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EXPRESSIVE VOCABULARY OF GERMAN-ENGLISH BILINGUAL TODDLERS

By

Dörte Antje Junker

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ABSTRACT

EXPRESSIVE VOCABULARY OF GERMAN-ENGLISH
BILINGUAL TODDLERS

By

Dörte Antje Junker

This study investigates whether young children learning two languages simultaneously are inherently weak language learners compared to their monolingual counterparts. The vocabulary skills of 10 German-English bilingual toddlers were compared with monolingual German- and English-speaking peers around 24 months of age using Rescorla's (1989) Language Development Survey, a vocabulary checklist based on parental report, in its original English and a German translated version.

Findings revealed that bilingual toddlers were not inferior in conceptual vocabulary size and verb diversity when words in both languages were pooled. In addition, almost half of the bilingual conceptual vocabulary (43%) was associated with lexical forms in both languages, from which it is inferred that language separation is possible at age 2.

These findings suggest that no special norms for vocabulary skills need be developed for German-English bilinguals, and that existing instruments may be exploited in the future for speakers of other languages.

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INTRODUCTION

De Bot (1992) estimated that more than half of the world's population can be considered bi- or multilingual. Therefore, he regarded monolingualism as an exception rather than the norm. Despite the widespread nature of the phenomenon, there is no consensus in the literature on what bilingualism is, given the tremendous diversity among bilingual speakers. For example, a child growing up in a Spanish-English bilingual community in Florida might have a different language experience than a child growing up in a French-English community in Quebec, and both may differ from children learning the same languages, but with little or no access to bilingual communities. Cultural values, social and emotional attitudes, socioeconomic status, age of acquisition, and opportunities to speak the languages all influence proficiency as well as the motivation of the individual to use different languages (Ardila, 1998). Different environmental contexts also pose demands on the proficiency of the speaker. For example, a school setting might require competency in written language, which is generally not the case in a home environment. Thus, different proficiencies in each language–from low to full fluency in the spoken and/or written language–are conceivable. Some researchers have even claimed that there is no clear-cut dichotomy between monolingual and bilingual speakers and that language skills have to be judged on a continuum (Ardila, 1998). This variability among speakers and environments necessitates defining bilingualism as a prerequisite to studying the phenomenon.

Aspects of Bilingualism

Schreuder and Weltens (1993) pointed out that the extent to which people are considered bilingual largely depends on the definition of bilingualism. In the literature, different uses of the term have coexisted. Whereas Grosjean (1982) defined bilingualism simply as the regular usage of two languages, other authors have had a more restrictive understanding. Bloomfield (1933), for example, expected native-like proficiency in both languages, and Weinreich (1974) thought that the ability to speak both languages interchangeably and to switch from one language to the other according to situational demands (code switching) characterizes bilingual competence. Other authors, such as McLaughlin (1978) and Singleton and Lengyel (1995), introduced the factor of age and differentiated between simultaneous bilingualism, when a child is exposed to two languages from birth or at least before 3 years of age, and sequential or consecutive bilingualism, when the child acquires a second language (L2) in early childhood, but after the basic acquisition of a first language (L1). Weiss (1959) differentiated natural bilingualism, when languages are informally learned in a natural context, from cultural bilingualism, where the second language is learned in a formal setting, such as through instruction at school. As is evident from these examples, no agreement exists in

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the literature about the usage of the term *bilingualism.* What makes the situation even more confusing is that some definitions, such as the notion of sequential bilingualism, or cultural bilingualism, overlap with definitions of the term *second language acquisition.*

In this study, the term *bilingualism* refers exclusively to children being simultaneously exposed to two languages in a natural environment from infancy during their primary language learning years (Genesee, 1993). The exposure to both languages can be provided either in the home only or through additional language contacts outside of the home in cases where the language spoken at home is not the language of the speech community.

Prevalence of Bilingualism in the United States

Although no "hard statistics" (Genesee, 1993) are available, the majority of the world's population might be considered bilingual if one regards various degrees of competence of linguistic skills in more than one language as a minimal common denominator found in definitions of bilingualism. Bilingualism is not limited to specific regions of the world, nor to a specific socioeconomic group. It is found in recent immigrants as well as in indigenous people. Therefore, bilingualism is far from being an exceptional phenomenon.

According to the United States Census of 1990 (U.S. Bureau of the Census, 1998, p. 56), 31.84 million people, which represents about 14% of the total United States population, were identified as language minorities or families in which non-English languages are spoken, predominantly Spanish (17 million), 2C

followed by French (1.7 million), German (1.5 million), Italian (1.3 million), Chinese (1.2 million), and several smaller language groups. Of this population, 6.3 million are school children who speak languages other than English at home (U.S. Bureau of the Census, 1998, p. 55).

Presently, the proportion of children between 5 and 17 years of age who speak languages other than English represents 14% of the total American school-age population (45 million). Due to childbirth and immigration, their numbers are projected to rise to 9 million in 2010, when they will amount to 22% of the school-age population (Fix & Passel, 1994). Admittedly, these numbers might not exactly represent the number of polyglot speakers in the United States; however, they suggest that a significant part of the American population may be confronted with aspects of bilingualism.

Despite its significant prevalence, interest in bilingualism has only recently been emerging in the research literature. This seems odd because valuable insights into the mechanisms of language learning might be gained from the study of bilingualism.

What Can Be Learned From the Study of Bilingualism?

From a theoretical point of view, the study of bilingualism offers unique research opportunities because bilinguals may be regarded as their own "matched pair," according to De Houwer (1990), a fact that is especially useful in child language research. Studies on language acquisition commonly have reported huge variables in children's performances, especially when they are younger than 3 years of age. As Pearson, Fernández, Lewedeg, and Oller (1997) pointed out, this variability makes it difficult to separate influences of outside variables from differences among children. Bilingual speakers, on the other hand, make it possible to hold between-child effects constant and observe influences of outside variables on the child. One would like to know, for example, whether certain concepts, e.g., nouns or verbs, are easier or more difficult to learn than are others. Studies of the simultaneous exposure to different input patterns in different languages or cultures, such as Korean emphasizing verbs and English emphasizing nouns in parental speech addressed to young children, might shed light on this issue (see, for example, Choi, 1997; Gopnik & Choi, 1995). This debate touches on the fundamental controversy in the literature regarding whether specific input factors or universal learning strategies are prevalent in language learning. Research on bilingualism seems to offer an ideal opportunity to test whether universal principles apply across languages, and thus provide insights into the nature of language learning in general.

Universalists look for shared strategies in learners, regardless of whether they are mono-, bi-, or multilingual speakers. However, one aspect that bilinguals do not share with monolinguals is the very fact that the former are confronted with more than one language to learn. At the very least, the demands made by the sheer quantity of words and morpho-syntactic rules to be learned appear to be greater for bilinguals than for monolinguals. This prompts the question of whether more effort might be required to process the additional

information necessary to learn more than one language. MacNamara (1967) raised the possibility that major milestones of language development might be delayed in bilinguals because it may be more difficult, and thus take more time, to learn two languages simultaneously than just one. This is an important question to ask because language development seems to be related to other areas of development, especially cognition. Although discussions about whether cognition influences language development (e.g., MacNamara, 1972) or vice versa (e.g., Gopnik & Choi, 1995) are far from being resolved, there is agreement that at least part of cognitive development is mediated through language (Johnston, 1992; Kahmi, 1993). Numerous studies have documented that children with delayed expressive language abilities are more likely to develop learning disabilities or behavioral problems than children with normal language development (see review in Carson, Klee, Perry, Muskina, & Donaghy, 1998, p. 61).

If bilingual children lag behind in their language development, as is widely believed, they might be at a disadvantage developmentally when compared to same-age monolinguals because of the central role of language acquisition in general development. One goal of this study is to shed light on the so-called bilingualism deficit hypothesis (Oller, Eilers, Urbano, & Cobo-Lewis, 1997) because professionals as well as parents have struggled with this concern in the past.

Bilingualism and Clinical Issues

As indicated above, the situation of children being exposed to more than one language is not new, but it has only recently been addressed in the research literature. The reason for this neglect might be that, in the past, tremendous pressure to adapt to mainstream culture was exerted on immigrant and minority populations. More recently, the institutional and political emphasis on diversity in the United States has reflected the willingness of the society to legitimize cultural differences among groups within the population, including those who speak different languages and dialects (Battle, 1997).

The awareness of the possibility of speaking more than one language has created the professional issue of how to assess speech-language abilities in bilingual speakers. This is a problem because, according to a survey conducted by Campbell and Taylor (1992), more than 80% of speech-language professionals perceive themselves as either incompetent or only partly competent to deliver speech and language services to bilingual speakers. Of 713 respondents, 594 self-reported a lack of competence to perform evaluations and 570 self-reported a lack of competence to perform treatment with bilingual speakers. Among the 18 clinical skills inquired about on the survey, evaluation and treatment of bilingual speakers received the lowest ratings. The sense of unpreparedness in dealing with bilingual populations might in part be due to the scarcity of tools available to evaluate and treat these speakers.

Although a bilingual speaker, by definition, has knowledge in two languages, assessing only one (in this case, English), as has been done in the past, is not acceptable because the client's knowledge might not be spread equally between the languages. In fact, being completely balanced is rather exceptional, even in adults (Grosjean, 1982). Grosjean claimed that, especially in the lexicon, there will always be a proportion of words known only in one language. Therefore, to simply test only in one language and apply norms that have been derived from monolingual to bilingual populations would underestimate the competence of bilingual speakers, even if it is their strong language. To adequately judge language skills in bilingual children, their specific language context should be taken into consideration.

Whereas a few Spanish and Italian versions of vocabulary tests exist, assessment tools in other languages are practically nonexistent. This situation puts pressure on speech-language pathologists because they have a legal mandate to serve this growing diverse population of bilingual speakers. The Bilingual Education Act of 1968, growing out of the civil rights movement, grants equal educational access to all children in the United States regardless of race, color, or national origin (Taylor, 1986). The Education of All Handicapped Children Act of 1975 and its revisions, Public Law 94-142 and Public Law 98-199, specifically addressees children with special needs and explicitly requires clinicians to provide speech-language assessment and implement treatment programs "in the child's native language . . . unless it is clearly not feasible to do so" (Taylor, 1986, p. 9).

This study was undertaken to ease the discomfort professionals feel when faced with clients who acquire languages other than English by documenting how the language skills of German-English bilingual toddlers can be measured. As mentioned above, German constitutes the third largest foreign language community in the United States to date, according to the United States Census of 1990 (U.S. Bureau of the Census, 1998, p. 56).

STATEMENT OF THE PROBLEM

Need for Research on Early Bilingual Acquisition

Research on early simultaneous acquisition of two languages is scarce and mostly derived from case studies. De Houwer (1990) compiled an overview of existing case studies involving 33 bi- or multilingual subjects with language combinations such as English plus French, Spanish, or Hebrew, as well as German plus English, French, Spanish, or Italian. However, case studies allow only limited generalizability of findings. It is even more problematic that data have been collected and reported in different ways, which causes difficulties in comparing results.

Only recently has work involved systematic group studies, and so far these studies have focused mainly on Spanish-English bilinguals. Examples include Pearson, Fernández, and Oller's (1995b) study of 25 Spanish-English-speaking toddlers and Patterson's (1998) study of 102 Spanish-English-speaking toddlers from various social backgrounds. However, the above-mentioned researchers did not compare bilinguals with both groups of monolingual counterparts. This is surprising because different language structures might place different demands on the learner. For example, bilinguals may compare differently to age-matched peers in each language. Therefore, more studies, including large numbers of subjects from diverse bilingual populations of speakers, are necessary, as is the application of a more rigorous methodology.

The Early Bilingual Lexicon as the Focus of This Investigation

The huge information gap in the literature on early bilingualism is surprising, given the fact that speech-language pathologists have found it increasingly important to address the young language learner. When one focuses on early language, the central role of vocabulary development becomes evident. The initial stage of language acquisition, from the first words to the emergence of word combinations, is basically lexical, with morpho-syntactic rules just emerging. According to Clark (1993), the early lexicon offers a "unique window on the process of acquisition for language as a whole" (p. 1). She was especially interested in investigating cognitive-perceptual processes and strategies involved in developing early semantic concepts, as well as processes explaining how children attach meanings to words. If cognitive-perceptive principles can be regarded as one of the forces driving early vocabulary development, then semantic development should be more similar across languages than, for example, grammatical development. Whereas the acquisition of language forms clearly needs to focus on the syntactical and morphological rules of a given language (Slobin, 1992), early semantic development seems to be less language or culture specific, which would make it especially well suited for cross-linguistic analysis.

Various findings support this hypothesis. It is generally believed that the child's perceptions of and experiences with people, objects, routines, and so on, in his or her immediate environment form the basis of the cognitive concepts that underlie the meanings of words (Nelson, 1974). To some extent, small children may be assumed to have similar experience with their immediate physical and social environments across cultures. For example, children of all cultures interact with people in their immediate environment, mostly their families. They explore their bodies and objects; they are fed, dressed, and so on. Therefore, similar kinds of concepts or meanings should be accessible to all children regardless of the language they are learning. This does not imply that children acquire the same lexical forms or represent exactly the same meanings with the words they produce, but rather that they have words for referents in similar categories, such as types of food, clothing, people, body parts, and different types of activities. For example, a child growing up in the tropics would eat different foods from a child growing up in the arctic, but they both would be expected to have words referring to foods.

Other similarities were observed by Clark (1979), who found over- and underextensions of meanings in early child vocabularies in many different languages. Gentner (1982) and Caselli and colleagues (1995) found similarities in the composition of the early lexicon across languages, namely a predominance of nouns, whereas other word types, such as lexical verbs, emerged later. Gentner suggested that children prefer nouns, particularly object names, to words for encoding events or relations because they refer to stable entities and are perceptually most salient in the input. But these findings recently have been challenged in other studies. Fernald and Hiromi (1993) and Gopnik and Choi (1995), for example, claimed that noun bias found in Indo-European languages, namely English, is language or culture specific. In comparing studies on this issue, methodological differences become evident, which might in part have shaped their results. Whereas Caselli et al. used vocabulary checklists based on parental report, Fernald and Hiromi's and Gopnik and Choi's studies were based on free-speech samples. When the checklist methodology was used to assess Korean toddlers, a verb dominance as found by Gopnik and Choi disappeared. (See Pae, cited in Caselli et al., 1995.)

The literature has revealed some general similarities in the kinds and types of meanings that are encoded by words in young children. Therefore, the early vocabulary is suggested as a domain for assessment across languages. This has practical value: If assessment relies on shared properties of languages, instruments can be developed for use with more than one population of speakers.

What Parameters Have Been Studied?

Monolingual Vocabulary Development

Vocabulary size. Expressive vocabulary size of at least 50 different words by age 2 is one of the main parameters that has been used as a predictor for later language development in monolinguals. Numerous studies and developmental test norms of English-speaking toddlers have indicated that, by age 2, most children have acquired a productive vocabulary consisting of at least 50 words (Benedict, 1979; Clark, 1995; Coplan, Gleason, Ryan, Burke, & Williams, 1982; Rescorla, 1989). Similar results were reported in Grimm, Doil, Mueller, and Wilde's (1996) pilot study on monolingual German 2-year-olds.

Follow-up studies on children who had not reached the 50-word mark by 2 years of age, so-called "late talkers," indicated that language delay tended to persist into later years (Ellis Weismer, Murray-Branch, & Miller, 1994; Paul, 1996; Rescorla, 1989; Resnick, Allen, & Rapin, 1984). However, prevalence of later language delay in late talkers varied between 25% and 60%. According to Kelly (1998), this variation in findings might be due in part to different measures used. In general, spontaneous speech samples allow more detailed analysis and generate higher positive findings than standardized measures. Another reason might be that vocabulary size alone may not provide enough evidence to identify late talkers. Klee et al. (1998) suggested that nonlinguistic factors, such as use of symbolic gestures or cognitive measures, also be considered when identifying at-risk language development.

The 50+ word mark is one of the milestones of the minimum vocabulary skills expected by age 2, as measured by vocabulary checklists, and 95% of normally developing children statistically perform at or above this threshold. Numerous authors have reported, for example, that many children reach a vocabulary size of 50 words as early as 18 months of age (Bloom, 1973; Fenson et al., 1993; Nelson, 1974). Whereas the rate of vocabulary learning seems to be slow in the beginning (Goldfield & Resnick, 1990, 1996; Nelson, 1981), it typically accelerates toward the end of the second year of life, a phenomenon that is referred to as the vocabulary spurt. In the literature, it traditionally has been assumed that the onset of the vocabulary spurt occurred when the child's lexicon contained about 50 words (Benedict, 1979; Bloom, 1973), but the "late spurters" observed by Mervis and Bertrand (1995) had a vocabulary of more than 100 words before their lexical growth accelerated. Mervis and Bertrand provided evidence that all children spurt, but at different times with different patterns of lexical growth, such as a sharp rise after a period of slow growth (Goldfield & Resnick, 1990; Mervis & Bertrand, 1995), slow linear growth (Goldfield & Resnick, 1990), or periods of acceleration with plateaus in between spurts (Goldfield & Resnick, 1996). By the age of 24 months, children typically can produce between 50 and 500 words (Fenson et al., 1994), with 50 words being the minimal skill level separating typical from at-risk vocabulary development.

Word combinations. The 50-word mark seems to coincide with the onset of grammatical development, in its most basic stage: the emergence of word combinations. Nelson (1974) found that a certain critical mass of 50 words seems to be necessary before the child can begin to put words together and thus combine semantic concepts into semantic relations that lead to sentences.

Numerous studies have indicated that, by 2 years of age, 85% to 95% of English-speaking children begin to combine two to three words (Coplan, 1987; Fenson et al., 1993). Similar findings were reported for German monolingual 2-

year-olds in Grimm et al.'s (1996) pilot study. Therefore, the emergence of word combinations is considered another milestone that is reached by normally developing monolingual toddlers toward the end of their second year of life, at the latest by 24 months of age.

Vocabulary richness. Finally, Kauschke (1999) suggested that the richness of vocabulary, as indicated by the ability to produce a variety of different words and word types, be considered in efforts to identify at-risk behavior. In studies on the composition of the early vocabulary, children with language impairment tended to use more nouns and fewer verbs than MLU or age-matched normally developing peers (Watkins, Rice, & Moltz, 1993). Rice and Bode (1993) observed that a limited number of so-called general all-purpose verbs (GAP verbs), such as *have, make,* and *do,* accounted for more than 50% of verb usage by children with specific language impairments. Because the authors did not include normally developing control groups, they could not determine whether the reliance on GAP verbs was a compensatory strategy employed by language-impaired children, or whether this was age typical for preschool children in general. This question was investigated by Kelly (1997), who found that although GAP verbs were frequently used by normally developing peers as well, they appeared to use a greater variety of verbs than did children with language impairment. Therefore, verb diversity may be regarded as an indicator of vocabulary richness.

