1994

Private Speech in Bilingual Children

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LOYOLA UNIVERSITY OF CHICAGO

PRIVATE SPEECH IN BILINGUAL CHILDREN

A THESIS SUBMITTED TO THE FACULTY OF THE
GRADUATE SCHOOL OF LOYOLA UNIVERSITY CHICAGO
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTER OF ARTS

DEPARTMENT OF PSYCHOLOGY

BY

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CHICAGO, ILLINOIS

MAY, 1994

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to all who have helped me with this project. First of all, the guidance of Dr. Denise Davidson, the director of this thesis, was indispensable. Dr. Davidson made valuable suggestions at every stage of the project and improved this thesis greatly. Likewise, I am indebted to Dr. Carol S. Huntsinger, the reader of this thesis, for her insightful comments. Dr. Huntsinger's personal expertise with cross-cultural research was integral to a study of this nature.

Secondly, I wish to express my sincere appreciation to Heidi Eterovic, a fellow graduate student, and Marija Dugandzic, who worked diligently to provide the additional translations and back-translations that I needed.

Thirdly, special thanks go out to Mr. Ante Runac, President of the St. Jerome Croatian School, who went out of his way to ensure my access to enough children for my work.

Finally, I would like to thank Phil Huntsinger, my boyfriend, for his insights during each phase of this process. And last, but not least, I would like to thank my parents, Nikola and Slavica Jergovic, for teaching me to speak Croatian and to appreciate my Croatian heritage.

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CHAPTER 1

REVIEW OF THE LITERATURE

Private speech may be defined as speech which is not addressed or adapted to anyone in particular (Deutsch & Stein, 1972). It is usually an overt utterance made by a child, addressed to him or herself, when working alone on a task (e.g., Berk, 1985; Berk & Garvin, 1984; Manning & White, 1990). The occurrence of private speech was first discussed by Jean Piaget (1923/1962) and Lev Vygotsky (1934/1962).

Although Piaget and Vygotsky both discussed private speech, they had differing views. According to Piaget, private speech is indicative of the young child's cognitive immaturity (Piaget, 1923/1962). Children engage in private speech because they cannot take the perspective of another and therefore cannot engage in reciprocal communication (Piaget, 1923/1962). In essence, Piaget did not assign cognitive-developmental functions to private speech. In fact, subsequent researchers have applied the term "egocentric" to describe Piaget's findings (e.g., Bjorklund, 1989).

Conversely, Vygotsky (1934/1962) viewed private speech as a developmentally positive phenomenon. Private speech is assumed to be the developmental link between externalized

vocal speech and inner, self-guiding verbal speech (Berk, 1986). Vygotsky (1934/1962) proposed that private speech serves a function of cognitive self-guidance. For example, private speech may bring actions under the control of thought (Berk, 1986).

Private speech, however, is not a strategy which children spontaneously utilize. Rather, as with all individual mental functioning, Vygotsky believed that private speech has a social origin. Specifically, private speech originates from early social experiences between a parent and a child. As the parent and the child work together, the parent provides the speech that guides the child's activities (Wertsch, 1991). Later, as the child matures, he uses private speech to regulate his own behavior. Finally, private speech is internalized and becomes the silent thoughts that regulate behavior. Thus, language that was social in origin eventually underlies the internal cognitive functioning of the individual (Wertsch, 1991).

Implicit in Vygotsky's theory is that children begin to use private speech to understand or focus on a problem or a situation and to overcome difficulties (Berk, 1986; Harris, 1990). That is, children use this self-regulating private speech to mediate behavior when consequences of actions are delayed or not evident (Harris, 1990). Harris (1986) provides an example of a child using self-regulatory private speech while working on a puzzle. Harris (1986) used a

Playskool wooden puzzle "Shazam" to elicit private speech from her subjects. One puzzle piece was rigged so that it could not fit the puzzle correctly. Based on this procedure, Harris (1986) reports some examples of self-regulatory private speech: "This is a tricky one."; "Maybe I put that in wrong."; and "Maybe this goes here.". The private speech may serve to remind the child that there are alternatives when solving problems (Diaz, 1986). If the first approach does not work, the child's private speech can potentially serve as a reminder that there are other approaches to be tried.

Thus private speech serves as a mediator of behavior when children work on difficult tasks. Manning and White (1990) note, however, that only task-relevant private speech, i.e., speech that has a meaningful connection with the assignment at hand, will improve a child's performance on difficult tasks. Recent work by Diaz (1986) also indicates that task-relevant private speech may alter the course and outcome of a child's intellectual activity. Diaz (1986) states that private speech allows the child to include stimuli that lie outside the child's perceptual field.

Specifically, private speech helps children entertain a wide variety of possible actions. Therefore, the child can create specific plans of action and can thus act less impulsively. Two facts support this claim: (1) children who use private speech talk to themselves about the task or activities they are engaged in, and (2) private speech

increases at meaningful times during the task (Diaz, 1986). That is, task-relevant private speech may direct attention to relevant events; interpret an automatic response to environmental stimuli; allow the child to select alternative courses of action; enable the child to use rules, principles, and instructions to guide behavior; and maintain a sequence of actions in short term memory so they can be executed (Meichenbaum, 1979).

Numerous classification schemes have been created to code children's private speech (e.g., Berk & Diaz, 1992; Harris, 1986). The classifications employed in this study are based on the content, function, and form of the children's private speech. Content, according to Diaz (1991), is the referential aspect of the utterance, or more simply, what the child is talking about. The content of a child's private speech may be either task-relevant or task-irrelevant. Task-relevant comments often improve a child's performance on difficult tasks. Specifically, task-relevant private speech may provide feedback to the child; analyze the situation for the child; and alert the child about salient features of the materials in use. In contrast, task-irrelevant private speech includes word play, repetition, expletives, and non-words (e.g., "Hmm", "Ta da"). Affective statements such as "I'm tired" and "I miss Mommy" are also coded as task-irrelevant private speech.

In addition to classifications of private speech based on content, there are classifications based on function (Berk & Diaz, 1992). Function refers to the possible effects of utterances on the child's ongoing behavior. These effects could be directing the child's present activity, focusing the child's attention, or planning the child's future activity (Berk & Diaz, 1992).

Some researchers (Berk & Diaz, 1992) use the form of private speech to create a third major classification of private speech. Form refers to the prosodic and structural aspects of private speech such as loudness, intonation, and speed that could have potential functional significance. For example, a child may make a slow prosodic statement such as "I a-a-am pu-u-u-ting the re-e-e-ed (puzzle piece here)" in order to pace her motor activity, thus regulating her behavior (Berk & Diaz, 1992). This slow prose may also serve to keep the thought in the child's conscious memory so that she does not lose track of her plan of action. Similarly, a child who repeats a phrase may be trying to keep the thought conscious until she gets to that step of the task (e.g., "The red one next, the red one next...").

Classifying private speech according to content, function and form may elucidate the role private speech plays in task performance. Furthermore, other factors are important in facilitating the efficacious use of task-relevant private speech. Three such factors are: the type of

cognitive task, the age of the child and the cognitive development of the child (Behrend, Rosengren, & Perlmutter, 1989; Berk, 1986; Frauenglass & Diaz, 1985; Harris, 1990).

Cognitive tasks vary in their ability to elicit private speech (Berk & Diaz, 1992). In general, tasks that are within the child's zone of proximal development are most likely to elicit private speech (Vygotsky, 1962). The child's zone of proximal development, according to Behrend, Rosengren & Perlmutter (1989), is a range of tasks or skills which the child may not be able to master on her own, but will be able to master with expert guidance. Interestingly, Vygotsky (1962) argues that while the child works on a task in her zone of proximal development, her private speech is sometimes the only expert guidance necessary. Previous research has shown that the cognitive tasks most successful at eliciting private speech are moderately difficult academic tasks (Berk, 1986; Frauenglass & Diaz, 1985; Harris, 1990), although perceptual tasks such as puzzle solving also elicit private speech if they are difficult enough (Berk, 1986; Frauenglass & Diaz, 1985; Harris, 1990).

Likewise, the age of the child uttering private speech may influence the kind of private speech emitted. Previous research has indicated developmental differences in the use of private speech (e.g., Manning & White, 1990). Manning & White's (1990) research has shown that private speech is not task-relevant until 5 years of age. Prior to age 5, children

usually engage in task-irrelevant private speech. For instance, a 4-year-old may say "I'm hungry" when working on a puzzle, whereas an older child may say "I need a red piece" (Manning & White, 1990). An older child may also be more likely to use task-relevant private speech for self-regulation, attention directing, and problem solving. By the time the child turns 8 years old or so, he has internalized his private speech and is assumed to think to himself when performing cognitive tasks (Behrend, Rosengren, & Perlmutter, 1989; Berk & Landau, 1993; Manning & White, 1990).

Finally, the degree of cognitive development facilitates the benefits of task-relevant private speech (Diaz, 1985). For example, researchers have studied the effects of learning disabilities on private speech. Harris (1986) indicates that learning disabled children had significantly lower rates of private speech than normally achieving children. Moreover, the learning disabled group had significantly less task-relevant private speech than the normally achieving children. Conversely, children with advanced cognitive development have been shown to use more sophisticated forms of private speech more effectively (Berk, 1986). A special case of advanced cognitive development is the bilingual child (Diaz, 1985). Bilingualism is presumed to have an overall positive influence on children's cognitive development and cognitive abilities (Peal & Lambert, 1962; see Cummins, 1977 for an alternative view).

However, Diaz (1985) indicates that only "balanced bilinguals", children who have similar and age appropriate abilities in their two languages, show such positive effects of bilingualism. Of interest in this research is whether bilingualism is an important factor in mediating the efficacious use of private speech. To examine this issue, and also to assess how children's private speech is affected by bilingualism, bilingual children participated in this study.

Specifically, Croatian-American children who speak both English and Croatian were assessed in the present research. This study examined the private speech of bilingual children with respect to the relationship between the language of their private speech and the environment. Owens' (1988) states that bilingual children often speak one language in one environment and the other language in another environment. For example, a Croatian-English bilingual child in the United States most likely speaks Croatian at home and English in school. In addition, home-tasks are most likely assigned and completed in Croatian, and school-tasks are assigned and completed in English, regardless of the environment. Indeed, bilingual children rarely receive support for their non-English language in the classroom (Berk, 1994; p. 385).

In the sample of children used in this research, parents preferred that the Croatian language be spoken in the home.

Moreover, Croatian was the only language spoken at Croatian school. Croatian school is held weekly, on Friday night or Saturday morning, for school-age children of Croatian descent. In Croatian school, the children, who are already bilingual to some degree, are taught the formal rules and grammar structure of the Croatian language. Additionally, the children are taught the culture, history, and music (songs and dances) of their parents' native Croatia. Again, the only language of instruction and interaction spoken in Croatian school is Croatian (See Bradunas & Topping, 1988 for a detailed discussion of various ethnic heritage and language schools).

Thus, this study proposed to examine the effects of bilingualism and the language environment on children's use of private speech. Each child was observed twice, once in the Croatian school and once in the American school. To preserve the distinctiveness of each language environment, the experimenter (fluent in both Croatian and English) spoke only Croatian in the Croatian school and only English in the American school. In order to determine each child's degree of bilingualism, the children were administered two versions of the Peabody Picture Vocabulary Test- Revised (Dunn & Dunn, 1981): A Croatian version in the Croatian environment and an English version in the English environment. Then, the children were observed completing two cognitive tasks and drawing a picture (in each environment). Later, the nature,

development, and cognitive functioning of the private speech was assessed.

Specific hypotheses are as follows:

1. It is hypothesized that the language of the child's private speech will match the language of the environment in which the child is being observed (Croatian private speech in the Croatian school and English private speech in the American school). However, a language cross-over effect, as a function of task type, is expected in the Croatian environment. Specifically, because math is primarily taught in American schools rather than in the homes (Huntsinger & Jose, 1992), all math private speech is expected to be in English, the language of the schools.

2. Based on Berk & Landau's (1993) conclusion that any setting other than a truly academic one decreases the amount of private speech observed, it is hypothesized that there will be more private speech utterances in the American school setting than in the Croatian school setting.

3. Because balanced bilinguals are reported to have more advanced language development (Diaz, 1985), it is hypothesized that the children who are balanced bilinguals (i.e., exhibit similar skills in both languages) will produce more private speech in both languages than the children who are not balanced bilinguals (have greater facility in one language). Moreover, children who are not balanced

bilinguals are expected to produce more private speech in the language with which they are more proficient.

4. It is hypothesized that the older children will use more task-relevant private speech than task-irrelevant private speech, and more task-relevant private speech than the younger children.

5. The task-relevant private speech uttered is expected to be distributed differently across environments and tasks. In this research, the math task is considered an academic task because it is formally taught to children. The puzzle task is considered to be less academic because there is less formal teaching of puzzle completion skills than math skills. Finally, the draw-a-picture task is considered a non-academic task in this research because there has been no formal teaching of art skills to these children.

Thus, predictions have been made based on this distinction of the academic nature of the three tasks, and on the above-mentioned distinction of the academic nature of each environment. Specifically, it is predicted that the traditionally academic American school setting will elicit significantly more task-relevant private speech than the less academic environment of the Croatian school.

Moreover, it is predicted that the highly academic math task will elicit significantly more task-relevant private speech than the less academic puzzle task. Likewise, the non-academic draw-a-picture task is expected to elicit the

least amount of task-relevant private speech. These task related predictions are expected to be maintained across language environments.

6. Finally, it is hypothesized that the traditionally academic environment of the American school will elicit significantly more private speech serving a cognitive function than the less-academic environment of the Croatian school. Moreover, it is hypothesized that significantly more cognitive regulation will occur during the highly academic math task than during the less academic puzzle task. The non-academic draw-a-picture task is expected to elicit the least amount of private speech serving a cognitive function. Also, it is hypothesized that specific tasks will elicit private speech serving specific cognitive functions. That is, the math task and the puzzle tasks are expected to elicit significantly more private speech serving the cognitive function of directing present activity than focusing attention or planning future activity. The draw-a-picture task is expected to elicit more private speech focusing attention than either directing present activity or planning future activity.

CHAPTER 2

METHOD

Subjects

Twenty-four bilingual (English and Croatian speaking) children of immigrant Croatian parents participated in this study. Twelve children, 6 male and 6 female, were in kindergarten, (mean age = 5.11; age range = 5.6 years - 6.4 years) and 12 children, 5 male and 7 female, were in first grade (mean age = 6.10 years; age range = 6.7 years - 7.4 years). The children were recruited from Croatian school programs affiliated with two Chicago area Croatian American Catholic churches. Specifically, children attend parochial schools conducted in English during the week, and Croatian school on Friday night. The children were primarily from the lower-middle to upper-middle class.

Materials

Two sets of testing materials were prepared: one to assess bilingual language ability; and one to elicit private speech from the children.

Bilingual language ability. The Peabody Picture Vocabulary Test - Revised (PPVT-R) (Dunn & Dunn, 1981) is a non-verbal, no-reading, multiple choice test designed to assess the receptive knowledge of vocabulary of children

beginning at the age of 2 1/2 years of age. The PPVT-R has two forms, L and M, with 175 plates in each form. Each plate contains four pictures. Items are arranged in order of increased difficulty. The two forms are equivalent, but use different words and different pictures. For the purposes of this study, Form L form was translated into Croatian (see Diaz, 1985, for rationale and Spanish translation).

Private speech elicitors Two perceptual tasks and two math tasks were selected. All materials were age appropriate, yet likely to elicit private speech (see below). The perceptual tasks and the math tasks were marketed for children 3 to 9 years of age. Additionally, children were asked to draw any picture of their choice.

The first perceptual task used to elicit private speech was "The Part-Whole Puzzle". This is a wooden puzzle with inlays of three circles, three squares, and three hexagons, each divided into two pieces. The puzzle frame is natural wood and the two halves of each geometric shape are different primary colors and are colored on both sides. Color is not a cue in fitting the two halves of the shape together. The inside cut of each of the three like shapes is different. For example, one circle has a straight cut separating the two halves; one circle has a zigzag cut, and one circle has a curving cut. The completed puzzle was shown to the child for 10 seconds. Then the researcher disassembled it, put all the pieces to the child's right in random order, and placed the

puzzle frame in front of the child with the circles at the top. The private speech emitted was recorded.

The second perceptual task used to elicit private speech was the "Tell-By-Touch", a wooden matching set. The frame is natural wood with 10 textured holes. The 10 textured surfaces range from soft velvet to rough sandpaper. There are also 10 textured knobs that match the textured holes in texture and appearance. The child must match the knobs to the holes with his eyes closed. Thus, this task requires the use of tactile discrimination, rather than vision. The private speech uttered was recorded.

In addition to the two perceptual tasks employed, two math tasks were used to elicit private speech. The first math task was the "Self-Checking Domino Math" game. This is a game of sixty plastic dominoes, cut like jigsaw puzzle pieces that must be assembled. The concept is similar to ordinary dominoes. However, each domino is divided in half by a painted line. One half of the domino contains a "problem" and the other half of the domino contains the "solution". The solution to a problem is found on another domino. Two pieces fit together only if the solution is the correct one for that problem. Both addition and subtraction facts are included. The private speech emitted was recorded.

Finally, a threading bead and number set was the second math task used to elicit private speech from the children.. A 22" threading lace, 10 number tiles numbered 1-10, and 55

colored beads are used to display knowledge of counting and sorting. Beads can be strung in labeled groups (according to color); tiles can be strung in forward sequence or backward sequence; or tiles can be used to label strings of beads with their respective values. The amount of private speech uttered was recorded.

In addition to the above-mentioned tasks, children used colored pencils and paper to draw a picture of their choice. The private speech uttered was recorded.

All tasks were chosen because they are solvable, yet challenging. Each had a feature considered sufficient to elicit private speech. For example, the pieces of the Part-Whole Puzzle are very similar. Children must pay very careful attention to detail in order to successfully complete the puzzle. Similarly, the Tell-By-Touch pattern matching task requires children to use tactile discrimination abilities instead of their vision. Successful completion of this task relies upon the child's competent use of the seldom relied upon sense of touch. Due to their academic nature, the math tasks were chosen to elicit private speech. Previous research also indicates that academic math tasks elicit private speech (Berk, 1986; Frauenglass & Diaz, 1985; Harris, 1990).

Procedure

The experimenter, fluent in both English and Croatian, conducted all observations. The children were observed

twice-- once in Croatian school and once in English school. Each language environment was considered distinct. That is, once the children were in Croatian school, they were allowed to speak only Croatian. Similarly, in the English school, they were allowed to speak only English. Although it is recognized that Croatian-English bilingual children might use Croatian with each other in English school, or lapse into English in Croatian school, there is generally no support for the child's second language if the environment is exclusively Croatian or exclusively English (Berk, 1994, p.385).

In order to examine the effects of such language exclusivity, the experimenter decided to adhere to the language exclusivity of each environment. All interactions between the experimenter and children conformed to the language of the school. Therefore, the instructions for the PPVT-R and subsequent task were translated into Croatian and back translated (into English). To ensure complete language exclusivity, the experimenter observed all the children in their Croatian environment first. Therefore, the chance of the children identifying the experimenter as an adult from the American school was reduced. That is, while it is recognized that this allows for a possible order effect, the aforementioned problem is more important to the design of this study. Sufficient counterbalancing of all subsequent materials is hoped to prevent further systematic biases from affecting the results of this work.

In an attempt to empirically verify the Croatian and English language abilities of these children, the PPVT-R was administered as a rough measure of language proficiency. The children were administered a Croatian translation and an English version of the PPVT-R, in the respective environments. The presentation of the Croatian and English tests was at least one week apart. Different forms of the test were used for the English and Croatian versions so that there was no overlap in the specific vocabulary tested. Also, the order of administration of tasks was counterbalanced across subjects. The private speech of each child was written down by the experimenter and simultaneously audiotaped for later transcription and analysis.

CHAPTER 3

RESULTS

Comparison of Children's Language Abilities

Appendix A shows the mean English and Croatian PPVT-R scores for the bilingual children who participated in this study. A mixed-model analysis of variance was conducted with grade (kindergarten, first), as the between-subject variable and language (English, Croatian) as the within-subject variable. Main effects of grade, $F(1, 22) = 15.46$, $p < .001$, and language, $F(1, 22) = 77.99$, $p < .0001$ were obtained. Importantly however, post hoc comparisons conducted on the main effect of language revealed no significant difference between kindergarten or first grade children's Croatian and English PPVT-R scores (see Appendix A). In contrast, older children were more proficient than younger children across both languages (see Appendix A). The grade x language interaction was not significant $F(1, 22) = 2.71$, $p < .12$. Given no significant difference between kindergarten or first grade children's Croatian and English PPVT-R scores, it could be concluded that all children in this experiment were balanced bilinguals.

Comparison of Total Private Speech Across Environments

Appendix B shows the mean number of private speech words

uttered regardless of language. A mixed-model analysis of variance with grade as a between subject variable and language environment (Croatian, English) as the within subject variable revealed a significant main effect of language environment, $F(1, 22) = 5.15$, $p < .03$. There was significantly more private speech in the American school environment than in the Croatian school environment. However, there was no significant main effect of grade $F(1, 22) = .06$, $p < .81$, or significant grade x language environment interaction, $F(1, 22) = .91$, $p < .35$, with regards to the total amount of private speech the children used in the Croatian school environment and the amount of private speech that the children used in the American school environment.

Comparison of the Private Speech Uttered in the English Language Environment and the Croatian Language Environment

It was hypothesized that the language of the child's private speech would match the language of the environment in which the child was being observed (i.e. Croatian private speech was expected in the Croatian school environment and English private speech was expected in the American school environment), with the exception of the highly academic math task which was expected to elicit English private speech (see Hypothesis 1). However, an overwhelming amount of the private speech was English regardless of environment, task, and children's proficiency in both languages. Specifically,

the kindergarten children uttered .9% (33/3390 words) of their total private speech in Croatian and first grade children uttered 1.7% (54/3112) of their total private speech in Croatian. Because of the relatively few words of Croatian private speech uttered, language of private speech was dropped from subsequent analyses. However, language environment (Croatian school where the experimenter spoke only Croatian or American school where the experimenter spoke only English) was entered into analyses as planned.

Comparison of Task-Relevant and Task-Irrelevant Private Speech

Appendix C shows the mean number of task-relevant and task- irrelevant private speech utterances made by the kindergarten and first grade children. A mixed-model analysis of variance, with a between-subject variable of grade and a within-subject variable of task (math, puzzle, picture) was conducted on this data.

Results indicated a significant relevancy of private speech x environment interaction, F (1, 22) = 4.43, $p < .04$. Planned comparisons revealed a trend toward significantly more task-relevant private speech in the American school/English environment than in the Croatian school environment, t(1, 46) = -1.68, $p < .10$.

A significant relevancy of private speech x task interaction was also revealed, F(2, 44) = 11.92, $p < .0001$. Planned comparisons revealed significantly more task-relevant

private speech during the math task than during the puzzle task, $t(1, 69) = 2.329$, $p < .025$ (see Appendix C). Planned comparisons also revealed significantly more task-relevant private speech during the puzzle task than during the draw-a-picture task, $t(1, 69) = -2.37$, $p < .024$ (see Appendix C).

A significant main effect of relevancy of private speech was also found, $F(1, 22) = 29.87$, $p < .0001$. In general, these children used significantly more task-relevant private speech than task-irrelevant private speech (see Appendix C). Concurrent with results reported above, a significant main effect of language environment was found, $F(1, 22) = 5.15$, $p < .03$. These children used more private speech in the American school/English environment than they did in the Croatian school environment. Finally, a significant main effect of task was found, $F(2, 44) = 9.74$, $p < .0001$. In descending order of amount of private speech used, children used more private speech during the math task, than the puzzle task or the picture task (see Appendix C).

Analyses of the Cognitive Function of the Private Speech

Appendix D shows the mean number of private speech phrases or complete sentences serving a cognitive function. Cognitive functioning of private speech was coded on three dimensions: directing present activity, focusing attention, and planning future activity. A mixed-model analysis of variance was conducted on these results, with the between-

subject variable of grade and within-subject variables of language environment and task.

Results revealed a significant activity x task interaction, $F(4, 88) = 3.01$, $p < .022$. For the math task, planned comparisons revealed significantly more private speech serving the cognitive function of directing present activity than planning future events, $t(1, 143) = -3.39$, $p < .001$ (see Appendix D). Also, the planned comparison of directing present activity and focusing attention revealed a trend towards significance, $t(1, 143) = -1.77$, $p < .08$. It appears that there may be more private speech serving the cognitive function of directing present activity than focusing attention on the math task (see Appendix D).

For the puzzle task, planned comparisons indicate that significantly more private speech was used to direct present activity than was used to focus attention, $t(1, 143) = -2.41$, $p < .018$. Moreover, significantly more private speech was used to direct present activity than to plan future activity, $t(1, 143) = -4.45$, $p < .0001$. Planned comparisons also revealed that significantly more private speech during the puzzle task served the cognitive function of focusing attention than planning future activity, $t(1, 143) = -2.30$, $p < .025$ (see Appendix D).

Finally, planned comparisons did not indicate any significant differences between the three cognitive functions for the draw-a-picture task.

A trend towards significance was found for the activity x language environment interaction, $F(2, 44) = 2.68$, $p < .08$. Planned comparisons revealed that there was more private speech serving the cognitive function of directing present activity in the American school/English language environment than in the Croatian environment, $t(1, 47) = 5.01$, $p < .001$, although recall that children used English across environments (see Appendix D). Likewise, there was more private speech serving the cognitive function of focusing attention in the American school/English language environment than in the Croatian environment, $t(1, 47) = 9.14$, $p < .001$. Finally, planned comparisons revealed that there was more private speech serving the cognitive function of planning future activity in the American school/English language environment than in the Croatian environment, $t(1, 47) = 4.58$, $p < .001$ (see Appendix D).

Although no main effects of grade, $F(1, 22) = 1.14$, $p < .297$, and environment, $F(1, 22) = 2.56$, $p < .124$, were obtained, a significant main effect of activity emerged, $F(2, 44) = 13.65$, $p < .0001$. Follow-up comparisons indicate that, for both kindergarteners and first graders, there was significantly more private speech directing present activity, $t(1, 23) = 8.03$, $p < .001$, and focusing attention, $t(1, 23) = 4.83$, $p < .001$, than planning future activity (see Appendix D).

Finally, a significant main effect of task was revealed, $F(2, 44) = 8.19$, $p < .001$. Specifically, significantly more cognitive regulation occurred during the math task than during the puzzle task, $t(1, 23) = 6.74$, $p < .001$. Similarly, significantly more cognitive regulation occurred during the math task than during the draw-a-picture task, $t(1, 23) = 7.51$, $p < .001$ (see Appendix D).

CHAPTER 4

DISCUSSION

General Discussion

The purpose of this study was to examine the nature, development, and cognitive function of private speech in bilingual children. To date, no known study has examined private speech in bilingual children. Moreover, no known study has examined the private speech of bilingual children across two distinct language environments, as this one did.

Several predictions were made and assessed in this research. First, it was hypothesized that the children's private speech would match the language of the environment in which they were observed. Thus, it was expected that the Croatian environment would elicit Croatian private speech and the English environment would elicit English private speech. However, some language cross-over was expected in the Croatian environment. Specifically, it was hypothesized that the math task, because it was highly academic in nature, would elicit English private speech in the Croatian environment. Contrary to expectations, however, 98.7% of the private speech uttered in both environments was English. Only 1.3% of the total was Croatian private speech, which was emitted during the draw-a-picture task in the Croatian

environment. Importantly, the lack of Croatian private speech occurred in spite of the fact that all of the children were balanced bilinguals, i.e., they had similar, age appropriate abilities in Croatian and English. Therefore, another factor must be influencing the lack of Croatian private speech in this study.

Bradunas & Topping's (1988) work on preservation of ethnic heritage and language through ethnic heritage and language schools indicates that each specific ethnic society especially supports the preservation and use of its language through their specific ethnic heritage school. It was expected that the Croatian society would follow the same principle and not support use of the English language in Croatian homes or schools. However, it may be that American society does not support a child's second language outside of the home (Berk, 1994).

Indeed, it appears to be the case that American society may not support a child's second language anywhere. Garcia (1985) indicates that what is accepted in the United States is bilingualism, the use of two languages by individuals but not by society. That is, in the United States, there is no enduring societal arrangement for the existence of two languages, each having secure, legitimate functions (Garcia, 1985). That the United States has never declared English to be the official language should not lead us to doubt its primacy over all other languages (Ruiz, 1998). Indeed, Ruiz

(1988) suggests that English is perceived as the most important and powerful language in the world, thereby intensifying the pressure for Americans of non-English-speaking backgrounds to discard their native language in favor of English.

Moreover, the power of the American culture to transcend the boundaries of the Croatian school is evident in this research. For example, in the Croatian environment of the Croatian school, most children drew remarkedly American pictures. To illustrate, boys drew pictures of Teenage Mutant Ninja Turtles and Spiderman; and girls drew pictures of Frosty-the-Snowman, Casper-the-Friendly-Ghost, and their best friends from American school. Apparently, while overt influences of American society were not present (e.g., television and English language print materials), the covert influences of American society were present nonetheless. Thus, the children were thinking about Spiderman, American friends, and, as came out in some private speech, what they were going to do as soon as they left Croatian school that evening. Therefore, while Croatian school was the most intensely Croatian environment available, it was not possible to create a completely Croatian environment in the United States.

The prediction that the traditionally less academic environment of the Croatian school would elicit less private speech than the traditionally academic environment of the

American school was supported. This is not surprising in light of the fact that the activities at the Croatian school involve numerous non-academic activities. In addition, the children spend as much time singing and dancing as they do sitting in a classroom absorbing knowledge. In fact, most of these activities are probably not perceived as academic by the children. Moreover, the Croatian schools do not follow a traditionally academic schedule as they only meet on Friday nights.

The third hypothesis examined the effects of degree of bilingualism on the children's private speech. Unbalanced bilingual children in this study were expected 1.) to emit less private speech when compared to the balanced bilinguals, and 2.) to emit the most private speech in the language with which they were more proficient. However, because all of the children in this study were balanced bilinguals, this hypothesis could not be tested in the present research.

The fourth hypothesis concerned the nature of the private speech uttered. That is, whether the private speech was task-relevant (pertinent to the task at hand) or task-irrelevant (concerned with something other than the task). Support was found for the hypotheses that the older children would utter more task-relevant private speech than task-irrelevant private speech, and more task-relevant private speech than the younger children. The task-relevant private speech was also distributed across environments and tasks as

predicted. Specifically, there was a trend toward significantly more task-relevant private speech in the traditionally academic English language environment than in the less academic environment of the Croatian language environment. Moreover, significantly more task-relevant private speech was used for the highly academic math task than for the less academic puzzle task. The least amount of task-relevant private speech was used for the non-academic draw-a-picture task. These task-related findings were consistent across language environments.

The final group of hypotheses assessed the cognitive functioning of the private speech emitted. These hypotheses were based on the work of Furrow (1984a), Berk & Garvin (1984), and Berk (1993). Furrow (1984a) indicates that private speech "describing own activity" (i.e., in this research this was coded as "directing present activity") is favored by children who use private speech regardless of age or context. At the other extreme is "informative" private speech, speech referring to a non-present event (i.e., coded as planning future activities). According to Furrow (1984a), informative private speech is the last stage in the process of internalizing private speech. Specifically, the advent of "informative" private speech signals the completion of the Vygotskian cycle of external and social psychological functions becoming internal and individual psychological functions. Because the children in this study were still

well within the prime private speech years, this last stage of private speech was not expected from these children.

Berk & Garvin (1984) indicate that the cognitive function of private speech also varies with the nature of the task. For example, difficult academic tasks were found to elicit more task-relevant private speech than less difficult non-academic tasks. Therefore, this study predicted that the cognitive functioning of private speech would be unequally distributed among tasks of varying difficulty. Likewise, Berk's (1993) most recent research indicates that typical academic environments elicit more task-relevant private speech than less academic environments. Thus, this research examined the distribution of cognitive functioning of the private speech across environments differing in academic tone.

Also, the nature of the task should be taken into consideration when examining the cognitive functioning of the private speech emitted. For example, the math task and the puzzle task are both didactic and require convergent thinking. In addition, the pressure to find a correct solution for the math and puzzle tasks may be the reason that more private speech serving the cognitive functions of directing present activity and focusing attention was emitted. On the other hand, the draw-a-picture task has no correct solution. This task requires divergent thinking. Thus, the fact that no significant difference in type of

cognitive functioning was found in the private speech uttered during the draw-a-picture task should not be surprising. Indeed, there was no pressure on the children to produce a correct solution during the draw-a-picture task.

Specifically, it was hypothesized that the traditionally academic environment of the American school would elicit significantly more private speech serving a cognitive function than the less academic environment of the Croatian school. Moreover, it was thought that significantly more cognitive regulation would occur during the highly academic math task than during the less academic puzzle task. The non-academic draw-a-picture task was expected to elicit the least amount of private speech serving a cognitive function.

Also, it was hypothesized that specific tasks would elicit private speech serving specific cognitive functions. That is, the math task and the puzzle tasks were expected to elicit significantly more private speech serving the cognitive function of directing present activity than focusing attention or planning future activity. The draw-a-picture task was expected to elicit more private speech focusing attention than either directing present activity or planning future activity.

Overall, it was found that there was more private speech serving cognitive functions of directing present activity, focusing attention, and planning future activity in the more academic American environment than in the less academic

Croatian school environment. Secondly, there was significantly more cognitive regulation during the highly academic math task than during the less academic puzzle task. Likewise, there was more cognitive regulation during the less academic puzzle task than during the non-academic draw-a-picture task.

It was also found that both the math task and the puzzle task elicited significantly more private speech serving the cognitive function of directing present activity than either focusing attention or planning future activity. Thus, on the math and puzzle tasks private speech focusing attention was elicited significantly more than private speech planning future activity. However, the private speech emitted during the non-academic draw-a-picture task was not significantly differentiated among the cognitive functions of directing present activity, focusing attention, and planning future activities.

Conclusions

The most striking finding of this study was that kindergarten and first grade bilingual children who speak Croatian in their homes used primarily English for private speech. Future studies examining this issue may obtain different results by choosing ethnic groups with a bigger representation in both the residential and business communities (e.g., the Hispanic or Indian subcultures in America). It is possible that private speech in one's native

language would be used by children whose native language is more prevalent in the American community. Such communities would afford more opportunities for the children to engage in their native language, and perhaps weaken the influence of the American, English-speaking, culture. Relatedly, a comparable group of Croatian-English bilinguals in Croatia could be studied using this identical methodology to examine whether English private speech would be emitted in the English school environment in Croatia. Thus, new and enhanced methods should be attempted in future studies of the nature of private speech in bilingual children across cultures and settings.

A second important finding demonstrated that the private speech of bilingual children follows the typical pattern for monolingual children as reported in the literature (e.g., Berk, 1985; Manning & White, 1990). Furthermore, in addition to describing the development of private speech in bilingual children, this study successfully demonstrated the cognitive functions served by the private speech uttered by bilingual children. Both groups initially used private speech that described their present activity, and then used private speech that planned future activities.

In conclusion,the results of this seminal investigation indicate that balanced bilingual children use English private speech even when equally proficient in Croatian, and when attending Croatian school, suggesting the impact of American

culture. Secondly, the results of this research indicate that balanced bilingual children use task-relevant private speech for cognitive self-regulation. In light of these preliminary findings, future research should focus on illuminating the nature of bilingual children's private speech and how and why bilingual children choose to use one language instead of another.

APPENDIX A

Table 1

Mean PPVT-R Scores of Bilingual Children as a Function of Grade

	Language	
	English	Croatian
Grade		
Kindergarten	66	68
First Grade	83	86

Note: N = 12 per grade.

APPENDIX B

Table 2

Mean Number of Private Speech Words Uttered[a]

	Language Environment	
	American School/English	Croatian School
Grade		
Kindergarten	192	90
First Grade	150	108
Entire Sample	171	100

Note: [a]These means are collapsed across languages (see text for explanation).

APPENDIX C

Table 3

Mean Number of Task Relevant and Task Irrelevant Private Speech Words

	Language Environment					
	American School/English			Croatian School		
Task	Math	Puzzle	Picture	Math	Puzzle	Picture
	Task Relevant					
Grade						
K[a]	95	43	45	41	19	28
First	75	22	49	50	41	16
	Task Irrelevant					
K	.7	2	7	3	0	.6
First	.2	2	2	2	.8	0

Note: [a] K = Kindergarten

APPENDIX D

Table 4

Mean Number of Private Speech Utterances Serving a Cognitive Function[a]

	Language Environment					
	American School/English			Croatian School		
Task	Math	Puzzle	Picture	Math	Puzzle	Picture
	Direct Present Activity					
Grade						
K[b]	10	7	3	7	4	6
First	7	4	4	5	7	1
	Focus Attention					
K	8	5	5	3	2	3
First	5	1	3	2	2	.6
	Plan Future Activity					
K	3	1	3	2	.5	.9
First	2	.6	2	3	.5	.8

Note: [a] Cognitive functioning was examined in terms of phrases and whole sentences directing present activity, focusing attention, and planning future activities (see text for explanation).

[b] K = Kindergarten.

REFERENCES

Behrend, D. A., Rosengren, K. S., & Perlmutter, M. (1989 April). A new look at children's private speech: The effects of age, task difficulty, and parental presence. International Journal of Behavioral Development, 12, 305-320.

Berk, L. E. (1985). Why do children talk to themselves? Young Children, 40, 46-52.

Berk, L. E. (1986). Relationship of elementary school children's private speech to behavioral accompaniment to task, attention, and task performance. Developmental Psychology, 22, 671-680.

Berk, L. E. (1994). Child Development. Needham, MA: Paramount Publishers.

Berk, L. E., & Diaz, R. M. (1992). Private Speech: From Social Interaction to Self-Regulation. Hillsdale, New Jersey: Lawrence Earlbaum Associates.

Berk, L. E., & Garvin, R. A. (1984). Development of private speech among low income Appalachian children. Developmental Psychology, 20, 271-286.

Berk, L. E., & Landau, S. (1993). Private speech of learning disabled and normally achieving children in classroom academic and laboratory contexts. Child Development, 64, 556-571.

Bjorklund, D. F. (1989). Children's Thinking. Pine Grove, CA: Brooks & Cole.

Bradunas, E., & Topping, B. (1988). Ethnic Heritage and Language Schools in America. Studies in American Folklife. Washington, D. C.: U. S. Government Printing Office.

Deutsch, F., & Stein, A. H. (1972). The effects of personal responsibility and task interruption on the private speech of pre-schoolers. Human Development, 15, 310-324.

Diaz, R. M. (1985). Bilingual cognitive development: addressing three gaps in current research. Child Development, 56, 1376-1388.

Diaz, R. M. (1986). Issues in the empirical study of private speech: A response to Frawley and Lantolf's commentary. Developmental Psychology, 22, 709-711.

Dunn, L., & Dunn, L. (1981). Peabody Picture Vocabulary Test- Revised. Circle Pines, MN: American Guidance Service.

Frauenglass, M. H., & Diaz, R. M. (1985). Self-regulatory functions of children's private speech: a critical analysis of recent challenges to Vygotsky's theory. Developmental Psychology, 21, 357-364.

Furrow, D. (1984a). Social and private speech at two years. Child Development, 55, 355-362.

Garcia, S. O. (1985). Bilingualism in the United States: Present attitudes in light of past policies. In The English Language Today, ed. Sidney Greenbaum. Oxford: Pergamon Press, pp 147-58.

Harris, K. R. (1986). The effects of cognitive behavior modification on private speech and task performance during problem solving among learning disabled and normally achieving children. Journal of Abnormal Child Psychology, 14, 63-67.

Harris, K. R. (1990). Developing self-regulated learners: The role of private speech and self-instructions. Educational Psychologist, 25, 35-49.

Huntsinger, C. S., & Jose, P. E. (1992, February). Family variable effects on Chinese-American and Caucasian-American children's mathematics attitudes and mathematics performance. Paper presented at the annual meeting of the American Association for the Advancement of Science, Chicago, Il.

Manning B. H., & White, C. S. (1990). Task relevant private speech as a function of age and sociability. Psychology in the Schools, 27, 356-372.

Meichenbaum, D. (1977). Cognitive-Behvaior Modification: An Integrative Approach. New York:Plenum.

Owens, R. E. (1988). Language Development: An Introduction. Columbus, OH: Merrill Publishing Co.

Peal, E., & Lambert, W. (1962). The relation of bilingualism to intelligence. Psychological Monographs, 76, 1-23.

Piaget, J. (1962). The Language and Thought of the Child. (M. Gabain, Trans.). Cleveland, OH: Meridian. (Original work published 1923).

Ruiz, R. (1988). Bilingualism and bilingual education in the United States. In International Handbook of Bilingualism and Bilingual Education, ed. Christina Paulston. Westport, CN: Greenwood Press, pp. 539-60.

Vygotsky, L. S. (1962). Thought and Language. (E. Hanfmann & G. Vakar, Eds. & Trans.). Cambridge, MA: MIT Press. (Original work published 1934).

Wertsch, J. W., & Tulviste, P. (1992). L. S. Vygotsky and contemporary Developmental Psychology. Developmental Psychology, 28, 548-557.

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