as follows:

> **Quote 3/29**: Yes, first of all, they can build a relationship, of course. Yes, not merely know dogs, cats and guinea pigs, but [the children] can also build a relationship with other animals. [...] and in my personal opinion [the children] naturally develop a love for animals. Since they are able to see giraffes several times throughout the year, a relationship develops there as well. Also, they obtain an understanding of animal names and can talk with me about what they are called. So, what is created between the children and animals is something personal to them.

3.7 Language acquisition

Of course not only are the human-given names of the animals, such as "Nelly" and "Dirk" – two of the zoo's giraffes that are the favourite animals from the Bee Hive group and Cat House group – memorised by the children from the preschool, but real names are discussed by the children as well. Figure 7 illustrates the answers from the parents regarding this subject:

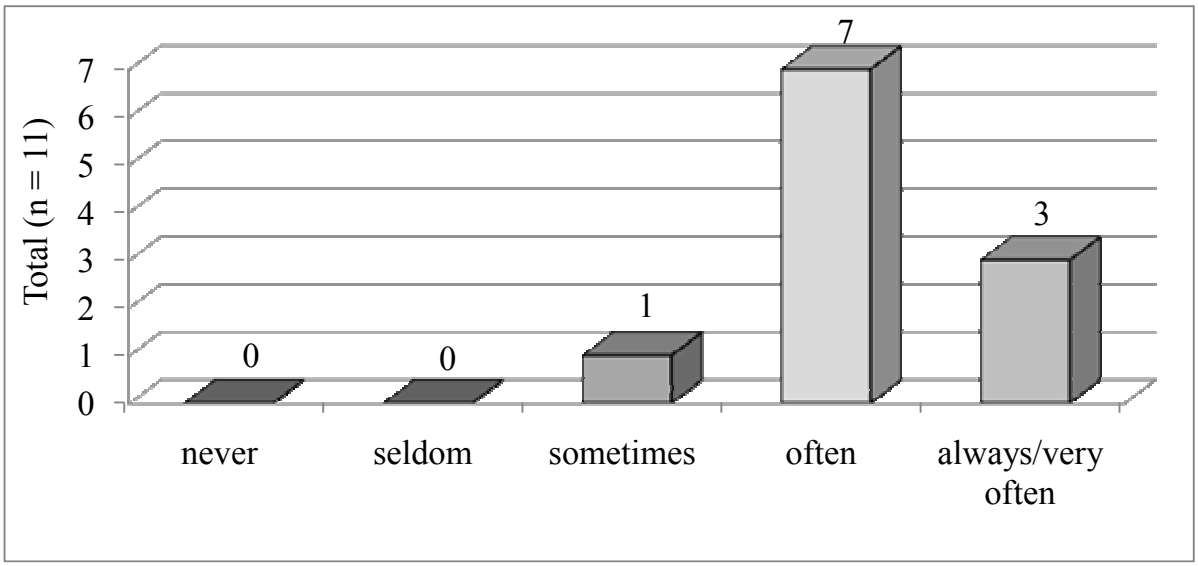


Fig. 7: "My child knows the names of animals."

The majority of the girls and boys are already able to correctly name various animal species, that is to say that they know correct animal vocabulary:

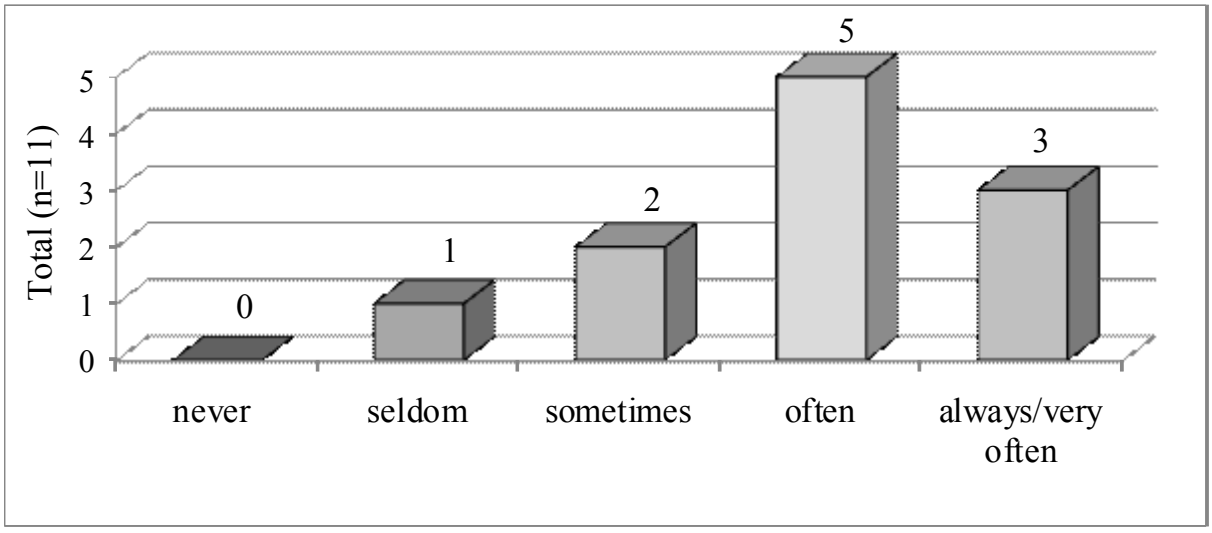


Fig. 8: "My child is able to name the various animal species."

Many preschool children speak about animals with their parents (n = 7 out of 11), and also speak about their animal and zoo experiences with friends:

Fig. 9: "My child enjoys talking about his/her experiences with animals."

3.8 Sensory training

Children use a lot of variation to discern and experience their surrounding environment.

> The emotions of an observer, such as amazement, wonder and fascination, as well as multisensory cognition of events awakens the interest to experience more and to know more. Posing questions about the 'unknown' and having an inner connection and sympathy also facilitate interest. (Weiser 1999: 41, translation is mine)

The zoo in Magdeburg is a place to encounter and experience. While invited to experience, discover and investigate the world around them, the children are supported as well, in the sharpening and training of their senses:

> **Quote 1/7**: I want the children to experience nature and the zoo with all five senses. To experience by touch, sight, sound, smell and maybe taste. So that children really begin to emotionally connect with and appreciate an animal or nature.

Results from neuroscience and research on the mental lexicon show that concrete sensory perception supports the acquisition of lexical concepts:

> Concepts can be reduced if during the learning process there was an absence of alternatives, such as experiencing sound, sight, smell and touch of an object. The knowledge remains unemotional/unreal and a person is unable to develop a full concept of that part of their environment. (Kiefer 2008, translation is mine)

Providing alternative stimulus while teaching a child can provide a richer learning environment, ensuring favourable growth.

3.9 Cognition

Not all animals in a zoo are harmless and can be touched by the children. Hence, untouchable animals are observed by attentively listening and watching. Through this process of guided learning, the children discover the unknown. The children can observe the social interactions of an animal family, or rather an entire animal colony, and develop in themselves a natural behaviour and manner in their interactions resulting from these observations of various animals. One interview partner describes an example of one such learning situation:

> **Quote 1/12**: We cannot touch a lion. We cannot play with a lion, but we can watch a lion. So we learn how to experience a lion by watching. [...] When a child looks and watches, observing the animal, they can see how that animal interacts with other animals, and in that instance the children observe social competence. The children see; 'oh, that monkey is playing with this other monkey and they are being nice to each other. But then this monkey gets angry and that other monkey doesn't like it'. And so they can see a kind of social competence in animals.

The survey results from this study support the assumption that such cognition training can improve the cognition quality (cf. Vernooij & Schneider 2008: 112). Most of the involved mothers and fathers acknowledged that their child was seen as an 'attentive observer' during the evaluation time of the study:

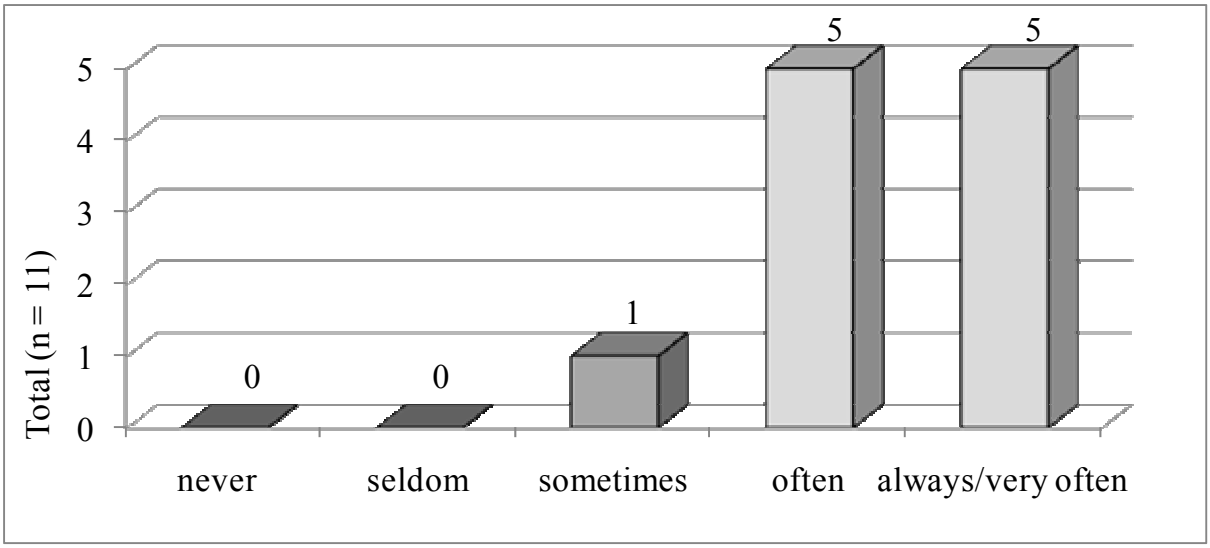


Fig. 10: "My child attentively observes animals."

