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AUTHOR Rueda, Robert
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ABSTRACT

The theoretical background and empirical studies concerned with the relationship between language and cognition in bilingual children and in bilingual mildly retarded children are examined. It is suggested that the effects of bilingualism are not necessarily detrimental to mildly handicapped children. Cognitive and interactional factors in the acquisition of literacy are discussed in the context of previous research and of observations of an ongoing investigation in a self-contained classroom composed of bilingual mildly handicapped children (grades 4-6). Here the instructional approach emphasizes the acquisition of writing skills through interaction in meaningful learning activities (journal writing). A reconceptualization of the teaching/learning process as a mutually constructed, interactive activity is advocated as holding much promise in the development of effective instructional options for bilingual handicapped students. (JW)

CHAPTER 3

COGNITIVE DEVELOPMENT AND LEARNING IN MILDLY HANDICAPPED BILINGUAL CHILDREN

Robert Rueda

According to a recent American Association on Mental Deficiency (AAMD) presentation (Levine & Langness, 1983), psychologists are beginning to look at behavior, especially language and cognition, as it occurs in everyday life. As Levine points out, there are at least two reasons to do so:

1. The issue of ecological validity, i.e., do cognitive tasks in the laboratory represent real life?

2. The converse of the above: namely, to try to produce instances of cognition and problem solving which might be adapted for more controlled laboratory studies.

As a result of this more intense focus on behavior in natural contexts, there has been much discussion regarding the relative merits of both the methods and theoretical bases for experimental, laboratory-based research as opposed to research taking place in everyday settings (see, for example, Brooks & Baumeister, 1977). This has been loosely called the distinction between quantitative and qualitative approaches. (See, for example, Edgerton & Langness, 1978, and Price-Williams & Gallimore, 1980 for more extended discussions of this issue.) Although this issue continues to generate much controversy, it seems reasonable to assume that these different perspectives both answer important questions, and that neither need be excluded from the researcher's "bag of tricks." Rather, the use of a particular paradigm should be fitted to the question being asked. The need for a variety of theoretical and methodological approaches is evident when considering the complex developmental and educational issues raised by looking at special education children who speak or are exposed to more than one language. Therefore, the current collaborative work of several colleagues and me, on special education children exposed to more than one language, incorporates a variety of perspectives.

In this paper, I will briefly describe two lines of ongoing work in the general area of cognition and cognitive development in mildly

handicapped children who are bilingual. One focus of this work in this general area has been the question of how access to two languages affects cognitive development. The first section of this paper, therefore, examines the theoretical background and empirical studies concerned with the relationship between language and cognition in bilingual children and bilingual mildly retarded children.

The second section, based upon work currently in progress, concerns an examination of cognitive and interactional factors in the acquisition of literacy. This section is based on an ongoing microethnographic, qualitative look at literacy development and social interaction in a special education classroom with bilingual children (Rueda & Flores, 1984). In this section, a case will be made for the consideration of learning as an interactive process, and for a move away from views of learning as primarily a "within-child" phenomenon.

LANGUAGE AND COGNITION IN BILINGUAL RETARDED CHILDREN

A recent article by Diaz (1983) outlined four widely held beliefs regarding the effects of bilingual education:

1. Children who are instructed bilingually from an early age will suffer cognitive or intellectual retardation in comparison with their monolingually instructed counterparts.

2. They will not achieve the same level of content mastery as their monolingually instructed counterparts.

3. They will not achieve acceptable native language or target language skills.

4. The majority will become anomic individuals without affiliation to either ethnolinguistic group.

Although there is little or no existing evidence, it is commonly assumed that the above mentioned negative effects on cognitive development due to bilingualism should be even more harmful to special education children than to those without special learning problems. Although little empirical work has been carried out on this question with special education children, a significant amount of research has been done with bilingual children without learning problems. A detailed report of this literature is beyond the scope of this paper; however, recent reviews by Diaz (1983) and Rueda (1983) summarize the work which has been done to date on this topic.

In general, the early work on the relationship between bilingualism and intellectual functioning suggested negative outcomes on a variety of dependent measures (Brown, Fournier, & Moyer, 1977; Darcy, 1963; Jensen, 1962, Peal & Lambert, 1962; Yela, 1975). The majority of early studies has been criticized for methodological errors, especially selection bias, instrumentation bias, and lack of control for language proficiency.