In summary, vocabulary size, emergence of word combinations, and richness of vocabulary have been used to separate adequate from delayed or deviant language development. Minimal skill levels have been established for vocabulary size and the emergence of word combinations by age 2.

<u>Bilingual Vocabulary Development</u>

<u>Vocabulary size.</u> Patterson (1998), who investigated whether milestones established for monolingual children also apply to bilingual children, found positive evidence for a vocabulary size of 50+ words in her sample. Eighty-one percent of her 102 Spanish-English bilingual subjects, ranging in age between 23 and 25 months, produced vocabularies consisting of 50+ words when different words in both languages were combined. Between 26 and 27 months of age, all subjects reached the 50+ word mark. Although no follow-up studies have been performed to date to follow later language development of low-performing bilingual children, it seems probable that a significant number of these children might be at risk as well.

Porsche's (1983) and Leopold's (1939) longitudinal case studies provide additional data for German-English bilingual vocabulary development. Both Porsche's son and Leopold's daughter, Hildegard, reached the 50+ word mark within their second year of life, according to their fathers' diary reports. Porsche's son was reported to have a combined German-English vocabulary of 66 words by 22 months of age. Leopold's daughter, by 16 months of age, already produced 74 words spread over both languages. By 2 years of age, her productive German-English vocabulary consisted of 241 words. More data, preferably by systematic group studies on a variety of language combinations, are needed to further illuminate this issue. This was one goal of the present empirical study.

Word combinations. For her bilingual Spanish-English-speaking sample, Patterson (1998) demonstrated that 84% of her subjects produced multiword utterances by the age of 24 months, as did 100% of the subjects by the age of 26 months. Leopold (1949) reported the emergence of word combinations for Hildegard around 18 months of age. No data on this topic were supplied by Porsche. Again, more information about diverse bilingual populations is needed, indicating the need for further investigation of preliminary findings.

Vocabulary richness. Vocabulary richness has been investigated across languages (e.g., Caselli et al., 1995), but not within bilingual speakers. This study was intended to provide first pilot data to shed light on qualitative aspects of the bilingual's vocabulary.

Conceptual Issues

Bilingualism Deficit Hypothesis

Considering the scarcity of information available on young bilingual learners, practical as well as conceptual reasons motivated the undertaking of this comparative study exploring early monolingual and bilingual vocabulary skills.

Popular views of early bilingualism have been shaped by a widespread belief that bilinguals are weak or inferior language learners. It is assumed that learning more than one language at the same time places higher information-processing demands on language acquisition, due to the child's having to learn two languages simultaneously. If this assumption, which Oller et al. (1997) dubbed the bilingualism deficit hypothesis, is true, bilingual children would be at a serious disadvantage. Implications of depressed language skills for cognitive development have been discussed (Johnson, 1992; Kahmi, 1993). In regard to vocabulary development, the bilingualism deficit hypothesis predicts that bilinguals reach characteristic milestones, such as the 50+ word mark and emerging word combinations, later, on average, than their monolingual peers and that vocabulary size and richness should be reduced.

Preliminary findings from previous studies have suggested that bilingual children produce fewer words than monolingual speakers in a given language, but that they do not have a deficit when the vocabulary in both languages is combined (Patterson, 1998; Pearson, Fernández, & Oller, 1995b). Given that both of these studies focused on Spanish-English speakers, it is not known whether their results would hold for speakers of other language combinations. In this study, a different language combination, German and English, was investigated.

Further research on comparing monolingual and bilingual vocabulary skills will not only shed light on the validity of the deficit hypothesis; it might also contribute to an understanding of the bilingual process, if and how bilingual children learn to separate languages. The deficit hypothesis feeds into another debate in the bilingual-acquisition literature, namely, whether one starts out with one or two languages. The information-overload assumption predicts a need for maturity in order to separate languages, implying that the cognitive constraints of the developing brain might not allow an immature speaker to switch between languages voluntarily.

Unitary Lexicon Hypothesis

The above-mentioned studies on the emerging bilingual vocabulary of young children suggest that it is distributed over the two languages to some extent. Early researchers on bilingualism argued that young children exposed to two languages from birth go through an initial stage of language mixing in their language acquisition, in which they do not distinguish between the languages (Grosjean, 1982; Leopold, 1949; Saunders, 1988; Vihman, 1985; Volterra & Taeschner, 1978). This involuntary language mixing or lack of language choice, if genuine, would reduce communicative effectiveness, at least in monolingual contexts. Thus, this theory, which Genesee (1989) referred to as the unitary language system hypothesis, also supports the notion that the bilingual learner is less competent than a monolingual speaker.

One type of evidence used in support of the theory of a single language system comes from the study of the child's lexicon: A child might have one single, undifferentiated lexicon if different words in each language are produced, with no evidence of cross-language synonyms or "translation equivalents" (Pearson et al., 1995a).

The unitary lexicon hypothesis is supported by Clark's (1987) earlier claim that the principle of contrast works not only within, but also across, languages in the early stage of vocabulary acquisition, until the child reaches a vocabulary size of 150 words. In Clark's theory, the principle of contrast can be thought of as one of several cognitive strategies that enable the child to process language within the cognitive constraints of the developing brain. In effect, the principle of contrast predicts that all young children–even monolingual children–expect each lexical form to have a different meaning. Therefore, synonyms are not possible. Even though children get exposed to different labels, they produce only one and reject others because, in the view of the child, they are synonymous. Applying the same rationale across languages, a child's learning a word form in one language prevents his learning the synonymous label in the other language. This would result in a single lexicon. Under this premise, no or very few translation equivalents should occur in the early lexicon.

However, recent researchers have questioned the hypothesis of a single lexicon in early bilingual vocabulary development. Pearson et al. (1995a) argued, for example, that the evidence of 30.8% translation equivalents, or cross-language synonyms, produced on average in their study by Spanish-English subjects suggested that the children were developing two different language systems from the start. However, one could dispute whether the evidence of translation equivalents can be taken as evidence for the capacity to separate languages. Volterra and Taeschner (1978) argued that the lexical equivalents found in their subjects were actually used by the children to refer to different concepts. For example, one of their Italian-German-speaking subjects, Liza, used the word *la* (meaning *there*) for things she could not see while speaking and the German equivalent *da* for things that were present during speaking.

This argument was taken to heart by Baum (1997), who followed two Spanish-English-speaking males, one from 18 to 30 months and the other from 15 to 19 months. She systematically used the same stimulus materials for play and conversational sequences (toys, picture books) in both languages and thus provided proof for "true" translation equivalents, in that Spanish-English doublets observed in the children's productive vocabularies really referred to the same referent.

The fact that bilingual children appear to be able to functionally separate both languages from early on has been used as further evidence refuting the single-language hypothesis (Baum, 1997; Köppe, 1996; Quay, 1995). In her case study, Quay found that her Spanish-English bilingual subject was able to functionally separate the two languages as early as 12 months. The girl was able to speak English predominantly with her monolingual English-speaking grandmother and Spanish with her monolingual Spanish-speaking grandfather. Quay's results were consistent with Baum's (1997) findings.

In the recent literature, there is evidence that increasingly speaks against the hypothesis of a single lexicon in the early bilingual vocabulary. However, researchers have focused on Spanish-English bilinguals. Evidence from other language populations is necessary to generalize results. Furthermore, the study of other languages might shed light on the question of whether the rate of learning or the proportion of translation equivalents in the vocabulary might be affected by how similar the two languages are. For example, Spanish and English are morphologically more different than alike, in comparison to German and English.

Clinical Issues

Collecting data about bilingual speakers becomes relevant to speech-language pathologists because they are concerned with the diagnosis of what is typical and what is exceptional. If the bilingual child is viewed as naturally or normally slow at learning languages, it would become a challenge to differentiate normal and delayed bilingual development. This task is made all the more difficult because few procedures exist that are targeted at bilingual populations.

But in the case of vocabulary assessment, instruments are available that yield useful results, namely vocabulary checklists. The MacArthur Communicative Development Inventories (CDI; Fenson et al., 1993) and the Rescorla Language Development Survey (LDS; Rescorla, 1989) are commonly used to assess vocabulary size in English-speaking toddlers, and both are valued as highly reliable and valid assessment tools (Dale, 1991; Klee et al., 1998). A checklist modeled after the above-mentioned instruments is being developed for German monolingual speakers (Grimm et al., 1996).

Among the checklists available, the LDS taps two of the parameters previously discussed to separate normal from at-risk language and vocabulary development. These parameters are (a) evidence of a productive vocabulary containing at least 50 different words and (b) emergence of word combinations by 2 years of age (Rescorla, 1991b). Neither of the checklists explicitly measures composition of vocabulary or vocabulary richness, but these can be easily inferred from the list.

Using vocabulary checklists for bilingual assessment has an added advantage. Because the judgment of vocabulary skills commonly relies on parental reports, the clinician would not be required to be a speaker of languages other than English. Relying on parental judgment is useful because experience has shown that small children do not demonstrate their potentials readily in front of an unfamiliar adult, such as a speech-language pathologist, even in informal play interactions (Dale, 1991). Furthermore, parental judgments are based on experience with their children in many different situations and settings, whereas a clinician typically sees the child once for a short period of time. Therefore, parents are increasingly regarded as a valuable source of information that should be used when trying to evaluate a young child.

Several researchers (Costarides & Shulman, 1998; Dale, 1991, 1996; Rescorla, 1993) have found that vocabulary checklists are valid and effective measures for assessing language skills in young children, even through the lists are not without flaws (Pearson, 1998). Vocabulary lists do not represent the child's vocabulary in its entirety. Rescorla (1989), for example, demonstrated that scores of vocabulary size in the upper and middle ranges have to be regarded as a function of the size of the list. The larger the lists provided, the larger the vocabulary measured. However, at the low end of the spectrum, size of the vocabulary list does not seem to matter, which means that different-sized lists appear to be equally sensitive in detecting at-risk populations (Rescorla, 1989).

This does not necessarily have to be regarded as a drawback. If one expects bilingual children to lag behind in language development, as is widely believed, then, logically, more bilingual children should fall under the at-risk category and their performance should in general be tending toward the lower range of the performance spectrum. Thus, using instruments that are sensitive to low performance levels, such as vocabulary checklists, appears to be especially appropriate for this study.

Pearson (1995b) and Patterson (1998) successfully used two-language measures that were based on existing checklists developed for monolingual English populations. Therefore, it seemed justified to develop a German-English vocabulary checklist that also made use of existing tools. Among the checklists available, Rescorla's LDS was preferred for this study because it taps previously discussed milestones of vocabulary development at one point in time. The second reason is that the LDS is an open list, unlike the CDI, which allows the parents to add words not appearing on the test form. This reduces bias and makes it especially appropriate for cross-cultural assessment.

Although it appears that one can rightly assume that a bilingual checklist developed for German-English bilingual toddlers will also prove to be useful, research is needed to test its usefulness. Because German speakers comprise the third-largest foreign language minority in the United States according to U.S.

Census data (U.S. Bureau of the Census, 1998, no. 59), it appears especially relevant to develop diagnostic standards and tools to serve this population.

RESEARCH QUESTIONS

The general goal of this study was to determine whether 2-year-old German-English bilingual toddlers exhibit comparable vocabulary skills relative to their respective monolingual peers, as measured by Rescorla's (1989) LDS. The descriptive outcome might allow inferences about hypotheses on the underpinnings of bilingual vocabulary acquisition. The following questions were addressed:

1. Is the size of the early German-English bilingual vocabulary comparable to that of respective monolingual peers, when different words in both languages are added up?

2. Is the number of verbs in the lexicon similar or different among German-English bilinguals and their monolingual peers?

3. How is the bilingual vocabulary distributed over the two languages? That is, how much semantic overlap in the form of translation equivalents is evident at age 2, and what proportion of words is produced in one language only?

METHODS AND PROCEDURES

Subjects

Data were collected from 10 normally developing bilingual subjects acquiring German and English simultaneously from birth or infancy. Nine children were being raised in German-English-speaking homes in the United States and Germany; one child was being reared in a German-speaking home and had been exposed to English during daycare since 3 months of age. Eight children resided in the area of Ann Arbor, Michigan, United States; one child in the area of Tübingen, Germany; and another one in the area of Aachen, Germany.

For each language, a monolingual control group was recruited. The monolingual English participants resided in Ann Arbor, Michigan, and the monolingual German participants in Tübingen, Aachen, and Kiel, Germany.

Each of the groups consisted of 5 males and 5 females, with 7 first-born and 3 later-born children. At the time of assessment, the ages for all participants ranged between 24 and 27 months (for bilinguals: $\underline{M} = 24.7$, $\underline{SD} = 1.06$; for German monolinguals: $\underline{M} = 24.9$, $\underline{SD} = 1.28$; for English monolinguals: $\underline{M} = 24.8$, $\underline{SD} = 1.22$). Statistical analysis using one-way analysis of variance (ANOVA) revealed no significant age differences across groups ($\underline{F}\ [2,27] = 0.07$, $\underline{p} > .05$). (See Table 1, Appendix A.)

Subject-Selection Criteria

Because this study was based on a relatively small sample, it was important to ensure homogeneity to control for confounding variables that could influence the results. The following selection criteria were applied.

Age. Rescorla's (1989) Language Development Survey (LDS), the measure used for this project, is standardized to assess milestones of early vocabulary development at 24 months of age. Consistent with Patterson (1998), a narrow age range of ± 3 months was permitted. In each group, 3 males and 3 females were exactly 24 months old. Of the remaining 4 children in each group, 2 ranged in age between 25 and 26 months and 2 had reached 27 months of age. No participant was younger than 24 months of age.

Gender. Each group required and included an equal number of males and females in order to counterbalance gender effects.

Developmental status. Because the goal of this study was to investigate the typically developing bilingual toddler, participants were included only if they were developing normally. The developmental status was determined using age-relevant questions from the Rosetti Infant-Toddler Language Scale (Rosetti, 1990), which is routinely used in the Ann Arbor school district (see Appendix D for parent interview form). The Rosetti Infant-Toddler Language Scale screens for receptive language abilities, as well as motor, cognitive, pragmatic, and play skills, based on parents' reports or through observation.

Uneventful birth history and pregnancy were checked by inquiring about Apgar values, birth weight, and whether the child was born at term date.

Children who failed the Rosetti Infant-Toddler Language Scale were excluded from the sample, as were children with at-risk birth history, as determined by Apgar values below 7, low birth weight (below 5 lb), or birth outside a 2-week range of expected full-term date. Other exclusionary criteria were hearing loss or repeated history of otitis media with effusion (more than two bouts within the preceding year, according to Leonard, 1998). All children participating in this study were typically developing toddlers with unremarkable births, normal medical and developmental histories, and no known hearing problems.

Competence of language models. A child acquiring a language should be exposed to competent speakers. To ensure competence of language models, the participating parents were required to be native speakers (ideally) or to demonstrate native-like fluency, with their skills having been enhanced by their having spent a minimum of 2 years in the country being exposed to the language used in child-parent communication.

In the bilingual group, 17 of 20 parents and grandparents reportedly addressed their children in their native language. Only 3 parents chose their weaker or second language to communicate with their child. Of these, 2 parents had been raised bilingually themselves by immigrant parents until they reached school age. Both parents took advanced German-language classes in high school and college. They both thought that they were stronger speakers of one language; however, they were able to easily follow and keep up conversations in their other language. The third parent used her second language regularly at work. At the time of the study, she and her child attended playgroups once a week that, aside from her, consisted only of native speakers.

In the monolingual control groups, all parents were native speakers of the main dialect of the majority language. Some had acquired knowledge of other languages, but none of them reported using languages other than their native languages to communicate with their children.

Educational background of parents. According to Hart and Risley's (1995) long-term study on 42 American families with children between 13 and 30 months of age, the amount of adult time spent interacting with a young child appears to be the single most positive factor influencing vocabulary growth. It was more important than birth order, ethnicity, or even gender. Hart and Risley also reported that the higher the parents' level of education, the higher the amount of child-parent interaction. More time spent with the child offers opportunities to provide mature language models. In their study, Hart and Risley found that the amount of input, tied to educational level of the parents, was significantly correlated with the productive vocabulary size of their children.

Families who elect to offer their child the opportunity of a bilingual education, especially in a country where the language community is relatively small, are likely to be motivated to spend time with their children. Extra effort is necessary to provide the children with the books, games, videotapes, and conversational partners of the minority language and culture. Therefore, the sample was expected to be biased toward higher levels of education and middle class.

Patterson (1998) criticized most studies on language acquisition for drawing on samples that do not consider diverse socioeconomic backgrounds. However, this was not seen as a drawback for answering the questions raised in this particular study. If one wants to know whether learning two languages is, in principle, as easy as or more difficult than learning just one, then it seems to be advantageous to select participants for whom conditions for learning are as favorable as possible so that, in the end, negative environmental factors could not be seen as responsible for possibly confounding the results.

To counterbalance the expected bias of the bilingual group toward middle class, an above-average educational level, consisting of at least some secondary training beyond high school, and professional employment of at least one parent, were required of, and met by, all families.

In 9 out of 10 families in the bilingual group, one parent or grandparent was able to stay home part or full time (8 mothers and 1 father) and had the opportunity to spend time with the child. All mothers in the monolingual German group stayed home full or part time, as did 9 mothers in the monolingual English-speaking control group. Consistent with Hart and Risley's (1995) findings, all parents reported that they allocated time and attention for their child every day. Of course, not only play but also everyday life activities, such as doing chores together, may provide opportunities for child-parent interactions and dialogues. But because families could not be observed in real life, as did Hart and Risley, the amount of playtime was taken as an indicator of parents' involvement with their child. Estimations of time were based on parents' reports of typical family routines during weekdays and weekends. All households in the study provided good conditions for active language learning. It was striking to learn that book reading and play were encouraged, whereas watching television, which also provides opportunities for language input but is not interactive, was either not an option or limited. None of the children were said to watch more than 30 minutes of television per day, but they spent at least 1 hour per day engaging in play or reading with their parents. To make a comparison: A 1999 United States survey revealed that children between 2 and 17 years of age spent 2-1/2 hours watching television every day on average (see national survey conducted by the Annenberg Public Policy Center at the University of Pennsylvania, cited by Dart, 1999).

Additional Selection Criteria for Bilingual Subjects

As discussed in the introduction, bilinguals are a heterogeneous population. To increase homogeneity in the bilingual cohort of this sample, the following additional criteria were applied.

Minimum exposure requirement. As Pearson et al. (1997) pointed out, most parents who raise their children bilingually intend to expose them equally to both languages, but a fully balanced exposure is rarely observed in reality. However, they found that a certain minimum amount of input appears to be necessary for successful bilingual development. In their longitudinal study of 25 Spanish-English bilingual toddlers, the above-mentioned authors observed that children who received less than 20% exposure to a language (which equals about 15 hours per week) were reluctant to use this language when interacting with their parents. On the other hand, children who were reported to receive higher amounts of language input were observed to use both languages according to language context. Only 1 out of 19 children refused to use one language despite having received almost balanced exposure (60% English and 40% Spanish). Therefore, Patterson's (1998) requirement of 8 hours of language contact is regarded as being too weak to select true bilingual speakers, and the more rigorous criterion determined by Pearson et al. (1997) is preferred.