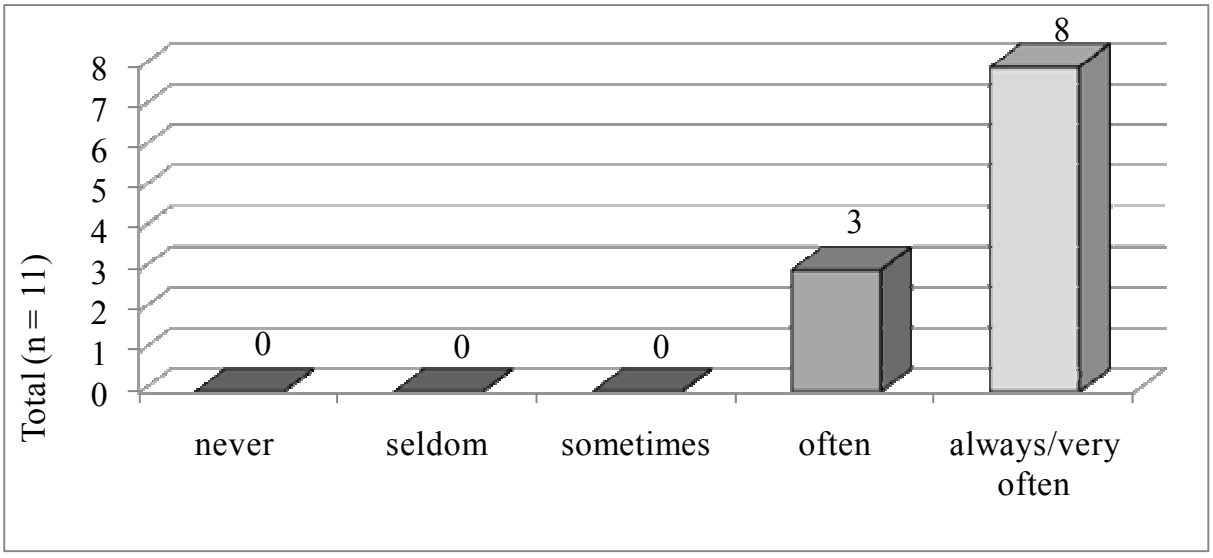


Fig. 11: "My child attentively observes their environment."

3.10 Knowledge acquisition

As the children in the zoo preschool are presented with numerous wonder-inducing environmental activities, there is an increase in their motivation to learn more about those topics. In the children's "morning circles," i.e. the structured morning activities in the zoo preschool, their desire to know more is fulfilled. On Mondays the older children, those in the Cat House, are presented with the biological and ecological activities. On Tuesdays the younger children, those in the Bee Hive, have their session. An interview partner explains the function of these groups in the following quote:

> **Quote 3/29**: The children participate in various animal-related topics in the morning circle and learn about those animals during that time. That means, during the morning circle the children discuss the animal of that week's zoo visit. The children discuss the background of that animal; what the animal eats, where the animal lives, what the animal looks like, and how they reproduce. Then on another day after that morning circle the children have an 'up-close' contact with that animal during the corresponding zoo visit. [...] And so the children receive, naturally, more background knowledge, than a child who only comes once a year to the zoo. A child that goes once a year to the zoo, will go through the zoo and find the animals amazing, but that child might not know the behaviour of a monkey, what a giraffe eats or from which land the animals come from. Thus, the children in the preschool get a lot more knowledge and experience than a normal zoo visitor may receive.

Interestingly, parents and individuals can find animal-related films on the internet (even on such readily accessible websites as youtube) which have a target audience as young as two years old; however these films are "second-hand experiences" (Rolff & Zimmermann 1990) and are no substitute for real animal experiences (Bauer 2009, Kiefer 2008, Langenhorst 2005). Learning does not actually take place via the media; instead only in direct contact with living creatures can an individual's joy, curiosity, esteem and empathy develop. As these traits solidify, so does an individual's sense of

responsibility for all creatures gradually develop (cf. Berck 2001, Meves & Illies 1981, Insensee 2008). The following excerpt is a quote from an interviewed educator:

> **Quote 2/4**: As for myself, when the children come to the zoo, they can pet the animals and feed them; [There are times] the children's eyes get as large as saucers. As the children are in the zoo their enthusiasm is really awakened, or so I think. Yes, − [more information, but not understandable] ...that is a full experience. Once – what was then the last time – there were these donkeys, small animals, llamas and so on, and the children could feed them, for example. Recently, the children have also fed the birds outside. Yes, as well as, they listen to the birds, not in the zoo, but we have, yeah, also a birdhouse outside. Yeah. Where the children can watch and observe.

3.11 Creation of the learning environment

The combination of innovative teaching and learning materials (animal training, photos, picture books, films, animal figurines, games, experiments, crafts, etc.) in the zoo serves to provide a deeper understanding and learning experience, as well as to help provide answers to any other questions posed during the learning time. (A more in depth insight as to the effectiveness of these different teaching methods and learning materials for the six levels of Green Immersion, is found with Thomas et al., this volume.) Furthermore, specific knowledge is provided through the 'behind-the-scenes' visits in the zoo. Zoo workers, such as the zoo keepers, help to provide this specific information on how the animals are handled and how they are cared for. Also, the programme includes relevant environmental topics on climate protection, environmental protection and species protection, all of which help to keep the programme current. The authoritative didactic principles regarding action and experience orientation which concern this particular situation are supported in these interview quotes:

> **Quote 3/20**: [...] that's how it was with the compost. And I found it very interesting that decomposition was really explained; that the different layers of a compost were really visible to the children. Also, that the activity allowed us to copy a compost in a very interesting approach. So, the activity provided the opportunity for the children to learn by copying a real compost. And that has, as I find it personally, a very lasting impression. And the children found it really amazing.

> **Quote 1/29**: The programme is appropriate for the children's learning abilities, because the children learn and experience in the preschool first, [...] and then they come into the zoo and they can really see what they learned, which a lot of other preschools cannot do. So other preschool programmes only learn about chimpanzees in the preschool, they watch videos and they look at pictures. Yes, the zoo preschool children can do the same, but then the next day they can come into the zoo and see the chimpanzee and hear it, really hear it, such as when the chimpanzee screams, or when the chimpanzee bangs on the glass. The children can really connect with the chimpanzees. So the closeness to the zoo is so important for the preschool. It really helps the children understand nature and animals.

3.12 Action orientation

All environmental activities are age-appropriate, in such that the themes should be interesting and enjoyable for children. Here are examples of various themes:

- animal habitats and their preservation
- biomes concerning water, air and soil (preservation and use)
- vegetation zones through the world (forests, deserts, savannahs) (cf. Children's House e.V. 2009)

In accordance with the concentration abilities and interest of the girls and boys, these environmental activities range from one to two hours.

As the answers from the surveyed parents exhibited, the children's interest in animals seems to awaken with the use of age-appropriate materials (9 affirmative answers). Depicted below, the survey showed that the children engaged well with materials such as animal videos, picture books, etc.:

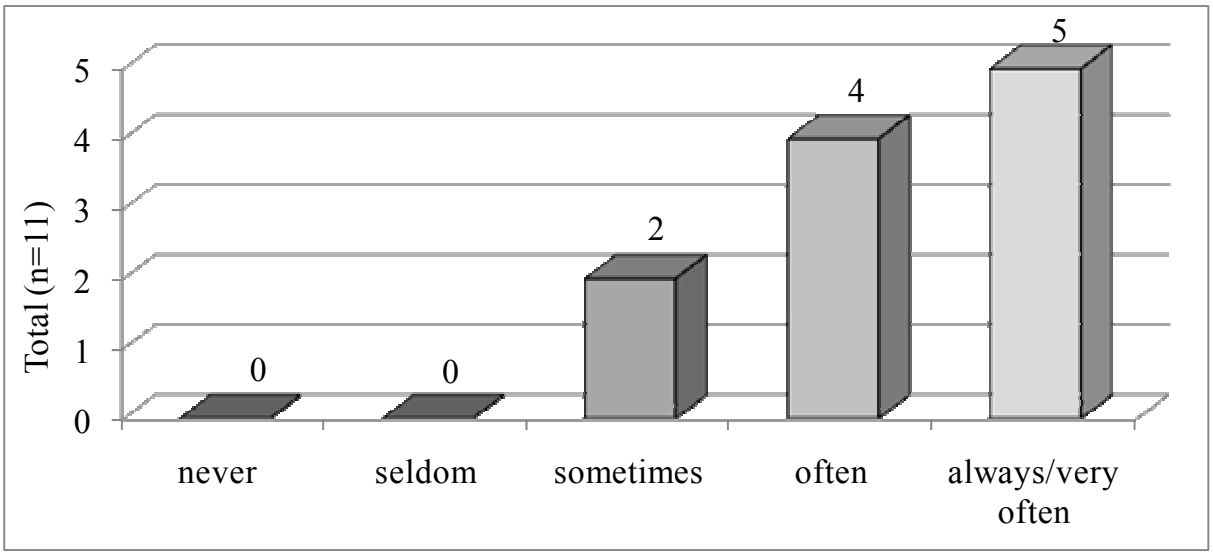


Fig. 12: "My child watches animal films or looks at animal picture books."

However, according to the surveyed parents, making animal crafts and drawing animals are far less interesting for the children, as seen in the following diagram:

Fig. 13: "My child does animal crafts or colours/draws animal pictures."

In Janßen's (1988) model the understanding process begins with emotionally experiencing nature, which is the basis for developing a deeper environmental awareness. The Green Immersion concept follows the basis of this model:

> Following this model, the Green Immersion activities in the zoo preschool are based on a six-stage process of environmental learning. The initial stage of Green Immersion introduces an environmental concept to the children and invites the children to connect with that concept on an emotional level. The second and third stages of Green Immersion are highly factual stages, encouraging the children to describe what they have observed and to reiterate the new information. The following stage, knowledge transfer, is when there is a cognitive recognition of the links between similar environmental concepts. [...] The final two stages of environmental learning, becoming environmentally aware and 'Action Competence', are supported at the zoo preschool, but not yet heavily emphasised for such young children" (ELIAS Early Language and Intercultural Acquisition Studies (2008). Progress report. Public Part. University of Magdeburg).