In contrast to this early work, later studies have supported a modification of these conclusions. Several investigations have found positive advantages in favor of bilinguals in certain cognitive domains. These have included concept formation (Peal & Lambert, 1962); mental flexibility (Leopold, 1939-49); reasoning and divergent thinking (Cummins & Gulutsan, 1974); separating word-sound and word-meaning (Ianco-Worrall, 1972; Ben Zeev, 1972); the abilities to manipulate and understand language as an abstract tool (Feldman & Shen, 1971; Cummins, 1978); and Piagetian reasoning skills (Liedtke & Nelson, 1968; Feldman & Shen, 1971; Kessler & Quinn 1979; Duncan & DeAvila, 1979).

Theoretical Frameworks

The work of Cummins (1978) has been used extensively as a theoretical framework in the interpretation of the numerous and sometimes conflicting studies dealing with language and cognitive development in bilinguals Specifically, it appears that there exists some theoretical threshold level of language proficiency necessary for the positive effects of bilingualism to be manifested. Further, there appears to be a second minimal threshold of language proficiency below which negative effects on cognitive development might be hypothesized.

A second theoretical framework for examining the effects of bilingualism on cognitive development is based upon a more Piagetian model (DeAvila & Duncan, 1981; DeAvila & Pulos, 1979; Kessler & Quinn, 1979). This may seem strange given the Piagetian emphasis that language follows cognitive development and that the acquisition of more than one language should have no particular consequences for a child's cognitive development. However, some researchers have argued that bilingualism represents an enriched form of experience that could potentially positively influence cognition (DeAvila & Duncan, 1981; Kessler & Quinn, 1979).

DeAvila and Duncan (1981) have discussed the notion of conceptual disequilibrium, a key element in the Piagetian developmental framework, as leading to the integration of schemes within the bilingual child's repertoire. This, in turn, is seen as the basis for cognitive development. As DeAvila and Duncan state, "...it is this capacity to integrate schemes to produce novel acts that defines intelligence or capacity" (p. 341). This process has been closely linked to the notions of metacognition and metalinguistic awareness by DeAvila and Duncan (1981) in their presentation and discussion of a "Metaset" theory of cognitive development of bilinguals based upon a Piagetian framework. An additional part of this theoretical framework proposes generalization of positive cognitive effects to other areas of cognition as well.

Bilingualism and Cognition in Mildly Retarded Children

As has been discussed, current theory proposes that proficient bilinguals might be expected to have a head start in certain cognitive areas such as an understanding of the arbitrary uses of language, cognitive flexibility, etc. As DeAvila and Duncan (1981) suggest, this is a key

aspect of metacognition. Mentally retarded children who are also bilingual represent a theoretically interesting group for study with regard to this last point. For example, one area of particular difficulty in terms of cognitive functioning for mentally retarded individuals is in the appropriate use of strategic behavior. This difficulty in the use of strategic behavior has been closely linked with metacognitive awareness and skills (Campione & Brown, 1977).

In essence, the preceding discussion results in a contradiction in terms. That is, by virtue of the deficits associated with mental retardation, children with this label might be expected to exhibit problems in metacognitive awareness and strategic behavior in general. However, by virtue of being bilingual, such children might be expected to be more advanced in the very same or related cognitive domains. Although there is little empirical work available, previous research with nonhandicapped children suggests that bilingual mildly retarded children might exhibit improved cognitive functioning with respect to a matched group of monolinguals.

The above hypothesis was tested in a recent study in which the cognitive performance of mildly retarded chldren with moderate levels of language proficiency in Spanish and English was compared with that of a matched group of monolingual children (Rueda, 1983). In that study, 23 mildly retarded subjects between the ages of 10 and 12 and with WISC IQ scores in the range of to 50-70 were compared with a matched group of monolingual subjects. The language proficiency of the bilingual subjects was assessed beforehand through the use of the Language Assessment Scales, and only bilingual subjects who scored at level three in both of their languages were included in the study. (Although this is not considered "proficient," it does reflect the delayed language skills of retarded children. Further, more stringent criteria for inclusion of bilinguals would have reduced the sample size to an unworkable number.)

