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ABSTRACT

Considered are ways in which developmental theories, methodologies, and research findings may be used to clarify the concept of experiential deficiencies of deaf children. Examined are the effects on deaf children of deprivations in physical experiences (such as the reduction of information about objects provided by auditory feedback) and in social experiences (such as the limitation imposed on parent-child interaction due to lack of a common communication mode). The author stresses the need for a communication system shared by the deaf child and the people in his environment, and suggests use of Signed English (rather than American Sign Language) in educational settings and in homes with hearing parents. (LS)

A Developmental Approach to the Experiential Deficiencies of Deaf Children

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It is probably a fair generalization to say that deaf children typically perform worse than their hearing peers on a variety of cognitive measures. Historically, this inferiority has been attributed to the impoverishment of the deaf child's language. If one holds that thought and language are inextricably linked, and if the deaf child does not have fully developed linguistic skills, then the deaf child's inferiority on cognitive measures is readily explained.

Many people have begun to reconsider the language-impoverishment explanation of the deaf child's cognitive deficits. One reason for this reexamination is the growing acceptance of Piaget's developmental theory in which actions, not language, are assumed to provide the foundations for logical thought. Thus, even if the child is deprived of language, his interactions with the physical world should enable him to develop his thinking more or less normally, at least through the concrete operational period.

The second impetus for the reexamination of the language-deprivation hypothesis is a growing dissatisfaction with the assumption that the deaf are in fact a group "without language." There are two reasons to question this assumption. The first is that although deaf people rarely become fully competant in English, often they do possess the level of English necessary for a particular cognitive task. The second is that some young deaf children, and most deaf adolescents and adults, have at least some competance in American Sign Language or Ameslan.

If, however, one or both of the initial assumptions of the language deficiency hypothesis is false, then another explanation of the deaf child's

poorer performance on cognitive measures must be found. Hans Furth (1966) has proposed one such alternative explanation, namely that the deaf child faces "experiential deficiencies," described as: "a blending of social, emotional, and intellective neglect [p. 120]."

The problem with the concept of experiential deficiency as it has been used in the past, is that it has been too general and too post hoc to be either theoretically or pragmatically useful. When deaf and hearing subjects perform equivalently on a task, it is assumed either that language is not really necessary for the task, or that the deaf child's language skills are sufficient to meet the linguistic demands. On the other hand, when the performance of deaf subjects is inferior to the performance of hearing subjects, the explanation of experiential deficiency is invoked. The key purpose of this presentation is to consider ways in which developmental theories, methodologies, and research findings may be used to clarify the concept of experiential deficiencies of deaf children.

This attempt has two major goals. The first is practical: an identification of deficits in the deaf child's environment should suggest appropriate channels for intervention. If such avenues can be identified, and if related interventions prove to be effective, deaf people would benefit accordingly. The second goal is theoretical: deaf populations provide an "experiment of nature" which may help to answer theoretically fascinating questions which could not otherwise be tested on human populations.

In considering the theoretical implications of deafness, however, it is crucial to pause to consider the ethics of such research. Many psychologists have been attracted to research with deaf people because they conceive of them as a population which will enable them to evaluate such

issues as the relation between language and thought, the role of audition per se in self-regulation, and so on. Such researchers frequently run their experiment, draw conclusions, and disappear forever. There are two reasons why such one-shot efforts should be avoided. The first is obviously ethical, since such research clearly exploits a population without concern for the benefit derived. The second is that such an approach simply isn't good psychology. It is difficult to imagine that a well-trained psychologist would consider studying child development in Spain, for example, without first learning Spanish and something about the Spanish culture. And yet, the equivalent happens repeatedly in studies of deaf populations. When researchers are not familiar with deaf people and lack appropriate communication skills, they are usually unaware of important control variables, and are probably unable to convey the requirements of the task. As a result, much of the research literature which currently exists on deaf populations is inaccurate or uninterpretable. In this regard, Mackay Vernon (1967) has observed that there is a tendency for the relative performance of deaf and hearing subjects to vary as a function of the investigator's familiarity with deaf people. These warnings are not to suggest that research on deaf populations should be avoided, but only that the researcher must first meet his obligation to acquire sufficient background information, and also, that in the quest for finding answers to theoretically interesting questions, he should not ignore the very real, immediate, applied concerns of deaf people themselves and of the professionals who serve them.