The framework of the Green Immersion research project by Thomas et al. (this volume) encompasses data documenting that the children attending the zoo show development to the level of being able to operate at the 'factual level' (cf. Janßen 1988). The survey reflects these findings; seven of the eleven surveyed parents answered that their child is able to answer questions regarding the animals in the zoo, as Figure 14 points out:

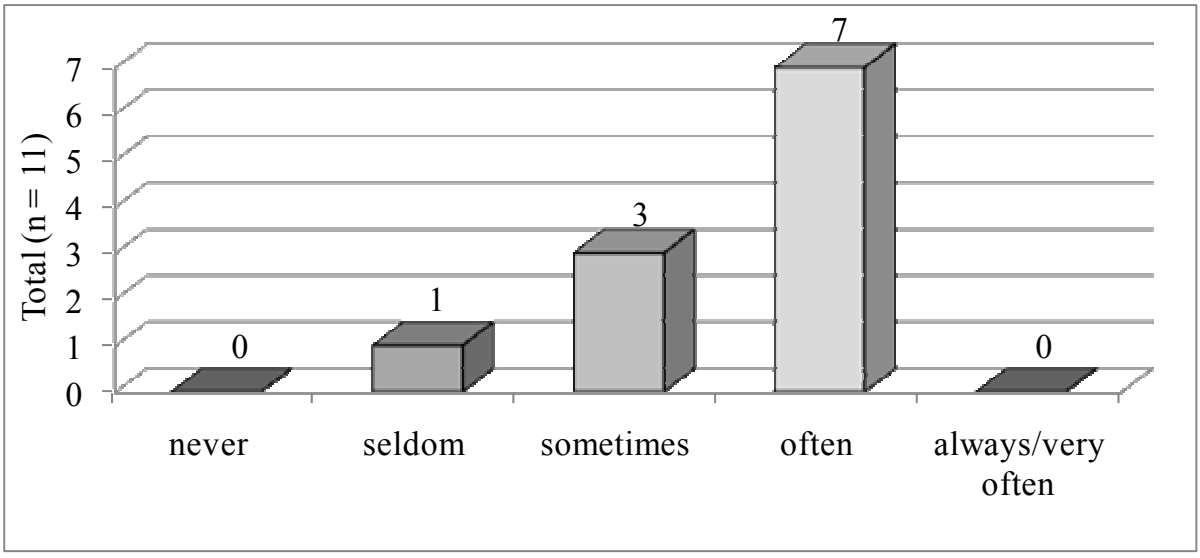


Fig. 14: "My child correctly answers questions regarding animal species."

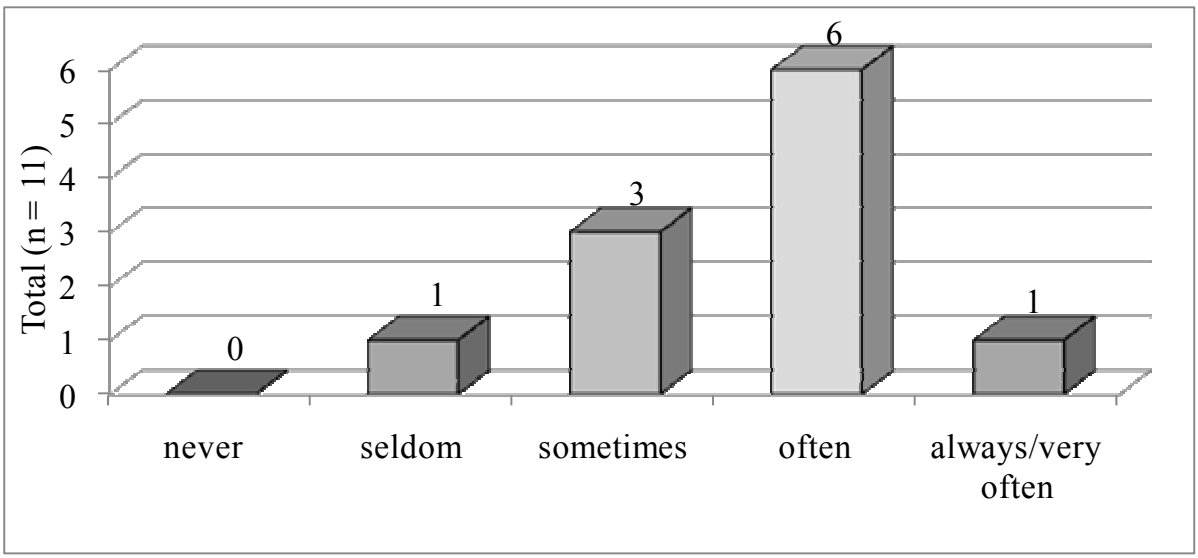


Fig. 15: "My child can answer questions regarding the zoo animal's care and mode of life."

3.13 Review of the model

To be able to learn how to respectfully interact with living creatures a child needs a role model who provides them with insight on proper responsible interactions. This role model is the example of naturalistic enthusiasm and animal protection which a child can emulate (Hüther 2005, Meves & Illies 1981, Pollack 2009, Zemanek 1992). Neurobiologically, it is natural for an individual to follow the example of a role model; and in the same way, the formation of empathetic feelings in social situations is a result of the effect from reflecting neurons (Bauer [4]2006, Hüther [2]2009). The cooperation between mentor and student provides an opportunity for overcoming the loss of knowledge between the different generations. The mentors, those who are older, can

provide children with their knowledge of plants and animals, their ideas about those topics and their practical abilities in working with plants and animals.

3.14 Transference benefits

It is through this bond that children can actively participate in knowledge acquisition and personally transfer that knowledge to themselves. That successful transfer of knowledge is learned in the preschool and is transferred to new applicable situations, as the following interview answer exemplifies:

> **Quote 1/52**: Yes, I can give you an example. There are many ladybugs here in the preschool and before the activities many children would take the ladybugs and carry them in their hands and play with it, or smash it and kill it. And, ah, which is not a good thing. We had an activity with ladybugs concerning how to build a ladybug home, what ladybugs are like, what do they eat, etc. Ladybugs like plants in their home. They like flowers. As a group in the preschool we built a ladybug home. And maybe three weeks after the activity a little girl came and said; 'Look, look! I have a ladybug.' I replied; 'Oh, where did you get the ladybug from?' She said; 'In my house there are ladybugs.' While at home she built a whole ladybug house with plants and flowers and everything that a ladybug needs, then found a ladybug and put the ladybug in it. And that's really cool to see her go from killing ladybugs to learning and keeping ladybugs.

3.15 Competence acquisition

The years of early childhood is best used for establishing an understanding of responsible human-nature relationships and from there to build the basis for continuing responsible environmental sustainability (Brämer 2006, Gräsel 1998, Stoltenberg 2008a). Through the personal exploration, playful investigation, and personal adaption to the world will congruent future key competences develop. These key competences enable responsible actions (age-appropriate) concerning nature and the environment (Hauenschild & Bolscho [3]2009, Children's House e.V. 2009: 20, Stoltenberg 2008b). Interacting with animals can support the cognitive, emotional and social development in children. Within these areas there is the basic acquisition of life competences, which are fundamental for the continuation of modelled thinking and actions.

3.16 Empathy / Sociability

Empirical studies document that the presence of animals is not only positive for constructing cooperative and communicative processes in groups, but also social-emotional learning processes can be similarly motivated (Neitzel 2003, Otterstedt 2007, Vernooij & Schneider 2008).

> As children learn the differences between living organisms, they can gradually put their 'egocentric' position into perspective. This perspective encourages their emotional and social development (Frick Tanner in Turner 2003, Poresky 1990 in Gebhardt 1994).

Furthering the education of responsible knowledge/understanding is another by-product of learning in the presence of animals. The results from the survey conducted in the Magdeburg zoo preschool supports these presumptions, such as in the following statements from the interviews:

> **Quote 2/24:** So, I would sometimes say, what the children learn if they handle animals, is most importantly this mutual thoughtfulness.

Also:

> **Quote 3/39**: [...] Well, I think empathy, well these are now the things that I think, yes I would say so. Obviously. Because when you observe animals and you observe or see that sometimes an animal is hurt or makes noises, then it helps in that way, already, in that way that the children build a relationship – empathy.

The above statements support the assumption that those education programmes which supply children-animal interaction possibilities positively support the development of competences in children. In addition, the surveyed parents also ascertained that their children begin to understand the needs of living creatures within their environment, such as is shown below:

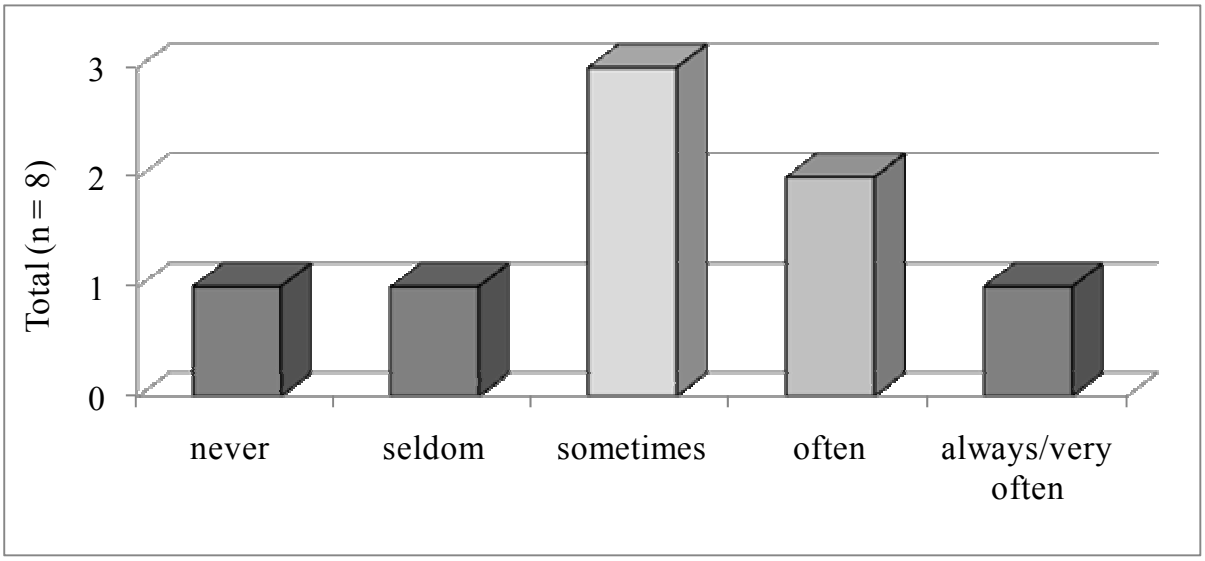


Fig. 16: "My child enjoys caring for other forms of life."

3.17 Self-perception

Contact with animals can heighten a child's self-awareness, so that their self-awareness increases. The comparison of animals and man provides information about the entire body, the behaviour patterns specific to a species, and (limited human) abilities. Quotes 1/34 and 1/70 clarify this:

> **Quote 1/34**: Ahm, animals help the children to understand themselves. When a child looks and watches or observes an animal, they can see how the animal interacts with the other animals, and the children see 'social competence'. The children see: 'Oh, that monkey is playing with this other monkey and they are being nice to each other. But then the first monkey gets angry and the sec-

ond monkey doesn't like it. So the children see social competences in animals, and then they can apply that to themselves. Also, animals can help children to become aware of their body, in that observing how an animal moves. Sometimes animals swim or jump and the children can look at those actions and question; How do the animals do that? Then the children look to their own bodies and they try and swim like a fish or jump like a kangaroo. So animals – yes – are environmental education, but they also help to teach the children a little bit about themselves.