Pearson et al. estimated that a child was awake about 12 hours a day on average, which adds up to 84 hours per week. Hours spent with Spanish or English speakers per week represent a fraction or percentage of 84 hours. As the authors admitted, these guidelines are relatively crude because (a) they are based on what parents estimated from memory and (b) they do not take the quality of interaction into account. Time spent reading books, for example, has the same value as time spent doing chores without necessarily engaging the child in a dialogue. To increase accuracy, the parents were asked to describe typical weekday and weekend activities and routines.

All 10 bilingual children included in this study met a minimum exposure requirement of at least 15 hours per week for either language. Three additional children who received less than the 15-hour-per-week minimum input in one language were excluded.

Consistency of language model. Although a certain amount of language mixing or code switching might be inevitable, even normal for bilingual speakers (Grosjean, 1989), excessive mixing by language models has been found to be disadvantageous for the child. The main concern is that it encourages language mixing by the child and thereby reduces incentive to voluntarily separate languages where necessary, as in the case of communicating with monolingual speakers. A child whose parents constantly code switch might be likely to imitate the model and also mix languages (Goodz, 1989; Kielhöfer & Jonekeit, 1998), which could be a confounding factor when analyzing whether the child develops one or two separate vocabularies. Another disadvantage of language mixing in the input language is that the amount of input provided in a particular language is reduced by the amount of mixing, which could be significant, depending on the extent of mixing.

Besides consistency of parental input during parent-child dialogues, another type of consistency applies to rules of language use in different contexts. There are different strategies reported in the literature, the most popular one being the one-person-one-language approach (Kielhöfer & Jonekeit, 1998). This strategy requires each parent to communicate with the child in a different language. Other rules might allocate particular languages to different settings, situations, times, and so on.

To meet the consistency criterion, clear-cut rules about contexts of language use were required, although it was not critical to adhere to a particular strategy. Consistency of language use during conversations with the child was observed by the writer during free-play sequences. Families who reported inconsistent language use or were unable to communicate consistently with their child in one language for 95% of the time during videotaped play interactions were excluded from the sample.

The language-modeling criterion was met by all parents participating. One additional family had to be excluded due to frequent language mixing during videotaped parent-child interaction.

All families in this study reported applying rules specifying contexts in which a certain language was to be used. The one-person-one-language strategy was reported by 80% of the parents; one family alternated speaking German or English on different days of the week, and one family spoke German at home and the child spoke English during daycare. When company was present or during activities outside of the home, 8 out of 10 families reported using the majority language even when communicating with the child. According to the parents, none of the children had reacted negatively to rules of language separation and none had so far rejected speaking one of the languages. In one family, older siblings (3 years and 5 years of age) were reported as not speaking their weaker language even though they were consistently addressed in it by their mother. For both siblings, the amount of exposure to their mother's language was reduced after attending all-day kindergarten programs that were taught in the other language.

Recruitment of Subjects

Participants for this study were recruited in part by contacting organizations that promote German language and institutions that target young children in general. Advertisements asking for participation in the project were posted at the German Cultural Center (Goethe Institute), the Steiner School, playgroups, pediatricians' offices, and daycare centers. Families who contacted the writer received a one-page informational letter about the project and conditions of participation (see letter to parents in Appendix D). The families were asked to give or withhold written consent within a 2-week period (see consent form in Appendix D). All families who contacted the writer were willing to participate in the study.

Description of Vocabulary Measures

Original Monolingual English Version of the Language Development Survey

A standardized parent report instrument, the Language Development Survey (LDS) developed by Rescorla (1989), was used to assess expressive vocabulary at a single point in time (see Appendix C). The LDS was preferred over the MacArthur Communicative Development Inventories (Fenson et al., 1993) because it does not require the child to know specific words. Unlike the MacArthur Communicative Development Inventories, the LDS allows the parents to add words that are not included on the checklist. This reduces possible bias and makes it more appropriate to use for cross-linguistic and cross-cultural assessment.

Content of the LDS. The LDS was specifically designed to screen expressive vocabulary of monolingual English-speaking toddlers at 24 months of age. It provides a checklist of 309 words organized into 14 semantic fields containing 31 words for types of food, 11 words for toys, 10 words for outdoor objects, 9 words for places, 21 words for types of animals, 21 words for body parts, 32 words for household items, 14 words for personal items, 15 words for people, 17 words for types of clothing, 10 words for vehicles, 52 action words, 33 modifiers, and 33 miscellaneous words, such as *hi, bye, please, meow, night,* and so on. The words were drawn from Rescorla's previous research on lexical development with normal English-speaking toddlers (see review in LDS manual, Rescorla, 1991b). For each semantic category, Rescorla chose a core set of highly frequent words as well as some words less frequently used by the children in the sample. As mentioned before, the LDS additionally provides a section for the parents to note words within the child's vocabulary that are not on the checklist. Parents are also asked whether word combinations are emerging within their child's vocabulary and, if so, to provide three examples. Children are identified as being at risk when their vocabulary is smaller than 50 words and/or no word combinations are emerging.

Reliability and validity of the LDS. Since initial publication of the LDS, a number of studies have investigated its validity as a diagnostic screening tool. Strong reliability was reported by Rescorla (1991b), with internal consistency and test-retest reliability coefficients as high as $\underline{r}$ = .99. Point-to-point reliability for individual words was somewhat lower, with $\underline{r} > .90$ for 32% of the items and $\underline{r} > .70$ for another 55% of the words (Rescorla, 1991b).

Concurrent validity of the LDS has been tested with several established measures. In a recent study administered by Klee et al. (1998), the LDS was correlated with a 20-minute spontaneous language sample, plus the Infant Mullen Scales of Early Learning. A high concurrent validity with levels of sensitivity and specificity of 91% and 87%, respectively, was reported, which means that the LDS identifies nearly all language-delayed children correctly without falsely identifying too large a proportion of normal children as delayed. This outcome is consistent with two other studies in which concurrent validity of the LDS with the Reynell Development Language Scales (Rescorla, 1991b) and with the Bayley Scales of Infant Development (Rescorla, Hadick-Wiley, & Escarce, 1993) were tested. Levels of sensitivity and specificity reported were at 89% and 86% in the first study and at 90% and 95% in the second study.

In contrast to concurrent validity, the predictive validity of the LDS was somewhat lower. To calculate predictive validity, children screened at age 2 using the LDS were reevaluated at age 3. Depending on the prevalence of the disorder, the positive predictive value was reported to be between 18% and 37% (Klee et al., 1998). Based on a prevalence of 3%, only one in five children who initially screened positive remained so at later assessment. If the prevalence was assumed to be 7%, then one in three children remained positive. The negative predictive value was 99%, which means that almost all children identified with normal language development remained so at later assessment.

According to Klee et al., these somewhat lower levels of positive predictive validity might indicate that a vocabulary checklist alone is not enough to identify late talkers. Other criteria, such as use of symbolic gestures, language comprehension, cognitive skills, and so on, should be considered in addition to the LDS score to home in on truly delayed children at age 2. However, this does not minimize the value of the LDS for assessing expressive language skills, as has been demonstrated by its high concurrent validity with other tests that identify delay, such as the Infant Mullen Scales of Early Learning, the Reynell Development Language Scales, and the Bayley Scales of Infant Development.

Because of its strong validity, the LDS has been used as a criterion measure for subject selection in two major studies of English-speaking late talkers (Paul et al., 1993, 1995; Rescorla, Roberts, & Dahlsgaard, 1997). As mentioned before, it also was tested in Patterson's (1998) cross-linguistic validation study for Spanish-English bilingual toddlers.

German Translated Version of the Language Development Survey

Because no vocabulary measure existed at the time of this study to assess German speakers at age 2, the writer translated the LDS into German, based on the assumption that lexical development may to some extent be similar across cultures for young children, as discussed earlier.

Comparison of English and German LDS items. To verify this assumption and to check whether the English and German versions of the LDS are of comparable difficulty, 50 items were randomly selected from the list and analyzed separately for each language in regard to frequency of occurrence in children's vocabularies. Unfortunately, no published corpora describing children's vocabulary as young as 2 years of age exist to date. Corpora that are available sample older children and thus have to be used with caution when implications are made for younger ages. Based on the American Heritage Word Frequency Book (Carroll, Davies, & Richman, 1971), which contains 86,741 different words (types) drawn from a sample of 5,088,721 words (tokens) in more than 1,000 published texts used in schools for grades 3 through 9, it could be determined that all 50 items sampled on the English version of the LDS were among the 10,000 words most frequently occurring. (See Word Frequency for English LDS items, Appendix B.) Detailed analysis revealed that roughly two thirds of the items (68%) were among the 2,000 most frequent words and almost half of the items (42%) were among the first 1,000 words most frequently occurring in children's texts used in schools.

Pregel and Rickert (1987), on the other hand, collected samples of productive speech to analyze word frequency in vocabularies of young German speakers. (See Table 2, Appendix A.) Their data pool, consisting of 260,374 words (tokens), was based on elicited oral and written discourse of German Elementary School students from grades 1 through 4. Analysis revealed that 70% of the German LDS equivalents sampled were highly frequent in first graders' vocabularies, and all items were present in third graders' vocabularies. (See Word Frequency for German LDS items, Appendix B.)

Furthermore, English and German LDS items of the random sample were ranked, based on frequency of occurrence in children's vocabularies. Their ranks were compared using the Spearman rank difference correlation. Statistical analysis revealed a moderate significant correlation between ranked items across languages with $\underline{r}$ (30) = .64 ($\underline{p}$ < .05).

Translation issues. The translation of LDS items into German was straightforward for the majority of words. Only a few words did not have an exact equivalent in German. Some simple English verbs, e.g., *[to] nap* or *[to] lunch* require a phrase in German, such as *Mittagsschlaf machen* or *Mittag essen.* In order not to expect a higher performance from a German than from an English speaker, the German child was expected to produce only the noun part of the phrase. This decision is consistent with the LDS, which lists the adult phrase *[to] eat breakfast* as *breakfast* under the rubric of event words. Another difference between the languages is the German partiality for compound nouns where simple nouns are used in English. For example, *floor* translates to *Fuß-boden*, which contains three times as many syllables as the English equivalent. Again, in order not to expect higher performance from a German speaker, only the main part of the German compound had to be produced in order to be counted, unless the whole compound was necessary to discriminate it from other items, such as *Hausschuhe* versus *Turnschuhe* versus *Handschuhe* (house slippers, tennis shoes, gloves). If only part of the compound was expected, it was indicated on the list by putting the less important part of the compound in parentheses, such as *(Fuß)boden.*

Finally, for three words on the English vocabulary list, dialectal alternatives were listed on the German version because they are typical for different regions of Germany, even for speakers of High German. For example, for *bye* the alternatives *tschüß* and *ade* were listed.

All items considered, only 17 out of 309 words (about 5% of the total number of words provided) posed some translation difficulties as described above. The translation of more than 90% of the words was straightforward.

The German version of the LDS was tested in pilot studies with one 24-month-old monolingual German-speaking boy residing in Kiel, Germany, and one bilingual German-English-speaking 17-month-old boy residing in the United States at the time. Minor changes were made following suggestions of the parents who filled out the German vocabulary checklists. (See Appendix C.)

In summary, the LDS appears to be a highly reliable and valid instrument for assessing lexical skills of English speakers at age 2. Word-frequency analysis revealed that items used on the LDS are found in children's vocabularies of both languages. About two thirds of the items were among the most commonly occurring words, whereas one third were less frequent. For the translation, minor adaptations were made to ensure similar levels of difficulty. Because the level of difficulty appears to be comparable across languages, it seems legitimate to use the LDS for both English and German.

Data-Collection Procedures

Data were collected during one or two home visits to the families no more than 1 week apart. Both visits together did not exceed 2 hours.

Parent Interview

A 30-minute interview with one parent was conducted to verify the child's uneventful medical history (no premature birth, no major illnesses or disabilities, no history of recurring ear infections), and normal sensory-cognitive development.

Furthermore, information about possible environmental factors, such as educational background of the parents, socioeconomic status (here: employment status), patterns of language usage, and duration and type of parental interaction with the child were requested (see parent interview form in Appendix D).

Informal Observation of Child's Spontaneous Play

A 15- to 30-minute sequence of spontaneous play between the child and the parent was videotaped as an additional source of information about the child. It aimed to verify whether the child was normally developed, and to check parental consistency of language usage. However, only the data collected on the vocabulary checklist were used for this study.

All video recordings were made using a Panasonic AG-EZ20 digital camcorder with a built-in microphone. Because the video recordings served as additional evidence for subject selection and no transcriptions of speech samples were made, no external microphones were used.

Collection of Vocabulary Data

About 30 minutes were needed for one parent to complete the LDS. In the bilingual group, a second checklist in the other language had to be completed between 3 and 7 days later. The order in which the LDS was completed for each language was randomized.

As per the original LDS instructions, the parents were asked to mark each word within the child's production regardless of the child's pronunciation as long as the referent was stable and clear. If the parent was not sure whether the child's word production was recognizable for somebody outside of the family, he or she was asked to note it on the form, so that it could be decided later whether to count the word or not. For example, in one family the child said [nana] when it wanted to be nursed, which was not counted. But [gak] for *duck* or [fant] for *elephant* was counted because the pattern of articulatory simplification was consistent with common observations of young children's speech.

Parents were instructed to identify only words that the child spontaneously produced on its own without any adult modeling. Words or phrases that were merely imitated, or words that were understood but not actively produced, were not to be checked on the form. The parents also were asked if their child combined words and, if so, to provide examples. This instruction deviated slightly from Rescorla's original instructions, which asked for examples of the child's best and longest sentences. Following Patterson's (1998) suggestion, any examples of word combinations were accepted because, otherwise, the parents tended to dwell on the task.

In contrast to Patterson (1998), who condensed the Spanish and English vocabulary into one checklist, two separate lists, one in English and one in German, were handed to the parents on two different days, no more than 1 week apart. This procedure was used to avoid bias from one language to the other and to help the parent keep the languages separate. When the parent was asked to fill out the checklist in German, only German was spoken with the family on that occasion, and vice versa. English and German checklists were presented during the first or the second home visit. Due to the time constraints of the examiner, two bilingual families mailed back their second checklist.

As in Patterson's (1998) study, rater bias was controlled by having the same parent complete the LDS for both languages. But in contrast to Patterson, who reported having to include raters with only partial proficiency in one of the languages, this study required native competency in one language and native-like fluency in the other language in order to provide valid ratings.

The mothers most often supplied the data for this study: 7 mothers, 2 fathers, and 1 grandmother participated in the interview in the bilingual group; 8 mothers, 1 father, and 1 grandmother in the monolingual English control group; and 9 mothers plus 1 father in the monolingual German control group. Reliability data were collected from 18 parents (see Reliability of Data section).

Data Analysis

Methodological Issues

Definition of what counts as a word in child language. Before vocabulary size can be calculated, it has to be clear which types of utterances in the child's expressive repertoire can be counted as words. There are two factors that have to be taken into account when analyzing child language at age 2: (a) the child's phonetic inventory is not fully developed, and (b) word meanings in the child language might not be congruent with word meanings in the adult language.

Anybody listening to young children will notice simplification of the phonetic structure in words, such as [laid] for *slide,* or [nænə] for *banana,* as well as consonant substitution, for example, [g, k] for [d, t], as in [gak] for *duck* (see review of phonological development in English- and German-speaking children by Führing, Lettmayer, Elstner, & Lang, 1985; Vihman, 1996). Because phonetic deviations are commonly observed in young children's language production, the authors of both available vocabulary checklists (Fenson et al., 1993; Rescorla, 1991b) accepted "baby talk" and counted these utterances as words. Unfortunately, they are sketchy when defining what they mean by baby talk. In this study, children's utterances were counted as words, as long as the parents perceived the word forms as stable, regardless of whether the child's utterances contained consonant substitutions, simplification, or distortions or omissions.

Semantically, young children are often observed to over- or underextend words, e.g., *dog* might refer to dogs and wolves, or *dog* might only be used to refer to the child's own pet. Again, the parents were asked to note whether the child's word deviated from the target, so that it could be decided later whether to count it in the analysis. Similar to phonetic approximations, over- and underextensions of words might be interpreted as semantic approximations of target words. They are counted as words, but only once regardless of the number of referents. In the above example, in which *dog* referred to dogs and wolves, *dog* would only be counted once as one word.

Following Rescorla (1998), onomatopoeias, such as [tʃu-tʃu] for *train,* were also counted as words. The parents were asked to write these types of utterances next to the target word, as well as utterances that they were not sure could be regarded as a word. However, proto-words that had no obvious semantic relationship to the target word were not counted. One example is the lexical form [nana] to express a request to be nursed.

As in the original LDS, proper names and names of letters and numbers were counted as only one item, regardless of how many the child produced.

<u>Discrimination of the two languages.</u> Considering that small children tend to simplify words phonetically, they might use the same phonetic form in both language contexts, especially given the fact that German and English are highly related languages. Of the 309 items used in both versions of the LDS, 162 consist of cognates, which are words that can be traced back to similar etymological roots, such as *Hand* and *hand.* The concern that arises is whether parents can make valid judgments about their child's language choice when cognates are used. On the checklist the parents might check off target words only in one language without a verifiable basis for their language choice, or they

may possibly credit the child's utterance on both checklists, which might inflate the results.

Unfortunately, to date there is no information available about phonological development in bilingual toddlers to address the concern discussed above. Therefore, inferences have to be made from data that are available. One source of data is studies investigating young children's perceptive abilities because perception is a prerequisite for speech production. Various studies on auditory skills in young children have documented a high sensitivity to the ambient language from early on (see review in Locke, 1993, chapter 4). Mehler, Lambertz, Jusczyk, and Amiel-Tison (1986), for example, found that 4-day-old infants from French-speaking families reacted differently when addressed in French than in Russian. Eilers, Gavin, and Oller (1981) reported that monolingual English and Spanish infants were able to discriminate minimal phonological contrasts in novel stimuli (VCV), following rules of their ambient languages, at 6 to 8 months of age. Even more relevant are data on productive skills of young children across languages. Boysson-Bardies, Halle, Sagart, and Durand (1989), who examined spontaneous babbling of 10-month-old infants reared in monolingual English, French, Arabic, and Cantonese environments, found that vocalic elements in the children's babbling already resembled vowel contours of their ambient languages. An explanation might be that vowels are motorically easier than consonants, which is supported by the fact that language-impaired children rarely produce vowel errors (Führing et al., 1985). Despite the lack of data on bilingual phonological development, it might be inferred that the 2-year-old children targeted in this study should at least be able to produce proper vowel-quality words.

