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Thesis Topic:

English as a Heritage Language in Israel: The Age Effect

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1. Introduction

A Heritage Language (HL) is a minority language that is not the societal language (SL) and is spoken at home (see Benmamoun, et al, 2013; Montrul, 2008). HL speakers are a unique group of bilingual speakers with different trajectories to other bilingual children, monolingual children and adult second language (L2) learners. They experience more variation in their environment than monolingual children (Paradis & Jia, 2016), differ in cognitive maturity to adults (Schwartz, 1992) and are affected by different sociolinguistic circumstances to other bilingual groups (Montrul, 2010a).

In Israel, English is a HL for English-Hebrew bilingual children. While many studies focus on English as the SL, there is a paucity of research focusing on English as a HL. This study aims to investigate the language learning outcomes of English as a HL for English-Hebrew speaking bilingual children in Israel. It explores the impact of Age of Onset (AoO) of the SL and variations in language aptitude/abilities.

Research focusing on HL speakers has increased over the last decade, recognizing the need to develop our knowledge in order to support their individual language learning needs (Montrul, 2010a). Furthermore, developing our understanding of bilingual development will improve the identification of differential diagnoses between typical developing bilingual children (BiTLD) and those with specific language impairment (BiSLI) – a phenomenon that has been indicated to be a clinical challenge due to observed similarities between the two groups. It will also contribute to developing theories on language acquisition. For instance, illustrating that environmental factors and language input influence language outcomes supports input-driven accounts of language development. Thus implying that maturational factors are not exclusively able to explain variations (Paradis & Jia, 2016).

Studies have shown that language outcomes for HL speakers vary. The AoO of the SL may be a significant contributing factor (e.g. Bedore, 2016; Flores, 2015). However, the effect AoO has on different linguistic domains in English as the HL is unknown. Furthermore, clarity is needed to substantiate the influence of AoO on the linguistic outcomes of children of different chronological ages (CA) and different diagnoses (i.e. BiTLD and BiSLI). Accordingly, the goal of the proposed study is to examine English as a HL. In particular, determining how the AoO of bilingualism shapes its development in English-Hebrew speaking bilingual children. The impact of AoO will be focused on in depth, investigating into its role across different linguistic sub-domains and CAs. The influence of AoO on linguistic outcomes for those with BiTLD and BiSLI will also be determined.

2. Literature Review

A brief introduction will first be provided on HL speakers, focusing on English as a HL. This will be followed by an overview on the linguistic outcomes and a discussion on influencing factors, including cross-linguistic transfer and child internal and external characteristics. AoO as an influencing factor

will then be detailed, including a discussion on the impact of CA on the effect of AoO. The influence of AoO on language development for children with BiSLI will be deliberated and finally conclusions, hypotheses and predictions will be formulated.

2.1 Heritage Language Development

A HL is typically spoken by second generation immigrants who are exposed to a socio-politically minority language at home during the first years of life either sequentially or simultaneously with the SL (Benmamoun et al, 2013, Montrul, 2016). This paper focuses on English as a HL in Israel. Arguably, English differs from other HLs. It has been identified as having a high socio-economic status that is used within a global context (Crystal, 2003). Furthermore, it is the only language which is reported to be spoken by more people as a L2 than a first language (Majidi, 2013). The status of English has grown in Israeli society. Parents regard it as socially valuable, electing to maintain it in the home and in their local communities (Armon-Lotem et al, 2014). This is likely to impact on HL learning outcomes as using the HL at home has been proven to support its development (Anstatt, 2008).

2.2 Heritage Language Linguistic Outcomes

There is a particular focus in the research on understanding the linguistic outcome of HL acquisition (Montrul, 2016). Kupisch and Rothman (2016) posit that differences observed between HL speakers and monolinguals are to be expected as input differs qualitatively and quantitatively. Discussions on HL linguistic outcomes often result in researchers concluding that the HL is not 'native-like' (e.g. Benmamoum et al, 2013). However, others assert that language outcomes should be described as different and HL speakers should be perceived as a subset of native speakers (Rothman & Treffers-Daller, 2014).

HLs often present with systematic simplifications and structural changes with some language domains being more affected than others (Montrul, 2016). As such, whilst phonology is relatively spared, the restricted experiences of the HL may impact on lexical development (Montrul, 2010a). Word finding difficulties may also ensue for infrequently used words (Montrul, 2010a). Other vulnerable domains include morphology (Benmamoun et al, 2013) and the syntax-discourse interface phenomenon (Monrul, 2016). Finally, asymmetric abilities between expressive and receptive skills have been confirmed, possibly reflecting a bias towards stronger listening skills (Benmamoun et al, 2013).

Flores (2015) suggests that the uneven development may be explained by analyzing the successive developmental stages of different linguistic domains. Flores (2015) claims that properties stabilized in early HL development are expected to be similar to monolingual children. However, the introduction of the L2 causes later acquired properties to take a greater length of time to develop fully.