Quote 1/70: [...] An example is: The older children who have been in the preschool for one and a half years went on a zoo visit with me, to visit the chimpanzees. Our two chimpanzees were frightened and – because the zoo keeper was not there – were jumping on the glass. They were screaming, running around and were very loud. That is even scary for me. But the children, as we have taught them over the last year to stay silent, remained silent and watched, it was o.k. Just as children cry, scream and run around, chimpanzees cry, scream and run around. Then, once the chimpanzees were calm again, the children had lots of questions: 'Why did they do that?' The children were really interested and asked; 'Why did the chimpanzees scream?' I replied 'Well, the chimpanzees were scared.' [...] One girl replied, 'Oh, I get very scared when my mom is not here.' So the children really connected with that experience. They thought; 'Chimpanzees can cry and I can cry.' That was a very good learning experience for the children.

3.18 Language / communication

Animals can also provide a variety of learning topics. In regards to the relationship of 'language / communication', the educators (see quotes 2/9 and 3/43) and parents (8 of 11 surveyed) surveyed stated that through animals the positive language of the children will be awakened and even the youngest of them will be motivated to speak about their experiences.

The question of whether or not the children spoke with their parents about their experiences with animals was recorded as being positively surveyed. The following two quotes are examples of this:

Quote 2/9: Yes, of course even the little ones who actually are a little more shy and do not speak, even they excitedly told their parents of what wonderful things we have done. Often there is an action plan or a weekly plan for the parents to see and later question their children about their experiences in the zoo. Also, it appears that the children begin to speak about their experiences as well.

Quote 3/43: Yes, every instance. The children talk about the zoo visits. They speak about the animals as well. The parents are of course interested and ask questions and we often have [...] notices where the parents can look at the photos taken during the zoo visits about what the children did and where they went.

The answers of the parents – with 8 of 11 scoring – point in this direction as well:

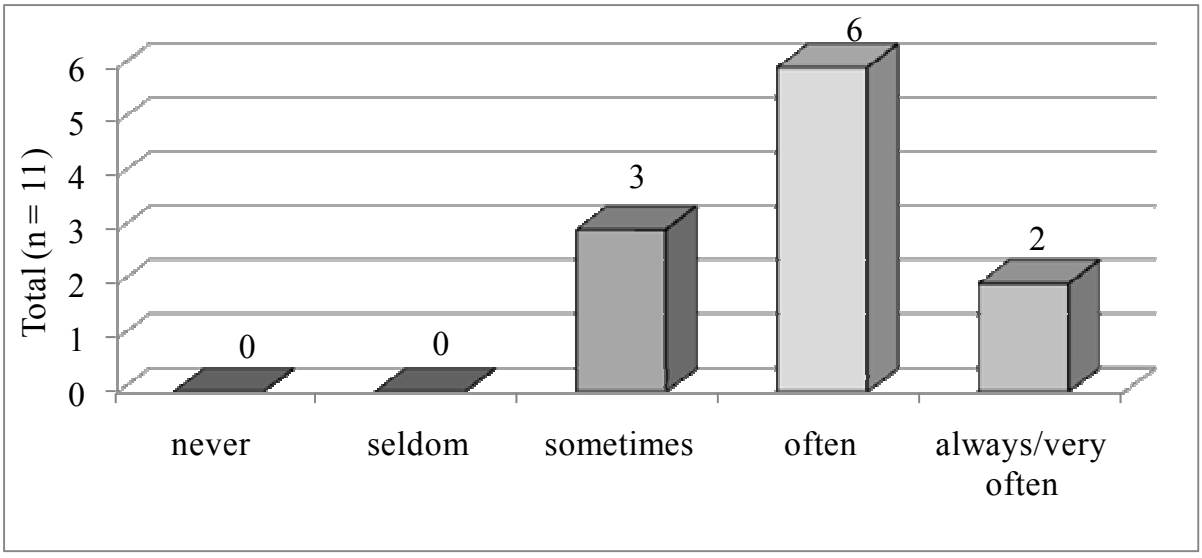


Fig. 17: "My child talks about animals."

The surveyed parents indicated that their children enjoy speaking with animals (score of 8):

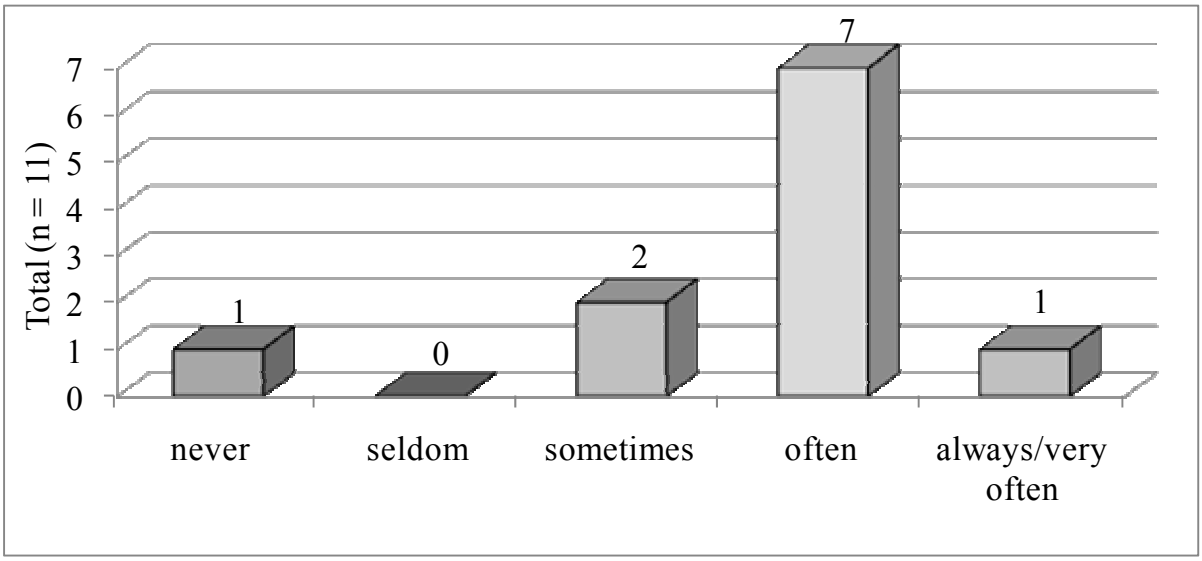


Fig. 18: "My child talks with animals."

The comprehension of the animal world in the educational material of the educational organisations reflect that not only are they beneficial, but they help to reform the environmental educational processes. Animal-supported educational concepts provide the needed input for the personal development of growing individuals.

> **Quote 1/70**: The children see and they learn. And over the last, well since September 2008, they have grown extremely or actually grown enormously [...] with their contact to animals.

4. Conclusion

The knowledge attained within the scope of the ELIAS project regarding "how small children discover their conscientiousness of the animal world and our environment" (Kersten 2009), depicts an original approach to zoo education theory. Children exhibit an interest for animals, as with also the children from the Bee Hive and Cat House groups in the Magdeburg preschool (cf. Figure 6).

The real contact with animals is presumably an essential motivation factor for the acquisition of the basic competences, which is the basis for the lasting impressions and actions. Animals assume the role of 'mediator' during those situations as a child begins to establish their respect for nature. This 'mediator' role assists the children in their learning, and possibly supports the development of their communicative abilities (cf. Children's House 2009: 15). The results from this study provides knowledge which details for example, that majority of the children enjoy their experiences with the animals, as indicated in the answers provided by the parents and educators (cf. Figures 10, 17).

Through the educational work with zoo animals, an important approach regarding animal observation was found (cf. Weiser 1999: 41). The attained results indicated that the observational quality of children may be increased through guided and deliberate observations (cf. Figures 11, 12).

Learning with animals accounted for the social environment of the children and can, through specific themes, educational materials and media, systematically extend and deepen that experience. This deeper understanding provides the stepping stone for ensuring lasting knowledge acquisition in the later stages of education. Nevertheless, educational institutions must provide opportunities for the children to learn, experience and create. These opportunities guarantee that adolescents can establish themselves as competent and responsible (co) creators of the social environment, and can also develop key competences relevant for the future (Hauenschild & Bolscho [3]2009: 116, Hüther 2005: 231; Programm Transfer-21: 3, Stoltenberg 2008b: 4f.).

Regarding the practical work for a similar environmental programme it is sensible to consider the following recommendations:

- the children should be able to have personal contact with animals (safely)
- in addition, activities and educational materials regarding animals and the 'real thing' should be age-appropriate (books, figurines, photos, etc.)[4]
- the learning groups should be small (approx. 10 children)

4 With regards to the EU-research project ELIAS, in cooperation with the first world-wide zoo preschool in Magdeburg, the educational material and educational information can be accessed, downloaded and copied via the ELIAS website: www.elias.bilikita.org

- further animal education can be conducted in other situations (forests, farms, etc.) and can combine outside expert advice (e.g. foresters, farmers) to help teach the children, which all provides a larger learning environment.

If the purpose of an environmental programme such as depicted in this paper is intended for lasting development, the larger environmental picture must be kept in mind. Children are fond of asking questions, and often those questions lead to more complex environmental topics, hence the reason for a wider knowledge of the environment. The zoo preschool in Magdeburg helps to illustrate how a programme like this could be approached, as the following quote clarifies:

> **Quote 1/64**: I have found that when children learn about animals they also begin to ask questions about the larger picture, the entire world. They say, 'Ah, here is a tiger. A tiger is orange, but where does a tiger live? Okay, look the tiger lives here. What is here?' Then the children want to know more and more. So for a new preschool: Don't be scared to teach children about the larger environment. Sometimes environment is not always taught. The children are interested in the whole environmental and not just specifics. They can understand pollution and conservation and natural resources. Our children understand that, and I think that's important too.

The animal-supported education in Germany is still an unexplored/unfamiliar/little-known field (Olbrich & Otterstedt 2003: 11, Vernooij & Schneider 2008: 110). Animals, for many children, are of great importance (Haase 2004: 137, Neitzel 2003: 109; World Vision 2007) and experts suggest that animals used in early education may be of great value to the educational process (incl: v. Hentig 1993: 242, Meves & Illies 1981). Although it has already been determined that the basis for establishing a responsible human-nature relation occurs in the early stages of childhood (Brämer 2006: 166, Gräsel 1998: 80, Stoltenberg 2008a: 50), the validation for this research area is not as sufficient as needed (Adomßent & Rieckmann 2006: 101, Bundesministerium für Bildung und Forschung 2009: 17). In both areas, animal-supported education and human-nature relations, a considerable need exists in the German-speaking area to research these topics more thoroughly. This study provides insight into these topics. In addition, this study indicates the added value of integrating animals into the learning system. Resulting from many families' lacking household pets (possibly on account of smaller living accommodations), an animal-supported education opportunity might be of increasing interest (also: Otterstedt 2007). Within institutions providing animal-supported education, children have the opportunity to experience the living world, and perhaps be led to take responsibility for it.