Piaget has identified four factors as causes of development--maturation, experience with objects, social experience, and equilibration.

Of the four, the typical deaf child probably suffers from restrictions in both physical and social experience. According to Piaget, two kinds of knowledge are gained through experience with objects. The first includes knowledge from the objects themselves (for example, that metals are heavy but cotton light), and the second includes knowledge gained from the actions effected on those objects (for example, that counting a heap of marbles is unaffected by the order in which the marbles are counted).

There are also two benefits derived from social experience. First, it provides the opportunity for formal and informal transmission of the society's knowledge, folklore, mores, etc. Second, it provides informal interaction with adults and peers which are important in leading the child to recognize that others' viewpoints differ from his own. These experiences help the child to decenter from his own egocentric view, an important aspect of the movement from preoperational to concrete operational thinking.

With regard to physical experience, the deaf child is obviously deprived of the sound-making qualities of objects and actions. Insofar as one acquires knowledge about objects and about actions upon objects through auditory information, the absence of an auditory channel might be expected to limit exploration and knowledge. It is interesting that while people readily recognize the importance of vision as an impetus for exploration, comparable attention has not been directed toward audition. Yet, many of the observations made by Piaget do suggest the importance of sounds in the child's sensorimotor exploration. The following is one of many possible examples which illustrate this point from The Origins of Intelligence:

> As early as 0;2 (26) Laurent, in whose right hand I have put the handle of a rattle, shakes it by chance, hears the noise and laughs at the result. But he does not see the

rattle and looks for it in the direction of the hood, at the place from which such a sound usually comes. When he finally sees the rattle he does not understand that this is the object which is making the noise nor that he himself makes it move. He nevertheless continues his activity. [p. 166]

It seems clear from this and other protocols in The Origins of Intelligence that auditory feedback provides important information about objects and acts as an important impetus for actions upon objects. Little work has been addressed to the role of early audition on exploration and on cognitive development. This research vacuum is not surprising for human studies since in deafness, unlike blindness, the child's deficit is only rarely diagnosed before the end of the sensorimotor period. It is, however, surprising that there has not been more animal research on early auditory deprivation, especially when contrasted with the vast literature on the effects of early visual deprivation.

Assuming that there are exploratory deficits associated with early deafness, it would seem appropriate to increase the visual responsiveness of the environment, much the way Selma Fraiberg has increased the auditory-responsiveness of the environment for blind infants. Thus, one could use rattles with visible noise-making material, light displays which vary in color, intensity, and duration as a function of the pitch, volume, and length of sounds. A light-box of this kind might also be useful as a mechanism for providing rhythmic experiences which Penny Odom-Brooks (Note 1) has suggested may be an important component of reading skills. Due to the problem of late diagnosis of hearing loss, it might be beneficial to use such objects routinely, since they would be attractive to normally-sighted and hearing children, and would encourage the coordination of visual and auditory schemes.

In addition to a narrowing of the physical environment as a direct consequence of the absence of audition, there may also be a narrowing of the environment as a function of the social and educational behavior of the child's caretakers. The developmental literature on institutionalization is useful here. Although it is unlikely that a deaf child without additional severe handicaps would be subjected to the extremes of maternal- and stimulus-deprivation found by Spitz (1945), Dennis (1960), and Bowlby (1965), aspects of such deprivations may occur in the typical deaf child's life. Audiologists and speech therapists, for example, often note that parents tend to stop speaking to their child once a diagnosis of deafness is made. This behavior reduces the opportunity for developing the use of residual hearing and errodes parent-child interaction.

After infancy, deaf children are frequently sent to residential institutions, sometimes as young as 3 years of age. While the most dramatic effects of institutionalization have been reported for infant facilities, there is also evidence that later restrictions affect development. Zigler (1966) reviewed research on institutionalization and concluded that it commonly hampers the child's motivation, emotional growth, and problem-solving strategies. Although Zigler's review focused on institutions for the mentally retarded, many of his observations may be equally applicable to institutions for the deaf.

That the residential schools for the deaf do provide restricted environments has been noted by deaf adults themselves (Reich & Reich, 1973) and has been suggested as a contributing factor to cognitive deficits of the deaf (e.g., Templin, 1950). Specific research is needed to identify to what extent and in what ways residential schools for the deaf are

restrictive, and how these restrictions can be eliminated. The group child-rearing practices used in other cultures may provide good models for planning better residential living.

Thus, there are many areas in which the physical restrictiveness of the deaf child's environment may limit his opportunities and impetus for exploration. While some of these are a direct consequence of hearing loss, others are not inherently linked with deafness and thus could be modified.

Probably even more devastating, however, to the deaf child's cognitive and social development are the restrictions on his social experience. Social interaction is obviously thwarted whenever an individual and those around him do not share a communication system. For approximately 10% of deaf children--those with deaf parents--there is a shared system, American Sign Language. Research by Bellugi and Schlesinger demonstrates that in this situation, language is acquired naturally, similarly to the way hearing children acquire language, except that it is in a different mode --visual instead of auditory. For the other 90% of deaf children--those with hearing parents--there is typically no system for communication other than elementary, iconic, home-made gestures and non-verbal communication. Thus, for the vast majority of deaf children, social transmission and interaction are severely restricted in the early years. Even after the child enters schools, oral skills are slow to develop, and thus the difficulties in communication continue, both within the family and in the society at large.

Such limitations have devastating impact on the social transmission of knowledge, mores, and rules of the society. They also limit the opportunities for social interaction which are normally an important mechanism

for encouraging the child's decentration from his own egocentric viewpoint, an important aspect of the transition from preoperational to concrete operational thinking.

There is some research on deaf children which supports the contention that reduced channels of communication may inhibit the acquisition both of factual information and the perspective-taking skills of the deaf child.

A study by Nass (1964), for example, may be interpreted as evidence for restricted information-flow. Nass studied the ability of deaf and hearing children to deduce agents of causality when the agents either were, or were not, accessible to direct experience (Levels 1 and 2, respectively). Nass found that 8-10 year-old deaf and hearing children gave comparable explanations of Level 1 phenomena (e.g., "How come leaves fall off the trees?" "How do we get shadows?"), but that deaf children gave more primitive explanations than their hearing peers for Level 2 phenomena (e.g., "How does the snow come?" "How is it that the stars shine?"). By the age of 12, these deaf-hearing differences had disappeared. Although Nass suggested that the deaf-hearing differences indicate that younger deaf children have less adequate reasoning abilities than hearing children, it seems equally plausible that the findings occurred because of inadequate information. Many of the questions about Level 2 phenomena are precisely the sorts of questions normally asked during the "why" period of childhood. The deaf child does not often have the communication skills needed to ask these "whys," nor to understand the explanations when they are given.

Thus, the informal channels for acquiring information may be utilized less effectively by the deaf child because of communication difficulties. The hypothesis that deaf children do not have the usual opportunity to ask

"Why" questions in informal situations may also be extended to the formal instructional setting of the classroom. Craig and Collins (1970) studied communicative patterns in classes for deaf children and found that communication was overwhelmingly dominated by teachers. In the primary grades, teacher generated communication accounted for almost 80% of classroom communication, while only 3% of the communication was student-initiated. Even when students did initiate communication, teacher-responsiveness was not high: teachers' responses accounted for less than 4% of communication. It seems clear that a teacher-dominated setting such as this one could not possibly respond adequately to the child's individual needs, questions, and interests. Furthermore, such an environment would seem especially unsuited for the development of communication skills, which is presumably an underlying goal of any content lesson.

Informational deficiencies may also occur in the classroom as a simple function of the curriculum planned for the students. Deaf adults often complain that too little was expected of them in school. In a survey of deaf adults, Reich and Reich (1973) found that about one-fifth of the respondents made comments similar to the following: "English in school for deaf should be equal to hearing (schools)," "In deaf school, when finished reading, teacher asked 'What did the boy do?'--in hearing school asked 'What was the climax?'"

There is, therefore, reason to believe that communication channels are limited for the deaf child and that passing on of factual knowledge is concomitantly reduced. There is also some indication that reduced communication may interfere with the usual socialization processes. For example,

various researchers have reported lower levels of emotional maturity (Levine, 1956) and poorer impulse control (Altshuler & Rainer, 1963; Harris, Note 2) in deaf people. Socialization into "appropriate" sex roles may also be attenuated (please note that the appropriateness is in quotes). Myklebust (1960) reviews literature from which he concludes that there is a tendency for deaf men to be "feminized" and for deaf women to be "masculinized," while Blanton and Nunnally (1964) found an attenuation of the usual sex differences in cognitive style.

The lessened opportunity for social interaction would also lead to the expectation of poorer perspective-taking skills in deaf children. Using a communication task, Hoemann (1972) did find that young deaf children were less able to consider a peer's perspective in communicating than were hearing children of the same age.

It seems obvious that what is needed to overcome many of the deficits discussed is a communication system shared by the deaf child and the people in his environment. In evaluating why educational programs have avoided manual language as a possible solution to this need, it is useful to recognize that the deaf culture and language represents a minority subculture. Traditionally, cultural and linguistic differences have been interpreted as cultural and linguistic deficiencies, as in the case of Black versus white English dialects. Only recently has work such as Labov's (1970) begun to dispell notions of linguistic and therefore cognitive deficits among those using Black dialects. Similarly, the assumption has been made that sign language is merely a loose collection of gestures, without systematic internal structure, and which are strung together without hierarchical organization (Bellugi & Klima, in press).

As the work of Bellugi and Klima has shown, Ameslan has a considerable degree of systematicity and hierarchical organization comparable to that found in other human languages, although differing in the forms of expression. Similarly, Bellugi and Klima (in press) dispute the assumption that Ameslan cannot be used except for concrete thinking and communication, saying that: "American Sign Language is in no way limited to expressing 'concrete ideas.' It is a full-fledged language with the possibility for expression at any level of abstraction. There is vocabulary dealing with religion, politics, ethics, history, and other realms of mental abstraction and/or fantasy."

Thus, American Sign Language could permit the establishment of a sophisticated communication channel, and thus need not be discouraged among deaf people. My own preference, however, is toward using some form of Signed English rather than Ameslan in educational settings and in homes with hearing parents. Proficiency in Signed English would transfer better than Ameslan to the other English skills which are needed for interacting with the majority hearing culture. Furthermore, Signed English fits more readily with the hearing parents' own linguistic competancies.

It may appear that we have come full circle and returned to the linguistic-deficiency hypothesis. In some sense this is true, in that language skills have been shown to be of crucial importance in the child's acquisition of knowledge, in socialization, and in the establishment of affective relationships. In another sense, it is untrue, since rather than language affecting thought directly as suggested in the original formulation, language here is thought to have its affect on cognition indirectly, being mediated through interactions with family, peers, teachers, and the

society in general. Perhaps it is time to relinquish our belief that only oral languages can fulfill communicative and cognitive needs, and to encourage the use of combined manual and spoken language systems with deaf children. By doing so, we should be able to reduce a large component of the experiential deficiencies now faced by deaf children.

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