This theory is supported by studies conducted by Santos and Flores (2013, as cited in Flores, 2015, p.8) and Flores and Barbosa (2014).

In addition to the claims that linguistic domains in HL speakers' develop asymmetrically, linguistic outcomes may vary within HL speakers and across their lifespan (Benmamoun et al, 2013; Bridges & Hoff, 2014; Montrul, 2010a). This may explain the contradictory results observed in research: some studies indicate that the HL is not usually delayed in BiTLD children (Abutbul-Oz & Joffe, 2011). Others have determined that the HL can lag behind the developmental monolingual norms (Schlyter, 1993). Furthermore, literature implicates a number of influencing factors that contribute to the heterogeneous nature of HL speakers' language outcomes. These include cross linguistic influence which is dependent on the language pair learned, and differences in child internal and external factors. These factors will now be examined in greater detail.

2.3 Cross-Linguistic Influence

Performance mismatch between HL speakers and monolingual speakers may reflect transference from the SL onto the HL. Cuza and Frank (2011) suggest that this may result in arrested development of the transferred structure. Flores (2015) explains that when HL speakers have more than one linguistic structure to choose from, they will abandon structures that are only present in their HL. Evidence for cross transference has been indicated in the literature. Albirini et al. (2011) found transference from the SL (English) to the HL (Arabic) in a number of linguistic domains. Other examples include the syntactic transfer in Russian (Laleko 2010); and English-language influence in the grammaticality rating of clitic left dislocations and differential object marking in Spanish (Montrul 2010b). Moreover, it has been established that cross-linguistic transfer from the SL to the HL occurs in children whose SL language is newly acquired and in children whose SL is established (Meir et al, 2015).

2.4 Child Internal and External Factors

Child internal and external factors contribute to individual differences in language development, including, inter-alia, AoO, input quality, SES, parental education, family size and birth order (e.g. Kaltsa et al, 2015; Marini et al, 2016). Sociolinguistic factors, such as ethnolinguistic identity and attitudes, also impact on language learning outcomes (Armon-Lotem et al, 2015). Studies indicate that their contributions are asymmetric and that language environment factors account for more variance in language performance than cognitive factors (Paradi & Jia, 2016).

This study focuses on language exposure as well-grounded research provides robust evidence on its effect on BiTLD children's language acquisition. Gathercole (2002a, 2002b, 2002c), Cobo-Lewis (2002a, 2002b), Carroll (2015) and Paradis and Jia (2016) all observe that greater exposure to language positively affects language outcomes. However, the precise effect of language exposure on

development remains unclear, possibly reflecting the wide variability of influencing factors that it interacts with, such as parental education and SES (Unsworth et al, 2014).

Identifying the amount of exposure a child experiences in a language has been indicated to be a useful tool in order to identify when bilingual children's language should be comparable to their monolingual peers. In a study on English-French children in Canada, approximately 40%-60% exposure was sufficient for the bilingual children to attain receptive vocabulary scores that were comparable to their monolingual counterparts. However, expressive vocabulary required more than 60%, indicating differences between receptive and expressive language development (Thordardottir, 2011). These findings have been replicated for younger bilingual children in the UK (e.g. Cattani et al (2014). Some researchers assert that comparing bilingual children to monolingual norms may not be helpful, (Westby, 2002). Instead, norms for bilingual children's linguistic outcomes should be formed, reflecting models of their development and acknowledging that their trajectories have a greater degree of variability (Paradis & Jia, 2016).

The effect of the amount of exposure of HL development can be captured in several ways, with many studies using AoO of the SL or/and Length of Exposure (LoE) to the SL. Both measurements strongly correlate with each other since LoE is obtained from subtracting the AoO from the CA (Armon-Lotem et al, 2015). Thus only one measurement is deemed necessary. LoE is considered unreliable as the quality of exposure is unknown and the exact amount of exposure substantially varies (Unsworth et al, 2014), measuring the LoE is unreliable. In contrast, AoO is a more dependable, precise measure, reflecting bilingual exposure commencing. Furthermore, recent literature confirms it as a valuable measurement, impacting on language attainment (e.g. Meir et al, 2016). Thus for this study AoO is used to measure the amount of SL exposure.