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Profiles of the ELIAS Preschools[1]

Insa Wippermann, Christine Tiefenthal, Annelie Schober, Lena Gotthardt

1. Introduction

In the ELIAS project, the eleven preschools and two schools[2] came from four European countries (i.e. Belgium, Germany, Sweden and the UK). As this chapter will illustrate, all these institutions differ in terms of their cultural backgrounds, individual daily routines and employ teachers with different linguistic and educational backgrounds. In order to better understand the differences in the L2 outcomes of the children who participated in the project, this chapter provides a general overview of the different preschools which contributed data. Data collection was accomplished with the newly designed *ELIAS Preschool Overview Questionnaire* (ELIAS POQ, see appendix). The data were collected in February 2010 and therefore reflect the settings of the preschools at that time only. However, until the end of the ELIAS project, no major changes in the preschool settings have occurred in any of the institutions.

The *ELIAS POQ* was usually filled out by a representative of each preschool. In some cases, however, the data was collected by a student assistant from the ELIAS project, in other cases by a teacher or the principal of the preschool. The responses are subjective in the sense that these people differ in their degree of familiarity with the institution. In addition, variables such as cultural context or other interpersonal differences may affect the responses given in this questionnaire (cf. Atteslander 2006). However, the majority of the questions on the *ELIAS POQ* are generally aimed at eliciting non-observational data, e.g. statistics best-known by the respective preschool's staff. The following general overviewincludes information on the languages spoken at the institutions as well as on the children, teachers and parents.

2. Background information on the participating preschools

The following section presents differences between the ELIAS preschools in terms of their geographical setting, their language background, opening hours and pedagogical

1 We would like to thank Aafke Buyl, Anna Flyman- Mattson, Barbara Leloux, Sylvia Luft, Svenja Pahl, Rachel Ramsey, Anja Steinlen, Ramona Thierer, Shannon Thomas, Martina Weitz, and many others who helped to gather information and supported us in the writing process with many ideas and fruitful discussions.

2 All partners are considered preschools in their country's educational system, except partner 1b from Belgium and partner 10b from England, which are the primary schools following the preschools 1a and 10a, respectively. In this chapter, the term "preschool" will be used in order to refer to all partners of the ELIAS project (i.e. also the ones which include primary schools as well, where, in the case of Belgium and the UK, the data for the children age 5 and 6 were collected).

approaches. In all preschools the target L2 was English; its development has been assessed in the ELIAS project.

2.1 Geographical distribution of the ELIAS preschools

In the following, a closer look will be taken at the geographical distribution of the preschools, especially with respect to the question whether the preschool is situated in an urban or in a rural area. For example, an urban setting may point towardgreater cultural and linguistic diversity, as findings in Gogolin and Neumann's (1997) case study on possible influences of the learning environment conducted at a primary school in Hamburg, Germany show.

From the thirteen different preschools of the four European countries which were part of the ELIAS project, two partners came from Belgium, one from Sweden, three from the UK and seven from Germany (three of them situated in the north, two in the west, one in the east and one in the south of Germany).

Category / Code	Country	Region
1a	Belgium	small town
1b[3]	Belgium	small town
2	Germany	urban
3	Germany	urban
4	Germany	rural
5	Germany	urban
6	Germany	rural
7	Sweden	urban
8	Germany	urban
9	Germany	urban
10a	UK	suburban
10b	UK	suburban
11	UK	rural

Tab. 1: Geographical distribution of the ELIAS preschools

Within this geographical distribution of the countries, the Belgian institutions (a preschool and a primary school) are both located in the same town and housed under one roof. The Swedish preschool is situated in an urban area. The vast majority of the German partners are situated in an urban area, except for two preschools. Of the UK partners, two are located in a suburban area and the third in a rural area.

3 The numbers 1 and 10 were assigned to twice as the data was collected at two different institutions. Recall that in the UK and Belgium, children above age 5 do not attend a preschool anymore, therefore, their data was collected in a primary school. In order to distinguish between these institutions, 1a and 1b and 10a and 10b are used as an abbreviation in this chapter.

2.2 Languages used in the preschools

All preschools promote the country's official language – or, in the case of Belgium, one of the country's official languages, which is also the L1 of the majority of the children who attended the preschool during the ELIAS data collection (see Table 2).[4] In terms of the target language, all participants of the ELIAS project chose English.

Code	Country	Monolingual / bilingual / trilingual	L1 and L2 used in the preschools
1a	Belgium	Bilingual and monolingual groups	L1: French, L2: English
1b	Belgium	Bilingual and monolingual groups	L1: French, L2: English
2	Germany	Bilingual	L1: German, L2: English
3	Germany	Bilingual	L1: German, L2: English
4	Germany	Bilingual	L1: German, L2: English
5	Germany	Bilingual	L1: German, L2: English
6	Germany	Bilingual	L1: German, L2: English
7	Sweden	Trilingual	L1: Swedish, L2/L3: English/French
8	Germany	Bilingual	L1: German, L2: English
9	Germany	Bilingual	L1: German, L2: English
10a	UK	Monolingual	L1: English
10b	UK	Monolingual	L1: English
11	UK	Bilingual	L1: German, L2: English

Tab. 2: Languages used in and around the ELIAS preschools

As shown in Table 2, the Belgian institutions are not solely bilingual but include monolingual groups as well. In the Swedish preschool, French is used alongside English. The British preschool and primary school are monolingual English institutions that have been included to provide data that serve as a benchmark for the language tests conducted in the ELIAS project.

2.3 Languages of communication in the preschools

Table 3 summarises the languages which the teachers and children use in the different ELIAS preschools. The preferred language of communication used among the team members and in staff meetings are shown in columns 2 and 4. Column 3 displays the language which is generally used when children are present (i.e. the children's ambient language and the target L2). Most preschools adhere to the one person-one language approach (e.g. Ronjat 1913, Baker 2000, Wode 2001).

4 While Belgium has three official languages (Dutch, French and German), the children's ambient language in the Belgian ELIAS preschool was French.

Code	Language communication among the team	Language of communication when children are present	Language of communication in team meeting	Language of communication with the parents
1a	French	L2 speakers speak as much as possible in their L2 in front of the children, sometimes have to use their L1 to talk to the L1 teachers	French	French
1b	French	L2 speakers speak as much as possible in their L2 in front of the children, sometimes have to use their L1 to talk to the L1 teachers	French	French
2	One person-one language: English and German	One person-one language: English and German	German	English in front of the children, in private German
3	mostly German	mostly German	mostly German	Mostly depends on the teacher (L2 teacher speaks mostly English; L1 teacher speaks mostly German)
4	mixed, mostly German	mixed, mostly German	mixed, mostly German	German
5	One person-one language: English and German	One person-one language: English and German	German	English in front of the children, in private German
6	One person-one language: English and German	One person-one language: English and German	OPOL (one person one language)	English/German (one person-one language), in private German
7[1]	Swedish and English	Swedish and English	Swedish and English	Swedish, English and French
8	One person-one language: English and German	One person-one language: English and German	mostly German, some L2 speakers speak English (but understand German)	if there are children present, everyone speaks "their language," if not sometimes an L2 speaker will speak German too
9	One person-one language: English and German	One person-one language: English and German	German	mostly German
10a[2]	English	English	English	English
10b[2]	English	English	English	English
11	English and German	English and German	German	English and German

Tab. 3: Languages of communication in different situations; [1] Trilingual preschool with Swedish, English and French, [2] Monolingual preschools with English

As Table 3 illustrates, the ELIAS partners chose similar communication strategies, though some preschools appear to be stricter in terms of consequently using the one

person-one language approach than others. It may be speculated that a reduced use of the L2 in daily situations may be reflected in the results of the BPVS II and the ELIAS Grammar Test. The importance of qualitatively and quantitatively sound L2 input and its effects on L2 lexical and grammatical development are discussed by Weitz et al., this volume.

2.4 Setting of the tested preschools

Apart from the languages in the preschools, the preschools may be embedded within the educational system of each country in different ways. For example, in Belgium all children from age 2½ to 6 are entitled to free day care. At the age of 3, most of the Belgian children attend a preschool or a similar institution, which are often housed in the same building as the subsequent primary school (Oberhuemer & Schreyer 2010) which the children start at the age of 5 years. In Germany, the organisation of preschools (*Kindertagesstätten*) and day care institutions is in the responsibility of each federal state separately, and is either privately or publicly funded. Preschools in Germany may follow a variety of pedagogical approaches (Oberhuemer & Schreyer 2010). The children usually start to attend primary school at the age of 6. In Sweden, the *förskolan* offer day care for children aged 1-5 years. At the age of 6, almost all children attend a non-mandatory course in day care institutions aimed at preparing them for primary school. Even though most day care is funded by the state, all institutions (public and private) are obliged to follow the same standards (Oberhuemer & Schreyer 2010). Finally, in the UK (with the exception of Northern Ireland) children enter primary school at the age of 5.

In the ELIAS project, the opening hours of the preschools differ greatly, ranging from 4.5 hours to 11 hours per day. Data on how much time each child is present during the day was not collected in the *ELIAS POQ*. However, the longer the opening hours, the longer each child is potentially exposed to the L2 English. The importance of L2 input quantity is discussed in Weitz et al., this volume; the ELIAS Input Intensity Score was calculated, including factors such as opening hours, L2 teachers' and children's attendance time in the preschool per week, and the number of children in each institution.

The *ELIAS POQ* did not enquire at what point in time the bilingual programme was adopted in the respective preschools. As Baker (2006: 292) points out, this information might indicate what kind and amount of experience in bilingual daily routines the preschool teachers have to rely on.

Looking at whether the preschools are funded publicly or privately may provide clues on their financial background. Experience has shown – and considering that there are often fees to be paid, common sense dictates – that the socio-economic status of parents in privately funded preschools is generally high. This may also affect the setting of such a preschool, as, for example, more teachers may be employed there than in a publicly funded institution (see section 6 for further information).