This is important because the vowel spaces for German and English are distinctly different (Kohler, 1977; Ladefoged, 1982). When the phonological structures of items used on the LDS are compared, it becomes evident that among cognates it is particularly vowel quality that accounts for differences, whereas some consonants, mostly initial consonants, are retained, such as in *Brot/bread.* See phonetic transcription of English and German LDS items in Appendix B. Because 2-year-old children are expected to produce proper vowels as well as some consonants, they are likely to make distinctions between cognates, which should be detectable by their parents. Levels of above 80% agreement of parental judgment in test-retest as well as inter-rater reliability ratings performed by this researcher support this assumption.

Calculation of Vocabulary Size

Monolingual children. For monolingual children, vocabulary size was determined by simply counting the number of different words checked off on the LDS. Following Pearson et al. (1995), the number of different words was viewed as a rough measure of the number of semantic concepts for which the monolingual child has a lexical representation.

Bilingual children. With bilingual children, the relationship between words and semantic concepts is more complex. Ideally, two different word forms should be associated with each semantic concept. Therefore, the number of word forms and concepts is not expected to be congruent, as is the case with monolingual children. A complicating factor is whether so-called "translation equivalents" really do evoke the same mental image in the child (Pearson, 1998). For example, the semantic pair *dinner/Abendbrot* illustrates that the meanings of some words may be culture specific and not fully equivalent. Following this argument, it would be necessary for a bilingual child to acquire twice as many concepts as a monolingual child in order to be fully communicative in both cultures. On the other hand, a monolingual English-speaking child growing up in the United States, for example, might also be confronted with different cultural influences from each parent due to the fact that American society is diverse. Different religious, ethnic, or geographical roots within the family might shape meanings of words in different ways. For example, the phrase *holiday season* might evoke very different images of rituals depending on the background of each parent. Without minimizing the existence of cultural differences, especially between different language communities, one should also not overemphasize them. The very fact that it seems possible to translate from one language into another implies that there has to be at least some semantic overlap between concepts across languages. Therefore, the term *translation equivalents* was used with the implied understanding of two phonetically different word forms sharing a core meaning, at the same time that they might represent different connotations across languages (and cultures).

Vocabulary size in bilingual children is calculated in two different ways:

1. The numbers of different word forms checked off on the English and the German vocabulary list were added up to calculate the total vocabulary. In this calculation, translation equivalents were counted as two words, with the exception of phonetically indistinguishable pairs, such as *fish/Fisch.* Words of foreign origin, or English words used on both lists, were also counted only once, such as *pizza/Pizza* or *MacDonald's.* Also counted only once were the name of the child, and a pet name. Unpaired items made up 4.5% (14 items) of the sample and were counted only once when calculating the total vocabulary.

2. To assess semantic knowledge, or total conceptual vocabulary, the number of different concepts was added up. Under this premise, translation equivalents were counted as one concept.

Calculation of Vocabulary Richness

As discussed before, the number of verbs is seen as an indicator of vocabulary richness. For all groups, the number of different verbs recorded was summed up.

Calculation of Proportion of Translation Equivalents in the Child's Vocabulary

All word pairs associated with a single referent were counted as translation equivalents. Not counted were word pairs with indistinguishable phonological structures, such as *fish/Fisch.* Calculated was the proportion of concepts for which the child was reported to produce labels in each language.

An example below (for vocabulary of a fictitious child) illustrates the calculation method used.

English	German	
fish	Fisch	(Phonetically indistinguishable)
dog	Hund	(translation equivalent)
car	Auto	(translation equivalent)
duck		
turkey		
	Blume	
	Vogel	
	Flugzeug	

The pair *fish/Fisch* is phonetically indistinguishable; therefore, it is ambiguous and not counted. The remaining vocabulary consists of two translation equivalents: *dog/Hund* and *car/Auto* and five single lexical forms with no equivalent in the other language. So the child's vocabulary amounts to two paired and five unpaired words. The proportion of paired words or translation equivalents in the vocabulary is therefore 28%.

The preceding calculation deviates from Pearson et al. (1995a), who did not calculate for how many concepts the child had double lexical representations, but they used total vocabulary as a reference point. In the above example they would calculate a total vocabulary of 11 words. Of these 11 words, four (*dog/Hund* and *car/Auto)* would be counted as translation equivalents. They suggested counting *fish/Fisch,* the phonetically indistinguishable pair, as one word, reducing the total vocabulary to 10 words. In Pearson et al.'s view, 5/10 words would be described as translation equivalents, amounting to 50% of the total vocabulary. In this calculation, the proportion of overlap between languages appears higher because translation equivalents are counted twice (as two words versus one pair). Because this seems to inflate the amount of overlap, especially in the low ranges, the present researcher preferred the other calculation method. But to make comparisons to Pearson et al.'s study, percentages were calculated both ways.

Reliability of Data

Test-retest and inter-rater reliability data were collected from three sets of parents in each group.

Inter-rater (test-retest) reliability. There was a high agreement on reported vocabulary size for all groups between the initial and the second measurement, which was repeated 5 to 10 days after the initial administration by the same parent. Levels of $r = .92$ for the bilingual subject group, $r = .93$ for the monolingual English group, and r for the monolingual German control group were somewhat lower than levels of $r = .99$ reported by Rescorla (1991b) and Patterson (1998), but they still demonstrate a high stability of rating over a short period of time.

Despite the fact that item-by-item analyses are rarely reported in the literature, they are even more revealing in regard to reliability of an instrument. In this study the agreement between items reported during initial testing and reassessment continued to be very high: A mean point-to-point agreement of r = .87 was demonstrated by the bilingual group, t = .90 by the monolingual English group, and r = .92 by the monolingual German control group. In comparison, Rescorla (1991b) only reported levels of point-to-point agreement between r = .70 and r = .89 for 83% of the items used on the LDS, which might be due to a greater diversity in regard to socioeconomic background and parental level of education in her sample as compared to the present sample.

Of the 9 children who were reassessed, 6 had a larger vocabulary at the second reporting, whereas the vocabulary size for 3 children was reported to have decreased. A dominant tendency of a vocabulary increase was expected because children continue to develop during assessment intervals. Repeated measurements might also have increased the parents' awareness of the child's language development, which might have increased their ratings.

Inter-rater reliability. To measure the stability of the overall LDS vocabulary score across different raters, both parents were asked to assess their child's vocabulary during the first visit; their scores were then compared. Reported vocabulary size revealed moderate levels of agreement for the bilingual group (r = .74) and high inter-rater agreement for both monolingual control groups (monolingual English control group r = .87, monolingual German control group r = .92). The lower levels of reliability in the bilingual group were in part caused by one parent, whose assessment of vocabulary size significantly deviated from the spouse's in regard to vocabulary size of one language (25 words versus 95 words reported by the spouse). Nevertheless, item-by-item analysis revealed that 22 of the 25 words reported by the parent were also checked off by the spouse, which corresponds to 88% agreement. The parent who had reported the low vocabulary score in one language was also reported not to communicate much in that language with the child, which may in part explain his rating. Omitting this particular parent's rating, the level of inter-rater agreement would rise to $r = .84$, which is only slightly below the levels reported for the control groups.

Item-by-item analysis again revealed slightly higher inter-rater agreement for the control groups than for the subject group ($r = .76$), with levels of $r = .84$ for the monolingual English group and $r = .82$ for the monolingual German group.

In summary, reliability testing revealed high stability of vocabulary scores over time and moderate to high agreement between different raters. The general tendency of somewhat lower agreement in ratings observed within the bilingual group might be due to the fact that more variables had to be judged.

Statistical Treatment of Data

Mean values and standard deviations were calculated for all dependent variables. Variations of scores among the three subject groups were subjected to statistical analysis using one-way ANOVA, and further analyzed with Tukey t-tests. Chi-square correlations were used to analyze individual scores within groups.

RESULTS

Vocabulary Size

Total Conceptual Vocabulary

The conceptual vocabulary is defined as the number of different semantic concepts for which the child has a lexical representation. For a monolingual child, the number of different concepts is assumed to be congruent with the number of lexical forms. Because a bilingual child may associate two labels, one in each language, with a single conceptual referent, the conceptual vocabulary size may differ from the number of lexical forms. For the bilingual group, different concepts in both languages were pooled.

Figure 1, depicting average conceptual vocabulary size across groups, shows that the conceptual vocabulary reported for the bilingual group was close to that of both monolingual control groups. Compared to the bilingual group (BL), the average conceptual vocabulary was slightly higher for the monolingual German group (MLG) and slightly lower for the monolingual English group (MLE) (BL: M = 210.6, SD = 48.15; MLG = 224, SD = 50.6; MLE: M = 205.7, N = 10 for each group). One-way ANOVA revealed no significant differences between average conceptual vocabulary across groups (F [2,27] = 0.22, p > .05). T-tests performed to compare individual groups with each other confirmed the above results (BL and MLG: t [df = 17] = 0.16, p > .05; MLE and MLG; t [df = 12) = 0.58, p > .05).

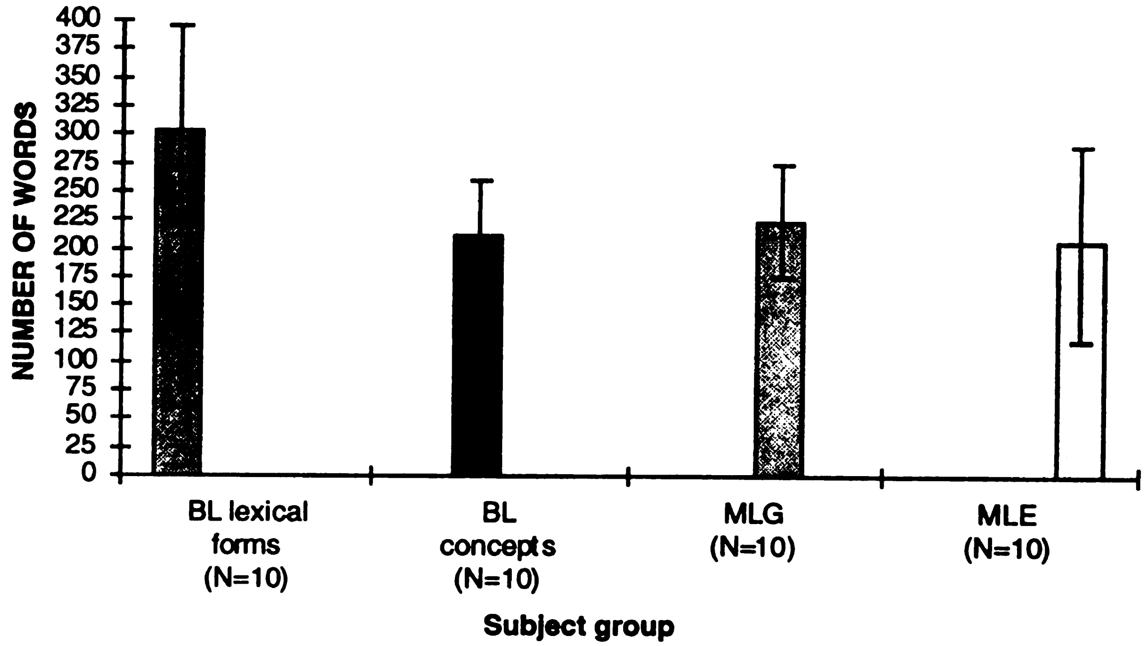

Figure 1. Mean number of lexical forms and concepts across the bilingual (BL), the monolingual German (MLG), and the monolingual English (MLE) subject groups.

Note. For the monolingual groups, the number of lexical forms was congruent with the number of concepts.

Individual conceptual vocabulary scores depicted in Figure 2 show wide ranges of individual performances within and across groups with no group bias. Each group contained low and high performers. Whereas 1 subject performed above and 1 below one standard deviation from the mean (M = 213.43, SD pooled = 64.03) in the bilingual (BL 6 = 286; BL 1 = 143) and in the monolingual German group (MLG 8 = 308; MLG 3 = 117), 1 subject performed above and 5 at or below one standard deviation from the mean in the monolingual English group (MLE 1 = 363 vs. MLE 8 = 149; MLE 9 = 148; MLE 2 = 133; MLE 3 = 124).

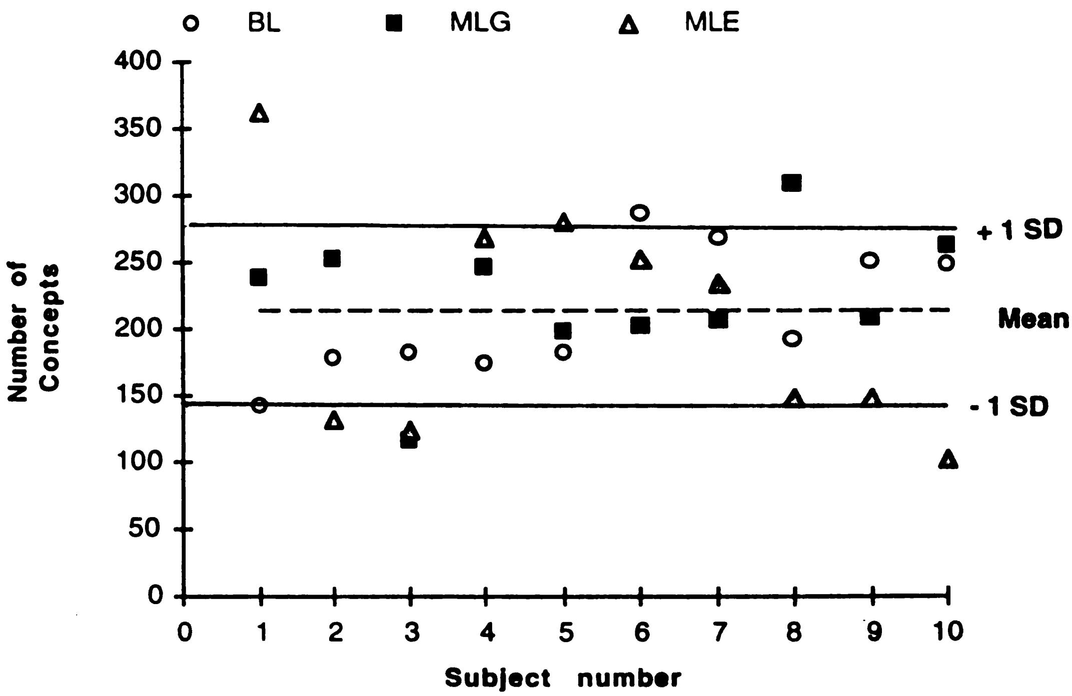

Figure 2. Individual vocabulary scores within and across the bilingual (BL), the monolingual German (MLG), and the monolingual English (MLE) groups.

Note. For the bilingual group, conceptual vocabulary scores were used.

Comparison of individual scores across groups revealed the maximum and that the minimum score was produced by subjects from the monolingual English group, which performed lowest on average (maximum number of different concepts for MLE 1 = 363; minimum number of different concepts for MLE 10 = 102). Three monolingual English subjects showed performance levels below the lowest bilingual scores (MLE 10 = 102; MLE 3 = 124; for MLE 2 = 133 vs. BL 1 = 143), and 1 subject from each monolingual control group showed higher scores than the highest performer in the bilingual group (MLE 1 = 363, MLG 8 = 308 vs. BL 8 = 268).

Total Lexical Vocabulary

Total vocabulary is defined as the total number of lexical forms produced by the child. In contrast to the close proximity of average conceptual vocabulary across groups, Figure 1 shows much larger differences between average total vocabulary of the bilingual group versus average vocabulary size of both monolingual control groups (BL: $\underline{M}$ = 303, $\underline{SD}$ = 92.1). Statistical ANOVA revealed significant differences between the bilingual across groups ($\underline{F}$ [2,26] = 3.48, $\underline{p} < .05$). However, further analyses with multiple comparison Tukey (a) tests revealed that only one pair of means between the bilingual and monolingual English groups was significant (Tukey [a] HSD = 87.5, BL [total vocabulary] vs. MLE [total vocabulary] = 98.2, $\underline{p} < .05$). The differences between the bilingual and monolingual German groups, although sizable, did not reach significance at conventional levels (Tukey [a], HSD = 87.5, BL [total vocabulary] vs. MLE [total vocabulary] = 79.9).

Vocabulary Richness

As discussed earlier, the number of different verbs or event words in the vocabulary is regarded as an indicator of vocabulary richness. Figure 3 depicts the average number of different verbs calculated for each group (BL: $\underline{M}$ = 32, $\underline{SD}$ = 11.65; MLG: $\underline{M}$ = 37.2, $\underline{SD}$ = 9.61; MLE: $\underline{M}$ = 30.78; $\underline{SD}$ = 15.45). As with conceptual vocabulary, the monolingual German group demonstrated the highest average verb score, followed by the bilingual group and the monolingual

English group, but the differences observed did not reach significance when statistically analyzed using ANOVA (F [2.26] = 1.07, p > .05).

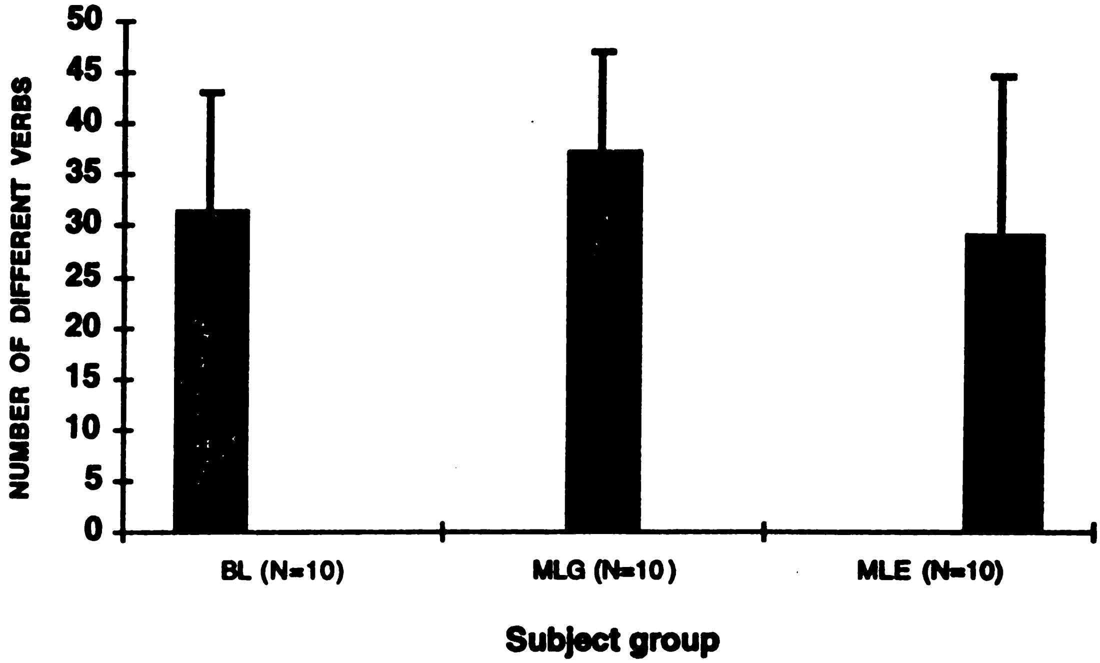

Figure 3. Average number of different verbs across the bilingual (BL), the monolingual German (MLG), and the monolingual English (MLE) groups.