2.5 Age of Onset of the SL (AoO) as an Influencing Factor

It has been indicated that increasing AoO relates to declines in HL proficiency, possibly reflecting the division of input across two languages (Montrul, 2008). This has been supported in research on both Spanish-English speakers (Hammer et al, 2012) and Russian-Hebrew speakers (Meir et al, 2016). The introduction of the SL may also impact on the type of input and restrict the contexts in which the HL is learned (Flores, 2015). Flores (2015) argues that children are often introduced to the SL around ages 3-7, restricting the language learning contexts at the time when monolingual children experience diverse linguistic contexts and language registers. The literature also discusses the relationship between AoO and language proficiency within the context of memory and brain maturation changes. It is asserted that as children get older these changes impact on learning strategies and have repercussions for language proficiency (Blom & Paradis, 2016). Finally, it has been implied that not all linguistic domains will be equally affected by AoO. It has been demonstrated that oral

comprehension (see Hammer et al, 2008), non-word repetition and sentence imitation (Thordardotti & Brandeker, 2013) are insensitive to the amount of exposure. In contrast, grammatical forms are influenced significantly by AoO (e.g. Davison and Hammer, 2012). AoO as an influencing factor on HL proficiency is complex and multifaceted. Research has recently indicated that CA and the diagnosis of BiSLI also impact on the influence AoO has on HL proficiency. The literature on these factors will now be examined.

2.6 Chronological Age (CA) as an Influencing Factor

Gathercole (2014) asserts that early language develops slowly and is highly influenced by the environment and context in which it is learned. However, as children get older, the amount of linguistic knowledge monolingual and bilingual children share increases, narrowing differences. They may also be less sensitive to the language learning environment as they have experienced a sufficient amount of input, enabling them to generalize and fully develop language constructions (Gathercole & Mon Thomas, 2009). This convergence of language skills is observed in the SL by Cobo-Lewis et al (2002b) in the development of English vocabulary. However the impact of CA on the effect of AoO on HL proficiency may differ. Gathercole and Mon Thomas (2009) cite that whilst the SL becomes less sensitive to exposure as children get older, the HL does not.

Bedore et al (2016) also determine that HL continues to be sensitive to input, with earlier exposure to the SL being associated with reduced HL outcomes. However, they report a relative difference in the variance accounted for by AoO to SL in third-graders relative to their first-grade counterparts. One proposed explanation is that older children shift their attention more to the SL, increasing its dominance (Bedore et al, 2016). It is also proposed that the language learning environment changes with age as younger children are at home more and amongst a greater number of HL speakers (Bedore et al, 2016). Furthermore, AoO may become less influential in older children due to a reduction in the relative difference in the LoE.

2.7 Bilingual children with Specific Language Impairment (BiSLI) and the Impact of AoO on Linguistic Outcomes

Specific language impairment (SLI), is a neurodevelopmental language disorder that has no obvious identifiable cause such as hearing loss, autistic spectrum condition or motor disorders. SLI affects 5–7% of bilingual and monolingual children (Leonard, 2014). It has been asserted that diagnosing BiSLI is challenging as a result of asymmetric outcomes in linguistic profiles of BilTLD children (Kohnert 2010) and an overlap of language abilities between BiTLD and BiSLI (for an overview, see Armon-Lotem and de Jong 2015).

Guidelines on diagnosing BiSLI propose that children should be assessed in both languages, ideally using bilingual norms (American Speech–Language–Hearing Association, 2004). Literature

has also identified the importance for bilingual norms to consider exposure factors and language dominance (Paradis et al, 2007). However, there are few normative language assessments for bilingual populations, resulting in over and under diagnosis (Gagarina et al, 2016; Paradis, 2010). Thus, research focusing on identifying clinical markers for diagnosing BiSLI is increasing. Studies aim to identify linguistic tasks/domains that easily distinguish BiTLD and BiSLI. Blom and Paradis (2013) assert that the use of tense in the L2 could potentially distinguish BiTLD and BiSLI. They conclude that although children who are BiTLD and language impaired overlap in the erroneous use of irregular past tense, BiTLD use regular past tense inflections more accurately and make more over-regularizations in their L2.

However, there is a paucity of research investigating into the impact of AoO on the language development of BiSLI compared to BiTLD. Armon- Lotem (2016) writes that children with BiSLI would be expected to have impaired language development irrespective of the quantity of exposure experienced. This is in contrast to BiTLD who are sensitive to input. Accordingly, a divergence in BiTLD and BiSLI HL outcomes would be expected in language sub-domains that are insensitive to input. This theory is supported by Armon-Lotem and Meir (2016) and Meir et al (2016) in studies on the diagnostic accuracy of repetition tasks. For instance, Meir et al (2016) determined that repetition tasks are not significantly correlated to LoE and that Russian-Hebrew BiTLD children perform significantly better than BiSLI children in both their languages, irrespective of input. It would be clinically useful to determine if this outcome is also observed in English-Hebrew bilingual children, as linguistic profiles of children with SLI may be language dependent (Leonard, 2000). Furthermore, establishing if there are other sub-domains that are also not correlated to AoO would also be beneficial, helping to identify potential clinical markers.

3. Research Questions and Hypotheses

HL speakers present varying rates of development. However, it is unknown how AoO of bilingualism affects the development of English as a HL across different sub-domains and whether it's impact on linguistic outcomes is affected by CA. Furthermore, little is known on the impact of AoO on linguistic outcomes for children with a diagnoses of BiSLI and whether it differs from BiTLD.