Code	Who initiated founding of the preschool?	Public vs. private funding	Daily opening hours	Is preschool followed by bilingual primary school
1a	school board	public	6.5 hours (8:30-15:00)	yes
1b	school board	public	6.5 hours (8:30-15:00)	unknown
2	initiative of a well-known foundation	private & public	10 hours (8:00-18:00)	no
3	parents	private & public	10 hours (7:30-17:30)	to be opened in August 2010
4	parents	private	10 hours (7:30-17:30)	no
5	AWO (Worker's Welfare Association)	public	8 hours (6:45-16:30)	no
6	communal	public	8 hours (7:00-15:00)	no
7	parents' inititative	private	10 hours (7:15-17:20)	yes
8	the idea of combining environmental learning and L2 acquisition	private	10 hours (7:15-17:20)	no
9	founded by the town	public	10 hours (7:15-17:20)	yes
10a	unknown	private	6.25 hours (9:15-15:30)	no
10b	Voluntary Evacuees Welfare Committee	private & public	10.5 hours (7:30-18:15)	no
11	German School Association (Deutscher Schulverein)	private & public	10.5 hours (7:30-18:15)	yes

Tab. 4: Preschools' foundation, funding and opening hours

Finally, Wode (2001, see also this volume) argues that preschools and primary schools should be linked so that the children can be given many years of continued exposure to their first foreign language. Such a setup is still very rare, which is also shown in the data of the ELIAS project: Not even half of the ELIAS preschools have a follow-up-programme in a cooperating primary school. However, one will be opened in the near future.

In general, the number of bilingual preschools and primary schools has increased in most European countries over the past years. According to Lommel (2009), the approximate number of bilingual preschools in Germany is 680 (accounting to about 1% of all German preschools). In 2009, there were 926 bilingual primary schools in Germany. These data do not indicate the number of bilingual preschools with a follow-up programme in a primary school. For Sweden and Belgium, no current data on the number of bilingual preschools are available.

2.5 Pedagogical approaches of the tested preschools

The ELIAS preschools follow different pedagogical approaches. This finding suggests that immersion programmes are suitable for all sorts of pedagogical approaches. Wode (2009) argues that in order to meet the different needs of various learner types, a number of different approaches are called for. However, no empirical data are available yet as to which approach may be beneficial for certain learner types.

Table 5 presents the different pedagogical approaches which the ELIAS preschools adhere to. Note that this overview does not necessarily indicate how strictly the respective pedagogical approaches are adhered to by each preschool. Furthermore, the realisation of the approaches may differ from preschool to preschool, especially if more than one approach is adopted by the preschool.

Code	Pedagogical approach
1a	• regular community school
1b	• regular community school
2	• Reggio pedagogy
3	• Montessori pedagogy
4	• situation-oriented approach (*situationsorientierter Ansatz*) • Waldorf education • Montessori pedagogy • Reggio pedagogy • Nature pedagogy
5	• open approach (special architecture of the preschool) *(Situationsansatz)*
6	• contingency approach (*Situationsansatz*) • half-open approach
7	• Montessori pedagogy
8	• Montessori pedagogy
9	• contingency approach • open house with similar age groups
10a	• unknown
10b	• unknown
11	• support children's development holistically

Tab. 5: Pedagogical approaches of the preschools

As Table 5 shows, the preschools of the ELIAS project follow, for example, Reggio pedagogy, Montessori pedagogy, Waldorf pedagogy, nature pedagogy, a situation-oriented approach (*situationsorientierter Ansatz*), a contingency approach *(Situationsansatz)* and an open approach. *Montessori pedagogy* is the approach most widely adopted in the ELIAS preschools. Two preschools follow the *Reggio pedagogy* and the *contingency approach* (*Situationsansatz*), and one preschool each offers the *situation-oriented approach* (*situationsorientierter Ansatz*), *the open approach*, *Waldorf education* or *nature pedagogy*. Some preschools follow more than one approach and refer to different pedagogical philosophies (e.g. preschool 4). Two preschools base their work on the regular community school curriculum, another preschool works holistically but did not state a specific pedagogic approach. Finally, two preschools reported that they

do not follow any particular pedagogical approach. As some of the pedagogical approaches put special emphasis on language (see descriptions below), the pedagogical approach may be of interest with respect to the language input that is being given.

Reggio pedagogy is an educational philosophy that sees the child within the context of its family, society and culture and not as an isolated individual (Stenger 2002: 220). According to the Reggio approach, the child is the instigator of her own development, knowledge, and skills that she develops on the basis of mutual trust, freedom and time. Accompanied by project-based learning, the child is understood as a curious and eager scientist who educates herself by exploring the world in terms of experiments, trial and error and also pushes the limits of these experiences (cf. Knauf 2005). In order to ensure that the child can do this, it is the preschool's responsibility to create the necessary conditions for each child to act in the role of a scientist, explorer and designer of her own development and knowledge (Knauf 2005); the teacher acts as a competent companion, scientist, and observer, who stimulates, accompanies, supports and documents the child's research. In addition to the adult teachers, the architecture of the Reggio preschool is considered to function as an additional teacher that offers the child protection and stimulation at the same time (Knauf 2005). Special interest is given to everything that a child "produces" (e.g. paintings, etc.) with or without the help of a teacher. By acquiring many perspectives on the world, the child learns different "languages," i.e. ways of expressing herself in terms of dancing, drawing, movements etc. According to the Reggio approach, during her development, the child loses 99 languages out of 100 it possesses and is, as an adult, finally left with the spoken language only. Teachers are obliged to support the multiplicity of each child's languages in order to preserve them. In order to "understand" the languages of the children, especially when the spoken language has not been acquired yet, teachers must possess very good perception skills. Project-based learning and arts are, therefore, the most important methodical concept of a Reggio preschool (Stenger 2002: 221).

Montessori pedagogy considers the child to be her own architect. The main task of the teacher is to support the child in discovering her environment (Erler 2000). In order to allow the child to develop her own personality, the focus is explicitly on the child's needs (Esser & Wilde 1995). Those needs are indicators for the child's intellectual and physical development. Hence, it is important to let the child go after her own learning needs. Important attributes of *Montessori pedagogy* are individualised learning phases, specific material and the teacher. With the help of individualised learning instructions children have the opportunity to work, learn and think for themselves, which helps the children to make their own decisions. Following this approach, the child's personality and free will are treated with respect and individual development and needs are supported. Similar to the *Reggio* approach, Montessori teachers function as observers and supporters of the child's development. Furthermore, teachers stimulate the child's mental and intellectual development by offering manual activities and multi-sensory experiences. According to Montessori, children have an inner desire for learning in order

to achieve the interpersonal goal they strive for, following an inner developmental plan (i.e., the Montessori-defined sensitive phases, see Esser & Wilde 1995).

Situation-oriented approach (*situationsorientierter Ansatz*) was developed in the 1970's and focuses on real-life situations and a variety of didactic measures which combine the development of personal and social competence and the mastery of skills and knowledge. It is, therefore, a holistic pedagogical approach in which the teachers value and respond to the individual experiences of each child. Therefore, the children can establish practical competencies, expand their experiences, gain self-confidence and learn to think and act independently (Krenz 2008). Compared to other pedagogical approaches, the *situation-oriented approach* focuses on the child in terms of her life situation (which includes the child's language development), and on teachers who constantly reflect on themselves and their actions (Krenz 2008).

The basic principle of ***Waldorf pedagogy*** is imitation, i.e., the teacher serves as a role model and also functions as a natural authority. The teacher chooses meaningful activities in order to animate the children to imitate, which is also done with respect to language. Routines of the daily preschool life mainly are rhythm, art crafts and technical activities, which are sometimes also combined with language, as in songs etc. According to *Waldorf pedagogy*, the child develops thoughts in language at the age of three, in which imagination takes an important part. Thus, in the Waldorf approach, language is intimately connected with imagination and games (Almon 2000).

Proponents of *nature pedagogy* want the child to experience, experiment and observe nature through various senses (touching, smelling, seeing, hearing, moving). Through contact with nature, children gain the opportunity to experience an intense feeling for nature, their own body – especially their motor functions – and gain knowledge of nature and the environment which surrounds them (cf. Huppertz 2006). It is a child-oriented pedagogy where the interests, wants and desires of children are the main priority. The teachers support all actions the children wish to perform, without imposing any structure or frame, in order to let them develop their own norms and values. Additionally, the teachers try to give the children a moral understanding of nature, in terms of protecting and appreciating the environment (cf. Huppertz 2006).

Open approaches (as employed by AWO-preschools in Germany) offer free space for children to act, try out and learn through playing independently without constant supervision. The rooms are opened up in order to support the child's development as efficiently as possible. Working with such an approach requires open groups, open activity across different groups and free working phases that characterise the preschool's daily routine. Since the children are not obliged to remain in one particular room, they can choose – depending on their interests – what they would like to do and where to do it, at any time. Each teacher is usually responsible for one room; her role is to observe and accompany the children during their time in the preschool and to shape their environment appropriately (e.g. Textor-Becker & Textor 1997). With respect to language development, children can choose their own input to a certain extent (e.g. by choosing

the room or the activity). In addition, in mixed age groups, the younger children benefit from older children's input whereas older children learn to assume responsibility for their younger peers.

According to the ***contingency approach*** (*Situationsansatz*), education enables the child to behave and to function appropriately in the world (Zimmer 2000). The *contingency approach* was developed in the 1970's in Germany and can generally be described as "*inducement pedagogy*" in which the given situation is used for the child's education (Müller 2006). The explicit goals of the contingency approach are children's autonomy and emancipation, as well as social learning. The role of language is of great importance. However, specific language tutoring and support is merely offered to children with migrant background or to support multilingualism. Concrete instructions for immersion/bilingual preschools are not yet developed (Müller 2006).

2.6 Preschool and group sizes

In the *ELIAS POQ*, the preschools were also asked about the number of their children, groups and playrooms in order to get a more complete picture of the institutions and their settings. For example, in terms of size, the preschools of the ELIAS project varied from 15 to 90 children. As the number of children differed, the number of playrooms did too, often due to different requirements of pedagogical approaches (e.g. Reggio). Finally, the number of preschool groups also differed from preschool to preschool, ranging from one to eight, depending on the size of the preschool and their pedagogical approach.

Code	# of children	# of groups	# of playrooms
1a	38	2 *	3
1b	80	4 *	3
2	30	2	2
3	20	1 **	2
4	15	1	6
5	90	8	12
6	55	3	3
7	33	2	3
8	28	2	2
9	88	5	12
10a	unknown	8	12
10b	68	7	4
11	80	5	5

Tab. 6: Number of children and groups. * bilingual groups, ** crèche: 1

All ELIAS preschools have outside playground areas which provide ample opportunities for outside projects. As indicated in the chapter on preschool materials (Tiefenthal et al., volume II) as well as in the chapter on guidelines for language use (Kersten et al., volume II), varying learning activities and surroundings may improve the learning

conditions for the children. In multi-sensory learning, various channels are engaged in the learning process and therefore meet the different needs of the several learning types to support substantial learning (cf. Thole et al. 2008).

