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Identifiers- Representational Competence

Representational competence refers to the individual's capability to respond appropriately to external representations. For example, a child engaged in a grouping task may collect together all like objects even if the group contains varying representations of the object, including (1) the object itself, (2) a three-dimensional likeness of the object, (3) a picture of the object, and (4) a word that symbolizes the object. Research indicated that middle class children generally demonstrate much greater representational competence than disadvantaged black children. The acquisition of representational competence is in part obtained from experiences which create temporal, spatial, or psychological distance between self and object. This process is termed "distancing," and the hypothesis offered to explain it is called the "distancing hypothesis." In short, representational competence is the resultant of experiences creating an awareness of the difference between objects and their symbols and an awareness of ideas from actions. Although some authorities have said the crucial period for obtaining these distancing experiences is the first 2 years of life, recent data suggest that the crucial period is between 2 and 4 years of age. (WD)

THE DISTANCING HYPOTHESIS: A HYPOTHESIS CRUCIAL TO THE DEVELOPMENT OF REPRESENTATIONAL COMPETENCE*

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In 1953, I reported that lower-middle-class boys with average mental ability, when faced with the classification task, performed similarly irrespective of the mode of representation of the stimuli (Sigel, 1953). Three-dimensional toys, black and white pictures, and words were used in separate free-sorting tasks, containing familiar items, such as vehicles, furniture, animals and people. No statistical differences occurred as a function of the kinds of classifications made among these conditions. It was concluded that the mode of representation, i.e. the object, picture, or word, was not the significant dimension for children ages 7, 9, and 11. The child had acquired the meaning of the object and it was the meaning which apparently transcended the physical representation. To put it another way, the meaning of an object was not altered by alteration in the mode of presentation (Sigel, 1954). In effect, there is a conservation of the intrinsic meaning of the object. The child is dealing with the representation of the object and is not confused by variations in mode of presentation. The ability of the child to respond in such a consistent manner has been designated as representational competence,

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i.e. the ability to deal competently and equivalently with representational material.

Many years later when I resumed work in cognitive styles, I decided to pretest some pictures for sorting task purposes. The only school available which contained the age groups we needed, namely children aged 5 and 6, was a lower-class Negro school. I blithely proceeded to present the materials in the usual format and discovered that these children had difficulty building classes with pictures. They tended to group them not in classifications or groupings based on commonalities, but by chaining, in thematic ways. Items selected would bear little or no functional relationship to subsequent or previous choices. A picture was selected, for example, of an object and a second one was chosen as related to that, but a third one was not necessarily related to the first. The difficulty of creating groupings and the creating of chaining raised two interesting questions: (1) do these children lack the capability of classifying objects at all, and hence their failure to perform, of (2) is the lack of ability due to the mode of presentation. Since the children were able to label each of the pictures correctly, there was reason to believe that the mode of representation was not at issue, but rather the capability in grouping. We were quickly disabused of this notion by an astute kindergarten teacher who said that the correct labeling of the picture does not necessarily reflect the child's understanding or knowledge of what's in that picture or, therefore, of the object. That the child could not group pictures was the function of the lack of awareness that the picture was in face a representation. It disturbed us that we received such a sophisticated answer from a teacher where we could not have thought of this ourselves. The bit of wisdom I learned is that we tend frequently to overlook contributions from experienced teachers. But, believing that she was dead wrong, and not completely

convinced of my conviction, I decided to repeat the format of the earlier classification studies, testing lower-class children with life-sized objects along with two-dimensional counterparts. Two sorting tasks were created which involved three-dimensional, life-sized objects, e.g. cup, pencil, pipe, etc., and two-dimensional colored photographs of these objects blown up to approximate as close as possible the size and color of the objects. A series of studies were done in which it was found that indeed the teacher was right, the mode of presentation posed a problem. Given three-dimensional objects, the lower-class children did not show any greater difficulty in grouping than middle-class children, but the difference between the use of pictures between the two socio-economic groups showed considerable difficulty where greater frequencies of non-grouping and non-performance were found. The difference between the use of objects and pictures was also significant for the lower-class child, but not for the middle-class child (Sigel, Anderson, Shapiro, 1966; Sigel & McBane, 1967). These findings were indeed surprising in the face of the fact that these children did have language, a system of signs, and could use this language to label these objects. Is it not said that language when considered a sign is, in fact, representational? If this is so, how can it be said that these children lack representational competence?

We shall return to this issue later.

Three other sets of data helped solidify the interpretation that lower-class black children had difficulty in coping with the non-present, or the inferential, or re-present reality, i.e. the representation.

The first is based on performance results with a group of preschool underprivileged children on the Motor Encoding test of the Illinois Test of Psycholinguistics. It will be recalled that in this task the child is presented with

a black and white picture of an object and asked to show in gestures only what is done with the object. This task is one of the most difficult ones for these underprivileged children between 3 and 5 years of age (Sigel & Perry, 1968). If the child, however, is given a three-dimensional version of the same object depicted in the picture, he has less difficulty in acting out, again in gestures, what the object is for. When given the actual object he has no problems at all, even if unable to label it. We were faced with the question, what makes the task harder apparently in the picture than the three-dimensional condition. In the three-dimensional condition the child has a wide array of cues, but more than that, he has the gestalt of the object in its spatial locale, its palpability and its consistency with his own active experience with objects. Three-dimensional objects have a greater action -evocation potential than pictures. Should not pictures as representations, however, have the same action evocation as the object if it is acknowledged that the picture is a representation of the latter? If the child is truly representational, the difference between the object and the picture conditions should be nonsignificant.

A second piece of evidence comes from doll play situations with lower-class Negro children. The children were presented with three dolls, a male adult, a female adult, and a like-sexed child. No other props were used. The stories related are action packed and reality based, i.e. the presentation of plausible situations which appear to be reenactments of life rather than the types of condensation of symbolism so frequently associated with the more middle-class children. Very few importations are used, rather the actions are attributed to the individuals, frequently accompanied by having the objects act one upon the other. The lower-class child rarely uses words referring to inner feelings or inner thoughts. The stories are primarily statements of actions and interactions with little reference to the past of to the future.

A third source of evidence emerges from observations of play behavior of lower-class Negro children where the play of these children appears to be motoric, action based, with minimal use of imagery or pretending or role playing.

Why discrepancy in object-picture classifications?

Why the discrepancy in performance on the motor-encoding task between the three-dimensional condition and the picture condition?

Why are the story-telling and play so heavily weighted in the direction of motoric action level and minimally contain imaginative, role playing or as-if play?

The answer proposed is that the lower-class black children have difficulty in representing, i.e. reconstructing reality in symbolic terms.

In effect, the basic question is what accounts for the deficit in <u>representational competence</u>?

Posing the question this way stimulated a search of the literature for conceptualization of the phenomena. Piaget, Werner and Kaplan, and Bruner are the major writers who have defined the phenomena.

For Piaget, "Representation is characterized by the fact that it goes beyond the present, extending the field of adaptation both in space and time. In other words it evokes what lies outside the immediate perceptual and active field (Piaget, 1962, p. 273). He goes on to say, "Accordingly representation can be used in two different senses. In its broader sense representation is identical with thought, i.e. with all intelligence which is based on a system of concepts, on mental schemas, and not merely a perception of actions. In its narrower sense, representation is restricted to the mental or memory image, i.e. the symbolic evocation of absent realities" (Piaget, 1962, p. 67).

Bruner (Bruner, Olver, Greenfield, 1966) has recently offered some conceptions of representation. Bruner has proposed three stages of representation: enactive, ikonic and symbolic. The enactive refers to motoric behaviors, the ikonic to imagery and the symbolic to language.

For Bruner, "There are two senses in which representation can be understood: in terms of the medium employed and in terms of its objective. With respect to the first, we can talk of three ways in which somebody 'knows' something; through doing it, through a picture of image of it, and through some such symbolic means as language. ... understanding between the three can be achieved by viewing each as if it were external" (Bruner et al., 1966, p. 6). The objective of representation for Bruner seens to be a guide to action.

Werner and Kaplan deal with the concept of representation in the context of symbols, where the symbol "is employed when we wish to emphasize a fusion or indissolubility of form and meaning in the other it serves to designate a pattern or configuration in some medium (sounds, lines, body movements, etc.) insofar as this pattern is taken to refer to some content" (Werner & Kaplan, 1963, p. 15). Symbols are "entities which subserve a novel and unique function, the function of representation. The function of representation is a constitutive mark of a symbol; it distinguishes anything qua symbol from anything qua sign, signal, or thing" (Werner & Kaplan, 1963, p. 13-14).

Representation, then, involves a reconstructing of the world of objects, thereby leading to actions guided by such representations.

On the basis of the theoretical discussion of representation presented earlier, let it be made clear that for me representation is the reconstruction of reality which can be external or internal. Objects can be depicted by pictures or symbols, photographs, drawings, art forms, etc. Internal representation takes the form of imagery or schematization of reality in various degrees.

Representations must contain totally or schematically elements of the reality depicted. An image of a ball is a representation, as in a picture. A map is a representation, but is schematic--a representation of physical environment. The mental image of a ball or of one's spouse's face is internal, the picture of the ball is external. Representational competence refers to the individual's capability to respond appropriately to external representations, to behave in terms of internal referents, to reconstruct non-present reality.

Representations are distal from the reality. They are re-presented but not in their physical form. They are not intrinsic to the object or the event, a depiction of reality. Representations are separated from the physical reality--in time and/or distance. They may also be distinct in form and content, e.g. map. The child has to learn that the representation is a separate class of instances--distinct from and independent of their referent.

For some, language is also to be considered as representation (Bruner et al., 1966). The definition provided does not include language--since, as Dr. Marjorie Franklin of Bank Street College suggests, language is a non-representational system of signs. There generally is no overlap between the word, sentence, etc., and the object. The exceptions are onomatopoeic language or certain poetic rhythms. Thus, for me, language is not a representation as a picture is. Language functions by evoking representations, or by depicting representations as in a verbal description, or a picture or an event. The event can thereby be reconstructed (imagery) or anticipated. Language can serve as the vehicle by which the speaker refers to the event with the intent of evoking appropriate representations in the hearer.

Acquisition of representation is hypothesized as a function of experiences which create temporal and/or spatial and/or psychological distance between self

and object. The construct of distancing is proposed as the operational term by which to denote this process. The hypothesis offered is to be referred to as the distancing hypothesis.

The distancing construct is consonant with Piaget's, Bruner's, and Werner and Kaplan's definitions of representation. In each case there is the implicit or explicit statement that the representation and its referent are separated by physical or psychological distance. Be it the image, the picture, the symbol, or the sign, each one is distant from its referent. The distance may be temporal, as between a past event and a present recall; spatial, as with a picture or image and the pictured or the imaged; in its modality, the name and the object; or in degree of detail, a sketch of an object and the object itself.

Distancing is a way to characterize the subjective from the objective, the self from others, ideas from actions. Representational competence is hypothesized as the resultant of experiences creating such distance.

The foregoing implies that man has the generic capability to respond to distancing by creating representations of reality; the actualization of representational competence depends on the cultural distancing experiences.

The technological urbanized culture in the United States is a society that employs distancing and requires the construction of representations to a large extent. The time emphasis, the transmission of knowledge through pictorial representation and/or graphic signs all involve representational competence.

Since these are demands of the broader cultural system as expressed in our educational system, the difficulty found among these lower-class black children becomes poignant. That they have difficulty at the kindergarten level speaks to the potential for continuing difficulty in mastering those cognitive requirements prerequisite for academic performance.

Study of the conditions creating distance and the subsequent acquisition of representation is necessary not only for its potential contribution for remediation for those children having difficulty, but also because it extends our knowledge of a crucial cognitive acquisition.

A search of the empirical literature, aside from the classification studies mentioned earlier, is of little comfort. To be sure, some studies have demonstrated that levels of representation do in fact effect the quality of responses. Pictures elicit different responses than words in class inclusion problems (Wohlwill, 1968). Use of three-dimensional materials influence solution to conservation problems differently than verbal presentations (Sigel, Saltz, Roskind, 1967). But on the whole, other than the work of Bruner, Piaget, and Werner and Kaplan, little detailed empirical studies are available investigating origins and functioning of representation.

Thus, we are left with a major research task. the discovery of the conditions which define the necessary and sufficient conditions for the establishment of representational competence. In the remainder of this paper I should like to offer some specific hypotheses by which to test the distancing hypothesis.

Initially it was believed that differences in intellectual performance between lower- and middle-class children could be attributed to differences in distancing experiences in the first two years of life. Life for the lower-class child is very different from that of the middle-class child. Apparently the differences during the first two years of life are not sufficient to differentiate cognitive performance between the lower- and middle-class Negro child (Golden & Birns, 1968).

Such experiences may provide the basic ingredients upon which representational competence can be built. These may well be the necessary conditions, but subsequent interactions with the social world may provide the sufficient conditions. No socio-economic-status differences in tasks involving the displacement of objects, search for missing objects and Cattell IQ are found. These findings suggest that at the preverbal age (before 2) children from varying environments do have the ability to recall the existence of an object and to anticipate its location (Golden & Birns, 1968). Performance on such tasks indicates that rudimentary representation of the object and its place in space is present.

On the basis of these data one is left with the conclusion that differences between lower- and middle-class children in intellectual functioning found at later ages may well have their roots in the transitionary period, the last stage of the sensorimotor intelligence and the beginning of preoperational thought, that between 2 and 4 approximately. It may well be that it is during this period of life that the adult assumes a more significant psycho-social role in increasing distance between self and object and hence contributes to the development of representational competence.

During this transitional period, language and extended social contacts occur. My contention is that during this period the significant experiences begin to occur, the experiences necessary for acquisition of representational thought. It is at this time that lower-class parents differentiate themselves from middle-class parents by interposing time, space, and language to create distance between the child and his environment.

These experiences are presumed to occur in the following ways:

(1) providing a relatively orderly, structured and sequential environment;

(2) providing a linguistic environment which contains a high frequency of words denotative of distance between referent (object) and level of language (concrete-descriptive vs. abstract-inferential);

(3) providing models indicating the relevance and pragmatic value of distancing.

Each of these conditions is hypothesized as contributing significantly to the development of representational competence because each facilitate the establishing of "distance"--spatially and temporally between objects and their referents. The rationale for each is as follows:

(1) The child must have an environment which is relatively orderly, structured and sequential. The break in time-flow, the delineation of events which are nevertheless reiterated in coherent patterns, thereby structuring the world. Consequently predictability is possible not only because of the orderliness of the environment, but also because of the child's capacity for memory. These memories are particularly articulated when they serve gratification of needs. The result is the creation of a series of expectations, and what are expectations really but the anticipation of happenings. This anticipation is perforce represented at the preverbal level, perhaps by imagery (Decarie, 1965). In fact, there is a feedback cycle which occurs over time--programmed as follows--an event (present), memory for it (past), anticipation for reiteration (future). With the advent of language and stimulation to recall, evoked images are labeled and organized under particular rubrics. Language facilitates organization, because particular signs can encompass a wide array of instances. The degree of stability and predictability of the environment would predict to high level representational performance.

(2) The content of the linguistic environment must contain a high frequency of words referring to time, space, distance, and reference to past, present, and future to create psychological distance between reality and its reconstruction. This is not to say just the use of language is enough, rather it is the quality of the language. As was indicated, the lower-class children in our study did utilize language, and yet they were poor performers. Thus the hypothesis refers to the types of concepts that are used by the adults in the language. Lower-class children experience significantly greater concrete-motoric references and less abstract language than middle-class children (Hess & Shipman, 1964). Reality is thereby not reconstructed, and hence distancing is not so great among lower-class children. Language becomes the tool for, or the vehicle by which, objects and events can be distanced.

The grammatical structure of the language is also important. The way tenses are used expresses time concepts also. For example, it has been reported that in the language of lower-class Negroes, time is represented grammatically in the continuous present--"I does this"--which may refer to the past, present, or future. Clear-cut delineation of the three time dimension is apparently not made. If this is true then some explanation is possible for the difficulty found among lower-class children. Since time is also reflected in sequencing of events, sequencing becomes another variable that contributes to the quality of the children's performances. Thus the corollary hypotheses derived from such reasoning can be stated as follows: Representational competence is negatively influenced by the lack of time perspective concepts, those delineating distance in time past and future.

(3) The language and the orderliness of the environment can account for only some of the variance. There is still the requirement that the opportunity

for recall and reconstruction of the past and present, and planning for the future. Attention by adults to the past by recalling events and stimulating discussion of what has transpired provides the child with the opportunity to imitate and participate with adults. Such experiences are hypothesized as generating imagery for the experienced past event and thereby provide the groundwork for anticipatory responses. Correct anticipatory responses reveal to the child the orderliness and hence predictability of the world around him.

It can be argued that these explanations place the burden of explanation on the quality and quantity of social interaction and offer very little in the way of psychological mechanisms which can be explanatory, but it must be kept in mind that the psychological mechanisms can not be viewed in isolation of the context which stimulates them. The research on sensori deprivation highlights the significant role of particular levels and quality of response as a function of such deprivation.

I have presented in a schematic and exploratory way some ideas and hypotheses regarding the development of representational competence. Refinement of the theoretical base is still necessary delineating levels of representation, clarifying the conception of language, and spelling out in more operational terms the distancing hypothesis. Nevertheless, I believe the distancing hypothesis has a compelling logic that helps bring together much of the relevant theoretical literature and the few empirical studies. It helps to explain some of the data obtained with lower-class black children. The need, however, is to undertake experiments with very young black children at a preoperational level to test out these ideas. Time in this discussion provided only the opportunity to identify the problem and delineate some of the variables. The challenge is to construct significant tests of these hypotheses.

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