This study aims to provide a comprehensive picture on the impact of AoO on HL linguistic outcomes. From a theoretical perspective, it will contribute to child language development theories, supporting input-driven accounts of language development if AoO is found to influence linguistic outcomes. This will also have many applied implications. This study therefore proposes to address the following research questions:

Research question 1: Does AoO affect HL proficiency in BiTLD children across all linguistic domains? It is hypothesized that the earlier the AoO, the worse the HL outcomes. This reflects current

research findings on other HLs (e.g. Meir et al, 2016). It is also predicted that some linguistic domains will be more sensitive to AoO than others as asymmetric development has been indicated. For instance, receptive language skills and sentence repetition performance have been reported to be less sensitive to AoO (Benmamoun et al, 2013; Meir et al, 2016 accordingly). Furthermore, those domains stabilized in early language development may be more similar to monolingual children of the same age that those acquired later (Flores, 2015).

Research question 2: Does CA affect the impact of AoO on HL proficiency? It is proposed that if HL proficiency is directly related to AoO, irrespective of age, then the only influence AoO has is on the length of exposure. However, if the relationship between AoO and HL proficiency changes with age, other influencing factors need to be considered. It has been suggested that although the HL continues to be sensitive to exposure, the HL's sensitivity to AoO may lessen (e.g. Bedore et al, 2016). It has been indicated that AoO may become less influential as children get older due to a reduction in the relative difference in the length of exposure. It is therefore hypothesized that as CA increases, the impact of AoO on linguistic outcomes will be reduced.

Research question 3: Does AoO affect HL proficiency differently in BiTLD children compared to BiSLI children? Armon-Lotem (2016) proposes that children with BiSLI will be less sensitive to input than BiTLD. Accordingly, it is predicted that AoO will impact linguistic profiles for BiTLD children but not BiSLI children. Thus, an overlap in scores between BiTLD children with low AoO and BiSI children may be observed. However, the literature on BiTLD has indicated that not all linguistic sub-domains may be sensitive to input. It is therefore predicted that in those domains, differential outcomes will consistently be observed between the two cohorts.

4. Method

4.1 Participants

A total of 200 English-Hebrew bilingual children aged 5 to 6.5 years will participate in the study. They will first be divided into two groups:

1) Typically developing English-Hebrew speaking bilingual children (BiTLD) – 190 bilingual children attending Hebrew speaking kindergartens from the center of Israel. They will be divided into groups in accordance to their CA, Viz. group 1 (60-66 months), group 2 (67-72 months) and group 3 (73-78 months). There will be 27 BiTLD children in group 1, 99 BiTLD children in group 2 and 64 BiTLD children in group 3, reflecting availability. Each group will then be subdivided according to their AoO, Viz. group A (0-12 months), group B (13-24 months), group C (25-36 months), group D (37-48 months) and group E (49+ months).

2) English-Hebrew speaking bilingual children with Specific Language Impairment (BiSLI) – 10 bilingual children who have been diagnosed with SLI, reflecting the proportion of the population. To

ensure accurate diagnosis, only those with weak language assessment scores in both languages and reported parental concern will be considered. This is in accordance to recommendations by the American Speech–Language–Hearing Association (2004) and research indicating the value of parental concerns in the diagnoses of SLI in both monolingual children (e.g. Callu et al. 2003, as cited by Tuller, 2015, p.305) and multilingual children (e.g. Paradis 2010). To help prevent misdiagnosis, children will be excluded from the study if they present with difficulties in both languages and no parental concern or difficulties in one or no language and parental concern.

To determine weak Hebrew language, adjusted bilingual norms for the *"Goralnik Screening Test for Hebrew"* (Goralnik, 1995) by Altman et al. (2016) will be used. To date, there are no adjusted norms for bilingual children speaking English as a HL. The *"Clinical Evaluation of Language Fundimentals-Preschool-2"* (CELF-Preschool-2) (Wiig et al, 2004) includes a norm-referenced Core Language Score (CLS) to identify whether or not there is a language disorder in English speaking monolingual children. The assessment states that scores below -1 SD indicate language difficulties. However, standardized assessments based on monolingual norms can be problematic (Westby, 2002). The optimal cut off points are arbitrary and the criterion is often disputed, frequently reflecting requirements of service-providers' policies, researchers or speech and language pathologists (SLP) (Eadie et al, 2014). Performance of at least 1.25 SD below the mean is frequently used to define a language impairment (e.g. Eadie et al, 2014). Accordingly, this is the cut off that will be utilized for the purpose of this study. Following accurate diagnoses, the BiSLI children will be divided into groups in accordance to their AoO. There will be five children in group A (0-12 months) and in group D (37-48 months), reflecting availability. They are not divided according to CA due to the small sample size.