The cognitive measures used in the study included a Piagetian measure as well as three metalinguistic measures borrowed from Osherson and Markham (1975) and Cummins (1978). In spite of the limitations of the study (small sample sizes, only moderate proficiency on the part of the bilingual subjects, and failure to measure the language skills of the monolingual sample), it was found that the bilingual group did not differ from the monolingual group on the Piagetian measure, and, therefore, did not suffer any harmful effects as a result of exposure to two languages. Further, there were differences in favor of the bilingual group in some items of the metalinguistic tasks.

A follow-up investigation (Whitaker, Rueda, & Prieto, 1984) examined in more detail a further aspect of DeAvila and Duncan's (1981) Metaset theory. Specifically, the question of interest concerned the suggestion regarding the generalization of bilingual advantages to areas of cognition other than Piagetian and metalinguistic skills. This was examined in a study similar to the previous investigation by incorporating as a dependent measure information processing tasks which have not been previously used in those studies finding cognitive advantages for bilingual students.

The subjects in this investigation included 45 mildly retarded children between 7 and 8 years old. Subjects were selected and classified into three equal groups, including a low language proficient group, a high language proficient group, and a monolingual group based upon scores on the Language Assessment Scales. The cognitive dependent measures consisted of two neo-Piagetian tasks (the Cartoon Conservation Scales and a Static Imagery Task) and an information processing task (A Circular Recall Task). The Static Imagery Task (Inhelder & Piaget, 1971) incorporates two subtasks, a recognitory memory task and a reconstruction memory task. These subtasks involve copying an array of geometric forms from memory after having been presented a model, and then indicating whether various geometric forms had been part of the original array. The Circular Recall Task consists of the ordered recall of a serially presented list of items that are seen only once, with recall to begin on the last few items and end on the first few items (Belmont, Ferretti, & Mitchell, 1982). A 3/4 circular recall task was used in this study, in which recall begins with the last three items and ends with the first four items.

In summary, the high linguistic proficient bilinguals outperformed the low proficient bilinguals and the monolingual subjects on the dependent measures. In addition, there were moderate but signifiant correlations between the dependent measures.

Summary

The results of the last two studies are consistent with previous research which suggest that proficient bilinguals will demonstrate advantages in certain cognitive domains (Duncan and DeAvila, 1979; Cummins, 1978). The results of these studies suggest that the effects of bilingualism (given a relatively high degree of proficiency) are not detrimental to mildly handicapped children and that the same cognitive advantages which accrue to proficient bilinguals will also be evident in bilinguals who are mentally retarded. However, in light of the outcomes of the low linguistic proficient group, it appears that possible linguistic thresholds may exist for handicapped as well for nonhandicapped children.

Although present research suggests cognitive advantages for proficient bilingual mildly retarded children, there are no information processing studies with this group of children (Diaz, 1983). It has not clearly and empirically been demonstrated what cognitive processes (as opposed to products, or test scores) differentiate bilingual from monolingual children when anomalous cognitive development is present. Therefore, future research on the relationship between language and cognition in bilinguals should begin to specify the actual differences in processes between bilingual and monolingual mentally retarded children.

In the following section, work of a more qualitative nature will be summarized. Of particular importance in this next section is the difference in the theoretical perspective and the implications for conceptualizing cognitive activities, including learning.

PERSPECTIVES ON COGNITIVE DEVELOPMENT AND LEARNING: INTERACTIONAL FRAMEWORK

Although research on social interactional processes and on cognition are conceptualized as unrelated areas of investigation, there is increasing evidence that cognitive outcomes and social interactional processes are intimately related (Mehan, 1978). One cognitive area where this persepctive has been usefully exploited is in research on the acquisition and use of literacy (LCHC Newsletter, 1983; Rueda & Mehan, 1984). This is a topic of great importance with relation to special education children, since problems in the acquisition and use of literacy are formidable for these children. In the following discussion, research on literacy from an interactional framework will be briefly summarized, as well as the underlying theoretical framework guiding the research. This will be used to argue for a reconceptualization of learning as an interactive activity in contrast to a common view of learning as an outcome determined only by child characteristics.

This discussion and summary of ongoing work builds on an earlier research project originating at the Laboratory of Comparative Human Cognition at the University of California at San Diego, concerning school-related learning disabilities, especially in the area of reading (LCHC Newsletter, 1982; Cole and Griffin, 1983). One important outcome of that work was the realization that the children in the project were poor readers at least in part because their conceptualization of reading was basically incorrect. That is, rather than viewing reading as an integrated, whole activity which allows one to gain useful information about the world, they viewed reading as reading out loud for teacher approval. Part of this problem, at least, can be traced back to the decontextualized, "discrete-step" fashion which characterizes most instruction (see LCHC Newsletter, 1982, for further discussion of this issue). In our current work on writing, it has become evident that there is a great deal of overlap in the issues involved, both at the theoretical and applied levels of analysis. In order to provide a context for this work, a brief description of the guiding theoretical frameworks will be presented.

Theoretical Background

The research on literacy previously referred to has been guided by two seemingly different theoretical approaches that in actuality are complementary because they are both based upon the study of <u>learning as interaction</u> (learning in this sense includes the development of literacy over a period of time). This is a critical point, in light of the usual conceptualization of "cognitive style" and "learning style" as uniquely within-child characteristics. That is, learning activities and outcomes are assumed to depend entirely on cognitive and learning attributes that the child brings to the learning encounter. In the frameworks to be presented, the unit of analysis is shifted to the <u>activity</u> and the accompanying interaction (of which the child is only a part), instead of focusing exclusively on the child.

The first approach is the microethnographic approach to the study of schooling, and the second is the sociohistorical approach to the study of learning and development. Each will be described briefly in turn.

A basic premise of microethnographic studies is that social events such as classroom lessons and activities are interactional accomplishments (McDermott, 1977). Hence, a primary goal of such studies is to characterize the structures of lessons or other educational events by describing the interactional work of the participants that assemble their structures (Au, 1980; Mehan, 1979; Schultz, Florio, & Erickson, 1980).

A second theoretical base for this work is drawn from a body of research developed by the Soviet investigators of the sociohistorical school (e.g., Vygotsky, 1978; Wertsch, 1981). This framework has been used and expanded upon here in the United States, especially regarding the relationship between culturally organized experiences and learning (Brown & French, 1979; LCHC, 1982). These ideas are particularly useful because they emphasize how interactions between people become the principal mechanism by which learning and development occurs. In the study of any learning activity, the unit of analysis becomes the act or system of acts by which learning is composed. For example, a critical task in the analysis of writing becomes the careful and detailed description of the learning activity and its constituent sequence of acts including the interactional context in which it is embedded. These sequences of acts are jointly produced or collaboratively assembled by the student and others in his environment.

Another key part of the sociohistorical approach is that the intellectual skills acquired by children are considered to be directly related to how they interact with adults and peers in specific problem-solving environments. That is, children internalize the kind of help they receive from more capable other and eventually come to use the means of guidance initially provided by another to direct their own subsequent problem-solving behaviors. As can be seen, an explicit and direct connection is made between interactions between people and individual psychological processes. The path by which activities are moved from the level of social experience to that of individual experience (see Vygotsky, 1978) consists of a series of transformations. These transformations are the result of a number of developmental events. These events occur in learning situations which Vygotsky called the "zone of proximal development." This is defined as:

> ...the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers. (1978, p. 86)

Within this framework, the student's entering skills are perceived as a major determinant of the starting point of the zone. The kinds of skills that the teachers, schools, parents, and others want the child to master define the farthest end point of the zone. Implicit in this notion is that learning must precede development. This means that teaching oriented toward developmental levels that have already been reached is likely to be ineffective. Good teaching is that which provides students with goal-directed, meaningful, learning experiences which are in advance of development, thus guiding and creating its future. The activities which are organized in the classroom and engaged in by children provide the necessary practice to move the child from the initial, aided level to the final, independent level. It is exactly these activites, in the domain of writing, which have been the focus of attention in ongoing classroom observations.

In the work to be described here, preliminary observations of an ongoing investigation into bilingual mildly handicapped childrens' literacy development in a self-contained classroom have begun to be analyzed. In this investigation, naturalistic field methodology has been used extensively to examine the frequency, types, and processes of social construction involved in literacy events, especially those involving writing. In the present research, by examining literacy events, an attempt has been made to take into account that literacy is an interactional activity. Given this assumption, an effort has been made to specify the ways in which writing activities and events are constructed in both traditional drill-type, decontextualized writing activities as well as in more communicative-based, "authentic" writing activities.

Although the entire scope of the project has encompassed a number of issues including language use by the bilingual students and the accompanying participant structures (Phillips, 1972), the comments here will focus on a brief description of writing in the classroom under observation.

Classroom Description

The classroom in which we have conducted our observations is a self-contained, cross-categorical (learning disabled, emotionally handicapped, and educable mentally handicapped) secondary setting (e.g., grades 4-6). Eight of the students are labeled as learning disabled, one is labeled mentally handicapped, and four are labeled emotionally handicapped.

Writing Activities in the Classroom

This classroom has been of particular interest because of the approach to reading and writing embodied by the teacher. Briefly, the teacher has adopted several elements commonly associated with a "whole language" approach to reading and writing. A key element of this approach is that meaningful, authentic communication is the central focus of reading and writing (DeFord & Harste, 1982; Goodman & Goodman, 1981; Harste & Burke, 1977). As part of this approach, this teacher uses journal writing in

which a daily period is set aside for students to communicate in writing with the teacher about virtually any topic the student selects. The teacher, of course, responds on a daily basis, and the journals are periodically collated and "published," serving as available reading material. The mechanics of the student's writing are not corrected, since the goal is to establish an authentic interaction through a written medium. Rather, the teacher's responses provide a model in which appropriate writing conventions are embedded in a whole, meaningful activity. In essence, the teacher's responses provide a zone of proximal development, through which the child is able to incorporate various elements into his or her own system of written communication.

Although a more extensive discussion of this research is available in Rueda, Flores, and Porter (1984), of prime interest in this work has been to track the development of writing skills over time. A data analysis form has been developed by the second author which allows the quantification and specification of elements of interest in writing samples, including both the mechanial aspects as well as functional aspects. In this scheme, it is possible to monitor not only mechanics such as handwriting, spelling, punctuation, capitalization, and grammar usage, but stylistic aspects as well (selection of topics, expansive vocabulary, complex sentences, stylistic variations, and revision strategies). Data from teacher interviews, as well as product data on the writing samples of the students in different contexts over time indicate that the students have begun to produce a different kind of writing than that previously found on drill type assignments. The students in this classroom have begun to create thoughtful narratives in a more coherent and complete fashion than had been evident on ditto sheets and on teacher-selected writing activities. In addition to these emerging findings, the students are acquiring writing skills, recorded in journal entries, which have never been formally instructed. That is, not only are students becoming proficient at producing creative and thematically related narratives, but they are demonstrating proficiency in the mechanical aspects of writing which are usually the main and often the only focus of writing instruction. In essence, the students in this project have demonstrated interest, motivation, and competence in the acquisition of writing through interaction in meaningful learning activities. That is, embedding writing in an interactional context where the communication of feelings and thoughts was the joint goal of the activity appeared to have the result of maximizing the acquisition of both the form and function of writing in a group of students for whom this is traditionally a difficult area of learning.

Discussion

The theoretical background which has been presented, as well as our work on literacy and the work of others, suggests the reconceptualization of the teaching and learning process into a more interactive framework than is traditionally adopted in schools. This is not to say that notions such as learning style do not exist or are not important. The cross-cultural research of Phillips (1972) and Erickson and Mohatt (1982), for example, demonstrate the impact of student interactional styles on classroom organization. Further, Au (1980) has described how cultural

differences in interactional styles can be appropriated as a way of improving reading. Nevertheless, a more interactional notion of learning as mutually constructed activity appears to have much promise in the development of effective instructional options for children for whom teaching has traditionally been problematic.

A recent statement by Riel (1983) illustrates the point under discussion:

> Interaction is a constructive process in which participants engage in a process of creating understandings. These understandings form the mechanism of thought. Knowledge is activity and development is the process of internalizing and organizing these activity patterns. Since humans are essentially social, these activity patterns routinely involve interactions with others. Schools, however, often set up learning activities that are highly individualistic, thereby ignoring an important resource for learning." (p. 60)

In our current work, we have attempted to incorporate some of the theoretical principles discussed in an actual classroom situation. It is evident that a great deal of research remains to be completed. For example, data based upon the products of student's behavior, without specifying the processes by which they were created, permit only inferences and informed hypotheses. However, the preliminary findings indicate a great deal of promise in this framework which views learning as a social, interactive process. The final determination of the value of this theoretical framework depends upon further empirical demonstration. However, in light of the current concern with the education of handicapped children from diverse cultural backgrounds, and the often documented failure of current approaches, a critical examination of existing paradigms is warranted.

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