2.7 Child-teacher ratio

In terms of language input, not only the average number of children and the size of the preschools have to be taken into account, but also the number of teachers and children. Therefore, the ratio between children and preschool teacher/s was calculated for each preschool. Furthermore, the ratio between children and L2 teachers was calculated assuming that the smaller this ratio is, the more L2 input the children potentially receive (cf. Weitz et al., this volume).

Code	**1a**	**1b**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10a**	**10b**	**11**
# of children	38	80	30	20	15	90	55	33	28	88	u.	68	80
# of teachers	1* 6**	2* 9**	5	5	5	12	6	6	5	13	18	2	10
# of L2 teachers	0	1	1	3	2	1	3	2&2 ***	3	3	u.	n.a.	5
teacher - children ratio	5.4	7.3	6	4	3	7.5	9.1	5.5	5.6	6.7	u.	34	8
L2 teacher-children ratio	0	80	30	6.6	7.5	90	18.3	16.5 & 16.5	9.3	29.3	u.	n.a.	16

Tab. 7: Number of children and teachers in each ELIAS preschool. * immersion, ** other (monolingual groups), *** preschool with two L2, u. – unknown

As Table 7 shows, the ELIAS preschools vary greatly in terms of the number of children, the number of staff employed and the number of L2 teachers. Therefore, L2 teacher-children ratios were calculated for each preschool, which ranged from 90 to 6.6. Thus, it may be assumed (but not concluded) that the children's L2 input increases as the number of staff increases: The more L2 teachers are employed in a preschool and the fewer children they have to attend to, the more input the children may receive. Of course, such an assumption implies other factors as well, such as the L2 teacher's personality, the presence of the L2 teacher in the preschool per day, or the input quality (cf. Weitz et al., this volume).

3. Information on the children

3.1 Number of children and tested groups

As noted before, the number of children in the ELIAS preschools differed greatly and ranged from 15-90 children per preschool. As the number of children differed, so did the number of groups.

Code	1a	1b	2	3	4	5[5]	6	7	8	9	10a[1]	10b[1]	11
# of children	38	80	30	20	15	90	55	33	28	88	u.	68	80
# of groups	*	**	2	1 ***	1	8	3	2	2	5	8	7	5
# of children/ group (average)	19	20	14	20	16	13	19	16	14	20	30	9	18
# of tested groups	2	2	1	1 ***[1]	1	6	3	1	2	2	3	---	2

Tab. 8: Children and preschool groups. [1] monolingual programme, u. – unknown, * two bilingual groups in 3rd year of preschool; five monolingual French groups in the two preceding preschool years, ** four bilingual groups in 1st and 2nd year of primary school; seven groups in the succeeding primary years, i.e. 2 groups per year, except for the sixth year (1 group), *** crèche: 1, ***[1] crèche: 0, **** incl. crèche and after-school care club

As Table 8 shows, language tests and observations were not conducted in every preschool group. Table 9 illustrates how many groups per preschool were assessed in the ELIAS project.

Code	1a	1b	2	3	4	5	6	7	8	9	10a[1]	10b[1]	11
# of tested groups with L2 teacher	2	2 **[1]	1	1	1	1	3	1	2	2	u.	u.	2
# of tested groups with L1 teacher	0	0	1	0	0	7	0	1	2	0	0	u.	0
# of L2 teachers who provide input for each child (average)	1	2	1	1.5	2	1	3	2 E-E 2 F-E	3	3	u.	u.	2

Tab. 9: Children and tested groups. [1] monolingual programme, u. – unknown, **[1] i.e. first year of primary school, E-E: English Teacher, F-E: French Teacher

3.2 Age of children

Table 10 below presents the age range of the children in the ELIAS preschools. This is the only overview which includes all children from all preschools. However, for the language tests, only a subset of children was used (i.e. only the ones with parental permission, who were present and willing to participate). As mentioned above, the four European countries differ with respect to the age of entry to preschool and primary school. In Germany, for example, children may start preschool at age 3 and school at age 6, in Belgium and the UK, children start school already at age 5.

5 In this particular preschool, one teacher is responsible for one group (so-called dialogue groups).

Code	1a	1b	2	3	4	5	6	7	8	9	10a	10b	11
# of children	38	80	30	20	15	90	55	33	28	88	u.	68	80
age range in months	60-72	72-108	6-72	36-72	24-72	6-108	36-72	36-72	36-72	24-72	36-132	3-60	36-72

Tab. 10: Age of children in each preschool of the ELIAS project, u. – unknown

Even though the age range shows great differences across the preschools, the children's age generally ranges between 36 and 72 months. However, some preschools start with children from as early as 6 months (e.g. preschool 2), in other institutions children may not leave the institution before age 11 (i.e. after-school groups in Sweden). In the ELIAS project, only the data of children between 3 to 6 years were taken into consideration.

3.3 Sex of the children

In the literature it has often been reported that children's sex may affect their performance in language tests, be it in their L1 (e.g. Huttenlocher et al. 1991, Schlichting & Spelberg 2003, Bornstein et al. 2004, Radeborg et al. 2006, Roche 2008) or in their L2 (Burstall 1975, Schmid-Schönbein 1978, Boyle 1987, Klieme 2006). For each preschool, the number of boys and girls are displayed in Table 11. Most preschools show a fairly even distribution of boys and girls. The results of the language tests conducted during the ELIAS project always include analyses of sex-related differences (e.g. Steinlen et al., Steinlen et al., Rohde et al., this volume).

Code	1a	1b	2	3	4	5	6	7	8	9	10a	10b	11
# of children	38	80	30	20	15	90	55	33	28	88	*	68	80
# of boys	35	44	18	9	7	46	28	16	12	40	*	*	40
# of girls	13	36	12	11	8	44	27	17	16	48	*	*	40

Tab. 11: Boys and girls in the ELIAS preschools. * Information was not available

3.4 Language background(s) of the children

As Table 12 shows, in most preschools, the language spoken by the majority of children is generally identical with the country's official language, i.e. German in Germany, Swedish in Sweden, French in Belgium, and English in the UK. The L2 of all ELIAS preschools is English, with the exception of the trilingual concept in Sweden (whether a trilingual preschool setting affects the development of English as a foreign language was not part of the ELIAS project). Table 12 shows, furthermore, that many children's L1 does not correspond to the children's ambient language outside pre-

school. For example, in the Swedish preschool, the number of children whose L1 corresponds to the country's official language Swedish is relatively low. These figures are relevant insofar as the children's home language background may affect the development of their L2 English in preschool (e.g. Swain 1985, see also Steinlen et al., Steinlen et al., Rohde et al., this volume).

Code	# of children	L1s of children (if possible, # of speakers)	# of children who speak the preschool's L2 English	# of children with migrant background
1a[1]	38	Fr (38), Tu (1), Ar (3), plus around 16 other languages	0	Fr (38), Tu (1), Ar (3)
1b[2]	80	Fr (32), Hu (1), It (7), Du (20), Ar (13), plus around 11other languages	0	Fr (32), Hu (1), It (2), Du (1), Ar (1)
2	30	Ge (28), Po (2)	0	2
3	20	Ge (14), En/Ge (2), En (1), Sp/Ge (1), Fr/Ge (1), Hi (1)	3	0 to 6
4	15	Ge (14), Sp (1), Ch (1)	0	0 to 2
5	90	Ge, Ru, Tu	0	12
6	55	Ru, Tu, Sw, Po, Ar, Ge	1	7
7	33	2009: Sw (17), Sw/Fr (5), Sw/En (3), En (1), Fr (2), Sw/Pe (1), Hu (1), Fi/En (1), plus 2 other languages 2010: Sw (11), Sw/Fr (5), Sw/En (3), Sw/Pe (1), Hu (1), Fr (2), Th (1), Sp/Fr (1), Sw/Hu/Ro (1), Fi/En (1), and 5 other languages	8	data not available
8	28	Ge (15), En (2), Po (1)	2	3
9	88	Ge, Ru, Tu, Cz, Cr, Sp, Gr, Ch, En	2	16
10a	unknown	En	n.a.	unknown
10b	68	En	n.a.	unknown
11	80	En, Ge	27	v.f.
Language Codes	Fr: French, Tu: Turkish, Ar: Arabic, Hu: Hungarian, It: Italian, Du: Dutch, Ge: German, Po: Polish, En: English, Sp: Spanish, Hi: Hindi, Ch: Chinese, Ru: Russian, Sw: Swedish, Pe: Persian, Th: Thai, Fi: Finnish, Ro: Romanian, Cz: Czech, Cr: Croatian, Gr: Greek			

Tab. 12: Language backgrounds at the preschools. [1] immersion group, [2] first year of primary school, v.f. – very few

It may be speculated that the presence of peers who speak the preschool's target language English as their L1 is likely to have an impact on the development of L2 English by other children in this particular preschool. For example, three children in the Swe-

dish preschool have English as their L1. However, there are no studies yet which examine such effects for the bilingual preschool context.

Finally, there is a high number of children with L1 German in preschool 11, which is situated in the UK. This preschool is mainly attended by for children with a German family background who live in the UK. Their data are presented and contrasted with the data of their monolingual English peers by Schelletter & Ramsey, this volume.

In sum, the children's language backgrounds vary considerably across the ELIAS preschools. There are 21 different languages represented at the preschools. It is striking that some preschools have very few children whose home language does not correspond to the preschool's L1 or L2, while many different languages are present in other preschools.

4. Background information on preschool teachers

4.1 Language background

In Table 13 below, the preschool teachers' language background and migration background are presented, including the L2 preschool teachers' country of origin. This may allow for conclusions about the English accent which the children were exposed to in preschool.

Code	# of teachers	# of L2 preschool teachers	Origin of L2 teachers	# of L2 teachers	# of teachers with migrant background
1a	immersion: 1, other: 6	0	/	1	0
1b	immersion: 2, other: 9	1	UK	1	1
2	5	1	UK	1	1
3	5	3	UK, UK (Scotland), Canada	0	0
4	5	2	Trinidad, USA	1*	0
5	12	1	USA	0	1
6	6	3	Trinidad, UK, Australia	0	0
7[1]	6	4	2x UK, 2x France	2**	?
8	5	3	USA, Malaysia, Canada	0	?
9	13	3	USA, UK	1	1
10a[2]	18	n.a.	n.a.	n.a.	0
10b[2]	2	n.a.	n.a.	n.a.	0
11	10	5	UK	0	0

Tab. 13: Preschool teachers' language background in the ELIAS project. [1] Trilingual preschool with Swedish, English and French, [2] Monolingual preschools, * not on a regular basis, ** one for each language

Communication within the team and across languages is mandatory in the daily routines of a bilingual preschool and problems may occur if the team members cannot communicate properly. Therefore, some knowledge about the languages used in the preschools and a positive attitude towards multilingualism is beneficial for the staff in any bilingual preschool (cf. Kersten, volume II).