4.2 Materials and Procedure

Parents will be asked to sign a consent form and a questionnaire in order to encapsulate all the necessary information on development, language use and exposure. The questionnaire consists of qualitative and quantitative questions in English, the parent's home language (See Appendix A). Standardized language tests will be conducted by Speech and Language Pathologists (SLP).

1. The *"Goralnik Screening Test for Hebrew"* (Goralnik, 1995) will be administered in order to evaluate Hebrew proficiency. Testing will be conducted in one session, in the participants' kindergartens, by a native Hebrew speaking SLP. The *"Goralnik Screening Test for Hebrew"* is composed of six subtests: (a) Naming Objects, (b) Pronunciation, (c) Comprehension, (d) Sentence Repetition, (e) Expression and (f) Story Telling from a series of pictures.
2. The *CELF-Preschool-2* (Wiig et al, 2004) will be administered to assess participants' English proficiency. Testing will be conducted in one session, in the participants' kindergarten by a native English speaking SLP. The assessment will be executed on a different day to the Hebrew assessment. The *CELF-Preschool-2* is composed of 7 subtests that focus on describing language

outcomes. See Appendix C information on each subtest. Each subtest will be administered according to the guidelines and instructions outlined in the Examiner's Manual.

4.3 Data Analysis

The data will be analyzed in the following order:

1. The influence of AoO on HL proficiency will be investigated, analyzing the data on the BiTLD children in Group 2 (67-72 months). The data on the BiTLD children will be analyzed descriptively, comparing the children's demographics and linguistic proficiency in the HL and SL. The HL linguistic outcomes will then be analyzed, using the CELF-Preschool-2 (Wiig et al, 2004). To provide an overview of the children's language performance, the CLS will be computed and analyzed. It is a standardized scores based on norms from monolingual English speaking children from the UK. The raw scores of the subtests will be analyzed individually. Raw scores are more sensitive to variations in performance than standardized scores and may be useful to capture differences between bilingual children varying in AoO. For both the CLSs and subtests, group data will be submitted to ANOVAs and post-hoc comparisons will be administered as appropriate.

2. The influence of CA on the effect of AoO on HL proficiency will be investigated, comparing group 2 (67-72 months)'s HL outcome at different AoO with younger and older children with the same AoO, i.e. group 1 (60-66 months) and group 3 (73-78 months). The data on each of the age groups will be analyzed descriptively, comparing the children's demographics and linguistic proficiency in the HL and L2. The CELF-Preschool-2 (Wiig et al, 2004) CLS and sub-tests will be used to compare the groups' language outcomes. Group data will be submitted to ANOVAs and post-hoc comparisons will be administered as appropriate. Pearson's r will also be determined for each age group and compared, helping to identify the degree of relationship between AoO and HL outcomes at different CAs.

3. The data on the BiSLI children will be analyzed descriptively, comparing the children's demographics and linguistic proficiency in the HL and L2. The data will also be compared to the BiTLD group. The CELF-Preschool-2 (Wiig et al, 2004) CLS and sub-tests will be used to assess the impact of AoO on language proficiency for BiTLD and BiSLI children, using ANOVAs and post-hoc comparisons as appropriate.

5. Pilot Study

Pilot data has been collected from 200 children; 190 BiTLD and 10 BiSLI. The CLS for each child has been computed to test the feasibility of the proposed analyses and of the predictions.

The CLSs of 99 BiTLD children with a CA of 67-72 months varying in AoO (see Appendix D, Table 2) were revealed by a one way ANOVA to be significantly different (F (4,94) = 2.666, p = 0.037). Post hoc comparisons using the Tukey HSD test indicated that the CLS of BiTLD children

with an AoO of 37-48 months were significantly higher than CLSs of those with an AoO of 0-12 months. There were no other significant differences detected.

Appendix D, Graph 1 illustrates the impact of AoO on CLSs for BiTLD children of varying CA. The observed differences were not significant. Nevertheless, an ANOVA indicated a favorable statistical trend between the scores of BiTLD children that differed in the AoO at CA of 0-12months ($F(2,49) = 2.458$, $p = 0.096$). Furthermore, post hoc comparisons using the Tukey HSD test indicated a certain trend toward significance (p=0.082), with BiTLD children achieving higher scores at AoO of 61-66 months than an AoO at 67-72 months. Further investigation into other subtests may develop into an illuminating discussion.

Finally, an ANOVA revealed that, as expected, BiSLI's CLSs were significantly lower than BiTLD ($F(1,198) = 46.825$, $p=0.000$). There was no significant difference found between the scores of varying AoO, indicating that BiSLI may not be sensitive to input (see Appendix D, Table 3). This concurs with Armon-Lotem's (2016) assertions. The graph (see Appendix D, Graph 2) also illustrates that the range of CLSs in BiTLD children and BiSLI children overlap when their AoO is 0-12 months. This indicates less advanced HL outcomes for these BiTLD children and that CLSs should not be used for them in order to make diagnostic decisions. Further analysis of the subtests will determine if another HL score is more reliable for diagnostic purposes.

