

Listening, Remembering, and Speaking in Two Languages: How Did You Do That?

Calliope Haritos
Hunter College

Abstract

This study examined memory organization of story events presented in different languages to Greek-English bilingual children in Grades 2 and 4. Study results showed that recall was organized more by event than by language. The cognitive processes that comprise bilingual memory, including encoding, storage, and retrieval strategies, are examined within the context of children's daily language experiences.

The study of linguistic relativity has sparked numerous debates among researchers, from a variety of disciplines, over the past century. This is not surprising, given the numerous ways of defining and interpreting language and thought. As a result, the degree to which language influences thought may be indeterminable.

The relationship of language with respect to thought raises some interesting questions for bilingual individuals who use two languages on a regular basis. For instance, to what degree does language affect bilinguals' daily cognitive experiences? Do bilinguals perceive, organize, and remember information from their daily experiences in language-specific ways?

From an empirical standpoint, these questions are open to debate, given the lack of consistency among bilingual researchers, with respect to bilingual terminology and assessment. To date, there is no universally accepted method of assessing bilingual proficiency. In fact, it has been argued that a monolingual bias exists in bilingual research, using monolinguals as a yardstick to assess bilinguals' cognitive abilities (Grosjean, 1985, 1998; Pavlenko, 1999). Such comparisons have often resulted in claims of advantages (Bain, 1975; Kessler & Quinn, 1987; Liedtke & Nelson, 1968; Okoh, 1980) and disadvantages (Ben-Zeev, 1977; Tsushima & Hogan, 1975), with respect to bilingualism, and debates over the role of language(s), in this regard (see Cummins, 2000).

Even the term *bilingual* lacks a uniform definition among bilingual researchers (Paradis, 1997; Pavlenko, 2000). For example, there are bilinguals who acquire both of their languages during childhood, while there are some bilinguals who acquire their second language (L2) as adults. Furthermore, there are compound bilingual children, who learn and use both their languages on a daily basis, and coordinate bilinguals, who learn their L2 much later than their first language (L1) (Ervin & Osgood, 1954; Grosjean, 1982; Hamers & Blanc, 1990; Weinrich, 1953). Even among these few examples, there is considerable overlap and variation with respect to oral and written proficiency as well as daily patterns of language use. Therefore, findings of bilingual research may not be applicable to all “bilinguals” due to individual differences in language socialization experiences.

The present research study sought to examine the developing relationship between language(s) and the cognitive processes that comprise long-term memory for bilingual story narrative among compound bilingual children. It has been noted that bilingual memory research, in general, has not been very attentive to such processes (Francis, 2000).

The focus of the present study was on the language behavior exhibited by bilingual children in Grades 2 and 4, during a story recall task that was initiated by a bilingual experimenter. Three areas were of particular interest: the extent of bilingual memory (i.e., children’s ability to remember specific event details), bilingual memory organization, and strategies of retrieval. Attention was also given to the bilingual social context in which children were engaged. This included children’s understanding of the social and cognitive demands of the recall task as well as bilinguals’ cognitive awareness (metamemory) of the memory strategies they employed. It has been acknowledged that a comprehensive examination of bilingual memory necessitates due consideration of the social context at hand (Cummins, 2000; Durgunoglu & Roediger III, 1987; Vygotsky, 1986).

This study addressed three questions: (a) Will bilingual children be able to remember specific knowledge from story events heard in different languages, (b) is knowledge from story events encoded in a given language also remembered in that same language (i.e., is knowledge organized, stored, and remembered in language-specific ways), and (c) what kinds of retrieval strategies will bilingual children employ (i.e., will bilinguals remember information by thinking of the actual story events and/or the language of presentation of such events), and to what degree are they cognizant of their memory strategies?

It has been argued that during middle childhood (ages 6–11), information processing becomes more efficient and the amount of information that can be kept in memory increases, resulting in better recall (Flavell, Miller, & Miller, 1993). Children between the ages of 5 and 7 become increasingly able to recall event details (Janowsky & Carper, 1996).

The present research sought to evaluate these claims with respect to long-term memory of compound bilingual children between the ages of 7 and 9. Since bilingual memory research, in general, has not compared compound bilingual children of various ages in this regard, and given the tremendous amount of information bilingual children are expected to comprehend and remember in their everyday schooling, it was of interest to examine the degree to which bilingual children can perform such a memory task.

The concept of language-specific memories has been supported by research that has examined autobiographical memories in coordinate bilingual adults. It has been argued that events that are experienced in a given language are better remembered in that language (Marian & Neisser, 2000; Otoya, 1987). For example, studies have found that bilingual adults in therapy are better able to access childhood experiences through the language spoken at home at the time of the experience (Aragno & Schlachet, 1996; Perez-Foster, 1998).

Although bilingual adults may remember a given event in the language in which it was initially encoded internally, it is unclear whether or not this remembered information is accessible in both of their respective languages. Although it has been reported that personal memories are more accessible to bilinguals when the linguistic environment at retrieval matches the linguistic environment at encoding (Javier, Baroso, & Munoz, 1993; Javier & Marcos, 1989), it has also been demonstrated that autobiographical memories encoded in a particular language were easily retrievable in bilinguals' other language, suggesting that although some personal memories of bilinguals may be linguistic, others are conceptually represented and become linguistic when bilinguals engage in verbal recall (Schrauf & Rubin, 1998, 2000). The lack of consistency among research findings may stem from variability among bilingual subjects with respect to L1 and L2 fluency and usage, and a lack of differentiation between compound bilinguals, who are the focus of the present research, and coordinate bilinguals.

In fact, since the majority of these studies have used bilinguals who have learned their L2 well into their adulthood, the degree to which bilingual memory may be language specific among compound bilingual children is uncertain. This uncertainty was further illustrated in a recent study (Haritos & Nelson, 2001) of 8-year-old bilinguals engaged in a short-term memory story recall task. Greek-English bilinguals heard a story in either English or Greek and were subsequently asked to retell the story, some in English and others in Greek. Both language-independent and language-specific effects on memory were reported. Bilingual children had no difficulty comprehending the story in one language and retrieving it in another language. However, the semantic content of children's recall—namely, the components of the story they remembered and did not remember—varied, depending upon the actual language used at recall.

The present study sought to examine the possibility of language-specific storage and language-dependent recall among bilingual children who were engaged in a long-term memory task. In this study, English-Greek bilingual

participants heard two stories over the course of 2 days. On the third day, they were asked to retrieve all the foods they could remember from those stories. Each story consisted of two events, a breakfast and a birthday party, each presented in a different language. A bilingual experimenter initiated recall in English and in Greek. If language-specific storage was evident, it would be reflected in subjects' recall protocols. They would retrieve foods from events presented in English when the experimenter initiated recall in English, and remember foods from Greek events when recall was initiated in Greek.

Models of bilingual memory have also addressed the issue of language-dependent versus independent storage. Bilingual research (Hummel, 1986; Tulving & Colotla, 1970) has supported both the dual-storage model, that is, language-specific storage (Kolers, 1978), and the single-store model (McCormack, 1977), which advocates a common conceptual store, accessible to both languages (Liepmann & Saegert, 1974; Lopez & Young, 1974).

Two recent models of bilingual memory have somewhat conflicting viewpoints with respect to the degree of conceptual access to memory by bilinguals' L1 and L2. For example, the hierarchical model of bilingual memory advocates both single and dual memory systems (Dufour & Kroll, 1995; Kroll & Stewart, 1994), depending upon the level of L2 fluency. Bilinguals who are very fluent in the L2 have direct conceptual access to linguistic and conceptual memory stores from either the L1 or the L2. For bilinguals in the early stages of L2 development, memory is directly accessible only by the L1 lexicon. The argument is that one's L2 can only access memory through one's L1 by translation. It follows that bilinguals may retrieve a restricted set of concepts associated with L2 words but not necessarily L1 words. However, De Groot and Poot's model (1997), based on coordinate bilinguals, and further bilingual research (Altarriba & Mathis, 1997) argues for comparable L1 versus L2 conceptual access to memory, even in the beginning stages of L2 development.

The dichotomous characterization of bilingual memory storage may be a static interpretation of language processing, considering the heterogeneity of bilingual representation. It has been stated that many forms of bilingual representation are possible, depending upon language socialization, context of encoding, the nature of the retrieval task, and the attitudes, skills, and goals of the bilingual (Durgunoglu & Roediger III, 1987; Tulving & Colotla, 1970; Vygotsky, 1986; Whorf, 1956).

Notably, the ability to extend recent models of bilingual memory to bilingual children of the present study is uncertain because they tend to characterize a specific form of memory and a specific type of bilingual. First, for the most part, they address short-term memory and language relations at the level of the lexical task. It has been stated that bilingual research using lexical tasks does not shed light on real-life bilingual contexts of listening and speaking (Appel, 2000) and that memories often do not occur in lexical form (Ervin-Tripp, 2000). Second, based on coordinate bilinguals, these models address language relations in individuals whose presumably weaker L2 has been

acquired much later than their L1, that is, after they have already developed a linguistic and conceptual system in the L1. Therefore, such models are unclear with respect to the development of language relations in long-term memory and representation for story narrative among compound bilingual children who are developing these systems in the L1 and the L2 simultaneously each day in school and at home. Third, these models are also unclear with respect to the origins of memory structures in children.

The origins and subsequent development of children's memory structures are important considerations with respect to the examination of retrieval strategies in bilingual children, which is the third question addressed by the present research. According to Kuhn (2000), children's prior knowledge influences what they remember. Furthermore, children are said to construct and organize knowledge from their daily experiences and develop conceptual representations through schemas or event representations (Nelson, 1995; Nelson & Fivush, 2000; Nelson & Kessler Shaw, 2002). Event schemas involve social interaction through some activity or event. These schemas or scripts contain a variety of alternative actors, actions, and objects that occupy the same function at different occasions (Nelson, 1985). Language enters into these interactions as a means of communication and thus is initially highly contextualized. As children engage in subsequent interactions and their language experiences increase, it is believed that language becomes decontextualized (Nelson, 1999). It is at this point, presumably, that children may begin to use and think of language as a possible cognitive organizer of knowledge. The concept of event representations (ERs) in memory is especially compelling, from the vantage point of bilingual children. This is due to the fact that bilinguals can experience ERs in their L1, their L2, and/or both their languages.

The present study sought to examine the possible role of ERs with respect to bilingual children's retrieval strategies. Would bilinguals remember information presented in the context of language-specific story events by thinking of the actual events and/or the language of presentation of such events? If events are remembered in language-specific ways, it follows that bilinguals would remember and cluster foods from an English breakfast event, a Greek breakfast event, an English party event, and a Greek party event. By contrast, if events are remembered in a format indifferent to language, bilinguals' protocol lists may consist of simply general party foods and/or general breakfast foods. That is, bilinguals would cluster their recall by semantics (the events themselves) and not presentation language.

In order to examine bilingual children's awareness or knowledge of the memory strategies (metamemory) they employed, bilinguals were instructed, at recall, to think out loud and explain how they were remembering the foods from the stories. Since metamemory is said to develop between the ages of 5 and 7 (Janowsky & Carper, 1996), it was of particular interest to investigate this claim with respect to bilingual children in Grades 2 and 4.

From a developmental standpoint, it was also of interest to investigate whether the answers to these questions were consistent among second graders and fourth graders. It has been argued that bilingualism contributes to increased metalinguistic ability (Hamers & Blanc, 1990; Vygotsky, 1986). However, due to the scarcity of research comparing bilinguals from different age groups, it is unclear if and when bilingual children can begin to utilize their language as a cognitive tool for organizing their knowledge. Therefore, the present study sought to examine the degree to which second and fourth graders would be able to accomplish this task.

Method

Participants

The subjects of the present study were 16 second graders, with a mean age of 7.6, and 16 fourth graders, with a mean age of 9.3. Children were selected from a Greek-English parochial school, located in a predominately Greek-English, middle-class community in New York.

To minimize methodological problems associated with the term *bilingual*, the present research used language questionnaires and teacher ratings to empirically establish that subjects were fluent in each of their languages and actively using their languages each day. Information was obtained from each subject about his or her daily language experiences. This included familial patterns of language use, children's language preferences, if any, and self-ratings on language proficiency. These procedures are consistent with other bilingual research (Bialystok, 1997; Bochner, 1996; Francis, 1999; Hakuta, Ferdman, & Diaz, 1987) that has relied upon language usage and ratings of adeptness, acknowledging that identical L1-L2 proficiency is unrealistic and more of a theoretical ideal.

All children were compound-simultaneous bilinguals (Ervin & Osgood, 1954; Grosjean, 1982), who acquired both their languages before the age of 4 and were subsequently using and developing their languages each day in school and at home. Daily academic instruction was in Greek and in English. Greek instruction was conducted for 2 hours per day, by a Greek teacher, and consisted of reading, speaking, writing, grammar, history, and religion. English instruction was conducted for the remainder of the day. Children lived in an additive bilingual community (Hamers & Blanc, 1990), where both languages were used and valued.

All children reported speaking both English and Greek at home, with both parents. Furthermore, all children indicated that they felt equally competent in both languages, in terms of speech and comprehension. Approximately 71% stated that they liked to speak English the most. In addition to the language questionnaire, which was administered at the end of the recall task (see Appendix A), English and Greek teachers were also asked to rate

children's proficiency. Children identified as having language proficiency problems, either verbal or written, were not included in the study.

Materials

Researchers used two stories, each of which contained two different events, namely a breakfast event and a birthday party event. Within each story, one event was presented in English, while the other was presented in Greek. Each story had the same characters and event structure and schema as well as the same number of propositions. However, the breakfast and birthday party event from each story used different objects and actions. Each story had a total of 12 different food items, 6 per event. Every food in each event in Story 1 had a comparable food type in its respective event in Story 2 (see Appendix B). Notably, it is quite standard in psychological research to use short story-like passages. In fact, the stories of the present study are quite lengthy, in comparison to typical passages of about three to four sentences. The aim of the stories is not to present a narrative task but to embed materials in a familiar context.

Design and Procedure

Upon receiving written consent from the parochial schools, researchers sent letters to parents to seek consent for their children to participate in the study. Parents were informed that experimenter-child interactions would be audiotaped.

Children were instructed, in English, that they would hear two stories over the next 2 days and they should try to remember each story because they would be questioned on the third day. On the third day, the children were asked, in either English or Greek, to recall all the foods they could remember from the stories.

Children were randomly assigned to one of eight possible experimental orders. Orders varied in terms of story order, language order of event within a story, and language in which recall was initiated. There were two story orders: Story 1 on Day 1 and Story 2 on Day 2, or Story 2 on Day 1 and Story 1 on Day 2. The two possible language orders of events were either hearing Event 1 (breakfast) in English and Event 2 (party) in Greek (EGGE), or hearing Event 1 in Greek and Event 2 in English (GEEG). Recall was initiated in either English or Greek by a bilingual experimenter. If a child heard Event 1 in English and Event 2 in Greek on Day 1, then on Day 2, he or she heard Event 1 in Greek and Event 2 in English, and vice versa. Thus, the design of the present study was a 2 (story order) X 2 (language of event) X 2 (language at recall) between subjects design (see Figure 1).

Results

Responses were recorded and analyzed in terms of number of items recalled from each event, from each language, and from each story. Measures

English, Greek, Greek, English (EGGE)		Greek, English, English, Greek (GEEG)	
Day 1 Story 1 Breakfast (B1) (E) Party (P1) (G)	Day 2 Story 2 Breakfast (B2) (G) Party (P2) (E)	Day 1 Story 1 Breakfast (B1) (G) Party (P1) (E)	Day 2 Story 2 Breakfast (B2) (E) Party (P2) (G)
English, Greek, Greek, English (EGGE)		Greek, English, English, Greek (GEEG)	
Day 1 Story 2 Breakfast (B2) (E) Party (P2) (G)	Day 2 Story 1 Breakfast (B1) (G) Party (P1) (E)	Day 1 Story 2 Breakfast (B2) (G) Party (P2) (E)	Day 2 Story 1 Breakfast (B1) (E) Party (P1) (G)

Figure 1. Experimental orders.

Table 1

Summary of Significant Results for Bilingual Recall

Result	P Value
Main effect of grade: Total recall for fourth graders > second graders	$P < .01$
Main effect of event: Greater recall for party versus breakfast foods -second and fourth graders	$P < .01$
Main effect of language of presentation (LP): Greater recall for foods presented in Greek versus English -overall -fourth graders	$P < .01$ $P < .01$
Main effect of language used at recall (LS): More items recalled (said) in English -second and fourth graders	$P < .01$
Interaction of grade by event by LP: 1. Greater recall for party versus breakfast foods a) when both events were presented in Greek -second graders -fourth graders b) when both events were presented in English -second graders 2. Greater recall for party foods presented in Greek versus party foods presented in English -fourth graders	$P < .05$ $P < .01$ $P = .01$ $P = .01$

included number of total foods recalled, Story 1 foods, Story 2 foods, breakfast foods and party foods (within and across stories), foods presented in English, foods presented in Greek, foods recalled in Greek, and foods recalled in English.

Clustering was analyzed by event, language, and story using the Adjusted Ratio of Clustering (Roegner, Thompson, & Brown, 1971). This measures the degree to which items from a given category (event, story, or language) occur together (i.e., are clustered in recall, as compared to unordered or random ordering of lists of food words). Clustering scores range from 0 to 1. These measures included story clustering, two-event clustering (i.e., by breakfast and/or by party food items in any order—P2, P1, B1, B2), four-event clustering (by specific event—P1, P1, B2, B2, B1, B1, B1), and clustering by language of presentation (LP). Table 1 summarizes the significant findings of the present study.

There were no significant main effects for language order, story order, or language used by the experimenter. A 2 (grade) X 2 (event) X 2 (LP) ANOVA, on recall, with repeated measures on the last two factors, produced several main effects and a three-way interaction.

The main effect of grade indicated that fourth graders remembered significantly more foods than second graders, $F(1, 30) = 27.22, P < .01$. The main effect of event showed greater recall for party than breakfast foods, overall and at each grade, $F(1, 30) = 15.13, P < .01$. The main effect of language of presentation indicated overall better memory for foods presented in Greek than foods presented in English, $F(1, 30) = 10.42, P < .01$.

The three-way interaction, $F(1, 29) = 8.53, P < .01$, is graphed in Figure 2. Individual comparisons revealed that second graders remembered more party foods than breakfast foods overall, $F(1, 14) = 18.15, P < .01$, and in both languages. That is, second-grade recall for party foods was significantly higher than recall for breakfast foods when those foods were presented in Greek, $F(1, 14) = 6.0, P < .05$, and when foods were presented in English, $F(1, 14) = 6.17, P = .01$.

Fourth graders remembered significantly more foods presented in Greek than in English, $F(1, 14) = 7.9, P < .01$. They also recalled significantly more party foods than breakfast foods overall, $F(1, 14) = 8.05, P < .01$, but not in both languages. Recall for party foods was significantly higher than that of breakfast foods when these foods were presented in Greek, $F(1, 14) = 18.39, P < .01$, but not English. Unlike second graders, whose memory for English versus Greek party foods was comparable, fourth graders recalled significantly more Greek party foods than English party foods, $F(1, 14) = 29.01, P < .01$.

Although memory preferences were revealed for foods presented in Greek, overall, and for party foods, at both grade levels, bilinguals were not found to simply be retrieving more foods from the “Greek” event of each story or the “Greek party event” within a story. Mean recall was, in fact, comparable for B1 versus P1 and B2 versus P2 foods within a given story, among second

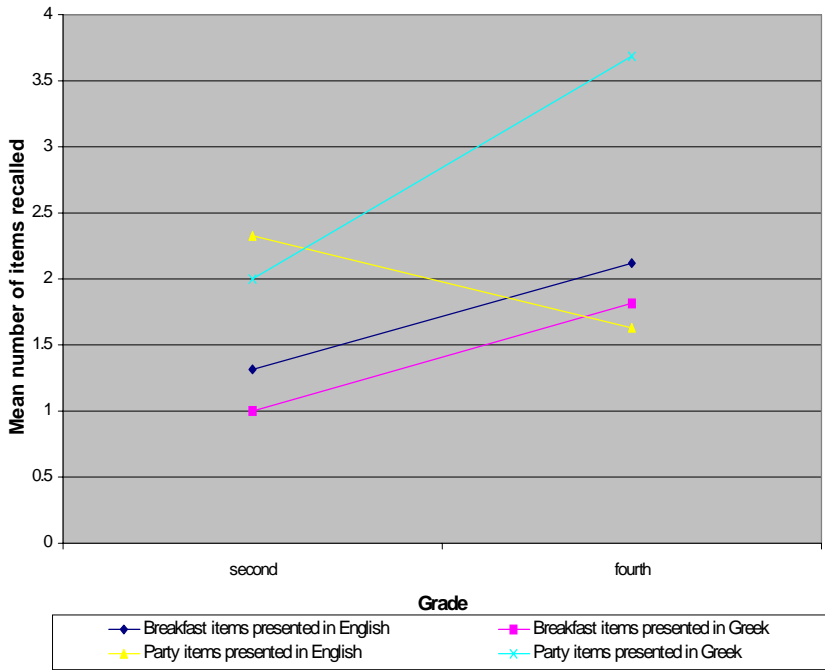


Figure 2. Grade by event by LP interaction.

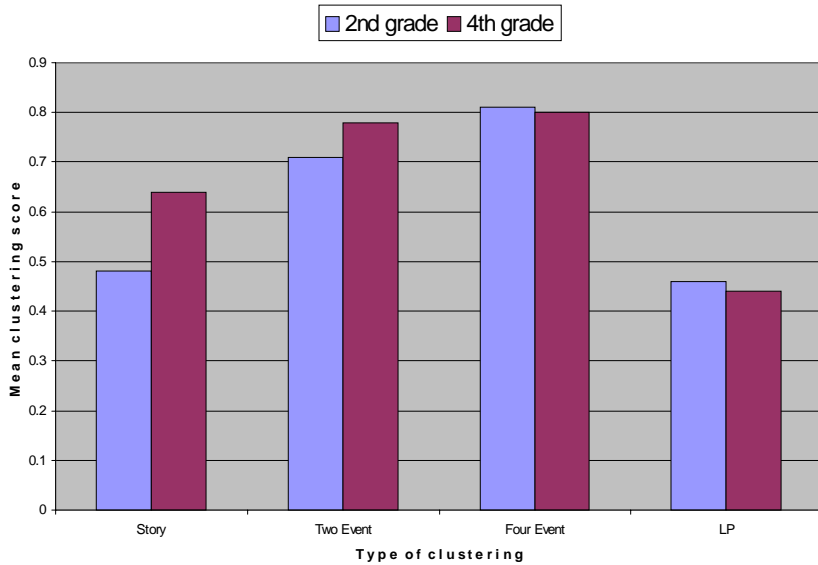


Figure 3. Clustering for bilingual children who heard stories.

graders (.81 vs. 2.56/1.5 vs. 1.75) and fourth graders (2.06 vs. 2.81/1.88 vs. 2.50). The relationship between grade, event, and LP, to be discussed later, is best understood within the context of bilinguals' socialization history.

All bilinguals of the present study responded in English at recall. Furthermore, LP of remembered foods did not influence this action since each child remembered foods heard in English and in Greek.

Clustering

Clustering scores were obtained for subjects using the Adjusted Ratio of Clustering measure. Recall was analyzed for story clustering, two-event clustering (breakfast and party), four-event clustering (B1, P1, B2, P2), and LP clustering. Mean cluster scores are illustrated in Figure 3.

The importance of event clustering was dominant among second- and fourth-grade bilingual children. For second graders, event clustering (two event and four event) was superior to story clustering and LP clustering. This pattern was also consistent among fourth-grade bilinguals.

Recall Protocols

Overall analyses of recall protocols indicated that 100% of both second graders' and fourth graders' memory was guided by specific events in each story. That is, all children, at recall, used the actual events they heard to help them retrieve the specific foods from each story. Two examples of experimenter-child discourse at recall are illustrated in Table 2.

Notably, 50% of the second graders and 56% of the fourth graders gave some verbal acknowledgement of the actual language in which a particular event was heard, before retrieval and/or during retrieval. However, this varied from child to child. This is illustrated in the excerpts of verbal exchange between child and experimenter, listed in Table 3.

Discussion

Language and Memory

This study examined the language behavior of compound English-Greek bilingual children, in Grades 2 and 4, within the social context of a long-term story recall task that was initiated by a bilingual experimenter. Attention was given to children's memory, storage and retrieval strategies, and awareness of such strategies.

The first two questions of interest examined whether or not bilinguals could remember specific information from story narrative and whether or not such knowledge was subsequently organized and remembered in language-specific ways. Results revealed that bilinguals were quite adept at such a memory task. Furthermore, consistent with research (Flavell et al., 1993; Janowsky & Carper, 1996) that recall of specific event details and memory

Table 2

Examples of Experimenter-Child Discourse at Recall

Example of bilingual child's discourse at recall (language group: EGGE)
<p>Experimenter (stated in English): Think out loud and tell me all the foods you can remember from the stories.</p> <p>Child (stated in English): From the first part, Mary and Steven made breakfast for their parents. They had sausages, coffee, and bread and left it next to the mother's door and ran away so they be could be surprised. <i>The other part was in Greek.</i> It was Mary's birthday, and they had chocolate cake and soda. They barbecued hamburgers and hot dogs. Then there was the father's birthday, <i>the English part</i>, it was a surprise party and Dad took the kids for pizza. They made him a lemon cake, the dad's favorite. They filled the bowls with pretzels and chips and when Dad came back, everyone said, "Happy Birthday." <i>In the breakfast part of the story, that was in Greek</i>, they made the other breakfast. They had melons with honey, and they put the biscuits in the oven.</p> <p>Experimenter: How were you able to remember all that?</p> <p>Child: I remembered there were parties and breakfasts, and I remembered one part in English and the other in Greek, and I translated it back.</p>
Example of bilingual child's discourse at recall (language group: GEEG)
<p>Experimenter (stated in English): Think out loud and tell me all the foods you can remember from the stories.</p> <p>Child (stated in English): OK, well, in the one from yesterday, <i>in the Greek part</i>, it was Mary's father's birthday. It was a surprise party, and they had pizza, wine, and chocolate ice cream. <i>The other party was the English one.</i> Mary had a surprise party. They barbecued hamburgers and hot dogs and they had chocolate cake. <i>Oh, and in the breakfast part—that was the Greek part—</i>Mary and Steven made eggs and sausages and surprised their parents.</p> <p>Experimenter: How were you able to remember all that?</p> <p>Child: I remembered there were parties and breakfasts in Greek and English, and I translated some parts back.</p>

Note. Italics are the researchers'.

Table 3

Examples of Experimenter-Child Language Interactions at Recall

Excerpts of bilingual experimenter–bilingual child language interactions
<p>Recall instructions Experimenter (stated in English): Think out loud and tell me all the foods you can remember from the stories.</p> <p>Child responses First child (stated in English): Do you want the English part? Experimenter (stated in English): Everything you can remember, however you remember them. First child (stated in English): Well, in the Greek birthday party, they had . . . and at the English party. . . .</p>
<p>Recall instructions Experimenter (stated in Greek): Think out loud and tell me all the foods you can remember from the stories.</p> <p>Child responses Second child (stated in English): You mean from the Greek parts? Experimenter (stated in Greek): However you remember them. Second child (stated in English): OK, well there was a party—in the Greek one there were . . . and in the breakfast, in English. . . .</p> <p>Third child (stated in Greek): In Greek or in English? Experimenter (stated in Greek): However you remember them. Third child (stated in English): I remember English parts and Greek parts. At the English birthday party there was . . . and then at the Greek breakfast, there were. . . .</p> <p>Fourth child (stated in English): Which parts? The Greek only? Experimenter (stated in Greek): Everything you remember, however you remember them. Fourth child (stated in English): Well, there was a party—the first one—in English . . . they . . . and at the breakfast. . . .</p>

improve through middle childhood, the results of this study showed that this ability increased significantly with age.

The nature of the retrieval task provided several ways for bilinguals to exhibit language-dependent recall. Each story the bilinguals heard consisted of two events and were presented in two different languages, Greek and English.

Therefore, it was possible for subjects to organize and remember the information in each story in the same language in which it was encoded. Likewise, bilinguals received language-specific instructions and retrieval cues from the experimenter. Each subject heard two sets of recall instructions, each of which was stated in a different language. If bilinguals did possess language-specific memory stores, it was presumed that such a cue would access its appropriate store of information; that is, recall initiated in English would access knowledge from the English events, whereas recall initiated in Greek would access knowledge from the Greek events.

Overall the results did not support the notion of language-dependent recall. First, clustering scores revealed that LP clustering was subordinate to semantic (event) clustering among second- and fourth-grade bilinguals. This was consistent with other studies (Dalrymple-Alford & Aamiry, 1969; Lambert, Ignatow, & Krauthamer, 1968; Nott & Lambert, 1968) that have reported the superiority of semantic clustering over language clustering, that is, clustering words by meaning as opposed to presentation language. In this study, the use of language specific retrieval cues did not yield language-specific recall. Bilingual children remembered foods initially heard in events presented in both Greek and English, regardless of the language of instruction used by the experimenter. Notably, the language used by all children at recall was English. Furthermore, the experimenter's second set of recall instructions did not initiate any further responses by any child. This was not unusual language behavior, since other studies, using English-Greek bilinguals, have also revealed the ability of participants to encode recall instructions at the semantic level (Papaioannou & Padilla, 1982). These findings, in totality, lend support to the idea that bilinguals have a common semantic store of knowledge that can be retrieved in each of their respective languages.

Strategies of Remembering: Event Representations and Language

The third question of interest that the present research addressed pertained to possible retrieval strategies of bilingual participants. Would bilinguals remember information by thinking of the actual story events in which such information was presented and/or the language in which the story events were initially heard? Notably, results illustrated the importance of ERs in this regard.

Since bilinguals were found to organize their recall in terms of events, it was of interest to investigate the possible roles of language(s) with respect to such a semantic organization. For instance, could language of presentation help bilinguals keep remembered events cognitively distinct?

In order to examine this possibility, recall results of the present study were examined more closely, starting with clustering scores. Bilinguals of the present study engaged in two types of event clustering, two event and four event. Both scores were relatively stable and exceeded that of LP clustering for second and fourth graders. In general, the children were not simply remembering party foods or breakfast foods. They were listing foods from

specific events in each story in order. Consider the following recall protocol list, taken from a bilingual fourth grader: B1, B1, B1, P2, P2, P1, P1. Referring to Figure 1, it is evident, from this recall list, that the child was abstracting information from one event type to another across stories (from B1 to P2) and then generalizing from one party event to another (from P2 to P1). The first two events, B1 and P2, were presented in the same language, while the third event, P1, was heard in a different language. Analyses of individual recall protocols revealed that more than 75% of bilinguals were able to either generalize or abstract information from stories. Notably, the ability to both generalize and abstract information from stories within a given recall protocol list doubled for fourth graders (14/16) as opposed to second graders (7/16).

To the degree that subjects were remembering each breakfast and party event in a language-specific manner, the ability to generalize and abstract information from stories illustrated a high degree of interlanguage conceptual mobility. This is not surprising, considering that these children were using both their languages on a daily basis at home and in school. This mobility was also evident from the fact that bilinguals remembered significantly more items presented in Greek than in English, yet they stated those items in English, even when the experimenter initiated recall in Greek.

Although the communicative role of language was evident from these results, the cognitive organizing function of language was not conclusive. It was still unclear whether or not it was the language itself that was helping children keep the events from each story cognitively separate. In order to examine how children actually retrieved information from memory, they were asked to think out loud at recall. Examination of recall protocols between the bilingual experimenter and the children revealed that the children were actually stating specific actions from specific events to retrieve specific information from such events (see Table 2).

Remembering Out Loud

Verbal comments made by participants of the present study support claims that metamemory is developing among children in this age range (Janowsky & Carper, 1996) and indicate that bilinguals were cognitively aware of the language of presentation of each remembered event. Consider the following phrases: “the other part was in Greek,” “the English part,” “in the breakfast part of the story that was in Greek,” “the Greek part,” “the other party was the English one,” and, “Oh, and in the breakfast part—that was the Greek part.” Recall strategies were also revealed in the children’s responses to the experimenter’s question, “How did you remember all that?” These included: “I remembered one part in English and the other in Greek and then I translated it back,” and, “I remembered there were parties and breakfasts in Greek and English and I translated some parts back.” These verbal exchanges suggest that the language of the event helped these bilinguals keep each event separate in memory.

Although the majority of bilingual children verbally acknowledged the language in which a remembered event was initially heard (see Table 3 for excerpts of experimenter-child language interactions), it is possible that more subjects were cognizant of the presentation language of remembered events but simply did not state it at recall. This may be due to the fact that the experimenter was also bilingual. For example, consider the following verbal exchange between the bilingual experimenter and one of the children:

Experimenter (in English): Think out loud and tell me all the foods you remember from the stories.

Child (in English): You want the ones from the English and the Greek parts?

Experimenter (in English): However you remember them.

Child (in English): OK, there were. . . .

In the above example, the child proceeded to describe and retrieve foods from a breakfast event that was heard in English, a party event heard in English, and a breakfast event heard in Greek. However, there was no mention of the language of presentation of each event as the child searched her memory. This example supports the claim that interactions between two bilinguals activate both languages of each bilingual, regardless of the actual language used in the conversation (Grosjean, 1998; Grosjean & Miller, 1994). It is possible that the child thought that the experimenter knew the events in each story were in different languages and felt no need to report that fact as she searched her memory. Notably, this is only an educated guess, but a plausible one, given the available data.

Bilingual Memory: The Role of Experience

In order to examine and better comprehend the relationship of language to ERs and memory, one must consider bilingual memory as a multilayered, dynamic, developing system, embedded in one's daily cultural and language experiences (see Figure 4). As noted in Figure 4, each circle is a system that consists of knowledge. The degree to which knowledge is encoded, stored, and retrieved in language-specific ways depends upon the relationship between each language of the bilingual (L1-L2) and his or her imagery system, within that system. The nature of this relationship, including the strength and direction of interlanguage-imagery links, is under the primary influence of the bilingual's language socialization experience. This includes how bilinguals acquire, develop, use, and think about their languages. For example, to the extent that bilinguals have engaged in interactive bilingual conversations, as children, they learn the social functions of language, including when to speak in each of their languages and with whom. Socialization experience also include individual preferences and attitudes towards one's language(s). For example, some bilinguals may prefer one of their languages to the other, which may

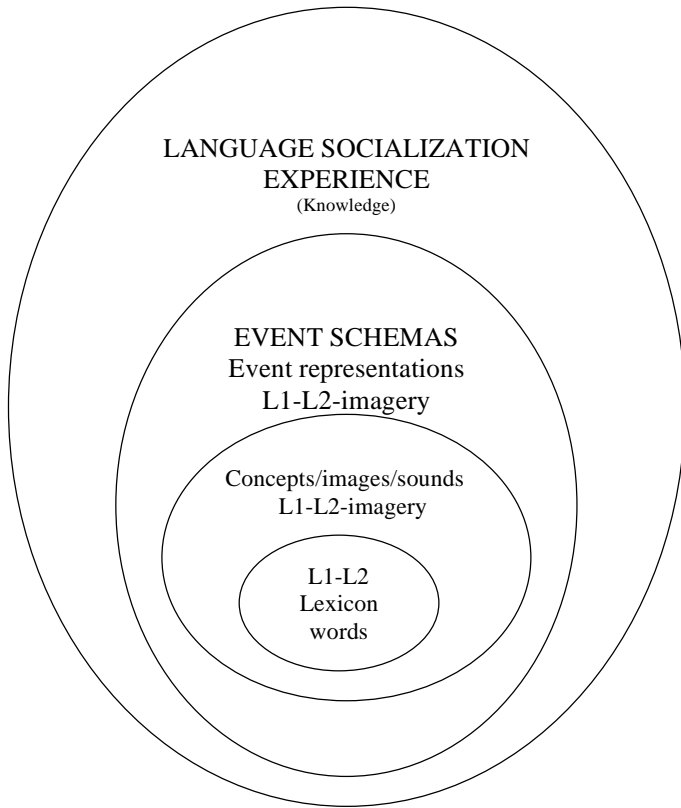


Figure 4. Bilingual memory.

influence its subsequent use or lack of use. These variables may influence various cognitive abilities of memory, including encoding, organization, and retrieval of knowledge.

Language experiences also consist of social interactions. These prior interactions, events in which bilingual children have participated, influence the nature of the L1-L2-imagery relationship, which, in turn, influences their representations. Bilinguals can experience such events in either of their languages and/or in both languages. These event schemas or event representations consist of words, concepts, images, and sounds, some of which may be language specific and some of which may be language indifferent, depending upon how bilinguals use and think of their languages.

Another important consideration, with respect to this characterization of memory, is the nature of the retrieval task that engages one's memory. It has been stated that different types of tasks tap into different levels of representation (Durgunoglu & Roediger III, 1987). Looking at Figure 4, it is evident that the nature of the recall task will activate different systems of

bilingual memory. For example, a lexical task may activate L1-L2-imagery relations at a microlexical level, whereas a semantic task involving story comprehension and recall may activate many systems. The strength and extent of this activation will depend upon the actual processing and retrieval requirements of the task as well as the nature of the interaction between the experimenter and the bilingual subject.

This depiction of memory is consistent with the idea that memories are more than storage compartments; that is, they are knowledge structures that are products of our understanding of our experiences and representations of those experiences, which initially develop through event schemas (Kuhn, 2000; Nelson, 1996). It is also congruent with the argument that remembering and retrieving information is a social activity with individual, cognitive, and social goals, in which language plays an integrative role (Bruner, 1983; Cummins, 2000; Nelson, 2002; Snow, 1986; Vygotsky, 1986; Werner & Kaplan, 1963). For bilinguals, especially, this role includes the negotiation of meaning between the bilingual speaker and the bilingual listener in deciding which language to use and when.

Examining Bilinguals' Language Behavior in Context

In this study, it was evident that children's language socialization experience and the retrieval task each played a role with respect to bilingual memory. That is, the language behavior exhibited by bilinguals, specifically, the way bilinguals comprehend, store, and retrieve information from memory, can be viewed as a product of both individual and contextual variables. Personal variables include children's language preferences and experiences with their languages, whereas contextual variables incorporate the cognitive and social demands of the recall task.

Bilingual children were adept at retrieving specific information from long-term memory. This information was presented within the context of events that were heard in different languages. This ability improved significantly with additional language development and language experience, since fourth graders remembered significantly more information than second graders. The ability to comprehend and remember information in both languages was not surprising because the children were actively using both languages each day, suggesting a strong L1-L2 relationship. School instruction was in Greek for 2 hours a day and in English for the remainder of the day. Therefore, comprehending and retrieving information in two languages was a daily occurrence.

The ability of bilinguals to organize their recall by specific event (B1, B2, P1, P2) was also consistent with their language socialization history. Since the bilingual children were using both their languages interchangeably at home, it is reasonable to presume that they experienced events similar to the ones depicted in the stories, such as a breakfast and a birthday party, in both their languages. Therefore, bilinguals' event representations may have been constructed in English, Greek, and/or in both English and Greek.

This heterogeneity, with respect to experience, may have affected the degree to which bilinguals used their languages to help keep events cognitively separate in memory. At recall, many subjects of the present study revealed that they remembered events from a story in Greek and then translated the information into English. This behavior was consistent with reports of bilinguals remembering an event in the language in which it was encoded and retrieving it in their other language (Schrauf & Rubin, 1998). Notably, all subjects of the present study engaged in some degree of translation. They heard and remembered items from events presented in English and Greek but subsequently stated their recall in English. This behavior did not change, even when the experimenter initiated recall in Greek. Such behavior reflected a high degree of language integration, which was consistent with bilinguals' daily interactions. This behavior was also congruent with the children's reported language preferences as revealed in the language questionnaires. Although the children reported that they used both languages at home and liked both their languages, 71% reported a preference for speaking in English as opposed to Greek.

Since language cannot be separated from experience, it is possible that the language in which children heard an event and the type of event itself may have caused bilinguals to remember a previous personal memory, such as going to a party or having breakfast with their parents, which, in turn, made the story event more distinct in their memory. In fact, there has been substantive evidence of culture-specific differences in mental images triggered by translation equivalents among bilinguals (Paivio & Desrochers, 1980; Pavlenko, 1999; Winograd, Cohen, & Barresi, 1976).

The role of language, with respect to event representations, must also be examined within the context of the retrieval task. The long-term memory task consisted of story and event comprehension in the L1 and the L2. This activated both languages at a semantic level. Since comprehension and retention of information was the primary goal, it was not unusual for bilinguals to remember each specific event (B1, P1, B2, P2). The fact that each event, within a story, was heard in a different language may also have contributed to its distinction. The bilingual experimenter instructed the children to remember as much of each story as possible, since they would be questioned in 3 days. Since this instruction initially took place in English, bilinguals may not have anticipated recall being initiated in both languages. This may explain why children did not retrieve any subsequent information from memory after the second set of recall instructions. Some bilinguals may have encoded the events in both languages and stored them semantically and/or in an imagistic format, while others may have stored them by language. In the former case, memory may have become linguistic at recall. In the latter example, bilinguals translated Greek memories into English. In fact, many bilinguals in the present study revealed the latter strategy to the experimenter during recall, when asked to "think out loud." Either strategy is plausible, given bilinguals' language experiences.

Unfortunately, individual strategies for each participant could not be identified with complete certainty due to limitations of the retrieval task of the present study. Bilinguals were not specifically asked if they remembered the events by language or by images. They were instructed to “think out loud.” As discussed earlier, since the experimenter was bilingual, it is possible that some children did not feel the need to verbally indicate the language in which an event was encoded. They may have presumed that the bilingual experimenter was aware of that information.

Conclusion

It is evident that the relationship between language(s) and event representation, and its impact on memory, must be examined within a larger contextual framework of daily language experiences. These experiences influence the nature, strength, and direction of interlingual-conceptual relations, which, in turn, may affect cognitive processes such as storage and retrieval of knowledge. From a developmental standpoint, these experiences and relations are subject to change, depending upon subsequent development and daily use of bilinguals’ language(s).

Future bilingual research should heed such factors when contemplating the use of particular types of retrieval tasks to examine bilingual memory. Consideration must be given to the nature of the task, its retrieval requirements, and the social context surrounding the task, that is, interaction between experimenter and participant. All these factors will affect which systems and language relations are activated in memory and the extent of that activation, which will ultimately impact the language behavior that is observed.

From an educational standpoint, the bilingual social context that surrounds a given memory task is an especially important consideration. That is, the behavior exhibited by a bilingual student on such a task, including how he or she remembers and how much he or she can remember, is under the influence of a number of variables. These include not only the cognitive demands of the task, but also the social demands, that is, how the bilingual is allowed to use his or her respective languages and the bilingual’s understanding of these demands. Notably, cognitive and social demands placed upon bilinguals may vary from situation to situation—home versus school, classroom versus lunchroom—as they interact with different bilingual and/or monolingual conversational partners. This is an important consideration for educators, who contemplate which language(s) to use when communicating with bilingual children, testing bilinguals’ memory, and creating daily learning experiences for bilingual students. Due consideration must be given to bilinguals’ previous patterns of daily language use, and special attention must also be placed on helping bilinguals understand the cognitive and social demands that are being placed upon them during their daily learning experiences in the classroom.

References

- Altarriba, J., & Mathis, K. M. (1997). Conceptual and lexical development in second language acquisition. *Journal of Memory and Language, 36*, 550–568.
- Appel, R. (2000). Language, concepts and culture: Old wine in new bottles? *Bilingualism: Language and Cognition, 3*(1), 5–6.
- Aragno, A., & Schlachet, P. J. (1996). Accessibility of early experience through the language of origin: A theoretical integration. *Psychoanalytic Psychology, 13*, 377–390.
- Bain, B. (1975). Toward an integration of Piaget and Vygotsky: Bilingual considerations. *Linguistics, 16*, 5–20.
- Ben-Zeev, S. (1977). Mechanisms by which childhood bilingualism affects understanding of language and cognitive structures. In P. A. Hornby (Ed.), *Bilingualism: Psychological, social and educational implications* (pp. 29–55). New York: Academic Press.
- Bialystok, E. (1997). Effects of bilingualism and biliteracy on children's emerging concepts of print. *Developmental Psychology, 33*, 429–440.
- Bochner, S. (1996). The learning strategies of bilingual versus monolingual students. *British Journal of Educational Psychology, 66*, 83–93.
- Bruner, J. S. (1983). *Child's talk: Learning to use language*. New York: Norton.
- Cummins, J. (2000). *Language, power, and pedagogy: Bilingual children in the crossfire*. New York: Multilingual Matters.
- Dalrymple-Alford, E. C., & Aamiry, A. (1969). Language and category clustering in bilingual free recall. *Journal of Verbal Learning and Verbal Behavior, 8*, 762–768.
- De Groot, A. M. B., & Poot, R. (1997). Word translation at three levels of proficiency in a second language: The ubiquitous involvement of conceptual memory. *Language Learning, 47*(2), 215–264.
- Dufour, R., & Kroll, J. F. (1995). Matching words to concepts in two languages: A test of the concept mediation model of bilingual representation. *Memory and Cognition, 23*(2), 166–180.
- Durgunoglu, A. Y., & Roediger, H. L., III. (1987). Test differences in accessing bilingual memory. *Journal of Memory and Language, 26*, 377–391.
- Ervin, S., & Osgood, C. (1954). Second language learning and bilingualism. *Journal of Abnormal and Social Psychology, 49*, 139–146.
- Ervin-Tripp, S. (2000). Bilingual minds. *Bilingualism: Language and Cognition, 3*(1), 10–12.
- Flavell, J. H., Miller, P. H., & Miller, S. A. (1993). *Cognitive development*. Englewood Cliffs, NJ: Prentice-Hall.

- Francis, W. S. (1999). Cognitive integration of language and memory in bilinguals: Semantic representation. *Psychological Bulletin*, 125(2), 193–222.
- Francis, W. S. (2000). Clarifying the cognitive experimental approach to bilingual research. *Bilingualism: Language and Cognition*, 3(1), 13–15.
- Grosjean, F. (1982). *Life with two languages: An introduction to bilingualism*. Cambridge, MA: Harvard University Press.
- Grosjean, F. (1985). The bilingual as a competent but specific speaker-hearer. *Journal of Multilingual and Multicultural Development*, 6, 467–477.
- Grosjean, F. (1998). Studying bilinguals; methodological and conceptual issues. *Bilingualism: Language and Cognition*, 1(2), 131–149.
- Grosjean, F., & Miller, J. L. (1994). Going in and out of languages: An example of bilingual flexibility. *Psychological Science*, 5(4), 201–209.
- Hakuta, K., Ferdman, B. M., & Diaz, R. M. (1987). Bilingualism and cognitive development: Three perspectives. In S. Rosenberg (Ed.), *Advances in applied psycholinguistics: Vol. 2. Reading, writing, and language learning* (pp. 284–319). Cambridge, England: Cambridge University Press.
- Hamers, J. F., & Blanc, M. (1990). *Bilinguality and bilingualism*. Cambridge, MA: Harvard University Press.
- Haritos, C., & Nelson, K. (2001). Bilingual memory: The interaction of language and thought. *Bilingual Research Journal*, 25(4), 605–626.
- Hummel, K. M. (1986). Memory for bilingual prose. In J. Vaid (Ed.), *Language processing in bilinguals: Psycholinguistic and neuropsychological perspectives* (pp. 47–64). Hillsdale, NJ: Earlbaum.
- Janowsky, J. S., & Carper, R. (1996). Is there a neural basis for cognitive transitions in school-age children? In A. J. Sameroff & M. M. Haith (Eds.), *The five to seven year shift: The age of reason and responsibility* (pp. 33–56). Chicago: University of Chicago Press.
- Javier, R. A., Baroso, F., & Munoz, M. A. (1993). Autobiographical memory in bilinguals. *Journal of Psycholinguistic Research*, 22, 319–338.
- Javier, R. A., & Marcos, L. R. (1989). The role of stress in the language independence and code switching phenomena. *Journal of Psycholinguistic Research*, 18, 449–472.
- Kessler, C., & Quinn, M. E. (1987). Language minority children's linguistic and cognitive creativity. *Journal of Multilingual and Multicultural Development*, 8, 173–186.
- Kolers, P. A. (1978). On the representation of experience. In D. Gerner & H. W. Sinaiko (Eds.), *Language, interpretation and communication* (pp. 79–98). New York: Plenum Press.

- Kroll, J. F., & Stewart, E. (1994). Category interference in translation and picture naming: Evidence for asymmetric connections between bilingual memory representations. *Journal of Memory and Language*, *33*, 149–174.
- Kuhn, D. (2000). Does memory development belong on an endangered topic list? *Child Development*, *71*(1), 21–25.
- Lambert, W. E., Ignatow, M., & Krauthamer, M. (1968). Bilingual organization in free recall. *Journal of Verbal Learning and Verbal Behavior*, *7*, 207–214.
- Liedtke, W. W., & Nelson, L. D. (1968). Concept formation and bilingualism. *Alberta Journal of Educational Research*, *14*, 225–232.
- Liepmann, D., & Saegert, J. (1974). Language tagging in bilingual free recall. *Journal of Experimental Psychology*, *103*, 1137–1141.
- Lopez, M., & Young, R. K. (1974). The linguistic interdependence of bilinguals. *Journal of Experimental Psychology*, *102*, 981–983.
- Marian, V., & Neisser, U. (2000). Language-dependent recall of autobiographical memories. *Journal of Experimental Psychology: General*, *129*(3), 361–368.
- McCormack, P. D. (1977). Bilingual linguistic memory: The Independence-interdependence issue revisited. In P. A. Hornby (Ed.), *Bilingualism: Psychological, social, and educational implications* (pp. 57–66). New York: Academic Press.
- Nelson, K. (1985). *Making sense: The acquisition of shared meaning*. New York: Academic Press.
- Nelson, K. (1995). From spontaneous to scientific concepts: Continuities and discontinuities from childhood to adulthood. In L. M. Martin, K. Nelson, & E. Tobach (Eds.), *Sociocultural psychology: Theory and practice of doing and knowing* (pp. 229–249). New York: Cambridge University Press.
- Nelson, K. (1996). *Language in cognitive development: The emergence of the mediated mind*. New York: Cambridge University Press.
- Nelson, K. (1999). Levels and modes of representation: Issues for the theory of conceptual change and development. In E. K. Scholnick & K. Nelson (Eds.), *Conceptual development: Piaget's legacy* (pp. 269–291). The Jean Piaget Symposium series. Mahwah, NJ: Lawrence Erlbaum Associates.
- Nelson, K., & Fivush, R. (2000). Socialization of memory. In E. Tulving & Fergus I. M. Craik (Eds.), *The Oxford handbook of memory* (pp. 283–295). London: Oxford University Press.

- Nelson, K., & Kessler Shaw, L. (2002). Developing a socially shared symbolic system. In E. Amsel & J. Byrnes (Eds.), *Language, literacy, and cognitive development: The development and consequences of symbolic communication* (pp. 27–57). Mahwah, NJ: Lawrence Erlbaum Associates.
- Nott, R., & Lambert, W. E. (1968). Free recall of bilinguals. *Journal of Verbal Learning and Verbal Behavior*, 7, 1065–1071.
- Okoh, N. (1980). Bilingualism and divergent thinking among Nigerian and Welsh school children. *Journal of Social Psychology*, 110, 163–170.
- Otoya, M. (1987). *A study of personal memories of bilinguals: The role of culture and language in memory encoding and recall*. Unpublished doctoral dissertation, Harvard University, Cambridge, MA.
- Paivio, A., & Desrochers, A. (1980). A dual-coding approach to bilingual memory. *Canadian Journal of Psychology*, 34, 388–399.
- Papaioannou, C., & Padilla, M. (1982). Bilingual memory of Greek-English bilinguals. *Psychological Reports*, 50, 1047–1054.
- Paradis, M. (1997). Representation lexicale et conceptuelle chez les bilingues: deux langues, trois systemes. In J. Auger & Y. Rose (Eds.), *Explorations du lexique* (pp. 15–27). Quebec: CIRAL.
- Pavlenko, A. (1999). New approaches to concepts in bilingual memory. *Bilingualism: Language and Cognition*, 2(3), 209–230.
- Pavlenko, A. (2000). New approaches to concepts in bilingual memory. *Bilingualism: Language and Cognition*, 3(1), 1–4.
- Perez-Foster, R. (1998). *The power of language in the clinical process: Assessing and treating the bilingual person*. North Bergen, NJ: Jason Aronson.
- Roenker, D. L., Thompson, C. P., & Brown, S. C. (1971). Comparison for the estimation of clustering in free recall. *Psychological Bulletin*, 76, 45–48.
- Schrauf, R. W., & Rubin, D. C. (1998). Bilingual autobiographical memory in older adult immigrants. A test of cognitive explanations of reminiscence bump and the linguistic encoding of memories. *Journal of Memory and Language*, 39, 437–457.
- Schrauf, R. W., & Rubin, D. C. (2000). Internal languages of retrieval: the bilingual encoding of memories for the personal past. *Memory and Cognition*, 28(4), 616–623.
- Snow, C. (1986). The social basis of language development. In P. Fletcher & M. Garman (Eds.), *Language acquisition* (2nd ed., pp. 69–89). Cambridge, England: Cambridge University Press.
- Tsushima, W. T., & Hogan, T. P. (1975). Verbal ability and school achievement of bilingual and monolingual children of different ages. *Journal of Educational Research*, 68, 349–353.

- Tulving, E., & Colotla, V. (1970). Free recall of trilingual lists. *Cognitive Psychology, 1*, 86–98.
- Vygotsky, L. S. (1986). *Thought and language*. Cambridge, MA: MIT Press.
- Weinrich, U. (1953). *Languages in contact*. The Hague, the Netherlands: Mouton.
- Werner, H., & Kaplan, B. (1963). *Symbol formation: An organismic-developmental approach to language and the expression of thought*. New York: Wiley.
- Whorf, B. L. (1956). *Language, thought, and reality*. Cambridge, MA: MIT Press.
- Winograd, E., Cohen, C., & Barresi, J. (1976). Memory for concrete and abstract words in bilingual speakers. *Memory and Cognition, 4*, 323–329.

Appendix A

Language Questionnaire

1. What language(s) do you speak at home?
English Greek English & Greek Other language
2. Do you speak to your Mommy in ____?
English Greek English & Greek Other language
3. Does Mommy speak to you in ____?
English Greek English & Greek Other language
4. Do you speak to your Daddy in ____?
English Greek English & Greek Other language
5. Does Daddy speak to you in ____?
English Greek English & Greek Other language
6. Is there a language that you speak most of the time?
Yes No
If yes, which ____? English Greek Other language
7. Is there a language that you like the most ?
Yes No
If yes, which ____? English Greek Other language
8. Is there a language that you think you speak better?
Yes No
If yes, which ____? English Greek Other language
9. Is there a language that you think you understand more?
Yes No
If yes, which ____? English Greek Other language
10. Is there anyone else at home you spend time with besides Mommy and Daddy?
Yes No
If yes, who and what language do you speak to her/him?

Appendix B

Stories

Story 1

One morning Mary and Steven got up early to make breakfast for their parents. “What should we make?” asked Steven.

“Why don’t you get two slices of bread and put them in the toaster?” Mary said. “I’ll fry up the eggs and sausages. I already made the coffee,” she added. When all the food was ready, Steven and Mary placed it all on two trays, along with a bowl of fresh strawberries and a cup of sugar. They took it and put it down in front of their parents’ bedroom door, knocked, and then ran away. “I bet they will be surprised,” Steven said to Mary.

A week later was Mary’s 8th birthday, and her parents were giving her a surprise party. Her father was barbecuing some hamburgers and hot dogs, and her mother was putting all the soda bottles in the refrigerator. Her brother, Steven, was filling up all the bowls in the living room with potato chips. When Mary’s father finished barbecuing, he called everyone outside to eat in the yard. Mary especially enjoyed dessert, chocolate cake covered with two scoops of cherry ice cream, her favorite. Mary got a lot of nice presents, and all her friends said it was the best party they had been to.

Story 2

Today, Mary and Steven’s family are making breakfast together. Mom is making omelets and cheese. Steven just finished making some freshly squeezed orange juice. “Dad, something smells delicious,” said Mary.

“It’s the biscuits in the oven,” he said.

“Well, here are the melons,” Mary said. “I cut them in half and put a teaspoon of honey over each of them.”

“Wonderful,” her father said. “I’ll just put them in the oven while it is still warm.”

“All the food is ready,” Mary’s mother said. “Let us eat.”

A week later was Mary’s father’s 40th birthday. Her mother was throwing him a surprise party. Mary’s mother told her husband to take the kids out for some pizza. As soon as they all left, the guests arrived. The women put all the bowls that were filled with pretzels into the living room, while the men carried in all the wine bottles and put them into the freezer along with the chocolate ice cream. Mary’s mother was reheating the chicken she cooked the day before and putting candles on the lemon cake—her husband’s favorite. At that moment, everyone heard a noise. As Mary’s father came in the front door, they all yelled, “Happy Birthday!” The party was great.