Unfortunately, the term "migrant background" (for the categories "*teachers with migrant background*" and "*children with migrant background*") in the *ELIAS POQ* was not properly defined. Depending on the interpretation of this term, people provided different responses to this question. For example, did the term "migrant background" refer to the parents' L1, to the children's home language or to the fact that the children's parents immigrated to the country in question? This example illustrates the importance of adequately defining and explaining categories used in questionnaires in order to be able to appropriately being able to interpret the results.

4.2 Educational background and languages of the preschool teachers

Apart from their language background, the educational background of the teachers may also be an important factor for educational and methodological practices at a preschool. Table 14 presents the educational backgrounds of the teachers at the ELIAS preschools. Note that different practices across individual preschools as well as different requirements for teachers in different countries may account for the varying educational backgrounds of the teachers. Furthermore, degrees may not always be transferable from one country to another, particularly when non-EU countries are involved. Table 14 also indicates that prior knowledge of the preschool's L1 or a degree in education was not always deemed necessary or a prerequisite for the employment of L2 teachers in some preschools.

Code	Degree/education of speakers of preschool's L2 teachers	L2 teachers' knowledge of preschool's L1	L1 teachers' knowledge of preschool's L2
1a	• Secondary School Teacher for English and Dutch	all native speakers of French	some passive l2 knowledge, no productive skills
1b	• Secondary School Teacher for English and Dutch • University degree + Postgraduate business and creative arts course + Postgraduate certificate in secondary education	either native speaker of French or non-native speaker of French with medium knowledge of French	some passive l2 knowledge, no productive skills
2	• State-approved teachers for preschools	perfect	very good
3	• Primary teacher • English language teacher for adults and children (6 years of nursery experience) • Social worker (degree in Canada)	high proficiency (reception & production)	average proficiency (reception)

4	• English language teacher for adults • No college degree, managed hostels for two years in New Zealand	average proficiency (reception & production) and below average	average
5	• State-approved teacher for preschools	perfect	very good
6	• BA Social Care Management / Teacher Training, state-approved preschool teacher • BA ED / MA Sports Administration, state-approved preschool teacher • State-approved teacher for preschools	perfect	good to very good
7[1]	• Preschool teacher	high proficiency (reception & production)[6]	high proficiency (reception & production)
8	• Master of Education • Early Education Diploma / BA in Biology	sufficient	sufficient
9	• State-approved teachers for preschools	sufficient	sufficient
10a[2]	unknown	unknown	unknown
10b[2]	unknown	unknown	unknown
11	• Trained nursery teachers or equivalent	good	generally good

Tab. 14: Preschool teachers' educational backgrounds. [1] trilingual preschool with Swedish, English and French, [2] monolingual preschools, * not on a regular basis, ** one for each language

Again, the categories of the *ELIAS POQ* relating to the L2 teachers' qualifications were not defined closely enough. Therefore, this table provides very general information about the degrees of education in a form that gives the opportunity for comparison but still expresses the individuality and variations at each preschool. Individual regulations of each country, state or preschool, however, cannot be supplied in this context. Wode (2009) argues in favour of specific training programmes tailored exclusively for L2 preschool teachers which would take into consideration the special context of bilingual preschools.

5. Background information on parents and the socio-economic setting of the children and the preschool

Parents are the most influential factor with regard to their children's (language) development. Therefore, information was collected about the preschoolers' parents' socio-economic status and their knowledge about the L2 English. For example, language use may vary as a function of the socio-economic status of the parents (and possibly of the teachers as well). For example, Clark (2003: 378f.) showed that children from parents of a middle-class background generally receive more input (i.e. 900 words per hour) than children from parents of a lower-class background (cf. Snow et al. 1976 and

6 As this preschool works trilingually, the comments for L1 and the L2 proficiency include French as well.

Miller 1982). Wode (2009) argues that parents should support the development of the children's L1 (i.e. their home language/s), especially when children attend bilingual preschools. For the development of the L2, the parents' role is less crucial because L2 acquisition primarily takes place at preschool. In this context, Wode (2009:110ff.) notes that parents should have a positive attitude towards the L2, without forcing the child to present its knowledge of the L2 by force, strategically tutoring them, or even switching the language of communication within the family to the L2. Parents' knowledge of the L2 can be (but does not have to be) an advantage – their attitude towards the L2, however, is more important (cf. Lenoz 2004). Table 15 provides an overview of the L2 knowledge of the parents as well as their socio-economic backgrounds.

Code	Parental knowledge of L2 (average)	Socio-economic background of parents, according to preschool teachers
1a	most parents very basic knowledge	majority rather low
1b	most parents very basic knowledge	majority rather low
2	roughly 90% understand more or less everything what the L2 teacher tells them in English	middle and upper class
3	good	upper middle / middle class
4	some	upper middle / middle class
5	roughly 70% understand more or less everything what the L2 teacher tells them in English	middle class / lower middle class
6	good to very good	middle class / higher middle class / academic
7[1]	varied	middle class
8	2 families with both parents: high knowledge; 14 families where 1 parent is either high in knowledge or low	middle class / higher middle class / academic
9	some	heterogeneous
10a[2]	unknown	middle class
10b[2]	unknown	rather wealthy
11	high level of L2	educated (to A-level and degree level)

Tab. 15: Background information on parents of the ELIAS preschools. [1] trilingual preschool with Swedish, English and French, [2] monolingual preschools

As Table 15 shows, the parents from the German preschools have an upper- to middle-class background.[7] This, unfortunately, confirms the impression that bilingual preschools and schools form a rather privileged education setting. The socio-economic settings of the other ELIAS partner preschools outside Germany cannot be properly interpreted as only one institution from Belgium, Sweden and the UK participated in the ELIAS study.

7 A difficulty of this survey was that the terms "lower, middle, upper class" were not clearly defined in the *ELIAS POQ*. Thus, the responses are highly variable and rather subjective.

6. Conclusions

The purpose of this chapter was to provide a comparison of the different settings of the preschools which participated in the ELIAS project. The newly designed *ELIAS POQ* was used, which allowed researchers to collect information on the settings of the institutions (i.e. their size, their location, the languages used by the children and by the staff, the education of the preschool teachers, the pedagogic approach and the parents). These factors have been chosen because they have shown to have an impact on the children's performance in language tests and, in general, on the success of bilingual programmes in the preschools. All preschools employed teachers who provide the L2 (English) input. However, striking differences were found with respect to the preschools' size, their teachers' education, the children's language background and the pedagogic approaches, to name just a few. This result shows that a bilingual programme may be implemented in any preschool, no matter what its setting is like. Bilingual programmes, therefore, do not require a certain setting, pedagogical approach or socio-economic background.

Furthermore, these different settings may also have an effect on the results of the L2 language tests. For example, the ratio between preschoolers and L2 teachers seems to be a decisive factor because the more L2 input the children receive, the better they can develop their L2 skills (e.g., Weitz et al., this volume). Finally, a prerequisite for establishing a successful bilingual programme is a preschool team that cooperates well and that values the importance of language in general for the children's development (see Schilk et al. i. pr.).

As the *ELIAS POQ* is a newly designed tool, there are many aspects which would invite further research. For example, further studies should examine whether the use of different pedagogical approaches (e.g. Reggio, Montessori, etc.) may affect the development of L2 skills. Furthermore, it is far from clear whether differences in the preschool teachers' educational background (especially those of L2 teachers) may influence the development of the children's L2. Although most L2 teachers nowadays receive additional training, their previous educational background and the attitudes towards child education may affect the way in which they interact with the children (e.g. a social worker vs. a school teacher vs. someone without any prior experience with children). Finally, the present study could not consider a number of minor changes in the preschools during the first and second test phase of the ELIAS project (e.g. a change in the number of children per group or the employment of a new teacher), which may also have affected the results of the preschool language tests.

In sum, background knowledge of all participating preschools presented here is vital in order to appropriately interpret and compare the test results obtained from the different ELIAS preschools. Many facts gathered in this *ELIAS POQ* have also been used to develop new tools in order to examine children's L2 development (see Weitz et al., this volume). The *ELIAS POQ* has been shown to be a valuable tool to highlight such dif-

ferences and to better understand under what circumstances children may learn a new language in a preschool context.

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Appendix

ELIAS Preschool Overview Questionnaire (ELIAS POQ)

The following questions were sent out to the ELIAS preschools in order to examine and compare their profiles.

Name of the preschool:

A. General information on the preschool

1. Name of the town and country the preschool is located in?
2. What is the pedagogical approach of the preschool?
3. Who initiated the founding of the preschool?
4. What year was the preschool founded in?
5. What are the opening hours of the preschool?
6. What region is the preschool located in?
7. What is the approximate size of the preschool building?
8. How many playrooms does the preschool have?
9. Does an outside play area exist?
10. How is the preschool funded?
11. Does a following bilingual primary school exist?

B. Information on the children

12. How many children attend the preschool?
13. How many boys/How many girls?
14. What is the age range of the children (in months)?
15. How many groups does the preschool have altogether?
16. How many groups were tested?
17. How many of these groups have a native speaker of the L2?
18. How many of these groups have a non-native speaker of the L2?
19. How many children does each group have on average?
20. Please list the L1s of the children. If possible list the number of speakers as well.
21. How many children speak the preschool's L2 as their L1?
22. How many children have a migrant background?
23. What is the number of native speakers who provide input for each child on average?

C. Information on the teachers

24. How many teachers does the preschool have?
25. How many male/How many female?
26. Number of native speakers of the preschool's L2?
27. What are the countries of origin of the native speaker(s)?
28. Number of non-native speakers that are L2 teachers?
29. Number of teachers with migrant background?
30. Please list the degree/education of the preschool's L2 teachers.

31. How often do team meetings take place?
32. What is the L2 proficiency of the L1 teachers?
33. What is the L1 proficiency of the L2 teachers?
34. What is the language of communication among the team on an everyday basis (children are present)?
35. What is the language of communication among the team if no children are present (e.g. in team meetings)
36. What is the language of communication with the parents?

D. Information on the parents

37. What is the socio-economic background of the parents?
38. How is the parent's general knowledge of the preschool's L2?

E. Information on L2 Material at the preschool

39. How many L2 books are provided for the children?
40. Please list the titles of the L2 children's books.
41. What kind of material is used (e.g. specific bilingual, monolingual from L2 speaking countries or adapted material)? Please list titles, if possible.