6. Contributions of the Study

This study aims to provide a comprehensive investigation into English as a HL, focusing on the effect of AoO across a variety of linguistic domains. The study intends to clarify the influence of AoO on HL outcomes of BiTLD children of different CAs and different diagnoses (i.e. BiTLD and BiSLI). This will help to tailor the support and advice provided by educators and others working with this population to meet their language learning needs. Furthermore, the scientific benefits of this study include contributing to developing norms for HL speakers and identifying potential robust clinical markers. This may help to curtail the clinical challenge in the differential diagnoses of BiTLD children and children with BiSLI.

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Appendices

Appendix A: Covering Letter and Consent Form

Dear parents,

We are currently conducting a study in the English Linguistics department of Bar Ilan University. The purpose of our study is to examine the language characteristics of bilingual children, in comparison to the language characteristics of monolingual children. The study is being conducted under Prof. Joel Walters and Dr. Sharon Armon-Lotem.

This letter serves to request your assistance by letting your child participate in the study.
In order to conduct the study, we would like to meet with some of the kindergarten children for a few short sessions (between 5-7 meetings) in the kindergarten. In these sessions, we will play with the child using dolls and other toys, tell stories together, and review several linguistic tasks. This will be done in a pleasant and comfortable atmosphere. In case the child speaks two languages, the data will be collected alternately in the two languages (for example Hebrew and English). While collecting the data, we will tape record the children who participate with a tape recorder, in order to enable us to transcribe the conversations later for research processing.

We commit ourselves not to use these tapes other than for the purpose of this study. If you desire, you may also listen to these tapes. We would also like to emphasize that any detail which might identify the subjects will be omitted from the tapes in no more than a year from the completion time of the data collection (30.7.2009). Likewise, the findings will be published in a way which will not enable identification of the children who will participate in the study or the kindergartens in which the data will be collected.

We would like to clarify that the study will be conducted with the coordination and confirmation of the kindergarten teacher. Confirmation from the Ministry of Education has already been obtained.

> At any time during the study you may, if you feel it is necessary, express your objection to continuation of the work with your child in the kindergarten. Likewise, if your child expresses his/her resistance to cooperate during the period of the study, the research work with him/her will be stopped immediately.

The data will be collected by advanced students of Linguistics and Education, who will do whatever they can in order to make the children enjoy the meetings. The language-oriented focus of this project may also contribute to the children from the didactic and emotional perspective.

If you agree to your child's participation in the study, please sign the enclosed consent form, and send it with your child to the kindergarten.

Thank you for your cooperation

Karen Rose
If you have any questions, please don't hesitate to contact me.
Telephone: 052 7431 907 **e-mail**: Kroseuniv@gmail.com
or Dr. Sharon Armon-Lotem: sharon.armonlotem@gmail.com

To Prof. Joel Walters and Dr. Sharon Armon-Lotem

Dear Sir/Madam,

A consent form to collect data which may identify the child

Since you are conducting a study (from then on 'the study') in the topic _____, and since you asked my consent to collect, as part of the study, data which may identify the child (from then on 'the data') about my son/daughter _____ (the name of the son/daughter),

I hereby declare as follows:

1. That you conveyed and explained to me the purposes of the study and the issues and subjects which will be examined;
2. That you conveyed and explained to me all the activities, along with their content, in which my child will participate during this study;
3. That you mentioned to me the time in which the identification will be omitted from the collected data;
4. That you described to me all the means you will take in order to guarantee the privacy of the details which may identify the child until their identification is omitted;
5. That you conveyed to me the way the data will be published;
6. Since I understand all that was said above, I hereby give my consent for the data collection by you.

We, the undersigned,

_____	_____	_____
Date	Name of the father/mother	Signature

agree to the above statements.

Appendix B: Developmental and Language Background Questionnaire

We would be grateful if you could complete a questionnaire of personal details about the child, which will be used **for the purposes of the study only.**

Name of child: _____ Sex: _____

Name of kindergarten: _____

Date of birth: _____(day)/_____(month)/_____(year). Place of birth (the country): _____

Year of immigration:_____

Number of children in the family (boys, girls): _____

Place in the family (eldest, youngest): _____

Number of years of education – the father: _____ occupation of the father: _____

Number of years of education – the mother: _____ occupation of the mother: _____

Please circle the language(s) spoken at home with the child:

(1) English (2) Hebrew (3) Both languages (4) another language _____

* If you circled **both languages** – please note from which age Hebrew became a spoken language in the home (for example: from age 0, age 2, since the child entered the kindergarten) _____

Who speaks Hebrew with the child at home? (father, mother, both parents, siblings, others)

_____

Please complete for your child:

Which language does the child speak with:	Mother	Father	Siblings	Grandparents	Neighborhood friends
English					
Hebrew					
Both					
Another language					