Distribution of individual scores, displayed in Figure 4, again shows a wide range of performance with no group bias. Four monolingual subjects performed at or below the lowest performing bilingual subject (number of different verbs for MLG 3 = 13, for MLE 10 = 13, for MLE 2 = 12, for MLE 3 = 12, vs. for BL 1 = 13) and only 1 monolingual subject (number of different verbs for MLE 1 = 54) had a higher verb score.

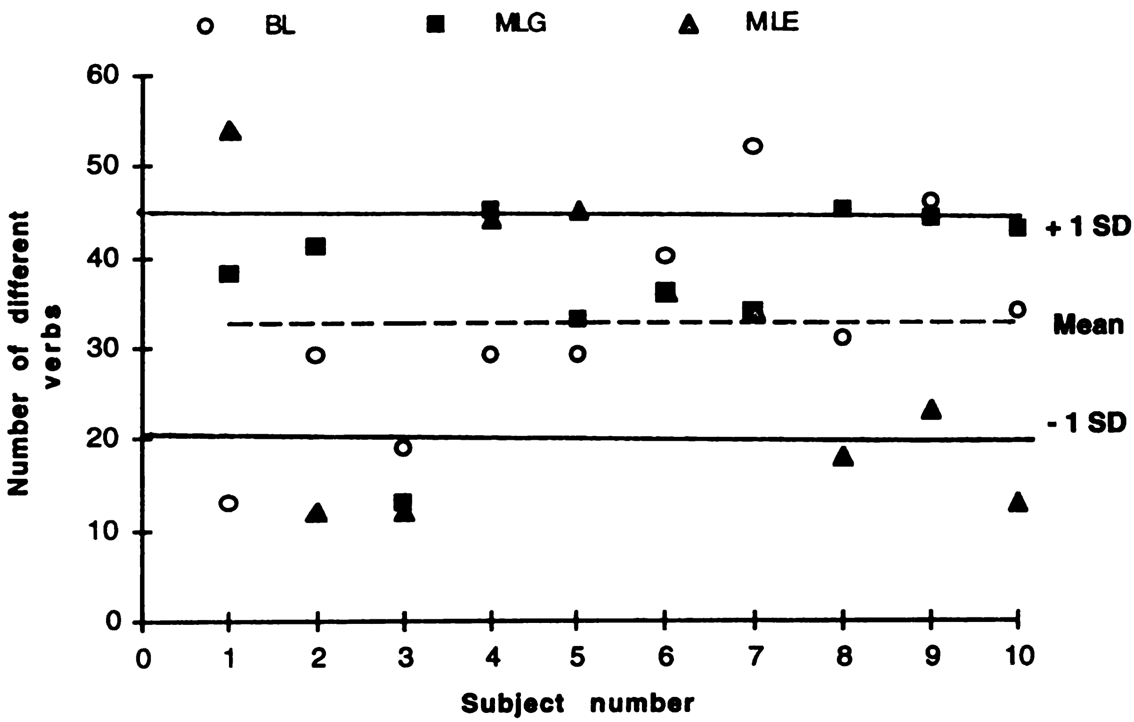

Figure 4. Number of different verbs produced by each subject within and across the bilingual (BL), the monolingual German (MLG), and the monolingual English (MLE) groups.

Distribution of Bilingual Vocabulary Over Two Languages

Proportion of Translation Equivalents in Conceptual Vocabulary

Translation equivalents are defined as cross-language synonyms associated with one referent. The proportion of semantic overlap in the bilingual vocabulary was calculated in relation to total conceptual vocabulary, which is depicted in Figure 5. It shows that all bilinguals produced translation equivalents (M = 43.7%, SD = 19.81), but that none of the children was 100% bilingual. On average, the number of double representations of concepts was smaller than the number of single representations, either in English or in

German. Individual proportions of translation equivalents in relation to conceptual vocabulary ranged between 10.7% and 84.2%.

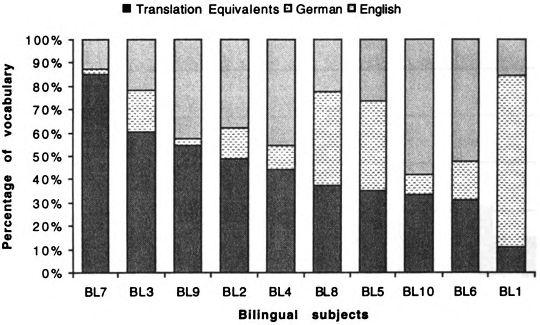

Figure 5. Proportion of translation equivalents within the conceptual bilingual vocabulary.

Distribution of Bilingual Lexical Forms Relative to Monolingual Groups

The bilingual group contained children who were stronger in English as well as children who were reported to have a larger vocabulary in German, as displayed in Figure 6.

Chi-square calculations used to determine language dominance revealed that five bilinguals were reported to produce significantly more lexical forms in English than in German (for BL2, χ^2 [df 1, N = 269] = 6.24, p < .05, SD; for BL4, χ^2 [df 1, N = 255], = 13.65, p < .05, SD; for BL6, χ^2 [df 1, N = 380] = 25.27, p <

.05, SD; for BL9, χ^2 [df 1, N = 389] = 23.2, p < .05, SD; and for BL10, χ^2 [df 1, N = 337] = 42.02, p < .05, SD). Therefore, they were regarded as English dominant.

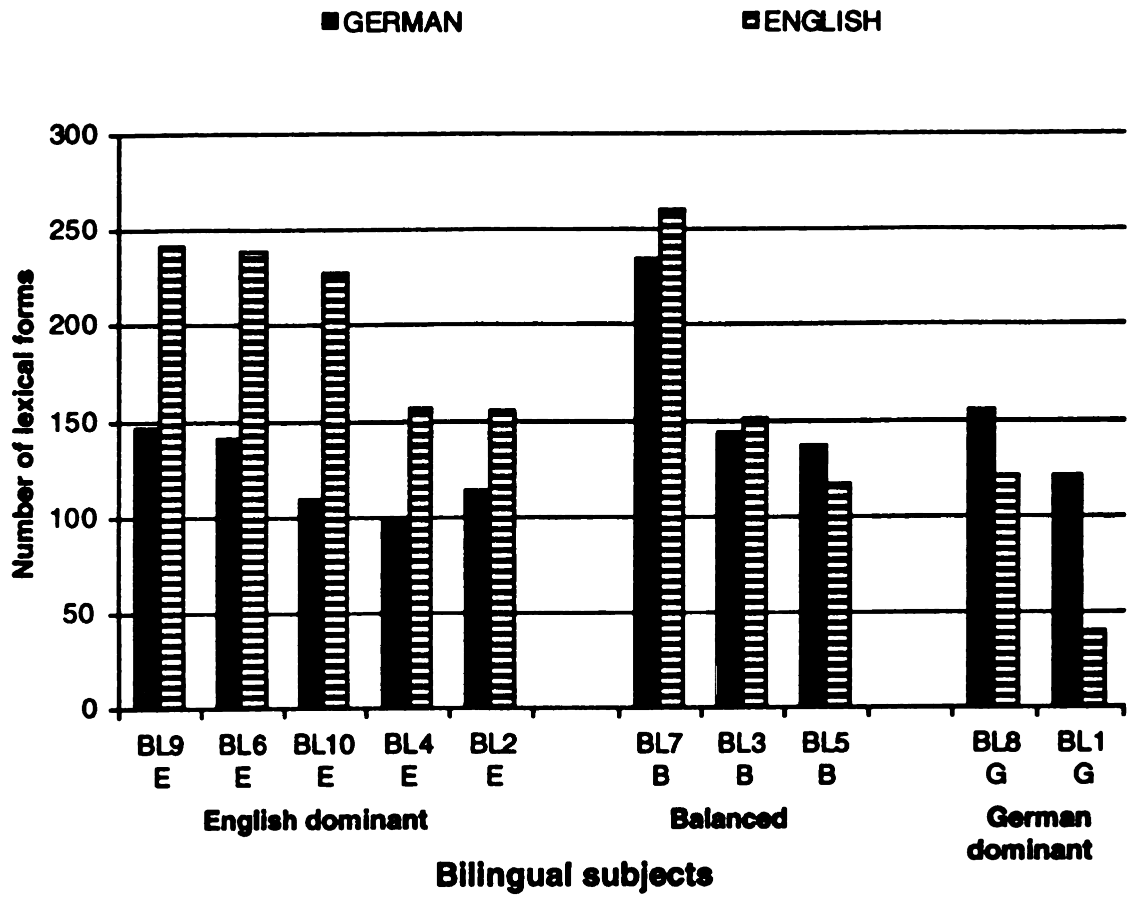

Figure 6. Number of lexical forms for German and English within the bilingual (BL) group.

Two bilinguals were reported to produce significantly more lexical forms in German than English word forms and were regarded as German dominant (for BL1, χ^2 [df 1, N = 161] = 40.73, p < .05, SD; for BL8, χ^2 [df 1, N = 387] = 4.18, p < .05, SD). For 3 bilinguals, chi-square calculations revealed no significant differences between the number of word forms produced in the two languages. These children were regarded as balanced bilinguals (for Bl3, χ^2 [df 1, N = 295]

$= 1.66$, $p < .05$, ns; for BL5, χ^2 [df 1, N = 254] = 1.57, $p < .05$, ns; for BL7, χ^2 [df 1, N = 494] = 1.36, $p < .05$, ns).

Figure 7, depicting English-only vocabulary of individual bilingual subjects relative to average monolingual vocabulary, shows that English-only vocabulary scores of 4 bilingual subjects (BL 6, 7, 9, and 10) were above the average score of the monolingual English group (number for English-only words for BL7 = 260; for BL6 = 239; for BL9 = 242, and for BL10 = 228 vs. MLE: M = 205.7, SD = 86.1). Of these bilinguals, only 3 were English dominant (BL 6, 9, and 10), whereas 1 was a balanced bilingual (BL7).

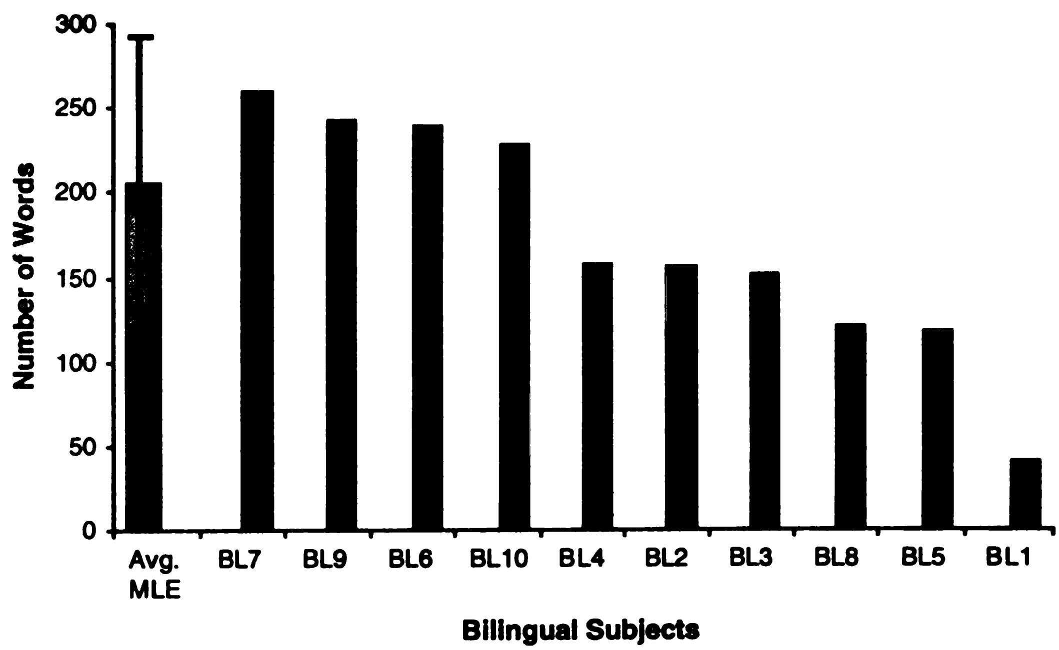

Figure 7. Average monolingual English (Avg. MLE) vocabulary and individual English-only vocabularies of bilingual (BL) subjects.

Note. For bilingual subjects, numbers of lexical forms are depicted.

Two more English-dominant subjects (BL 2 and 4) and 1 additional balanced bilingual (BL3) had scores within one standard deviation relative to the mean of the monolingual English control group (number of English-only words for BL4 = 157, for BL2 = 155, and for BL3 = 151). In summary, English-only vocabulary scores of 7 bilingual subjects fell within one standard deviation of the mean.

Figure 8 shows that 1 balanced bilingual subject (BL7) had a higher German-only score than was reported on average for German monolinguals (number of German-only words for BL7 = 234 vs. MLG: M = 224, SD = 50.6). All other German-only scores were below one standard deviation relative to the average vocabulary size for German monolinguals.

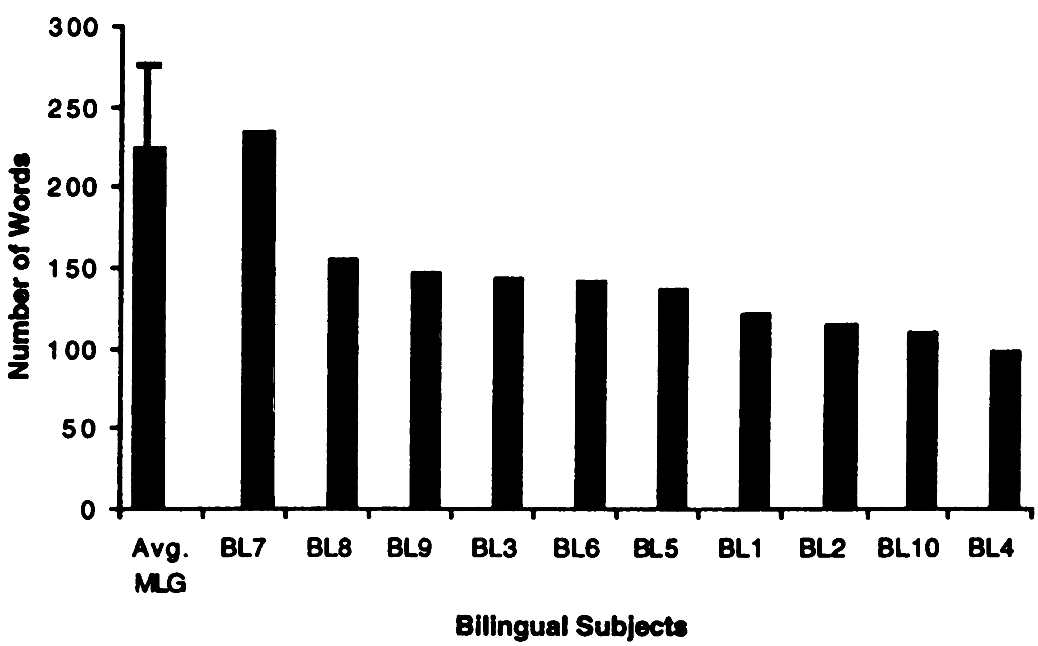

Figure 8. Average monolingual German vocabulary (Avg. MLG) and individual German-only vocabularies of bilingual (BL) subjects.

Note. For bilingual subjects, numbers of lexical forms are depicted.

DISCUSSION

This empirical study was in part motivated out of concerns about the lack of clinical tools available to serve a growing population of language learners in the United States who acquire more than one language. The task to identify bilingual speakers at risk is made even more difficult by the widely held assumption that bilinguals develop language skills more slowly than their monolingual counterparts.

To learn more about the early bilingual language acquisition process and to contribute information necessary to develop clinical standards to better serve bilingual populations in the future, vocabulary skills of 2-year-old German-English bilingual toddlers were compared to their respective monolingual peers.

Specific questions addressed were: (a) how German-English bilingual toddlers compared to their respective monolingual peers in regard to size and richness of vocabulary at 24 months of age, and (b) how the bilingual vocabulary was spread over the two languages.

To answer these questions, the productive vocabulary of 10 German-English bilingual toddlers was compared to that of 10 age-matched monolingual peers in each language, using a German and an English version of Rescorla's (1989) Language Development Survey.

The findings of this study have theoretical and practical implications that are discussed in the following pages.

Theoretical Implications

The widely held belief that regards young bilinguals as inherently weak learners has been supported by the deficit hypothesis (Oller et al., 1997). The rationale of this hypothesis is that the task of having to learn two languages simultaneously at a young age, as opposed to one, slows down the acquisition process due to the limited processing capacities of the developing brain.

To compare the educational potential in a bilingual child relative to monolingual peers, Pearson et al. (1995b) suggested determining for how many different concepts the bilingual child can produce lexical representations. When different concepts were pooled across languages in the present study, vocabulary size was comparable between the bilingual and monolingual groups. This is consistent with findings reported by Pearson et al.

When the number of lexical forms (total vocabulary) was calculated, the bilingual group had a somewhat larger vocabulary, but this difference was only significant between the bilingual and monolingual English groups and not between the bilingual and monolingual German groups. Pearson et al. (1995b) found no significant differences, but because they used one control group containing both Spanish and English monolingual toddlers, their results may not accurately reflect the differences.

No studies exist in the literature to date investigating the composition of the early bilingual vocabulary. First findings, gained through this study, show that vocabulary richness, expressed by the number of different verbs, was comparable for bilinguals and their monolingual counterparts, as was conceptual vocabulary size. The bilingual vocabulary differed neither in regard to quantity nor quality.

Post-hoc analysis revealed further similarities between monolingual and bilingual toddlers. Vocabulary sizes of all bilingual subjects was well above the 50+ word mark, and all parents reported emerging word combinations. This shows that characteristic milestones identified in the literature to determine adequate monolingual development were met by all bilinguals, too. This result is consistent with Patterson's (1998) finding on 102 Spanish-English toddlers.

These findings have profound implications for views of the general educational potential of the young bilingual learner. If language skills in a bilingual child are comparable to those of monolingual peers, and providing there is a correlation between language and cognitive development, then the bilingual child should not be at a disadvantage developmentally.

However, for the above evaluation of bilingual vocabulary skills, performance in both languages was combined. If one wants to know how well a bilingual child functions in the majority environment, one would want to know how strong the child is in one or the other language relative to the majority language (see Figures 7 and 8). This is important with respect to education because most bilinguals in the United States receive their education in the majority language. Therefore, low skills in the majority language would still put them at a disadvantage. As discussed earlier, as many as 40% of the bilingual subjects in this sample were reported to have higher than average scores for their English-only vocabulary relative to monolingual English controls, and about 70% had English-only scores comparable to monolingual English controls. In German only, 10% of the scores were above the monolingual German average. All other German-only scores fell below one standard deviation from the monolingual German average, but they were still well above the 50+ word mark. The relatively lower German-only scores might in part be due to the fact that for only 20% of the bilinguals was German the dominant language.

In summary, the above data speak against the foregone conclusion that all bilinguals are weak performers, even when only one language is concerned. A bilingual child may perform as well as, or even above, the monolingual average in one language only. Therefore, it cannot be assumed that the bilingual child necessarily communicates less effectively in a monolingual environment. These findings are again consistent with Pearson et al. (1995b).

Besides relative strength of each language in the bilingual vocabulary, this researcher examined how the bilingual vocabulary was distributed across languages in order to test another hypothesis, the so-called unitary language system hypothesis, which, similar to the deficit hypothesis, assumes inferior communication capacities in the young bilingual, namely the lack of voluntary language separation. On the basis of this hypothesis, no or only very little semantic overlap in the form of translation equivalents should be expected.

However, the data gathered in this study show that bilinguals do not avoid translation equivalents. For 43.8% or almost half of the bilingual conceptual vocabulary, their double lexical representations were evident. Pearson et al.'s (1995a) calculation method yields an even higher proportion of 63.9%. This finding demonstrates a definite potential for language choice, even though it cannot predict how the child uses words in communicative contexts. For their Spanish-English sample, Pearson et al. (1995) reported somewhat lower proportions of translation equivalents of around 30.8%, which might in part be due to the fact that Spanish and English are less similar languages than German and English.

On the other hand, bilinguals in this study showed a wide range of translation equivalents in their vocabularies, ranging from little (10.7%) to almost complete semantic overlap (84.2%) of the languages. This variety is consistent with findings reported by Pearson et al. (1995a). Therefore, other influences, e.g., environmental factors, such as language models or time of exposure, might affect the child's ability to associate two labels with one referent. In this study, some parents were observed to practically train translation equivalents by asking for names of objects in both languages.

Pearson et al. (1995a) suggested size of vocabulary as another possible influence. Children with vocabulary sizes of more than 500 words in their sample were reported to produce almost twice as many translation equivalents (59% vs. 30.8%) than children with smaller vocabularies. In this sample, the child with the largest total vocabulary of 488 lexical forms was reported to produce the largest proportion of translation equivalents (84.2%), which is consistent with the earlier finding. However, some children with lower vocabularies also produced high amounts of translation equivalents; e.g., one child whose vocabulary contained only 288 lexical forms also contained 60.5% translation equivalents. Logically, the amount of potential semantic overlap is in part a function of vocabulary size of the weak language; in other words, the number of translation equivalents cannot exceed the number of words in the weak language. Further research is necessary to investigate how children learn to associate two labels with one referent.

Clinical Implications and Contributions

These results have several implications for clinical praxis. If bilingual and monolingual children have comparable vocabulary skills, then bilinguals do not need to be regarded as an exceptional population for which separate evaluation standards and tools have to be developed. Tools that are already developed to assess vocabulary skills in monolinguals may be used for bilingual populations as well, as long as vocabulary in both languages is assessed.

To assess vocabulary skills in young learners, vocabulary checklists have been favored by clinicians. Some foreign language adaptations of existing vocabulary lists have already been developed, such as a Spanish version of the MacArthur Communicative Development Inventories (CDI) (Jackson-Maldonado & Bates, 1988) or a Spanish-English version of the LDS (Patterson, 1998). This study contributes a German version of Rescorla's (1991b) LDS that, together with her original English version, can be used as a double language measure and thus increases the number of bilingual populations that can be addressed by speech-language pathologists. All of the above tools are based on parental report, which is especially useful for clinical practice because it allows the clinician to assess vocabulary skills in languages other than English without being required to know these languages.

The use of double-language measures to assess bilingual populations is necessary because only a portion of the bilingual vocabulary is represented in each of the two languages. A large part of the vocabulary is represented in either one or the other language (see Figure 5). Therefore, any measure that assesses only one language will tap only part of the potential of a bilingual child.

Future Research

One reason that studies on simultaneous language acquisition are rare might be the complex methodology that is required to do research in this area. Besides the lack of instruments available to describe skills in languages other than English, there is a lack of agreement on many of the methodological issues. One problem is that any bilingual population of speakers is naturally heterogeneous. For example, this sample includes balanced bilinguals and bilinguals who demonstrate dominance in one language. A question that arises is: Can these subjects be compared with each other, or should subgroups be formed? It has been discussed earlier, for example, that the proportion of translation equivalents in the bilingual vocabulary is in part a function of vocabulary size of the weak language. This means that, theoretically, balanced bilinguals may be at an advantage compared to bilingual speakers with distinct dominance in one language, which, in turn, creates the danger of influencing group means in different directions. This is further complicated by the fact that the bilingual language status may be dynamic and language dominance might change over time.

Another problem is the issue of control groups. Should bilingual performance be related to monolingual counterparts in each language, or is one language sufficient? Is it even legitimate to mix monolinguals from each respective language in one control group, as has been done by Pearson et al. (1995a)? Because it is not known yet whether different languages are easier or more difficult to learn, it may be possible that bilinguals compare differently to different monolingual control groups. Standards are necessary in order to compare results gained in different studies.

Even more fundamental is the possibility of an implicit disadvantage for the monolingual participants observed in this comparative study of vocabulary skills. Whereas monolingual parents were asked to complete only one vocabulary checklist, parents of bilingual children were asked to complete two, which theoretically doubles the number of opportunities to identify words, even though they are semantically equivalent. Because one group performs a task twice as opposed to once, differential test effects have to be considered. Because no standards exist about comparability of monolingual and bilingual populations, it is possible that an implicit disadvantage of the monolingual group might have skewed the results of the present study. However, rigorous reliability testing was performed in this study to control for these effects.

Besides clarifying methodological issues, further research needs to explore different populations of learners. This study focused on vocabulary skills of normally developing German-English-speaking toddlers. No data are available yet on young bilinguals whose skills fall below or around characteristic milestones. Do they meet the challenge of handling two language systems simultaneously as do normally developing bilinguals, or are they especially disadvantaged due to the demands of processing a higher information load in the face of limited information-processing capacities? Further research is necessary to explore this issue.

Another open question is whether similarities or differences in the target languages facilitate or hamper the language-learning process. Evidence from this study and from literature suggests the possibility that similarities between languages might facilitate the learning process and/or retention and recall of translation equivalents. The proportion of translation equivalents in the German-English vocabulary was higher than measured in the Spanish-English vocabulary of same-age bilinguals. More research, especially from populations including speakers of unrelated languages, is necessary to increase our knowledge about the nature of bilingual language learning.

Finally, there is the issue that vocabulary lists, although clinically useful, do not consider language context. To understand better the process of how two languages are learned simultaneously at an early age, we need to know more about possible influences affecting this learning process. Environmental influences need to be investigated, such as overall exposure patterns in the ambient languages during everyday-life contexts, attitudes toward different languages, different types of language models, and so on. Just to name an example, some parents in this study were observed to overtly train language awareness by asking the child for "the word in the other language," which directs the child's attention to looking for synonymy between languages at a very early age. This again leads to the fundamental issue in the literature of whether cognitive strategies or environmental factors exert more influence on the learning process. Research into this question might shed more light on the nature of language learning in general.

SUMMARY AND CONCLUSIONS

There are many open questions in the field of early bilingual acquisition that need further research. One question this empirical study tried to answer was how vocabulary skills of German-English bilingual toddlers compare to their respective monolingual counterparts at one point in time. It was found that bilingual subjects had comparable skills in regard to vocabulary size and verb diversity, which was regarded as an indicator of vocabulary richness. Because no signs of inferiority could be found either in quantity or quality of vocabulary, it is concluded that the bilingual vocabulary, taken as a whole, does not differ from the monolingual.

Considering the similarities found between the bilingual and monolingual vocabularies and the fact that all bilinguals met characteristic milestones of language development at the same rate as their monolingual counterparts, as indicated by a productive vocabulary of at least 50 different words and emerging word combinations by age 2, the bilingual deficit hypothesis, which labels young bilinguals as deficient learners, cannot be upheld. Whatever information load has to be processed, the bilingual child appears to be able to handle it.

The other question that was raised was whether the bilingual child would be capable of representing concepts in more than one language at an early stage of the acquisition process. To answer this question, the proportion of translation equivalents in the child's vocabulary was assessed, which was found to amount to almost half of the child's conceptual vocabulary. Given the simultaneous representation of concepts in two languages, it is inferred that young bilinguals are capable of building two separate lexicons, even as early as 2 years of age. This finding does not justify the single lexicon theory.

In summary, findings from this study contribute to the growing body of literature that does not regard early simultaneous acquisition of more than one language as an inherent disadvantage for the child. This has consequences for clinical practice. If vocabulary skills are essentially similar regardless of whether one or two languages are learned, at least when they are as similar as German and English or Spanish and English, then existing assessment tools can be exploited. Clinicians have favored vocabulary checklists for which double language measures can be easily developed. Rescorla's (1989) LDS appears to be especially promising to adapt for bilingual populations because it is an instrument that contains very little inherent bias. A German-English version of the LDS was used successfully in this study; the usefulness of this instrument for studying other languages should be investigated in the future.

APPENDICES

APPENDIX A

TABLES–RAW DATA

Table 1: Subject pool: Overview of age, gender, and birth order.

Bilingual Subjects	Monolingual German Subjects	Monolingual English Subjects
BL1	MLG1	MLE1
27 months, male, 3rd born	24 months, male, 1st born	24 months, male, 1st born
BL2	MLG2	MLE2
25 months, male, 1st born	24 months, male, 1st born	24 months, male, 1st born
BL3	MLG3	MLE3
24 months, male, 1st born	24 months, male, 1st born	24 months, male, 2nd born
BL4	MLG4	MLE4
24 months, male, 1st born	26 months, male, 1st born	25 months, male, 1st born
BL5	MLG5	MLE5
24 months, male, 1st born	27 months, male, 3rd born	27 months, male, 1st born
BL6	MLG6	MLE6
24 months, female, 3rd born	24 months, female, 2nd born	24 months, female, 1st born
BL7	MLG7	MLE7
25 months, female, 1st born	24 months, female, 1st born	25 months, female, 3rd born
BL8	MLG8	MLE8
26 months, female, 2nd born	24 months, female, 1st born	27 months, female, 7th born
BL9	MLG9	MLE9
24 months, female, 1st born	25 months, female, 1st born	24 months, female, 1st born
BL10	MLG10	MLE10
24 months, female, 1st born	27 months, female, 2nd born	24 months, female, 1st born

Table 2: Productive vocabulary: Bilingual raw data.

subject	No. of German words	No. of English words	phonet. distinct Translation Equivalents	vocab.: total no. of concepts	vocab.: total no. of different words
BL1 (27 months)	103 G + 18 TE (121)	22 E + 18 TE (40)	15 (10.7%)	143	158
BL2 25 months)	23 G+ 91 TE (114)	64 E + 91 TE (155)	83 (46.6%)	178	261
BL3 (24 months)	31 G + 113 TE (144)	38E + 113 TE (151)	106 (60.5%)	182	288
BL4 (24 months)	17G +81 TE (98)	76E + 81 TE (157)	74 (44.3%)	174	249
BL5 (24 months)	66 + 71 TE (137)	46 + 71 TE (117)	61 (35.2%)	183	244
BL6 (24 months)	47 G + 94 TE (141)	145 E + 94 TE (239)	86 (30.9%)	286	372
BL7 (25 months)	7 G + 227 TE (234)	32 E + 227 TE (260)	220 (84.2.%)	268	488
BL8 (26 months)	77 G + 78 TE (155)	43 E + 78 TE (121)	71 (38.2%)	193	269
BL9 (24 months)	8 G + 139 TE (147)	103 E + 139 TE (242)	132 (54.3%)	250	381
BL10 (24 months)	21G + 88 TE (109)	140E + 88 TE (228)	80 (32.2%)	249	329
			M= 43.71% SD= 19.81	M = 210.6 SD = ±48.2	M = 303.9 SD = ±92.1

Note. G = German only

E = English only

TE = Translation Equivalent

Table 3: Monolingual German raw data.

Subject	Vocabulary German	Vocabulary English
MLG1 (24 months)	238	
MLG2 (24 months)	252	
MLG3 (24 months)	117	
MLG4 (26 months)	246	
MLG5 (27 months)	198	
MLG6 (24 months)	203	
MLG7 (24 months)	207	
MLG8 (24 months)	308	
MLG9 (25 months)	209	
MLG10 (27 months)	262	
	M = 224 SD = ±50.6	

Table 4: Monolingual English raw data.

Subject	Vocabulary German	Vocabulary English
MLE1 (24 months)		363
MLE2 (24 months)		133
MLE3 (24 months)		124
MLE4 (25 months)		269 (+64 bird names)
MLE5 (27 months)		281
MLE6 (24 months)		253
MLE7 (25 months)		235
MLE8 (27 months)		149
MLE9 (24 months)		148
MLE10 (24 months)		102
		M = 205.7 SD = ±86.1

Table 5: Number of different verbs across the bilingual and monolingual subject groups.

No. of Subject	Bilingual	German Monolingual	English Monolingual
1	13	38	54
2	29	41	12
3	19	13	12
4	29	45	44
5	29	33	45
6	40	36	36
7	52	34	34
8	31	45	18
9	46	44	23
10	34	43	13
mean	32.21	37.2	29.1
SD	11.65	9.61	15.53

APPENDIX B

ITEMS ON RESCORLA'S LANGUAGE DEVELOPMENT SURVEY: FREQUENCY OF OCCURRENCE IN CHILDREN'S VOCABULARIES AND PHONETIC TRANSCRIPTIONS

Table 6: Frequency of occurrence, rank order, and number of syllables for the sample of 50 randomly selected LDS items (English version).

No.	LDS Item	Frequency	Rank	Number of Syllables
1	coffee	280	1518	2
2	cookie	33	7899	2
3	juice	170	3049	1
4	orange	221	2058	2
5	soda	112	3689	2
6	tea	223	2291	1
7	blocks	260	1694	1
8	house	2705	195	1
9	cow	263	1705	1
10	dog	1380	387	1
11	horse	1263	431	1
12	bottom	858	584	2
13	ear	331	1522	1
14	eye	707	720	1
15	foot	849	571	1
16	knee	93	3987	1
17	teeth	538	943	1
18	store	681	737	1
19	catch	679	743	1
20	clap	89	9520	1
21	dance	608	1182	1
22	feed	372	1259	
23	have	22337	25	1
24	knock	85	4241	1
25	make	8333	71	1
26	run	1473	333	1
27	bottle	346	1442	2
28	chair	421	1139	1
29	clock	330	1474	1
30	cup	364	1684	1
31	towel	48	5961	1
32	money	1694	301	2
33	pencil	331	1636	1
34	aunt	109	3762	1

Table 6: Continued.

No.	LDS Item	Frequency	Rank	Number of Syllables
35	Grandpa	71	5908	2
36	belt	174	2726	1
37	boots	176	2451	1
38	bus	345	1375	1
39	train	556	905	1
40	boy	2529	213	1
41	dirty	143	2725	2
42	mine	378	1318	1
43	open (adj.)	1416	328	2
44	wet	418	1253	1
45	white	2085	252	1
46	away	3814	145	2
47	hi	85	4704	1
48	there	15194	37	1
49	where	5611	96	1
50	yes	1317	399	1

Note. Word frequency and rank order based on a corpus of 86,741 types and 5,088,721 tokens derived from published written materials used in U.S. school from grades 3 through 9.

This corpus was published by J. B. Carroll, P. Davies, & B. Richman. (1971). The American Heritage Word Frequency Book. New York: Houghton Mifflin.

Table 7: Frequency of occurrence, rank order, and number of syllables for the sample of 50 randomly selected LDS items (German version).

No.	Item	Frequency	Rank by Grade Level	Syllables
1	Kaffee (coffee)	38	224 (first grade)	2
2	Keks (cookie)	5	272 (first grade)	1
3	Saft (juice) here: Apfelsaft	3	623 (first grade)	1
4	Apfelsine (orange)	4	726 (second grade)	4
5	Brause (soda)	6	506 (second grade)	2
6	Tee (tea)	7	669 (second grade)	1
7	(Bau)klotz (blocks)	3	488 (first grade)	1
8	Haus (house)	477	4 (first grade)	1
9	Kuh (cow)	31	196 (first grade)	1
10	Hund (dog)	362	3 (first grade)	1
11	Pferd (horse)	78	90 (first grade)	1
12	Po(po) (bottom)	6	998 (first grade)	1
13	Ohr (ear)	125	25 (first grade)	1
14	Auge (eye)	399	11 (first grade)	2
15	Fuß (foot)	116	44 (first grade)	1
16	Knie (knee)	100	112 (first grade)	1
17	Zähne (teeth)	68	102 (first grade)	2
18	Laden (store)	10	455 (first grade)	2
19	fang(en) (catch)	114	55 (first grade)	2
20	Klatsch(en) (clap)	5	594 (first grade)	2
21	tanz(en) (dance)	18	403 (first grade)	2
22	fütter(n) (feed)	83	42 (first grade)	2
23	hab(en) (have)	3633	2 (first grade)	2
24	klopf(en) (knock)	12	746 (second grade)	2
25	mach(en) (make)	631	10 (first grade)	2
26	renn(en) (run)	55	17 (first grade)	2
27	Flasche (bottle)	27	334 (first grade)	2
28	Stuhl (chair)	52	124 (first grade)	1
29	Uhr (clock)	77	46 (first grade)	1
30	Tasse (cup)	23	206 (first grade)	2
31	(Hand)tuch (towel)	26	246 (first grade)	1
32	Geld (money)	28	223 (first grade)	1
33	(Blei)stift (pencil)	3	1062 (second grade)	1
34	Tante (aunt)	139	75 (first grade)	2

Table 7: Continued.

No.	Item	Frequency	Rank by Grade Level	Syllables
35	Opa (grandpa)	94	114 (first grade)	2
36	Stiefel (boots)	11	303 (first grade)	2
37	Junge (boy)	225	16 (first grade)	2
38	Gürtel (belt)	3	711 (third grade)	2
39	Bus (bus)	41	134 (first grade)	1
40	Zug (train)	79	186 (first grade)	1
41	schmutzig/dreckig (dirty)	12	93 (first grade)	2
43	auf (open) hier: offen	31	57 (first grade)	2
44	naß (wet)	56	60 (first grade)	1
45	weiß (white)	448	9 (first grade)	1
46	weg (away)	——	——	
Frequency was not assessed for:				
42	mein(s) (mine)			
46	weg (away)			
47	Hallo (hi, hello)			
48	da, dort (there)			
49	wo (where)			
50	ja (yes)			

Note. Word frequency, rank order and number of syllables of the sample of 50 randomly selected LDS items is based on a corpus of 260,374 words (tokens) of which 12.5% are nouns (3,772 types, 32,600 tokens), 16% are verbs (2,345 types, 41,889 tokens), and 5.9% are adjectives (804 types, 15,437 tokens). Whereas word frequency was calculated for the total corpus, the words were rank ordered for each grade level separately.

The corpus was published by D. Pregel & G. Rickheit. (1987). Der Wortschatz im Grundschulalter. Häufigkeitswörterbuch zum verbalen, substantivischen und adjektivischen Wortgebrauch. Hildesheim: Olms.

Phonetic Transcription of English and German Items on Rescorla's (1989) Language Development Survey
(based on guidelines of the International Phonetic Association)

Food	Lebensmittel
apple ['æ p l]	Apfel ['a p f əl]
banana [bə'n æ n ə]	Banane [ba'na:nə]
bread ['b rɛd]	Brot ['b ʀo:t]
butter ['b ʌt ɚ]	Butter ['bʊtɛʀ]
cake ['k eɪ k]	Kuchen ['ku:χ ŋ]
candy ['kændɪ]	Bonbon ['bɔŋbɔŋ]
cereal ['sɪrɪəl]	Müsli ['m y:slɪ]
cheese ['t ʃ i: z]	Käse ['ke:zə]
coffee ['kɔfɪ]	Kaffee ['kafə] ['kafe:]
cookie ['kʊkɪ]	Keks ['ke:ks]
crackers ['kræk ɚ z]	Zwieback ['tsvi:bak]
drink ['drɪŋk]	Trinken ['tʀɪŋkn]
egg ['ɛg]	Ei ['ae]
food ['fu:d]	Essen ['ɛsn]

grapes ['greɪps]	(Wein)trauben [(vaɪn) 'tʀaobn]
gum ['g ʌ m]	Kaugummi [kao'gʊmɪ]
Hamburger ['hæmb ɝg ɚ]	Hamburger ['hamburgɛʀ]
Hot Dog ['hɑdɔg]	Hot Dog ['hɔdɔk]
ice cream ['aɪs 'kri:m]	Eis ['aes]
juice ['ʤu:s]	Saft ['zaft]
meat ['mi:t]	Fleisch ['f la e ʃ]
milk ['mɪlk]	Milch ['mɪlç]
orange ['ɔrɪnʤ]	Apfelsine [apfəl 'zi:nə]
pizza ['pi:tsa]	Pizza ['pɪtsa]
pretzel ['prɛtsl]	Bretzel ['bʀe:tsl]
soda ['sodə]	Brause ['bʀaozə]
soup ['su:p]	Suppe ['zʊpə]
spaghetti [spə'gɛtɪ]	Spaghetti [ʃ pa'gɛtɪ]
tea ['ti:]	Tee ['te:]
toast ['tost]	Toast ['tost]
water ['wɔ:t ɚ]	Wasser ['vasəR]

Toys	**Spielzeug**
ball ['bɔl]	Ball [' bal]
balloon [bəl'u:n]	(Luft)ballon [('lʊft)ba'lɔŋ]
blocks ['blɑks]	(Bau)klotz [(bao)'klɔts]
book ['bʊk]	Buch ['bu:χ]
bubble ['b ʌ bl]	(Seifen)blase [(zaefn)'bla:zə]
crayons ['kreəns]	(Bunt)stifte [(bʊnt) ' ʃ tɪftə]
doll ['dɑl] ['dɔl]	Puppe ['pʊpə]
present ['prɛzn̩t]	Geschenk [gə' ʃ ɛŋk]
slide ['slaɪd]	Rutsche ['ʀʊ tʃ ə]
swing ['swɪŋ]	Schaukel [' ʃ aokl]
teddy bear ['tɛdɪ bɛr]	Teddy(bär) ['tɛdɪ (bɛ:ʀ)]
Outdoors	**draußen**
flower ['f laʊ ɚ]	Blume ['blu:mə]
house ['haʊs]	Haus [' haos]
moon ['mu:n]	Mond ['mo:nt]
rain ['reɪn] ['ren]	Regen ['ʀe:gn]

sidewalk ['saɪdwɔk]	Gehweg ['ge:ve:k]
snow ['sno]	Schnee [' ʃ ne:]
star ['star]	Stern [' ʃ tɛʀn]
street ['stri:t]	Straße [' ʃ tʀa:sə]
sun [' s ʌ n]	Sonne ['zɔnə]
tree ['tri:]	Baum [' baom]

Animals	Tiere
bear ['bɛr]	Bär ['bɛ:ʀ]
bee ['bi:]	Biene ['b i:nə]
bird [' b ɝ d]	Vogel [' f o:gəl]
bug [' b ʌ g]	Mücke/ Fliege ['mykə] ['fli:gə]
bunny [' b ʌ nɪ]	Hase ['ha:zə]
cat ['kæt]	Katze ['katsə]
chicken [' tʃ ɪkɪn]	Huhn ['hu:n]
cow ['kaʊ]	Kuh ['ku:]
dog ['dɔg] ['dɑg]	Hund ['hʊnt]
duck ['d ʌ k]	Ente [' ɛntə]

elephant ['ɛləfənt]

Elefant [elə'fant]

fish ['fɪʃ]

Fish ['fɪʃ]

frog ['frɑg] ['frɔg]

Frosch ['fʀɔʃ]

horse ['hɔrs]

Pferd ['(p)fe:ʀt]

monkey ['mʌŋkɪ]

Affe ['afə]

pig ['pɪg]

Schwein ['ʃvaen]

puppy ['pʌpɪ]

Hündchen ['hyntçɪn]

snake ['sneɪk]

Schlange ['ʃlaŋə]

tiger ['taɪgɚ]

Tiger ['ti:gɛʀ]

turkey ['tɝkɪ]

(Trut)hahn [(tʀʊt) ha:n]

turtle ['tɝtl]

Schildkröte ['ʃɪltkʀøtə]

Body Parts

Körperteile

arm ['arm]

Arm ['aʀm]

belly ['bɛlɪ]

Bauch ['baoχ]

bottom ['bɑtəm]

Po(po) ['po(po)]

chin ['tʃɪn]

Kinn ['kɪn]

ear ['ɪr]

Ohr ['o:ʀ]

elbow ['ɛlbo]	Ellenbogen ['ɛlənbogŋ]
eye ['aɪ]	Auge ['aogə]
face ['feɪs]	Gesicht [gə 'zɪçt]
finger ['fɪŋg ɚ]	Finger ['fɪŋəʀ]
foot ['fʊt]	Fuß ['fu:s]
hair ['hɛr]	Haar ['ha:ʀ]
hand ['hænd]	Hand ['hant]
knee ['ni:]	Knie ['kni:]
leg ['lɛg]	Bein ['baen]
mouth ['maʊθ]	Mund ['mʊnt]
neck ['nɛk]	Hals ['hals]
nose ['noz]	Nase ['na:zə]
teeth ['ti:θ]	Zähne ['tse:nə]
thumb ['θ ʌ m]	Daumen ['daomən]
toe ['to]	Zeh ['tse:]
tummy ['t ʌ mɪ]	Magen ['magn]

Places	Orte
church ['tʃ ɝ tʃ]	Kirche ['kɪʀçə]
home ['hom]	zu Hause/daheim [tsu: 'haozə]
hospital ['hɑspɪtl]	Krankenhaus ['kʀaŋkŋ'haoz]
library ['laɪbrɛrɪ]	Bücherei [byçə'ʀae]
McDonalds [mək'dɑnəlds]	McDonalds [mɛk'dɔnəlts]
park ['park]	Park ['pa:ʀk]
school ['sku:l]	Schule ['ʃu:lə]
store ['stor]	Laden ['la:dn]
zoo ['zu:]	Zoo [tso:]

Actions	Tätigkeiten
bath ['bæθ]	bad(en) ['ba:d(n)]
breakfast ['brɛkfəst]	frühstück(en) ['fʀyʃtyk(n)]
bring ['brɪŋ]	bring(en) ['bʀɪŋ(n)]
catch ['kætʃ]	fang(en) ['faŋ(n)]
clap ['klæp]	klatsch(en) ['klatʃ(n)]
close ['kloz]	zumach(en) ['tsumaχ(n)]

come ['k ʌ m]	komm(en) ['kɔm(n)]
cough ['kɔf]	hust(en) ['hʊst(n)]
cut ['k ʌ t]	schneid(en) [' ʃ naed(n)]]
dance ['dæns]	tanz(en) ['tants(n)]
dinner ['dɪn ɚ]	Abendbrot ['a:bəntbʀo:t]
doodoo ['du:du:]	(k)a-(k)a ['(k)a (k)a]
eat ['i:t]	esse(n) ['ɛs(n)]
feed ['fi:d]	fütter(n) ['fyt(n)ɛʀ]
finish ['fɪnɪ ʃ]	fertig ['fɛʀtɪç]
fix ['fɪks]	heil(e) ['haelə]
get ['gɛt]	krieg(en) ['kʀi:g(n)]
give ['gɪv]	geb(en) ['ge:b(n)]
go ['go]	geh(en) ['ge:(n)]
have ['hæv]	hab(en) ['ha:b(n)]
help ['hɛlp]	helf(en) ['hɛlf(n)]
hit ['hɪt]	hau(en)/schlag(en) ['hao(n)] [' ʃ la:g(n)]
hug ['h ʌ g]	schmus(en) [' ʃ mu:z(n)]
jump ['ʤ ʌ mp]	hüpf(en) ['hypf(n)]
kick ['kɪk]	schieß(en)/stoß(en) [' ʃ i:s(n)]

kiss ['kɪs]	küss(en) ['kys(n)]
knock ['nɑk]	klopf(en) ['klɔpf(n)]
look ['lʊk]	guck(en)/schau(en) ['gʊk(n)] ['ʃao(n)]
love ['lʌv]	lieb(en) ['li:b(n)]]
lunch ['lʌntʃ]	Mittag ['mɪta:k]
make ['meɪk]	mach(en) ['maχ(n)]
nap ['næp]	Mittagsschlaf [mɪtaks'ʃla:f]
outside ['aʊt'saɪd]	draußen ['draosən]
pattycake ['pɛdɪ keɪk]	Backe-Backe-Kuchen ['bakə bakə 'ku:χ(ə)n]
peekaboo ['pɪkə bu:]]	Guck-Guck ['gʊkʊk]
peepee ['pi:pi:]	pischer(n) ['pi:ʃɛʀ(n)]
push ['pʊʃ]	schieb(en) ['ʃi:b(n)]
read ['ri:d]	les(en) ['le:z(n)]
ride ['raɪd]	fahr(en) ['fa:ʀ(n)]
run ['rʊn]	renn(en) ['ʀɛn(n)]
see ['si:]	seh(en) ['ze:(n)]
show ['ʃo]	zeig(en) ['tsaeg(n)]

sing ['sɪŋ]	sing(en) ['sɪŋ(n)]
sit ['sɪt]	sitz(en) ['zɪts(n)]
sleep ['sli:p]	schlaf(en) ['ʃla:f(n)]
stop ['stɑp]	halt(en) ['halt(n)]
take ['teɪk]	nehm(en) ['ne:m(n)]
throw ['θro]	werf(en) ['vɛʀf(n)]
tickle ['tɪkl]	kitzel(n) ['kɪtsəl(n)]
walk ['wɔk]	lauf(en)/spazier(en) ['laof(n)]
want ['wɑnt]	wollen/will ['vɔl(n)] ['vɪl]
wash ['waʃ]	wasch(en) ['vaʃ(n)]

Household

Haushalt

bathtub ['bæθtʌb]	(Bade)wanne [(ba:də)'vanə]
bed ['bɛd]	Bett ['bɛt]
blanket ['blæŋkɪt]	Decke ['dɛkə]
bottle ['bɔtl]	Flasche ['flaʃə]
bowl ['bol]	Schüssel ['ʃysəl]

chair ['tʃɛr]	Stuhl ['ʃtu:l]
clock ['klɑk]	Uhr ['uʀ]
crib ['krɪb]	Wiege ['vi:gə]
cup ['kʌp]	Tasse ['tasə]
door ['dɔr]	Tür ['tyʀ]
floor ['flɔr]	(Fuß)boden [(fu:s)'bod(ə)n]
fork ['fɔrk]	Gabel ['ga:b(ə)l]
glass ['glæs]	Glas ['gla:s]
knife ['naɪf]	Messer ['mɛsəʀ]
light ['laɪt]	Lampe ['lampə]
mirror ['mɪrɚ]	Spiegel ['ʃpi:gl]
pillow ['pɪlo]	Spiegel ['ʃpi:gl]
plate ['pleɪt]	Teller ['tɛləʀ]
potty ['pɑdɪ]	Töpfchen ['tøpfçən]
radio ['redɪo]	Radio ['ʀadɪo]
room ['ru:m]	Zimmer ['tsɪmɛʀ]
sink ['sɪŋk]	Spüle ['ʃpylə]
soap ['sop]	Seife ['zaefə]
sofa ['sofə]	Sofa ['zofa]

spoon ['spu:n]	Löffel ['løfəl]
stairs ['stɛrz]	Treppe ['trɛpə]
table ['teɪbl]	Tisch ['tɪ ʃ]
telephone ['tɛləfon]	Telefon ['teləfon]
towel ['taʊl]	(Hand)tuch [(han)'tʊχ]
trash ['træ ʃ]	Müll ['myl]
TV [ti:'vi:]	Fernseher ['fɛʀn ze:ɛʀ]
window ['wɪndo] ['wɪndə]	Fenster ['fɛnstɛʀ]

Personal

Persönliches

brush ['br ʌ ʃ]	Bürste ['byʀstə]
comb ['kom]	Kamm ['kam]
glasses ['glæsɪz]	Brille ['bʀɪlə]
key ['ki:]	Schlüssel [' ʃ lysəl]
money ['m ʌ nɪ]	Geld ['gɛlt]
paper ['pep ɚ]	Papier [pa'pi:ʀ]
pen ['pɛn]	Kuli ['kʊlɪ]
pencil ['pɛnsl]	(Blei)stift [(blae)' ʃ tɪft]

penny ['pɛnɪ] — Pfennig ['(p)fɛnɪç]

pocketbook ['pɑkɪtbʊk] — Notizbuch [no'ti:tsbʊχ]

tissue ['tɪ ʃ ʊ] — Tempo ['tɛmpo]

toothbrush ['tʊ θ 'br ʌ ʃ] — Zahnbürste ['tsa:n byʀstə]

umbrella [ʌ m'brɛlə] — Schirm [' ʃ ɪʀm]

watch ['wɑ tʃ] — Armband(uhr) ['(aʀmbant)u:ʀ]

People — Personen

aunt ['ænt] — Tante ['tantə]

baby ['beɪbɪ] — Baby ['be:bɪ]

boy ['bɔɪ] — Junge ['jʊŋə]

daddy ['dædɪ] — Papa ['papa]

doctor ['dɑkt ɚ] — Doktor ['dɔktɔʀ]

girl ['g ɝ l] — Mädchen ['mɛtçən]

grandma ['græma] — Oma ['o:ma]

grandpa ['græmpɑ] — Opa ['o:pa]

lady ['leɪdɪ] — Frau ['frao]

man ['mæn] — Mann ['man]

mommy ['mɑmɪ]	Mama ['mama]
own name	eigener Name
pet name	Name e. Haustiers
uncle ['ʌŋkl]	Onkel ['ɔŋkəl]
Ernie, etc.	Peter, etc.

Clothes / Kleidung

belt ['bɛlt]	Gürtel ['gyʀtl]
boots ['bu:ts]	Stiefel ['ʃti:fl]
coat ['kot]	Mantel ['mantl]
diaper ['daɪpə]	Windel ['vɪndl]
dress ['drɛs]	Kleid ['klaɪt]
gloves ['glʌvz]	Handschuhe ['han tʃu:ə]
hat ['hæt]	Hut ['hʊt]
jacket ['ʤækɪt]	Jacke ['jakə]
mittens ['mɪtns]	Fäustlinge ['fɔøstlɪŋə]
pajamas [pə'ʤæməz]	Schlafanzug ['ʃlafantsʊk]
pants ['pænts]	Hose ['hozə]

shirt ['ʃ ɝt]

Hemd ['hæmt]

shoes ['ʃ u:z]

Schuhe ['ʃ u:ə]

slippers ['slɪp ɚz]

Hausschuhe ['haos ʃ u:ə]

sneakers ['sni:k ɚz]

Turnschuhe ['tʊʀn ʃ u:ə]

socks ['sɑks]

Socken ['zɔkn]

sweater ['svɛt ɚ]

Pulli ['pʊlɪ]

Vehicles

Fahrzeuge

bike ['baɪk]

(Fahr)rad [(fa)'ʀat]

boat ['bot]

Schiff ['ʃ ɪf]

bus ['b ʌ s]

Bus ['bʊs]

car ['kar]

Auto ['aoto]

motorbike ['mot ɚbaɪk]

Motorrad ['motoʀat]

plane ['pleɪn]

Flugzeug ['flʊktsɔɪk]

stroller ['strol ɚ]

Kinderwagen ['kɪndəʀva:gn]

train ['treɪn]

Zug ['tsu:k] ['tsʊχ]

trolley ['trɑlɪ]

Straßenbahn ['ʃ tʀasənba:n]

truck ['tr ʌ k]

Laster ['lastəʀ]

Modifyers	Bestimmungen (d. Ortes, Art u. Weise, etc.)
all gone ['ɔl gɔn]	alle (balle) ['alə ('balə)]
all right ['ɔl raɪt]	(alles) klar [('aləs) klaʀ]
bad ['bæd]	schlecht [' ʃ lɛχt]
big ['bɪg]	groß [gʀo:s]
black ['blæk]	schwarz [' ʃ vaʀts]
blue ['blu:]	blau ['blao]
broken ['brokən]	kaputt ['kapʊt]
clean ['kli:n]	sauber ['zaobɛʀ]
cold ['kold]	kalt ['kalt]
dark ['dark]	dunkel ['dʊŋkəl]
dirty ['d ɚtɪ]	schmutzig [' ʃ mʊtsɪk]
down ['daʊn]	unten ['ʊntən]
good ['gu:d]	gut ['gu:t]
happy ['hæpɪ]	glücklich ['glyklɪç]
heavy ['hɛvɪ]	schwer [' ʃ ve:ʀ]
hot ['hɑt]	heiß ['haes]
hungry ['h ʌ gŋrɪ]	hungrig ['hʊŋgʀɪç]

little ['lɪt l]	klein ['klaen]
mine ['maɪn]	mein ['maen]
more ['mor] ['mɔr]	mehr ['me:ʀ]
open ['opən] ['opm]	auf ['aof]
pretty ['prɪtɪ]	hübsch ['hyb ʃ]
red ['rɛd]	rot ['ʀo:t]
shut [' ʃ ʌ t]	zu ['tsu:]
stinky ['stɪŋkɪ]	eklig ['e:klɪç]
that [' ð æt]	das ['das]
this [' ð ɪs]	dies ['di:s]
tired ['taɪrd]	müde ['mydə]
up [' ʌ p]	hoch ['hoχ]
wet ['wɛt]	naß ['nas]
white ['hwaɪt]	weiß ['vaes]
yellow ['jɛlo] ['jɛlə]	gelb ['gɛlp]
yucky ['j ʌ kɪ]	igitt [i:'gɪt]

Others	Verschiedenes
A, B, C, etc.	A, B, C, etc.
away [ə'we]	weg ['vɛk]
booboo ['bu: bu:]	buh ['bu:]
byebye [baɪ'baɪ]	tschüß/ade [' tʃys] [a'de:]
cursewords	Schimpfworte
here ['hɪr]	hier ['hi:ʀ]
hi, hello ['haɪ] [hɛ'lo]	hallo [ha'lo]
in ['ɪn]	in ['ɪn]
me ['mi:]	mir/mich ['mɪʀ] ['mɪç]
meow ['mɪao]	miau ['mɪao]
my ['maɪ]	meins ['maens]
myself [maɪ'sɛlf]	ich/ selber ['ɪç] ['zɛlbə(ʀ)]
night-night ['naɪt'naɪt]	Nachti ['naχti:]
no ['no]	nein ['naen]
off ['ɔf]	runter /ab ['ʀʊntə(ʀ)] ['ap]
on ['ɔn] ['ɑn]	an/ auf ['an] ['aof]
out ['aʊt]	(r)aus ['(ʀ)aos]
please ['pli:z]	bitte ['bɪtə]

Sesame St. ['sɛsəmɪ 'stri:t]	Sesam Straße ['ze:zam 'ʃtʀa:sə]
scuse me ['skjʊs 'mi:]	Tschuldigung ['tʃʊldɪgʊŋk]
shut up ['ʃʌt ʌp]	Ruhe! ['ʀu:ə]
thank you ['θæŋk jʊ]	danke ['daŋkə]
there ['ðɛr]	da/ dort ['da] ['dɔʀt]
under ['ʌndɚ]	unter ['ʊntə(ʀ)]
welcome ['wɛlkəm]	
what ['hwɑt]	was ['vas]
where ['hwɛr]	wo ['vo]
why ['hwaɪ]	warum [va'ʀʊm]
woofwoof ['wʊf'wʊf]	wauwau ['vao'vao]
yes ['jɛs]	ja ['ja]
you ['ju:]	du ['du:]
yumyum ['jʌm'jʌm]	mm [mm]
1,2,3,etc. ['wʌn] ['tu:] ['θʀi:]	1,2,3, etc. ['aens] ['tsvae] ['dʀae]

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APPENDIX C

INSTRUMENTS

The Language Development Survey

Please circle each word your child says spontaneously. Do not include words that your child imitates. Furthermore do not circle words that your child understands, but does not say. Remember, only circle words that your child uses on his/'her own.

FOOD
apple
banana
bread
butter
cake
candy
cereal
cheese
coffee
cookie
crackers
drink
food
grapes
gum
hamburger
hot dog
ice cream
juice
meat
milk
orange
pizza
pretzel
soda
soup
spaghetti
tea
toast
water

TOYS
ball
balloon
blocks
book
bubble
crayons
doll
present
slide
swing
teddy bear

OUTDOORS
flower
house
moon
rain
sidewalk
snow
star
street
sun
tree

ANIMALS
bee
bird
bug
bunny
cat
chicken
cow
dog
duck
elephant
fish
frog
horse
monkey
pig
puppy
snake
tiger
turkey
turtle

BODY PARTS
arm
belly
bottom
chin
ear
elbow
eye
face
finger

BODY PARTS (Cont'd)
foot
hair
hand
knee
leg
mouth
neck
nose
teeth
thumb
toe
tummy

PLACES
church
home
hospital
library
McDonalds
park
school
store
zoo

ACTIONS
bath
breakfast
bring
catch
clap
close
come
cough
cut
dance
dinner
doodoo
eat
feed
finish
fix
get

ACTIONS (Cont'd)
give
go
have
help
hit
hug
jump
kick
kiss
knock
look
love
lunch
make
nap
outside
pattycake
peekaboo
peepee
push
read
ride
run
see
show
sing
sit
sleep
stop
take
throw
tickle
walk
want
wash

HOUSEHOLD

bathtub
bed
blanket
bottle
bowl
chair
clock
crib
cup
door
floor
fork
glass
knife
light
mirror
pillow
plate
potty
radio
room
sink
soap
sofa
spoon
stairs
table
telephone
towel
trash
TV
window

PERSONAL

brush
comb
glasses
key
money
paper
pen
pencil
penny
pocketbook
tissue
toothbrush
umbrella
watch

PEOPLE

aunt
baby
boy
daddy
doctor
girl
grandma
grandpa
lady
man
mommy
own name
pet name
uncle
Emie, etc.

CLOTHES

belt
boots
coat
diaper
dress
gloves
hat
jacket
mittens
pajamas
pants
shirt
shoes
slippers
sneakers
socks
sweater

VEHICLES

bike
boat
bus
car
motorbike
plane
stroller
train
trolley
truck

MODIFIERS

allgone
all right
bad
big
black
blue
broken
clean
cold
dark
dirty
down
good
happy
heavy
hot
hungry
little
mine
more
open
pretty
red
shut
stinky
that
this
tired
up
wet
white
yellow
yucky

OTHERS

A, B, C, etc.
away
booboo
byebye
curse words
here
hi, hello
in
me
meow
my
myself
nightnight
no
off
on
out
please
Sesame Street
scuse me
shut up
thank you
there
under
welcome
what
where
why
woofwoof
yes
you
yumyum
1, 2, 3, etc.

Please list any other words your child uses here: ______________________________

____

Does your child combine two or more words in phrases? (e.g., more cookie, car byebye, etc.)
Yes__________ No__________

Please list below THREE of your child's longest and best sentences or phrases.

____

____

____

Child's name: ______________________________
Date of birth: ______________________________
Filled out by: ______________________________

This survey instrument was developed by Leslie Rescorla, Ph.D. (1989).

Checkliste für Wortschatzentwicklung

Bitte kreisen Sie jedes Wort ein, das Ihr Kind spontan spricht. Wörter, die Ihr Kind imitiert bitte nicht markieren. Ebenso markieren Sie Wörter nicht, die Ihr Kind versteht, aber nicht spricht. Denken Sie daran, kreisen Sie nur Wörter ein, die Ihr Kind von selbst spricht.

Lebensmittel
Apfel
Banane
Brot
Butter
Kuchen
Bonbon
Müsli
Käse
Kaffee
Keks
Zwieback
Trinken
Ei
Essen
(Wein)traube
(Kau)gummi
Hamburger
Hot Dot
Eis
Saft
Fleisch
Milch
Apfelsine
Pizza
Brezel
Brause/Limo(nade)
Suppe
Spaghetti
Tee
Toast
Wasser

Spielzeug
Ball
(Luft)ballon
(Bau)klotz
Buch
(Seifen)blase
(Bunt)stifte
Puppe
Geschenk
Rutsche
Schaukel
Teddy

Tiere
Bär
Biene
Vogel
Mücke/Fliege
Hase
Katze
Huhn
Kuh
Hund
Ente
Elefant
Fisch
Frosch
Pferd
Affe
Schwein
Hündchen
Schlange
Tiger
(Trut)hahn
Schildkröte

Körperteile
Arm
Bauch
Popo/Hintern
Kinn
Ohr
Ellenbogen
Auge
Gesicht
Finger
Fuß
Haar
Hand
Knie
Bein
Mund
Hals
Nase
Zähne
Daumen
Zeh
Magen

Tätigkeiten
bad(en)
frühstück(en)
bring(en)
fang(en)
klatsch(en)
zumach(en)
komm(en)
hust(en)
schneid(en)
tanz(en)
Abendbrot
(k)a-(k)a
ess(en)
fütter(n)
fertig/end(en)
heil(e)
Krieg(en)
geb(en)
geh(en)
hab(en)
helf(en)
hau(en)/schlag(en)
schmus(en)
hüpf(en)
schieß(en)
Küss(en)
klopf(en)
guck(en)/schau(en)
lieb(en)
Mittag
mach(en)
Mittagsschalf
draußen
Backe, backe Kuchen
Guck-Guck
pischer(n)
schieb(en)
les(en)
fahr(en)
renn(en)
seh(en)
zeig(en)
sing(en)
sitz(en)
schlaf(en)

Tätigkeiten (Cont'd)
halt(en)
nehm(en)
werf(en)
kitzel(n)
lauf(en)/spazier(en)
woll(en)/will
wasch(en)

Haushalt
(Bade)wanne
Bett
Decke
Flasche
Schüssel
Stuhl
Uhr
Wiege
Tasse
Tür
(Fuß)Boden
Gabel
Glas
Messer
Lampe
Spiegel
Kissen
Teller
Töpf(chen)
Radio
Zimmer
Spüle/Waschbecken
Seife
Sofa
Löffel
Treppe
Tisch
Telefon
Handtuch
Müll
Fernseher
Fenster

draußen
Blume
Haus
Mond
Regen
Gehweg/Bürgersteig
Schnee
Stern
Straße
Sonne
Baum

Persönliches
Bürste
Kamm
Brille
Schlüssel
Geld
Papier
Kuli/Füller
(Blei)stift
Pfennig
Notizbuch
Tempo
Zahnbürste
Schirm
(Armband)Uhr

Personen
Tante
Baby
Junge
Papa
Doktor
Mädchen
Oma
Opa
Frau
Mann
Mama
eigener Name
Name e. Haustiers
Onkel
Peter, etc.

Orte
Kirche
zu Hause/daheim
Krankenhaus
Bücherei
McDonalds
Park
Schule
Laden
Zoo

Kleidung
Gürtel
Stiefel
Mantel
Windel
Kleid
Handschuh(e)
Hut/Mütze
Jacke
Fäustling
Schlafanzug
Hose
Hemd
Schuh
Hausschuhe
Turnschuhe
Socken
Pulli

Fahrzeuge
(Fahr)rad
Schiff
Bus
Auto
Motorrad
Flugzeug
Kinderwagen
Zug
Straßenbahn
Laster

Bestimmungen
(d. Ortes, d.
Art u. Weise, etc.)
alle (b)alle
(alles) klar
schlecht
groß
schwarz
blau
kaputt

Bestimmungen
(Cont'd)
sauber
kalt
dunkel
schmutzig
unten
gut
froh/glücklich
schwer
heiß
hungrig
klein
mein
mehr
auf
hübsch
rot
zu
stinkt/eklig
das
dies
müde
hoch
naß
weiß
gelb
igitt

Verschiedenes
A, B, C, etc.
weg
buh
tschüß/ade
Schimpfworte
hier
Hallo
in
mir/mich
miau
mein(s)
ich/selber
Nachti
nein
runter/ab
an/auf/dran
(r)aus
bitte
Sesam Straße
Tschuldigung
Ruhe!
danke

Verschiedenes
Cont'd
da/dort
unter
was
wo
warum
wauwau
ja
du
mm
1,2,3, etc.

Bitte notieren Sie hier alle anderen Wörter, die Ihr Kind benutzt:

____

____

Enthalten die Äußerungen Ihres Kindes Phrasen bestehend aus zwei oder mehr Wörten? (z.B. mehr Kekse, Auto tschüß etc.) ja__________ nein__________

Bitte notieren Sie **D R E I** Sätze oder Äußerungen Ihres Kindes

____

____

____

Name des Kindes: ____

Geburtsdatum: ____

ausgefüllt von: ____

Datum: ____

Dieser Fragebogen wurde entwickelt von Dr. Leslie Rescorla und übersetzt von Dörte Junker.

APPENDIX D

LETTER TO PARENTS, PARENT CONSENT FORM, AND PARENT QUESTIONNAIRE

Dear Parent,

I would like to ask for your permission to have your child participate in a research project on early language acquisition. I am specifically interested in learning more about how normal children build their vocabulary in the beginning of their language development. Typically we only study children when they are older and have a sizable vocabulary. Presently there is little information available about how young children normally develop before they have lots of words at their disposal. In the future, information about normal vocabulary development might contribute to knowledge necessary to identify children at risk early in life so they can receive appropriate support to enhance their language development.

My study will be based on parents' reports. If you decide to participate you will be asked to fill out a questionnaire about your child's developmental history. I will videotape a 15- to 20-minute free play interaction with your child. While I play with your child, you will be asked to fill out the Language Development Survey (LDS), developed by Leslie Rescorla in 1989. To accomplish this, I will make one or two visits to your home, which will take not more than two hours of your time (total time).

Participation by you or your child will be strictly voluntary and participation can be declined at any time. All information about your child will be kept confidential and will not be revealed in the results from this project.

If you are a parent of a toddler between 23 and 24 months of age who is beginning to learn English, or English and German simultaneously, and would be interested in supporting my research project, please contact me as soon as possible latest by June 15 via phone or email as listed below. I will also be happy to answer any further questions.

Respectfully,

Dörte Junker
Graduate Student at Michigan State University
Audiology and Speech Sciences
email: junkerdo@pilot.msu.edu
phone: 734-761-8255

Parent Consent Form

Dear Parent,

I would like to ask for your permission to have your child participate in a research project on early language acquisition. I am specifically interested in learning more about how normal children build their vocabulary in the beginning of their language development.

My study will be based on parents' reports. If you decide to participate you will be asked to fill out a questionnaire about your child's developmental history. I will videotape a 15- to 20-minute free-play interaction with your child. While I play with your child, you will be asked to fill out the Language Development Survey (LDS), developed by Leslie Rescorla in 1989. To accomplish this, I will make one or two visits to your home, which will take not more than two hours of your time (total time).

If you would be interested in supporting my research project, please fill out the consent statement below and return it to me as soon as possible, latest by June 15, 1999.

Parent Consent Statement

Title of the Project: Expressive Vocabulary Development and Word Combinations of English-Speaking, German-Speaking, and German-English Bilingual Toddlers

Investigator: Dörte Junker
Michigan State University
Department of Audiology and Speech Sciences
East Lansing, MI 49924

My child ______________________________

and I ______________________________ WILL/ WILL NOT agree to

participate in the research project on analysis of my child's vocabulary.

I have been informed by the investigator of the procedures and goals of the study. I understand that my child or I may refuse to participate or may discontinue participation at any time without penalty. I understand further that my child's identity will be kept confidential. Neither I nor my insurance company will incur any expense as a result of my child's participation in this project.

______________________________ ______________________

(Signature of parent/guardian) Date

Parents' Interview - Questionnaire

Child's name: ____________________
Child's birth date: ____________________
address: ____________________
____
mother's name: ____________________
profession____________________
education: high school diploma, college degree: BA, MA, PhD, other
foreign languages spoken
father's name: ____________________
profession____________________
education: high school diploma college degree: BA, MA, PhD, other
foreign languages spoken
siblings:

Medical History

1. Did any complications or health problems occur during pregnancy? Yes - No
if yes, please describe________________________________
2. Did any complications occur during birth? Yes - No
if yes, please describe________________________________
3. Was your child born at term date? Yes - No
What was your child's birth weight? ____________________
5. What were his Apgar values? ____________________
6. Has your child had any serious health problems or concerns? Yes - No
if yes, please describe________________________________
7. Has your child been hospitalized? Yes - No
if yes, please describe________________________________
8. Has your child participated in regular check-up visits at your pediatrician?
Yes - No
9. Has your child's hearing been checked? Yes - No
What was the result? ________________________________
10. Has your child had repeated ear infections? Yes - No
If yes, how many within the last year? ______________

Developmental History continued (based on The Rosetti Infant-Toddler Language Scale and Bang & Dodson, Birth to Three, Developmental Scale)

Pragmatic Skills

11. Mainly uses words to interact with others? Yes - No
12. Takes turns with others during conversations? Yes - No

Functional/Conventional and Symbolic Gestures

a) 21-24 months

13a) Pretend to pour from one container into another. Yes - No
(imitates adult object use)

4a) Flies a toy airplane in the air. Yes- No

b) 24-27 months

13b) Pretends to talk on the telephone. Yes-No

14b) Wipes his hands and and face with a napkin. bib or washcloth. Yes-No

Problem Solving

18-24 months

places three shapes in form box Yes- No
(places six pegs in pegboard)

24-30 months

places three shapes in rotated form box Yes-No
(builds six block tower)

Motor

18-24 months

pulls off own shoes, socks Yes-No

walks up stairs alone Yes-No

24-30 months

jumps in place two or more times Yes-No

descends stairs alone Yes-No

Play Skills

a) 21-24 months

15a) Attempts to repair broken toys. (also cognition) Yes-No

16a) Stacks or assembles play objects. (also fine motor) Yes-No

b) 24-27 months

15b) Performs many related activities with the same toy during a play sequence. Yes-No

16b) chooses toys selectively. Yes-No

17. Uses toys appropriately Yes-No
If no, describe type of toy and quantity of toys used in an unusual manner________________________________

Language Comprehension

a) 21-24 months

18a) Chooses one object from a group of five upon request. Yes-No
19a) Follows novel commands given without gestures. Yes-No
20a) Follows a two-step related command given without gestures. Yes-No
21a) Understand new words rapidly. Yes-No

b) 24-27 months

18b) Points to four action words in picture. Yes-No
19b) Recognizes family members by their given name. Yes-No
20b) Understands the concept of one. Yes-No
21b) Understands size concepts Yes-No

Language Expression

a) 21-24 months

22a) Uses two-word phrases frequently. Yes-No
22a) Uses 50 different words. Yes-No
23a) Uses new words regularily. Yes-No
24a) Relates personal experience. Yes-No
25a) Uses three word phrases occasionally. Yes-No
26a) Refers to self by name. Yes-No
27a) Uses early pronouns occasionally. Yes-No
28a) Mean length of 1.25-1.50 morphemes per utterance. Yes-No

b) 24-27 months

22b) Can ask questions (intonation pattern, two word question form).Yes-No
23b) Uses three-word phrases frequently. Yes-No
24b) Asks for assistance with personal needs. Yes-No
25b) Uses action words. Yes-No
26b) Mean length of 1.50-2.00 morphemes per utterance. Yes-No

Family History

29) At what age did your child say his/her first words? ____________
30) Family History of Speech, Language and/or Learning Problems Yes-No

For Bilingual Children

31) Who communicates with your child in English?____________

32) Who communicates with your child in German?____________

33) how many hours per week does your child communicate in English? ______

34) how many hours per week does your child communicate in German? ______

35) Are there certain settings, situations, play themes specific for one language? How do you separate the languages?

____

____

36) What is the native language of the mother__________father___________?

37) Which language is spoken within the family?________________________

38)Why do you want your child to learn two languages?

____

39) Have there been any problems with your child learning two languages simultaneously? If yes, describe.

____

For All Children

40) Do you or your spouse play with your child? Yes-No

if yes: a) How many minutes/hours per day? ________________________

b) What type of games? ________________________

41) Do you do special activities/classes with your child? Yes-No

if yes: what type of activities? ________________________

42) Do you read books with your child? Yes-No

if yes: How many minutes/hours? ________________________

43) Does your child watch TV? Yes-No

if yes: How many minutes/hours? ________________________

44) Describe a typical day/ routines + weekend activities

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