Please complete for your child:

Programming	No	Yes	Dates (from _ to _)	Hebrew or English?
Metapelet?				
Daycare?				
"Trom trom chova"				
"Trom Chova"				
"Gan Chova"				

How would you assess your child's English? (circle the right option) 1. Very bad 2. Bad 3. Good 4. Very good

How would you assess your child's Hebrew? (circle the right option) 1. Very bad 2. Bad 3. Good 4. Very good

Does your child have hearing problems? _____

Has your child suffered from repetitive ear inflammations during the recent year? _____

Were you ever concerned about your child's language development? _____

If yes, why? _____

4

Appendix C: Table Describing the CELF-Preschool-2 (Wiig et al, 2004) Subtests

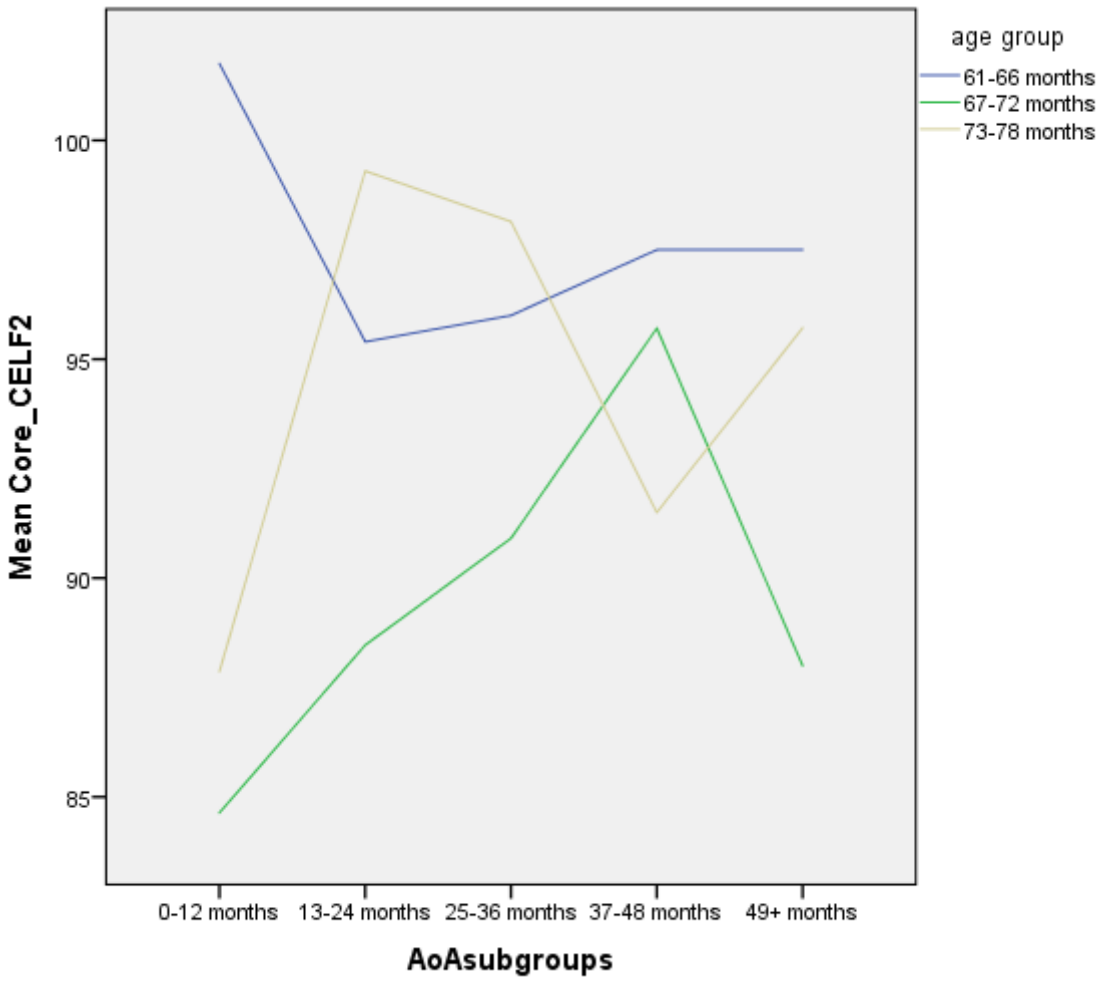
Subtest	Description
Sentence Structure	Requires a child to point to a picture from a choice of three, following spoken directions that increase in length and structural complexity. It assesses their understanding of grammatical structures.
Word Structure	Requires a child to complete sentences using word-endings and grammatical vocabulary, i.e. frog/frogs; walk/walked; this/that. It is designed to evaluate knowledge of morphological rules.
Expressive Vocabulary	Requires a child to label illustrations of people, objects and actions.
Concepts & Following Directions	Requires a child to follow directions of increasing length and complexity. child must understand a range of concepts (e.g. location concepts, sequenc concepts and temporal concepts) as well as have adequate auditory memor and attention and listening skills.
Basic Concepts	Requires a child to follow spoken, such as "Point to the one that shows many". This aims to evaluate knowledge of concepts, including attribute, size, position and number.
Recalling Sentences	Requires a child to repeat sentences of varying length and complexity
Word Classes a. Receptive b. Expressive	Requires a child to choose to point to two pictures that belong together (receptive) and then asked to explain how the two go together (expressive) This aims to evaluate the ability to understand and express relationships between words.

Table 1: CELF-Preschool-2 (Wiig et al, 2004) Subtests

Appendix D: Pilot Study Results

AoO	N	Mean Core Language Score (range)	SD
0-12 months	33	84.64	14.73
13-24 months	17	88.46	13.91
25-36 months	22	90.91	10.03
37-48 months	24	95.71	12.30
49+ months	3	88.00	2.00

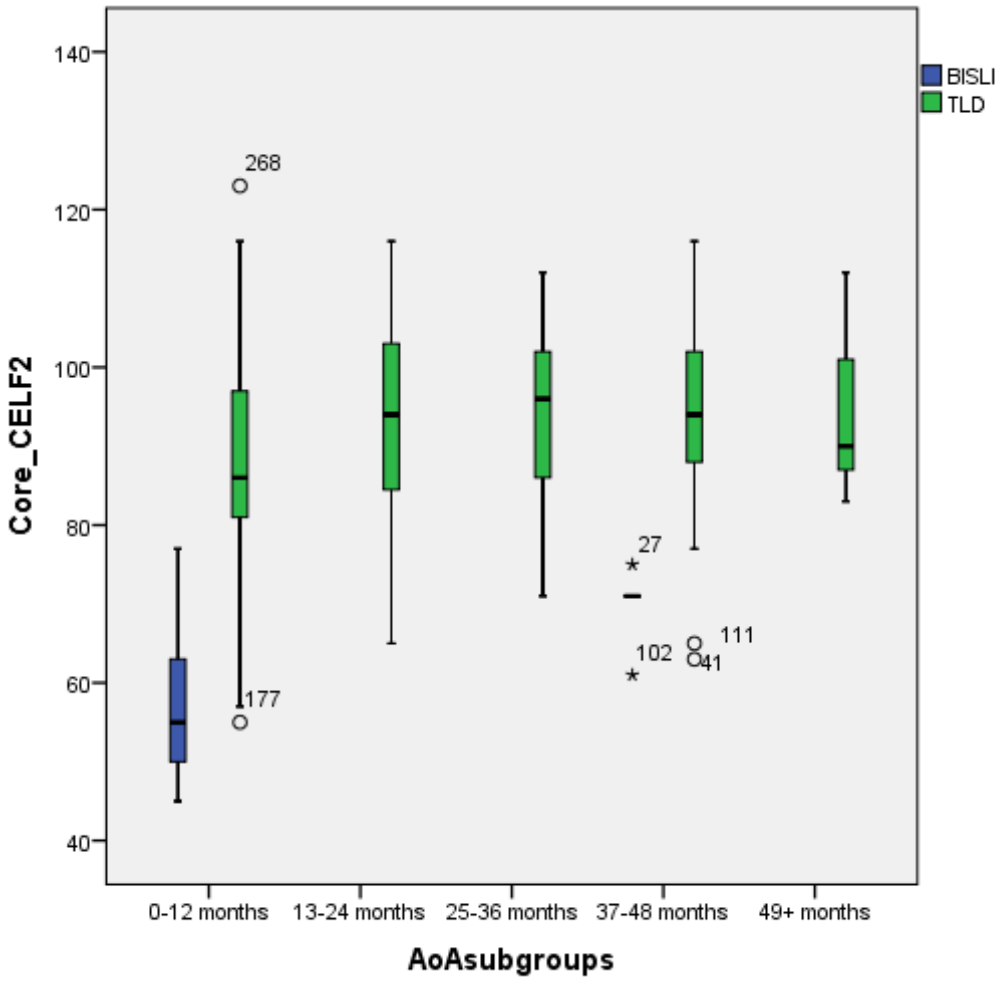
Table 2: Effect of AoO on the Total Language Score of BiTLD Children with a CA of 67-72 months.



Graph 1: The Impact of CA on the Mean Core Language Scores of BiLTD that differ in AoO

AoO	N	Mean Core Language Score (Range)	SD
0-12 months	5	58.00 (45-77)	12.530
13-24 months	0	N/A	N/A
25-36 months	0	N/A	N/A
37-48 months	5	69.80 (61-75)	5.215
49+ months	0	N/A	N/A

Table 3: Effect of AoO on Total Language Score of BiSLi children



Graph 2: Comparing Core Language Scores of Children with BiLTD and BiSLI

: