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EGOCENTRISM AND SOCIAL INTERACTION  
IN YOUNG AND OLD ADULTS.**

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EGOCENTRISM AND SOCIAL INTERACTION  
IN YOUNG AND OLD ADULTS

by

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## INTRODUCTION

Human communication has been, and is, one of the most complex phenomena investigated by psychologists. Even a casual observation of everyday conversation reveals that total misunderstanding can occur, even with full speech, when people's thoughts wander in different directions. One of the factors essential to the production of unintentional non-communication is the state of psychological functioning in each of the individual members of the communication dyad. As Vygotsky put it, "...those who are accustomed to solitary, independent thinking do not easily grasp another's thought and are very partial to their own..." (1962, pp. 141-142).

The present investigation was a study of the human communication process. The central element in this investigation was the concept of "egocentrism" or, perhaps, the "egocentric predicament", which has been defined as the "...difficulty... of knowing things or persons as they are in themselves, as distinguished from the way one necessarily knows and experiences them through one's own personality" (English & English, 1958). Egocentrism and its effect upon behavior has been extensively discussed and investigated in infants and children, and a limited amount of related research has been carried out with adolescent and young adult populations. The present study was an extension of this research on egocentrism to aged adults,

specifically as it relates to social interactions in general and communication skills in particular.

## REVIEW OF LITERATURE

## A Brief Overview of Piaget's Theory of Intellectual Growth

Before entering directly into the body of literature most pertinent to the present investigation, a brief summary of Jean Piaget's theory of intellectual development will be presented. Despite the fact that the major concern of this study had to do with certain cognitive abilities of young and old adults in social situations, much of the impetus for this research was derived from Piaget's theorizations about the growth of cognitive abilities in children and adolescents. To expedite the reader's understanding of the discussion to follow, and to avoid unnecessary repetition, a broad outline of Piaget's theory will be presented at this time. Several key concepts also necessary for understanding the theory will be defined. A more definitive summary of Piaget's position can be found in Berlyne (1957), Flavell (1963), or Piaget (1967).

Piaget's system is best viewed in the framework of genetic epistemology. Thus, the primary concern is the biology of knowing. How do the order and logic that characterize rational thought evolve? What is the genesis of the ability to apprehend the structures of science and mathematics? These are the questions underlying Piaget's life-long study of the origins of intellect.

Piaget describes mental development as a process involving successive states of equilibrium: "It may be likened to

the assembly of a subtle mechanism that goes through graduate phases of adjustment in which the individual pieces become more supple and mobile as the equilibrium of the mechanism as a whole becomes more stable" (Piaget, 1967, p. 4). The equilibrative and complementary processes of accommodation and assimilation that regulate the transformations from one phase to the next are considered to be constant. In contrast, each phase of this adjustive process can be represented by a characteristic organizational structure or form. Piaget traces the evolution of these variant structures through stages of development extending from parturition to adolescence. At each successive stage the individual gains psychological distance in his encounters with reality.

The first stage, called the "period of sensori-motor intelligence," deals with the construction of the logic of actions. Essentially, the process involves the organization of actions into operational patterns, or "schemata of actions," whose primary characteristics are to permit the infant to dissociate in his actions between means and ends. Through the dual process of accommodation to the environment and assimilation of the information gained, the infant gradually recognizes the permanence of objects.

The second stage, labeled "preoperational," witnesses the appearance of symbolic function, which includes the development of language. The integration of symbols allows the child to expand his range of operations; thus, from a response to an

event, intelligence is mediated through language. However, the child is not yet able to represent mentally abstractions that lead to ideas whose meanings are constant. These constancies have to do with aspects of the "objective world," such as substance, measure, motion, and logical categories. In this preoperational world everything appears to be related to the child's own point of view ("egocentrism").

In the following stage, extending from about the age of seven to the age of 11 or 12, the child constructs a world that is increasingly ordered and rational. This period is characterized by the development of "concrete operations." The child now no longer thinks only in terms of himself, but he also takes into account the limitations that the external, "concrete" world places upon him. Piaget's experiments permit him to describe the child's thought in terms of reversible logical structures and systems involving such operations as inversion, reciprocity, and multiplication. Nevertheless, thinking remains closely linked to manipulative actions with tangible, "concrete" objects: classifying them, putting them in series, or putting them in one-to-one correspondence. In essence, the child's world at this stage is concerned with necessary relations among objects.

The final stage of intellectual development, "formal operations," deals with the construction of an abstract ("formal") logic that is applicable to any kind of content. Thus, the adolescent can apprehend not only necessary relations

among objects and events, but also possible and impossible relations. He can imagine things that never were (e.g., a unicorn, a female president of the United States) and ask "Why not?" The adolescent is no longer directed only by concrete relations; he can make hypotheses and elaborate theories. He can dissociate the form of his thinking from its content.

Piaget's is a theory of subject-object equilibration. His view is that mental growth is governed by continual activity aimed at balancing the intrusions of the physical and social environment with the individual's need to conserve his existing mental structural systems.

#### The Concept of Egocentrism

A central concept in cognitive developmental psychology is that of egocentrism. This term does not refer to preoccupation with the self, but rather it implies that egocentric behavior stems from a limited awareness of the self. The essential meaning of egocentrism is an embeddedness in one's own point of view. As Church (1961) pointed out, in infancy this implies a complete absence of awareness that one has a point of view rather than an instantaneous, exhaustive, and infallible grasp of reality. This is not to imply that the child has no experience of himself, but rather that he does not experience himself experiencing.

Piaget (1950; Inhelder & Piaget, 1958) has placed the egocentrism concept in a central role in his theory of

intellectual development. Roughly speaking, this development is said to consist of the passage from an initial state of total egocentrism to a final state of total objectivity. As the individual matures he becomes more and more capable of discriminating subject from object in subject-object interactions (Piaget, 1962). At each stage of mental development this lack of discrimination, or differentiation, takes on a unique form and results in a unique set of behaviors. The following briefly summarizes Inhelder and Piaget's (1958) description of this succession of changes:

(1) At the sensori-motor level the child confuses his own activity with that of the external world. The developmental landmark of this stage, which occurs as this primitive form of egocentrism recedes, is the practical dissociation of these poles and the consequent formation of the object concept.

(2) The appearance of symbolic thinking brings back egocentrism which had once been overcome in the sensori-motor period. At this time there exists a lack of differentiation between the child's own viewpoint and that of other persons. The egocentrism of this stage seems to be very similar to the "self-differentiation" concept of Murphy (1937) and the notion of "assumption of similarity" as described by Gage, Leavitt, and Stone (1956). These writers were concerned primarily with studies of empathic ability, and they underscored the apparent inability of three-year-old children to differentiate themselves from other persons.

(3) The appearance of the reflective processes specific to formal thinking activates a third type of egocentrism by which the child is unable to differentiate his own perspective from that of the social milieu to which he must adapt. At this time the child must learn to think productively on a strict reality basis and to develop a genuine social reciprocity. This stage is said to last throughout adolescence; perfectly objective, totally non-egocentric thinking is achieved at this time. Elkind (1967) has discussed the phenomenon of adolescent egocentrism at length.

As can be inferred from the above discussion, the transition from one form of egocentrism to another takes place in a dialectic fashion in such a manner that the cognitive structures that free the child from a lower form of egocentrism are the same structures that entangle him in a higher egocentric form. From the developmental point of view it would seem legitimate to regard egocentrism as a negative by-product of any emergent mental system, for it produces a new set of unrealistic, non-objective representations of the world at each newly-achieved level of thought.

Related to the egocentrism construct is the phenomenon of "centering", or "centration." This process refers to the child's tendency to center his attention on one detail of an object or event. Piaget (1950) placed heavy emphasis on the child's inability to "decenter", i.e., his inability to shift his attention from only one aspect of an object or an

event. By neglecting other important aspects of a stimulus array, the child's reasoning is distorted. The inability to decenter appears to be most characteristic of the preoperational child. The individual at this stage seems to be confined to the surface aspects of the phenomena he tries to think about, and thereby he assimilates only those superficial features which dominate his perceptual field. For example, in the water-level problem, which is used to test the child's understanding of the invariant qualities of substance, he will center either on the height of the container (and therefore say that the taller one is larger) or perhaps the width (and that the wider one is larger). What the child characteristically fails to do is decenter by considering both height and width simultaneously, which would allow him to relate the changes in one of these dimensions to compensatory changes in the other.

To summarize, decentering refers to development from passive, "best" form-dominated perception, typical of the young child, to active, operation-directed perception of the older child and adult. This concept appears to be similar to the "reasonable reorientation" hypothesis of Wertheimer (1961). This was described as "...reorientation which enables the subject to view the given situation in a new and more penetrating perspective" (Wertheimer, 1961, p. 170).

In his extensive empirical investigations of the Piagetian tasks, Elkind rather exhaustively studied the decentering

phenomenon (Elkind & Scott, 1962). Nursery and elementary school children were tested with a set of ambiguous pictures. Success in perceiving these ambiguous pictures (which, in this task, revealed the ability to decenter) increased significantly with age, articulation of pictures, and IQ.

Ability to decenter also has been studied as a function of several other variables. Confirming the results of Elkind and Scott (1962), success in decentering has been shown to correlate positively with age (Houssiadass & Brown, 1967; Stuart, 1967; Sullivan & Hunt, 1967) and intelligence level (Stuart, 1967; Sullivan & Hunt, 1967). Other positive relationships with decentering ability have been found with these variables: the ability to make mature moral and causal judgments (Stuart, 1967); social class (Sullivan & Hunt, 1967); categorization ability (Weinberg, 1959, 1963). Houssiadass and Brown (1967) found that the developmental sequence for centering-decentering found in normal children also exists in mentally retarded children (mean IQ = 55, ages 8 to 15 years).

At this point one might reasonably ask the question: How is this childish egocentrism overcome? In what way does the growing individual achieve the ability to decenter his perceptions? As research has demonstrated, the child becomes more and more able to differentiate himself from his external world and to assimilate features of his environment other than those most perceptually dominant. No longer do pronouncements of "increasing maturity" provide satisfactory explanations for

these age-related changes. In search for a more satisfactory explanation of this diminution of childhood egocentricity, Flavell (1963) had this to say:

There are ...other difficulties which derive directly from the child's egocentrism. First, the child -- lacking other-role orientation -- feels neither the compunction to justify his reasonings to others nor to look for possible contradictions in his logic. And causally related to this, he finds it exceedingly difficult to treat his own thought processes as an object of thought.... One of Piaget's firmest beliefs...is that thought becomes aware of itself, able to justify itself, and in general able to adhere to logical-social norms of noncontradiction, coherence, etc., and that all these things and more can emerge only from repeated interpersonal interactions....It is social interaction which gives the ultimate coup de grace to childish egocentrism (pp. 156-157).

### Egocentrism and Social Interaction

#### Theoretical background

Piaget (1928, 1950) has suggested that egocentrism taints the child's efforts in virtually all spheres of activity. He has written extensively about various kinds of childhood functioning which reveal the effects of this pervasive egocentric cast of mind. Examples would include the child's primitive conceptions of the physical world (artificialism, animism), representations of objects and space, attitudes about moral-ethical phenomena, and interpersonal activities which require role-taking ability (including verbal ability). But as the child grows older, he gains facility in various cognitive skills; these cognitive changes imply a decline in

egocentricity of thought.

Piaget (1950) has argued that, in addition to the effects of maturation of biologically programmed "structures," the child gains new cognitive skills because of his increasing interaction with his social environment. "The human being is immersed right from birth in a social environment which affects him just as much as his physical environment. Society, even more, in a sense, than the physical environment, changes the very structure of the individual, because it not only compels him to recognize facts, but also provides him with a ready-made system of signs, which modify his thought"

(Piaget, 1950, p. 156). The decline of egocentrism (particularly after age seven or eight) is therefore believed to result, in large part, from reinforcements (including negative ones) issuing from interactions with peers. According to Flavell (1963),

...social interaction is the principal liberating factor, particularly social interaction with peers. In the course of his contacts (and especially, his conflicts and arguments) with other children, the child increasingly finds himself forced to reexamine his own percepts and concepts in the light of those of others, and by so doing, gradually rids himself of cognitive egocentrism (p. 279).

Piaget (1928) put it this way:

What then gives rise to the need for verification? Surely it must be the shock of our thought coming into contact with that of others, which produces doubt and the desire to prove....The social need to share the

thought of others and to communicate our own with success is at the root of our need for verification. Proof is the outcome of argument....Logical reasoning is an argument which we have with ourselves, and which reproduces internally the features of a real argument (p. 204).

Feffer and his colleagues (Feffer, 1959, 1967; Feffer & Gourevitch, 1960; Feffer & Suchotliff, 1966) have proposed that the decentering concept provides continuity between the general aspect of internal cognitive organization and the cognitive structuring of social content. In other words, this extension of the decentering concept to interpersonal behavior rests on the assumption that the same processes are involved in both impersonal cognition (person to object) and interpersonal cognition (person to person). Furthermore, according to Feffer, this decentering interpretation also can be applied to the structuring of interpersonal events at different levels of cognitive maturity. The argument runs as follows: The dovetailing of responses involved in effective social interaction demands that each participant modify his intended behavior in anticipation of the other's reaction to this behavior. In order to anticipate accurately this reaction, one must be able to see his intended behavior from the perspective of the other person, but at the same time he must also view his intended action from his own perspective. The cognitive organization of an individual capable of effective social interaction can be interpreted as one in which different perspectives are considered simultaneously in relation to each

other such that the distortion engendered by a given viewpoint (or centering) is equilibrated or corrected by another perspective. In contrast, persons who are able only to focus sequentially upon their behavior from a single perspective at a time should have difficulty in effectively modifying their responses. It is in this light, according to Feffer, that the decentering concept provides continuity between the general aspect of internal cognitive organization and the cognitive structuring of social content. With regard to the young child, therefore, Piaget (1950) underscored ineffectual social communication in the following way:

...however dependent he may be on surrounding intellectual influence, the young child assimilates them in his own way. He reduces them to his point of view and therefore distorts them without realizing it, simply because he cannot yet distinguish his point of view from that of others through failure to coordinate or "group" the points of view. Thus, both on the social and on the physical plane, he is egocentric through ignorance of his own subjectivity (p. 160).

These theoretical notions have generated a spate of empirical investigations. The categorical names under which these research efforts fall include studies of empathic ability, role-taking skills, and verbal communication effectiveness, to name a few. In an early review of the role-taking skills literature, Sarbin (1954) attempted to identify the essential elements in interpersonal behavioral phenomena. In accordance with Piaget and others, Sarbin concluded that the essential ingredient in any sort of skill sequence in role-taking seems

to be a process by which the individual somehow cognizes, apprehends, grasps, or whatever, certain attributes of another individual. Of necessity these must be inferential attributes (rather than directly perceptible attributes): needs, intentions, opinions, capacities, limitations, and so on. Sarbin proposed that the estimate of these attributes formed by the role taker or the effective communicator must be a synthesis of two sources of information: (a) knowledge of people and their behavior in various situations, and (b) perceptual input from the overt behavior of the other person or from other cue sources in the immediate situation. In a more recent analysis, Krauss and Glucksberg (1969) essentially concurred on the importance of these informational sources. Roger Brown (1965), in his encoding-decoding analysis of interpersonal communication, insisted that the ability to control a lexicon and a grammar of language is a third essential requirement.

#### Empirical investigations of interpersonal skills

With this theoretical framework thus established, a number of representative empirical studies now will be reviewed.

Elkind (1961) replicated an early Piagetian study of children's relational concepts, i.e., concepts whose very meaning seems to imply the notion of differing viewpoints. Analyzing children's notions of right and left, Elkind distinguished three rough levels of understanding: (a) At the initial level the child can accurately identify his own right and left

arms and legs but not those of the examiner facing him;

(b) At the second level he masters the first problem, but he still retains the notion that right and left are inherent properties of objects, rather than pure relations which hold only between objects from some particular point of view;

(c) The child at the third level of understanding holds a completely differentiated and abstract conception of these relational terms. Elkind assumed that these levels reflect the underlying development from egocentrism to role-taking disposition and skill.

Burns and Cavey (1957) investigated the empathic ability of nursery school children. Using a set of pictures of various facial expressions as stimulus materials, they found that the number of empathic responses given by younger subjects (ages three to five years) were significantly lower than those given by older subjects (ages five to six-and-a-half). In a somewhat similar study of empathic-like abilities, Flapan (1968) examined children's ability to perceive or to make inferences about feelings, thoughts, and intentions, and to interpret or explain sequences of behavior that occur in interpersonal relationships. He found that ages six to nine years appear to represent a transitional developmental stage with regard to these kinds of skills. This conclusion is in accord with many other studies of cognitive changes; the seventh year of life, give or take a couple of years, appears to be the year of the "cognitive revolution."

Cowan (1966) has devised an ingenious procedure to study the effects of egocentric thinking in social interaction situations. From an adaptation of Piaget's "three mountain problem" (the child must select from an array of photographs the view "seen" by a doll positioned at a particular orientation to a three-dimensional display) a measure of cognitive egocentrism is obtained for each child. On the basis of these egocentrism scores subjects are paired together in three ways: Hi-Hi pairs (both subjects scored high, i.e., they displayed little egocentricity on the first task), Lo-Lo pairs (both received low scores on the first task), and Hi-Lo pairs. The two subjects are then seated back-to-back at small tables. On each table top is an identical four-by-four matrix arrangement, with the top eight squares colored yellow and the bottom eight squares colored red. Each subject is then given an identical set of 16 objects -- circles, squares, small toys, etc. The children are told not to turn around. The children are told to place their objects, one at a time, one in each square, so that their boards would end up looking the same ("the same" is not defined). From this task can be derived measures of communication efficiency (how well the task was performed), egocentric language, and descriptions of the properties of the system of communication developed by the two participants. In the two studies using this technique that Cowan has reported thus far (1966, 1967), the Hi-Hi pairs (children with low egocentrism scores) performed in a

manner far superior to the other two kinds of pairings: communication was more efficient, little egocentric language was evidenced, and usually very effective forms of communication patterns were established. The Hi-Lo pairs also tended to perform far better than the Lo-Lo pairs. Cowan (1967) has also reported that a slight sex difference was evident among his subjects (female pairs did better than male pairs), and that middle- and upper-class children performed better than lower class children. Cowan has concluded that these data suggest that Piaget's concept of egocentric language provides a useful conceptual tool for analyzing the link between the structural properties of the individual child and the formal properties of his social interaction.

A number of other studies have employed procedures similar to those of Cowan. For example, Alvy (1968) tested six, eight, and 11-year olds on a verbal communication task where success was assumed to be a function of the ability to take each other's viewpoint. The members of a pair were separated by an opaque screen; one subject had to select from a set of pictures the one being described to him by the other child. Two main differences were found as a function of age: decreases in egocentric communications and increases in verbal exchange. Cohen and Klein (1968), in a similar study, obtained similar results.

An extensive program of research on role-taking and communication skills in children has been conducted by John

Flavell and associates (Flavell, 1966; Flavell, Beach, & Chinsky, 1966; Flavell, Botkin, Fry, Wright, & Jarvis, 1968). This research has systematically confirmed and extended Piaget's (1926) studies of social communication in children. Most of these studies involved some variation of a basic procedure in which different-aged children are presented with tasks requiring an ability to shift perspectives. Their principal finding was an indication that young children, when speaking, confuse their own perspective with that of the auditor in communication situations. This confusion was found to decline regularly with age in the period from six to nine years. This, of course, is in complete agreement with the studies described earlier.

Fry (1966), one of Flavell's associates, applied an encoding-decoding analysis to the transcriptions of the communication which occurred in his investigation. Presumably, Fry reasoned, as children get older they should be able to monitor their own communications to others at a cognitive level so as to make them more readily decodable by the particular listener. His data, obtained from subjects aged five to 15 years, confirmed this hypothesis. Additionally, the data indicated that children become increasingly adept with age at perceiving that someone else's point of view may differ considerably from one's own.

Krauss and Glucksberg (see Glucksberg, Krauss, & Weisberg, 1966) have developed another procedure for studying referential

communication, which they call the "Stack the Blocks" game. Two persons are seated on opposite sides of an opaque screen so that neither can see the other. Each is given a duplicate set of six wooden blocks; each block has a novel design stamped on one side. The blocks have holes drilled through them so that they can be stacked on an upright wooden peg. One person in the pair is randomly designated the "speaker" and the other becomes the "listener." The object of the game is to build two matching stacks of blocks, with the "speaker" providing the "listener" all the instructions. It was found that this procedure could be employed over a wide age range (nursery school children through adults). The major finding, obtained from a series of studies, was that pairs of nursery school children were unable to converge upon a shared nomenclature for these novel forms (Glucksberg, Krauss, & Weisberg, 1966), while college adult subjects were able to develop standardized nomenclatures fairly easily (Krauss & Weinheimer, 1964a, 1964b). The children's difficulty seemed to stem from their use of reference phrases which were idiosyncratic and not descriptive of the forms. They tended to use private imagery rather than conventional or socially shared forms. However, when the novel graphic forms were replaced with familiar figures (such as animals), the children performed almost error-free (Krauss, 1968).

Perhaps one of the most significant aspects of the work of Krauss and Glucksberg has been the extension of the analysis

of communications skills into the adult years. A recent study demonstrated the high utility of their procedure for comparing variously-aged subjects (Krauss & Glucksberg, 1969).

It should be noted in passing that Maclay and Newman (1960) devised a similar task for adult subjects which antedates that of Krauss and Glucksberg. Their method required one subject to describe a picture to a listener seated behind a screen so that the latter could identify it from a number of pictures before him. The results suggested that normal adult communicators are likely to show a fair amount of sensitivity to the listener's apparent input needs, augmenting their messages whenever they have information (such as negative feedback) which suggests that these needs are high.

Feffer (1959) has extended the concept of decentering activity to an analysis of the cognitive structuring of social content as revealed in role-taking activities. The Role Taking Task (RTT) was specifically designed by Feffer to relate decentering to the interpersonal domain. The RTT is a projective task derived from the Make-a-Picture-Story task, which requires the subject make up initial stories for a number of ambiguous scenes. After the stories are completed, each scene is presented again, and the subject is asked to retell the initial story from the viewpoint of each of his characters. Evaluation is based upon the degree to which the subject is able to refocus upon his initial story from the perspectives of his characters, while at the same time maintaining

continuity between his various versions of the initial story. The underlying assumption is that the change and continuity which define successful role-taking performances are indicative of the subject's ability to consider his behavior simultaneously from differing viewpoints. Thus, a subtle degree of coordination among versions of the initial story is interpreted as a type of decentering which is simultaneously regulated by previous and anticipated centerings; in contrast, inconsistency or discontinuity among the characters' perspectives is interpreted as a form of sequential decentering.

Feffer and Gourevitch (1960) gave children of various chronological ages the RTT and a series of impersonal cognitive tasks developed by Piaget. They found that a developmental ordering of role-taking behavior in terms of the decentering concept showed an expected progression with age as well as the expected correlations with the independent assessments of decentering ability on the impersonal cognitive tasks. A later study (Feffer & Suchotliff, 1966) used the RTT scores as a basis for pairing college adult subjects for a social interaction task. This latter task was a Password-type game in which each member of the pair was required to communicate test words via one-word association clues to his partner, who did not know the words. The higher RTT-scoring pairs communicated words more quickly and with fewer clues than did the lower RTT-scoring pairs. (It is of interest to the present study that control procedures revealed that neither verbal fluency nor

WAIS Vocabulary scores were significantly related to either RTT or Password measures.)

As discussed previously, it has been suggested that the decentering concept provides a conceptual tool for bridging cognitive structuring between impersonal and interpersonal situations. The studies just discussed gave support to this notion. However, one bit of dissonant evidence came from a study by Sullivan and Hunt (1967). They found that scores on the RTT and a modification of Piaget's "three mountain problem" correlated only .26 for their seven-year-old sample, .03 at the nine-year-old level, and .41 for subjects aged 11. It is possible that these tasks, at least as employed by Sullivan and Hunt, are not quantitatively comparable.

#### Egocentric speech and social interaction

Another important feature in the literature on communicative skills and social interaction is that of "egocentric speech" (or "private speech"). Apparently the first appearance of the term "egocentric speech" was in the book The Language and Thought of the Child, authored by Jean Piaget (1926). In this book Piaget described a series of quasi-experimental studies of social communication with his three young children. His general procedure was to explain something to one child and then ask that child to explain it to another. One example he used was the operation of an ordinary water tap. He found that a seven-year-old could understand this operation completely but could not communicate it to another. Piaget

attributed this lack of communication skill to egocentrism.

In the same book Piaget also described his observations of children's spontaneous speech productions. He categorized these recorded utterances into two major classes (and, as is his wont, into several subclasses within each major class). "Egocentric speech" is speech which, whether uttered in solitude or in the presence of others, is judged to lack a primary communicative aim. There seems to be no attempt on the part of the child to take the role of the listener and hence to adapt the message to the listener's informational needs or input capacity. Indeed, as Piaget emphasized, there is no attempt even to make sure the listener is listening. "Socialized speech," on the other hand, applies to utterances which do seem to possess a genuine communicative orientation. This communication is characterized by the child's very real attempts to inform the listener, to persuade or coerce him to some course of action, and so on.

Werner and Kaplan (1963) have also discussed the function of the speech of young children. Similar to Piaget's distinction between egocentric and socialized speech, Werner and Kaplan drew a distinction between "inner" and "external" speech:

...the distinction between inner and external speech is relatively slight: speech for the self and speech for the other are little differentiated from one another. In the older child and in the normal adult...the differentiation between speech for the self and speech for others becomes progressively more marked (p. 328).

Piaget (1926) judged that about 50 percent of the utterances of children between the ages of five and six could be classed as egocentric rather than socialized. The supposedly high prevalence of this type of speech became a point of contention rather quickly. Researchers at the University of Minnesota's Institute of Child Welfare called to question the frequency of egocentric speech (Davis, 1937; McCarthy, 1930, 1954). Based upon their naturalistic studies, they supplied evidence indicating that only two or three percent of the spontaneous utterances of preschool children could be classified as egocentric. However, many other researchers also observed children's speech in naturalistic settings, and their data supported Piaget's observations. These latter studies included both observations of children in free peer settings (Katz & Katz, 1928; Smith, 1935; Vygotsky & Luria, 1930) and of children alone (Klein, 1963; Weir, 1962). The most recent confirmatory evidence came from Kohlberg, Yaeger, and Hjertholm (1968). They found a substantial amount of egocentric speech among preschool children, and in further agreement with Piaget, they found this form of speech to decline with age (it was practically absent in ten-year-olds). The percentages of egocentric speech they reported for younger children were not nearly as high as Piaget's 50 percent, but they were still substantially high.

Certain other persons have agreed with Piaget's claims regarding the frequency of this phenomenon, but they have found

reason to dispute his explanation of the phenomenon. Vygotsky (1962)<sup>1</sup> did not agree that private speech reveals a "presocial" lack of intent to communicate or an egocentric lack of awareness of the auditor's perspective. He claimed that the failure to communicate is due to the fact that egocentric speech has a different function than social communication, and that is the function of cognitive self-guidance. In other words, according to Vygotsky, the child cannot think in a purely covert fashion, as can the older child or the adult; the child must sometimes "think out loud", to make concrete his thoughts in order to guide his actions. The age decline in self-directing egocentric speech, therefore, indicates that it has "gone underground" as verbal thought, rather than that presocial speech has been replaced by a more socially communicative form of speech.

Kohlberg, Yaeger, and Hjertholm (1968), somewhat analogously to Vygotsky, objected to Piaget's conception of egocentric speech in that they felt he did not clearly distinguish between the contributions of the defects of social and of cognitive skill to the production of private speech.

Elkind (1967) also suggested that Piaget's explanation might not be the most satisfactory one. Elkind noted, for example, that when explaining a piece of apparatus to another child, a young child uses many indefinite terms and leaves out important information. Instead of assuming that this is explained by saying that the child fails to take the other

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<sup>1</sup>It is well to recognize that this publication of Vygotsky's was written nearly 40 years ago.

person's point of view, Elkind suggested that this might be better explained by saying that the child assumes words carry much more information than they actually do. This results from the child's belief that even the indefinite "thing" in some way conveys the properties of the object which it represents. In other words, "the egocentrism of this period consists in a lack of clear differentiation between symbols and their referents" (Elkind, 1967, p. 1027).

#### Studies of communication skills in adults

As is the case for many forms of psychological functioning, egocentrism has been little studied in adults. A few studies, however, can be interpreted in the egocentrism-social interaction framework employed in this review. Schneidman and Farberow (1957) systematically investigated suicide cases of both the successful and unsuccessful varieties. They asked psychologists who study language to separate genuine suicide notes from simulated ones (written by non-suicidal types asked specifically to write suicide notes). This separation was accomplished very easily. It seemed that the pretender did not always write to the point of view of his supposed addressee, and this easily gave him away. Schneidman and Farberow provided as one example the note written by a man instructed to write to his wife. This pretender explained that "I am disappointed with my job at General Motors" and that "I hate to leave our son John." This man seemed to be writing to the informational requirements of the psychologists

to be reading these notes, not to his soon-to-be-bereaved wife.

Werner and Kaplan (1963) conducted an investigation in which adult subjects were instructed to write two sets of descriptions of novel drawings to be used at a future time. One set was written for the subject's own use, and the other was written by the subject to be used by someone else. The former descriptions were about half as long as the latter. It was apparent that the subject was addressing himself to two different sets of informational requirements. For himself he could be more brief and could perhaps make reference to idiosyncratic experience. This factor seems to be revealed in the common occurrence of an undergraduate asking to borrow the lecture notes of another. The frequent reply of the lender in this situation is, "You can borrow them, but I don't think you'll be able to get much out of them."

A recent experiment (Krauss, Vivekananthan, & Weinheimer, 1968) was similar to that of Kaplan's. College students were engaged in a color coding task; coding was done both for personal use and for the use of others. An analysis of the products revealed that the nonsocial coding condition produced more low frequency (unusual) words than the social condition.

Soskin and John (1963) analyzed a series of ordinary adult conversations. Their data suggested that private speech is a rare or useless category of adult speech. It is to be noted, however, that no systematic studies of private speech

in the adult years have been carried out.

To close this discussion of egocentrism and social interaction, particularly as this topic pertains to adults, the following observation by Piaget seems most appropriate:

There is no reason to believe that cognitive egocentrism, marked by unconscious preferential focusing, or by a lack of differentiation of viewpoints, has no application to the field of interpersonal relations, in particular those which are expressed in language. To take an example from adult life, every beginning instructor discovers sooner or later that his first lectures were incomprehensible because he was talking to himself, so to say, mindful only of his own point of view. He realizes only gradually and with difficulty that it is not easy to place oneself in the shoes of students who do not yet know what he knows about the subject matter of the course (Piaget, 1962, p. 5).

#### Egocentrism and Aged Adults

Is egocentrism a useful construct in describing and explaining the behavior of adults beyond the flush of youth and middle age? Although the underlying mechanisms are not at all well understood, it has been well documented that in old age many kinds of interest and performance changes occur (see, for example, Birren, 1964, and Botwinick, 1967). How are these changes to be accounted for?

In the Piagetian theory of intellectual development it is assumed that egocentrism recedes with the acquisition of formal operational characteristics of thought by the early or mid teens. However, it must be recognized that Piaget has not

concerned himself with adult modes of thinking; he assumes, apparently, that all the important cognitive developments of person's life have taken place by around the fifteenth year. Nevertheless, there is a growing literature documenting quite conclusively that significant intellectual changes do occur in later life. Some abilities seem to undergo sharp declines, while others are maintained or perhaps even improved. As yet there is no theory extant which is able to provide a convincing account for these changes.

Several years ago Wayne Dennis (1948, 1949) was led to hypothesize that with the onset of old age there occurs a regression to child-like concepts. While the regression hypothesis has not been a popular one, Dennis' data, particularly that on animistic thought in elderly people, certainly were suggestive of such a process.

There has been very little research on Piagetian tasks with adults and older persons. This undoubtedly is due, at least in part, to the prevailing notion that the kinds of mental processes Piaget is most concerned with are invariant and irreversible. Other than the work of Dennis mentioned before, just a few bits of Piagetian-adult research have been reported in the literature. Piaget and Inhelder (1962) mentioned briefly in the preface to their French-edition book a study in Geneva by de Ajuriaguerra, Müller, and Mandl. These investigators gave a series of the traditional conservation tasks (number, substance, etc.) to a group of "seniles"

and found evidence that these abilities disintegrate in reverse order of their formation in childhood. Another study, at the University of Montreal, found a striking decrement in performance on a conservation-of-surface task in an aged group, as compared with two groups of younger adults (Sanders, Laurendeau, & Bergeron, 1966).

Following from the discussion earlier in this review, it is proposed that one underlying construct to account for poor performance in these kinds of tasks is that of egocentrism, or the inability to effectively decenter one's thoughts and perceptions. The concept of egocentrism, however, at least in the Genevan sense of the word, is simply not to be found in the literature on maturity and old age. A perusal of the indexes of all available texts and other sorts of compendia on old age by the present author revealed only a single reference to "egocentrism." Cameron (1967) investigated the relationship between "introversion" and "egocentrism" among the aged, but his definition of the latter concept was "having to do with one's wants and needs" (p. 465), which is a meaning quite different than that employed by child psychologists.

One concept which is often discussed with regard to old age, and which may be similar to the egocentrism concept, is that of rigidity. Unfortunately, the many different writers who have employed the term "rigidity" all seemed to have been using a somewhat different definition. The result has been a confusing array of research methodologies and data

interpretations. Of the population of definitions of rigidity, the following is a representative sample: the inability to change one's set when the objective conditions demand it (Rokeach, 1948); a restricted range of behavior (Wolpert, 1955); adherence to present performance in an inadequate way (Goldstein, 1943); the presence of strong boundaries between mental functions (Lewinian theory; e.g., Kounin, 1941); a lack of change of behavior, where a change is necessary for success at the task, and where the subject knows that a change is likely to be demanded (Chown, 1961); a tendency to persevere and resist conceptual change, to resist acquisition of new patterns of behavior, to refuse to relinquish old and established behavior patterns (Schaie, 1958).

The typical research procedure for studying rigidity in old adults has been to administer some sort of test of rigidity (such as the Test of Behavioral Rigidity; Schaie, 1955) and obtain correlations with various kinds of problem-solving tasks. As Chown (1961) pointed out, however, there are over 50 tests that have been used by different investigators as measures of rigidity. The relationship among these tests is largely unknown.

Seemingly there might be a relationship between the concepts of rigidity and egocentrism. For example, in one report of a study of rigidity and problem solving in the aged the following observation was made: "Overcoming the influence of a problem-solving set involves the ability to change one's

approach or point of view" (Heglin, 1956). This sounds very much like the operation of the decentering process, which is essential to the overcoming of childhood egocentrism. Yet this remains a verbal link; no empirical link between rigidity and egocentrism exists at the present time. Until a consensus is reached on the delineation of the rigidity construct, and until more comparable research methodologies are used in the investigation of "rigid" behaviors of the elderly, little fruit is likely to be gained from this particular line of endeavor.

On occasion the criticism is raised that the findings of lowered performance in old age are not generalizable because the subject samples used in the research were not representative of the elderly portion of the population. It may be possible, it is argued, that the poor performance often found is a function of institutionalization or some other detrimental factor inherent in the immediate environmental circumstances. Schale and Strother (1968a, 1968b) were able to test extensively 50 aged persons (25 males, 25 females; mean age 76.5 years) who volunteered for a comprehensive research endeavor. All of these subjects were college graduates and had been associated with universities most of their lives. The testing revealed that some apparent cortical deterioration was extant among this group. Some decrement in flexibility (greater "rigidity") or response speed had occurred since middle adulthood. The maximum decrement, however, in comparison

with the younger reference group, was found on these variables: psychomotor speed, memory, and motor-cognitive rigidity.

These results, obtained from an assessment of a carefully selected and presumably highly motivated sample of advanced age, lent strong support to the proposition that psychological age decrements reported in the literature cannot be criticized or refuted simply by referring to low motivation or to sampling artifacts. As Schaie and Strother emphasized, these persons reported generally satisfying environmental and social conditions, all had a high level of education, and most held professional kinds of positions. Nevertheless, the state of psychological functioning of this group was at best at or slightly below the population average for young adults. Schaie and Strother suggested that these obvious decrements from peak performance were most likely related to some sort of physiological decrement, particularly of a sensory nature, and also to a general slowing down of response speed as well.

Another one of the current views about changes accompanying the aging process is that older individuals tend to dissociate themselves from some part of their environment, particularly that necessitating some form of social interaction. In other words, the individual becomes a willing accomplice in the process of disengagement (Cumming and Henry, 1961). Many factors may lead to this withdrawal from the active social world; changes in health, feelings of energy, and mental sluggishness may all contribute to a limiting condition on

one's interpersonal relationships. Seen in this light, therefore, disengagement seems to be a process of cognitive and affective load-shedding, or perhaps an adaptive constriction of psychological involvement in order to conserve energy and to maintain an optimum balance of demands and rewards.

To extend this discussion a bit further, it may be conjectured that if poorer performance is characteristic of advanced age, perhaps the decrement could be due to this process of reducing one's interaction with others. This would lead to reduced feedback in social interaction situations, and thus one might slip back into egocentric-type speech. This process would appear to be the reverse of the improvement found in children, as discussed by Piaget (1950), George Herbert Mead (1934), and other theorists. In general, they suggested that peer-peer interactions provide opportunities for communication practice, for "verification" of one's perspective (Piaget, 1950), and that feedback in these practice experiences teaches children better and better communication habits.

The disengagement process would also seem to be the reverse of the process concerning the interaction of environmental circumstances with developmental functions, as discussed by J. McV. Hunt (1961). According to his argument, the greater the variety of situations to which the child must accommodate his behavioral structures, the more differentiated and mobile these structures become. Extrapolating these notions to the

circumstances of the aged, perhaps their restricted environments (due to infirmity, expectations, or whatever) will eventuate in less differentiated and less mobile cognitive structures. Botwinick's (1966) suggestion to use "cautiousness" as an explanatory construct in interpreting age-related performance decrement is enhanced by the ideas just presented.

The theory of disengagement is not wholeheartedly acclaimed by all those involved with the psychology of aging. Thus far its value has been more heuristic than practical. It does appear to represent a plausible theoretical starting point for attempting to describe and explain psychological decrements occurring with advancing age. Nevertheless, with due credit given to Cumming and Henry (1961) for their explicit formulation of this theory, some acknowledgment should be accorded to that individual who first appeared to have recognized the disengagement process at work. In the autumn of his life G. Stanley Hall made the following observation:

Now that the pressure of outer reality and its duties remit, attention tends more to focus on self and introspective and mentation may take on a slightly dreamy character in that it is less under the domination of the objective environment, from which there is a new sense of freedom. The demand for rigorous proof of one's theorizations is somewhat less insistent and critics of them are felt to be lacking in insight. There is a slight shift from inductive to deductive thinking and as the senses begin to grow dim their verification of our speculations seems a trifle less imperative (Hall, 1922, p. 401).

## OBJECTIVES OF THE PRESENT INVESTIGATION

The present investigation represented an attempt to extend to the portion of the human life span labeled "aged" the existing theoretical constructs and research methodologies pertaining to egocentrism, decentering, social interaction, and social communication. Thus far these concepts have been rather extensively studied in child, adolescent, and young adult samples, but only a few of the existing studies of the aged have been even tangentially related to these ideas.

The seminal study for the present work was Cowan's (1966) investigation of egocentrism and social interaction in children. Cowan's design and procedures were adapted in such a way to make them more appropriate for adult subjects, both young and old.

The major questions examined in the present investigation were these:

- (1) How do young adults and old adults compare on a measure of cognitive egocentrism, i.e., an individual measure of the ability to decenter or shift to other perspectives or points of attention?
- (2) What is the comparative performance of pairs of young adults and pairs of old adults in a standardized social interaction or communication task?
- (3) Is egocentrism, as measured in individual subjects, related to performance of these subjects matched into pairs

in a communication dyad situation?

A number of aspects of lesser importance in the social interaction situation were also examined extensively.

To summarize, the basic intent of the present study was to obtain descriptive data from samples of young and old adults engaged in tasks identical or, in some respects, conceptually similar to those used extensively with young and older children. The primary theoretical notion underlying the present study, as well as the earlier studies with children, was that egocentrism is a pervasive mental construct inherently related to both intrapersonal and interpersonal cognitive functioning.

## METHOD

## Subjects

Subjects (Ss) for this investigation consisted of two age groupings, young adults and old adults. The young adults were 46 students enrolled in introductory psychology classes at Iowa State University; no individuals older than 21 years of age were accepted for this group. The old adults were obtained from two sources. Sixteen were residents of a retirement community center located in Ames, Iowa; the remaining 18 were residents of Ames living in the general community. This latter community-residing group was tested at weekly meetings of an organization for retired and elderly citizens. The criterion for inclusion in the old adult sample was age 65 years or older.

Table 1 summarizes the description of the S samples used in this study.

## Procedure and Test Materials

Initially the Vocabulary subtest from the Wechsler Adult Intelligence Scale was administered to all Ss. This instrument was intended to be used as a rough mental screening device; however, no Ss were eliminated from further participation in the study on the basis of these scores. The vocabulary scores were retained and used in the final data analysis as covariates.

Table 1. Description of subject samples

| Characteristic               | Young Adults | Old Adults <sup>a</sup> |                     |
|------------------------------|--------------|-------------------------|---------------------|
|                              |              | Retirement Center       | Community Residents |
| Sex: Males                   | 28           | 2                       | 6                   |
| Females                      | 18           | 14                      | 12                  |
| Age Range (years)            | 18 to 21     | 66 to 91                | 67 to 91            |
| Mean Age (years)             | 18.85        | 77.38                   | 76.94               |
| Standard Deviation           | 0.97         | 10.22                   | 7.21                |
| Mean Education Level (years) | -            | 14.41                   | 11.08               |
| Standard Deviation           | -            | 3.31                    | 2.96                |

<sup>a</sup>The mean age for the old adults combined was 77.15 years (SD=7.46); the mean educational level for the combined group was 12.65 years (SD=3.51).

Cognitive egocentrism, or the ability to decenter, was measured with a variant of a task used by Piaget and Inhelder (1956) and Cowan (1966, 1967). The task, originally used with children, was adapted to make it more appropriate for adult Ss. Each S, tested individually, was seated at a table opposite to the investigator (E). A pictorial illustration of this arrangement appears in Figure 1. Lying on the table between S and E was a five-by-six matrix board on which appeared six large red dots arranged in a particular fashion. Directly in front of S was another board which had four smaller five-by-six matrices; each of these smaller matrices contained either a replica or a variant of the red-dot arrangement of the large matrix. The following instructions were given to S: "What I want you to do is carefully examine

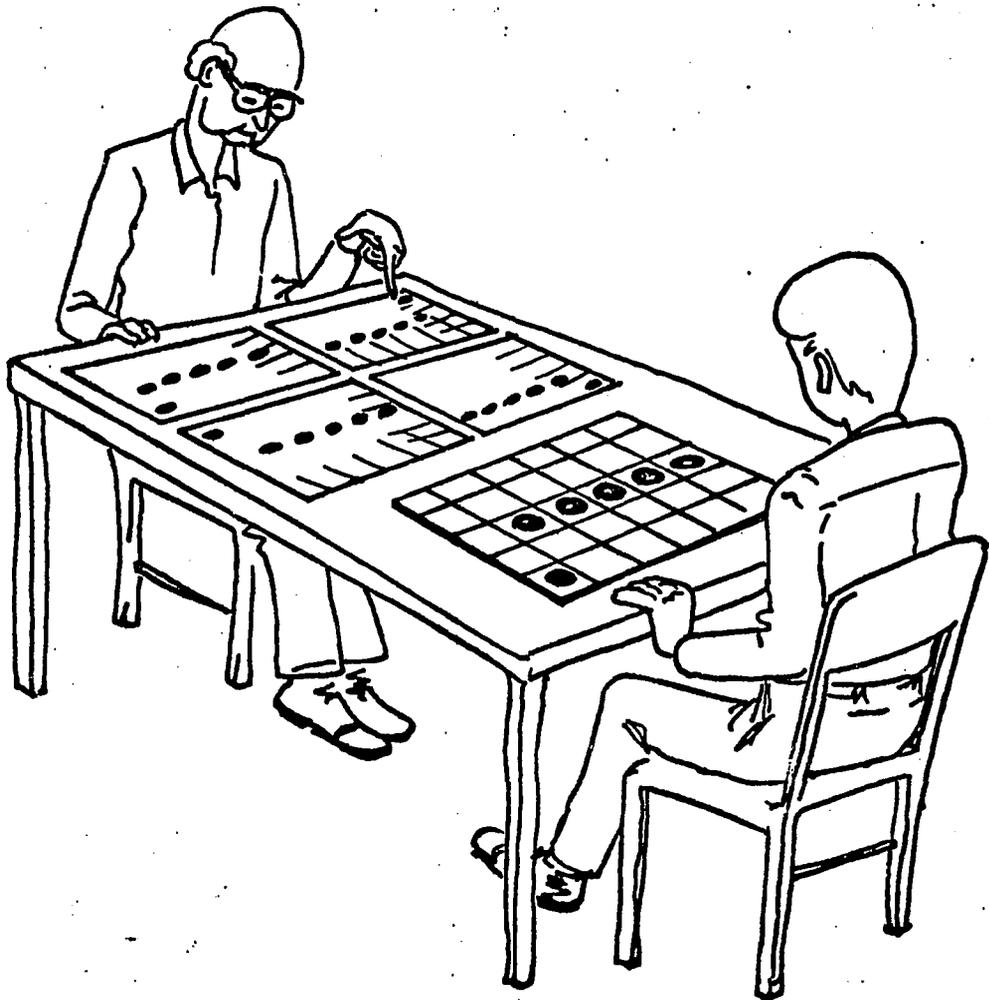


Figure 1. The Egocentrism Task

this large pattern between us. Then look at the four patterns directly in front of you; select the one which shows this large pattern as I see it on my side of the table. In other words, I want you to put yourself mentally in my position and pick out that arrangement which I see. I want you to pick out my point of view. Do you understand what I want you to do?" If S gave indication that he did not understand, the instructions were repeated. S was also encouraged to repeat the instructions in his own words in order to insure complete understanding.

There were ten of these items included in the Egocentrism Task. Thus each S received a score in the range from zero to ten. The ten test patterns appear in Appendix A. A copy of E's scoring sheet can be found in Appendix B.

On the basis of the scores received on the Egocentrism Task Ss were matched into three kinds of pairs within each age group. Ss who received scores in the zero-to-five range constituted the "Lo" Ss; those receiving scores in the six-to-ten group were the "Hi" Ss. Thus the three kinds of pairs derived from these two groups of Ss were Lo-Lo, Hi-Lo, and Hi-Hi. There were no mixed-sex pairs: all were either male-male or female-female. In composing the Hi-Lo pairs, a difference of at least four had to exist between the scores of the members on each pair.

Each of the pairs was then placed into the social interaction situation (this generally took place a few days after the initial egocentrism and WAIS Vocabulary scores were

obtained). The basic intent of the Social Interaction (SI) Task was to look for ways by which Ss implied, or failed to imply, that they were aware of each other's point of view. This task was essentially identical to that employed by Cowan (1966, 1967) in his studies with children.

The two Ss in a matched pair were seated back-to-back at card tables. On each of the tables were identical felt-cloth "boards" which were arranged as four-by-four matrices. A schematic representation of this situation appears in Figure 2, and a pictorial illustration of the task appears in Figure 3.

The top eight squares on each board were colored yellow and the bottom eight squares were colored red. To the side of each S was a small table on which was placed a set of 16 objects. Both Ss received identical sets of objects. A list of the objects included in these sets appears in Table 2.

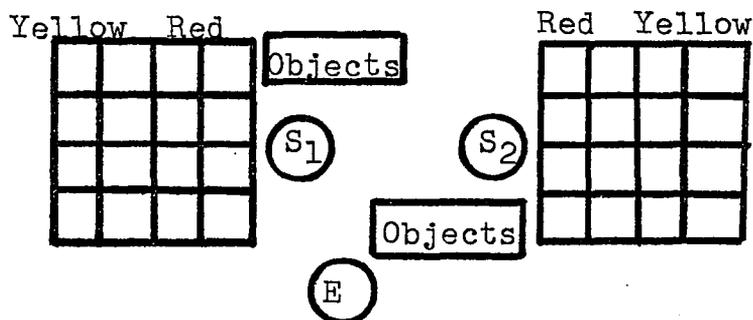


Figure 2. A bird's-eye view of the Social Interaction Task

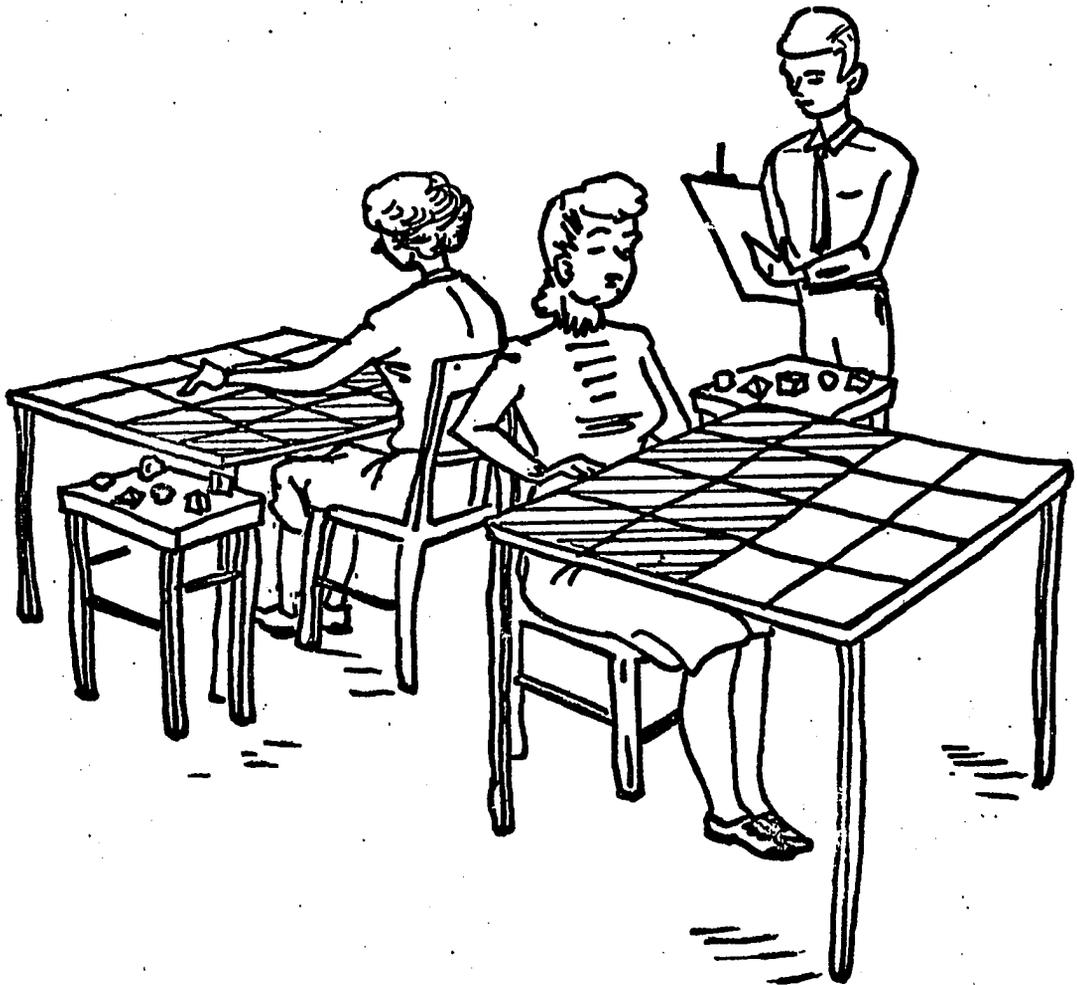


Figure 3. The Social Interaction Task

Table 2. Objects employed in the Social Interaction Task

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|   |                              |
|---|------------------------------|
| 1. yellow felt square                                 | 8. matchbook                 |
| 2. red felt square                                    | 9. blue poker chip           |
| 3. small metal can                                    | 10. small red wire           |
| 4. cardboard pattern,<br>random shape #1              | 11. large paper clip         |
| 5. cardboard pattern,<br>random shape #2              | 12. small paper clip         |
| 6. cardboard pattern,<br>random shape #3 <sup>a</sup> | 13. cuff link                |
| 7. pipe cleaner                                       | 14. white magnetic tape clip |
|   | 15. bolt                     |
|   | 16. penny                    |

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<sup>a</sup>Illustrations of the three random shapes appear in Appendix C.

It was assumed that the objects differed in their "codability", i.e., how easily they could be described to another person. Some of the objects were familiar items and thus easily labeled (e.g., penny, matchbook); some objects were of the same class or category but varied in one attribute (e.g., red and yellow felt squares, small and large paper clips); some were assumed to be difficult to label or describe (e.g., tape clip, random shapes).

The instructions to the pair of Ss were as follows: "For this task you may not turn around to look at your partner. What you are to do is take the objects you have and place them in the squares on the board in front of you. One object is to go in each square. The real objective, however, is that when you are finished, I want your boards to end up looking the same. OK, you may begin." The instructions were deliberately made to be ambiguous; "the same" arrangement

of objects was not defined any further. Essentially the only restriction put upon Ss was that they could not turn around to look at each other's work; nothing was said about verbal communication. The task was of such a nature that verbal communication had to be used in order to achieve the objective given to Ss in their instructions.

The actions of Ss were noted by E during the course of the task. Also, the verbalizations of selected pairs were tape-recorded. There were two principal measures. One was "communication efficiency," or the total number of the 16 objects that were placed in identical cells in the Ss' respective boards. For scoring purposes "identical" was decided to be identical relative to each S's body (e.g., in the lower left-hand corner relative to each S). According to Cowan's (1969) criterion, mirror images were counted as incorrect unless explicit recognition of this problem was made by both members of the pair. The other principal measure was the total time required by the pair to complete the task. The time interval began at the end of the formal instructions and ended when Ss agreed with each other that they were finished placing the 16 objects to their satisfaction. Time was recorded without Ss' awareness of this fact. Other descriptive measures of the communication system which developed between the two Ss were also noted. These included the following: (a) the occurrence of metacommunication (discussion about how they were going to talk to each other) before starting to place the

objects; (b) the manner of object placement (systematic, random, etc.); (c) the first objects to be placed by mutual agreement; (d) the last objects to be placed. A copy of E's scoring sheet for the SI Task can be found in Appendix D.

## RESULTS

The results of the WAIS Vocabulary subtest appear in Table 3. As can be seen, the young adult (YA) mean score was higher than the mean score of the combined old adult (OA) group. This difference was significant ( $t = 2.59$ ,  $df = 78$ ;  $p < .01$ ). The mean score on this subtest for the retirement-center OA group was 53.25 ( $SD = 11.25$ ), and the mean score for the community-residing OA group was 46.44 ( $SD = 10.45$ ). This difference did not reach significance ( $t = 1.77$ ,  $df = 32$ ).

Table 3. Summary of WAIS Vocabulary subtest results

| Group        | Mean  | Standard Deviation |
|--------------|-------|--------------------|
| Young Adults | 55.35 | 8.20               |
| Old Adults   | 49.65 | 11.20              |

The results of the Egocentrism Task are presented in Table 4. The difference favoring the YA group on this ten-item test was highly significant ( $t = 8.25$ ,  $df = 78$ ;  $p < .001$ ). Looking at the OA sample alone, the mean score of the retirement-center group was 4.88 ( $SD = 2.13$ ); the community-residing group mean was 3.89 ( $SD = 3.23$ ). This difference was non-significant ( $t = 1.01$ ,  $df = 32$ ).

Following the criteria stated earlier, Ss' performance on the Egocentrism Task permitted the formation of the following

Table 4. Summary of Egocentrism Task results

| Group        | Mean Score | Standard Deviation |
|--------------|------------|--------------------|
| Young Adults | 6.33       | 3.66               |
| Old Adults   | 4.35       | 2.77               |

numbers of pair combinations for the SI Task: Hi-Hi -- 11 YA pairs and 4 OA pairs; Hi-Lo -- 6 YA and 6 OA; Lo-Lo -- 6 YA and 7 OA.

The two variables of major interest in the SI Task were "communication efficiency," or the number of identical placements of the 16 objects by each pair, and the time required to complete the task. A summary of the results on these two variables appears in Table 5; these results are presented graphically in Figures 4 and 5.

Table 5. Summary of major Social Interaction Task results

| Pair Combination | Group | Mean Number Identical Placements | Mean Time Required for Task Completion (seconds) |
|------------------|-------|----------------------------------|--|
| Hi-Hi            | Young | 13.82                            | 285.1  |
|                  | Old   | 12.00                            | 512.5  |
| Hi-Lo            | Young | 12.33                            | 244.3  |
|                  | Old   | 12.67                            | 484.9  |
| Lo-Lo            | Young | 15.50                            | 212.0  |
|                  | Old   | 8.86                             | 576.7  |

Table 6. Analysis of variance: SI identical placement scores

| Source                   | SS     | df | MS   | F    |
|--------------------------|--------|----|------|------|
| Age                      | 88.5   | 1  | 88.5 | 3.33 |
| Pair Combinations        | 12.5   | 2  | 6.3  | 0.24 |
| Age x Pair Combinations  | 79.8   | 2  | 39.9 | 1.50 |
| WAIS Vocab. Covariate #1 | 0.1    | 1  | 0.1  | 0.00 |
| WAIS Vocab. Covariate #2 | 19.7   | 1  | 19.7 | 0.74 |
| Error                    | 851.2  | 32 | 26.6 |      |
| Total                    | 1051.8 | 39 |      |      |

Note -- Due to the regression analysis used, it was not possible to combine the two WAIS Vocabulary covariates into one effect. Thus, the first covariate refers to the higher Vocabulary score in each subject pair, and the second refers to the lower score.

Table 6 presents the variance analysis of the SI identical-placement scores, and Table 7 presents the analysis of variance of the time-requirement scores from the SI Task. These analyses indicated that the only significant effect was age in the time-requirement analysis: Old adults required more than twice the time to complete the task then did young adults. No other effect or interaction reached statistical significance. Thus, it is of importance to note that the three forms of pair combinations were not differentiated with regard to communication efficiency or time required to complete the SI Task. The mean scores for all YA pairs on identical placement and the time requirement were, respectively, 13.87

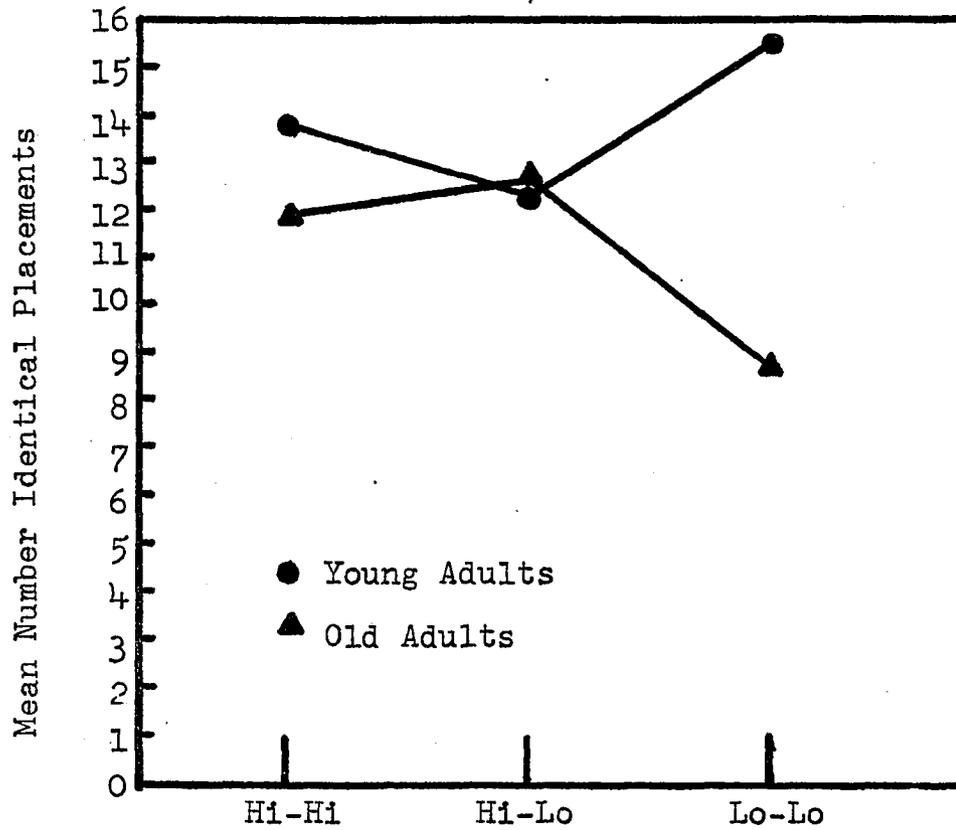


Figure 4. Mean number of identical object placements for subject pairs in the Social Interaction Task

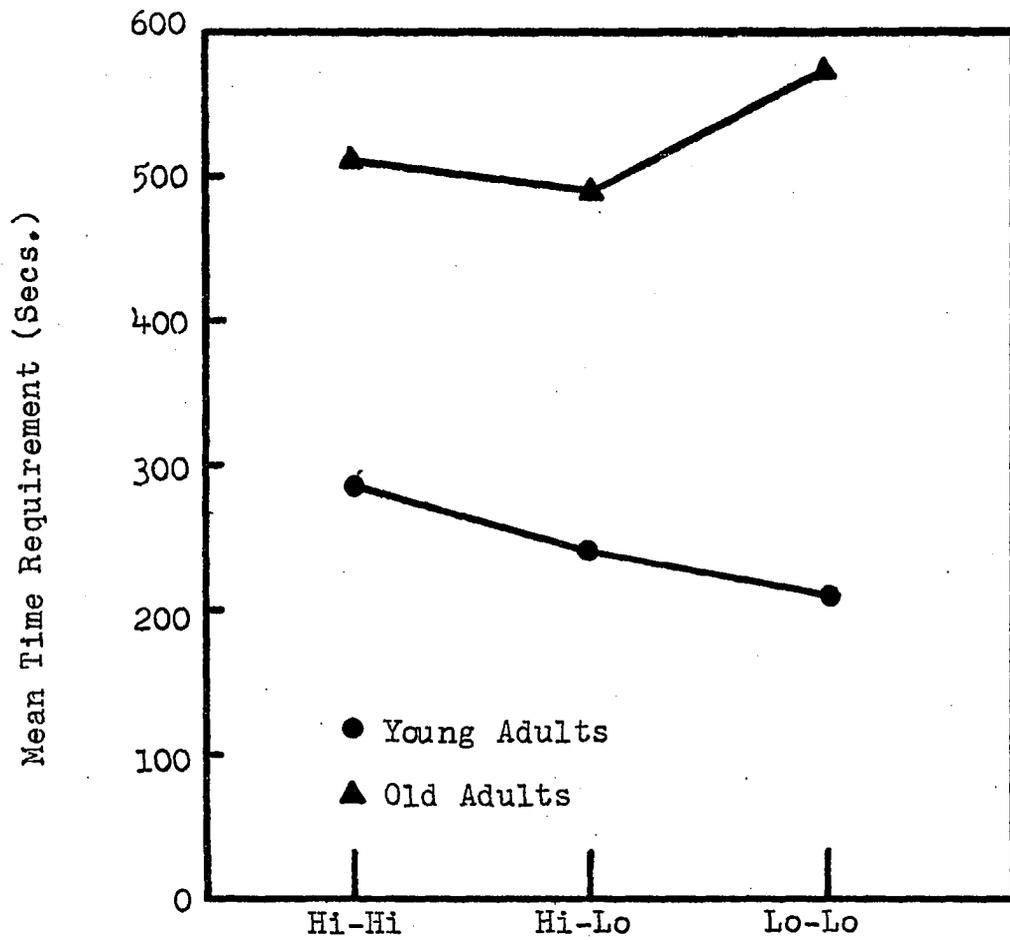


Figure 5. Mean time required to complete the Social Interaction Task by subject pairs

Table 7. Analysis of variance: Time required to complete SI Task

| Source                   | SS        | df | MS      | F      |
|--------------------------|-----------|----|---------|--------|
| Age                      | 429,351   | 1  | 429,351 | 20.77* |
| Pair Combination         | 10,097    | 2  | 5,048   | 0.24   |
| Age x Pair Combination   | 21,846    | 2  | 10,923  | 0.53   |
| WAIS Vocab. Covariate #1 | 10,677    | 1  | 10,677  | 0.52   |
| WAIS Vocab. Covariate #2 | 6,664     | 1  | 3,664   | 0.18   |
| Error                    | 661,355   | 32 | 20,667  |        |
| Total                    | 1,136,990 | 39 |         |        |

\*  $p < .001$ .

and 255.39 (secs.); the comparable scores for all OA pairs were 10.94 and 529.18 (secs.).

Table 8 presents the intercorrelations among selected variables from the SI Task and the WAIS Vocabulary covariates. With regard to the two primary dependent variables, these correlations are in agreement with the analysis of variance results presented earlier: There was a substantial, significant correlation between the time-requirement scores and the age groups (older Ss performed this task considerably more slowly than young Ss), and there was a small, nonsignificant correlation between the identical-placements scores and age. As can be noted from the table, the two dependent variables intercorrelated lowly and at a nonsignificant level (-.20).

Table 8. Intercorrelations among selected Social Interaction Task variables and the WAIS Vocabulary covariates

| Measure                     | 1     | 2    | 3     | 4    |
|-----------------------------|-------|------|-------|------|
| 1. Age                      |       |      |       |      |
| 2. Identical Placements     | .28   |      |       |      |
| 3. Time Requirement         | -.71* | -.20 |       |      |
| 4. WAIS Vocab. Covariate #1 | .13   | .04  | -.24  |      |
| 5. WAIS Vocab. Covariate #2 | .56*  | .07  | -.48* | .46* |

Note - N = 40

\*  $p < .01$ .

The moderately high correlation between age and the second vocabulary covariate is best accounted for by considering the substantial correlation between that covariate and the time-requirement variable. The proportions of variance involved in these relationships are explained by the high correlation between the two variables common to them -- age and time.

During the course of the SI Task with each pair of Ss, the investigator recorded several observations concerning the mode of operation employed by the pair. One such observation was concerned with the manner by the pair placed the objects on the squares in front of them. The most efficient strategy appeared to be one in which objects were placed in some sequential order, i.e., across rows or up and down columns.

This type of strategy eliminated the need to establish coordinates each time a new object was placed; each S understood that each new object was to be placed in the cell adjacent to the cell in which the last object was placed. In contrast to this systematic strategy was a procedure used by some pairs that was essentially random: There was no relationship between the placement of one object and the placement of the next. Table 9 presents a tabulation of the

Table 9. Frequency of employment of efficient object-placement strategies

| Pair Combination | Young Adults | Old Adults | Total | Percentage |
|------------------|--------------|------------|-------|------------|
| H1-H1            | 7/11         | 2/4        | 9/15  | 60%        |
| H1-Lo            | 3/6          | 2/6        | 5/12  | 42%        |
| Lo-Lo            | 4/6          | 3/7        | 7/13  | 53%        |
| Total            | 14/23        | 7/17       |       |            |
| Percentage       | 61%          | 41%        |       |            |

Note - Each fraction represents the number of pairs using an efficient strategy over the total number of pairs in that group.

frequency of employment of these "efficient" (or systematic) strategies as opposed to any other kind of strategy. As can be noted, the pair combinations evidenced no systematic trend in the use of efficient strategies, although young adults used them more frequently than old adults. When both age groups were pooled together, no systematic trend was found across the

three pair combinations with regard to the frequency of employment of efficient strategies ( $X^2 = 1.00$ ,  $df = 2$ ).

Another observation made was concerned with the occurrence of metacommunication before either S in a pair began placing objects in the cells. In other words, did Ss recognize that it was necessary to establish some sort of verbal communication system in order to solve this task, and, consequently, did they discuss this matter with each other before they set out placing the objects? Table 10 presents these results.

Table 10. Frequency of occurrence of initial metacommunication

| Pair Combination | Young Adults | Old Adults | Total | Percentage |
|------------------|--------------|------------|-------|------------|
| Hi-Hi            | 4/11         | 3/4        | 7/15  | 47%        |
| Hi-Lo            | 4/6          | 1/6        | 5/12  | 41%        |
| Lo-Lo            | 6/6          | 2/7        | 8/13  | 62%        |
| Total            | 14/23        | 6/17       |       |            |
| Percentage       | 61%          | 35%        |       |            |

Note - Similar to Table 9, each fraction here represents the number of pairs in which metacommunication occurred before the placement of objects over the total number of pairs in that group.

It can be seen that again no systematic relationship occurred across the pair combinations, but that considerably more YA pairs engaged in this preliminary communication than did OA pairs. When the age groups were collapsed together, still no

systematic trend was found across pair combinations with regard to the occurrence of this initial metacommunication ( $\chi^2 = 1.09$ ,  $df = 2$ ).

A final observation recorded during the course of the SI Task concerned the order in which each of the 16 objects were placed. It can be hypothesized that those objects which can be most easily labeled or verbally described would be placed first, and those objects which are most difficult to describe would be put off until last (when there are fewer degrees of freedom remaining in the matrix of cells). Table 11 presents these observations. The observations in this table are pairs; that is, the data in each column represent the number of pairs who made that particular object as one of their first, middle, or last placements. As can be observed from the table, the yellow and red felt pieces were by far the most common first placements, and the can and the three random shapes were far and away the most frequent objects to be placed last. However, it is to be noted that the high frequency of final placement of the can is accounted for by the fact that the other 15 objects were initially contained in the can; thus, the can was, in most cases, the last object "available" for placement.

Table 11. Order of object-placement frequencies

| Object                         | Placement Order <sup>a</sup> |        |      |
|--------------------------------|------------------------------|--------|------|
|                                | First                        | Middle | Last |
| yellow felt                    | 24                           | 14     | 2    |
| red felt                       | 28                           | 17     | 5    |
| can                            | 4                            | 12     | 24   |
| random shapes (3) <sup>b</sup> | 10                           | 63     | 47   |
| pipe cleaner                   | 5                            | 31     | 4    |
| matchbook                      | 14                           | 24     | 2    |
| poker chip                     | 9                            | 31     | 0    |
| red wire                       | 2                            | 30     | 8    |
| large paper clip               | 3                            | 37     | 0    |
| small paper slip               | 2                            | 34     | 4    |
| cuff link                      | 8                            | 31     | 1    |
| tape clip                      | 1                            | 30     | 9    |
| bolt                           | 1                            | 35     | 4    |
| penny                          | 6                            | 32     | 2    |

<sup>a</sup>"First" indicates inclusion in one of the first three object placements; "Middle" indicates inclusion in one of the middle ten placements; "Last" indicates inclusion in one of the last three placements. These frequencies are summed over the total 40 subject pairs.

<sup>b</sup>The orders of placements for the three random shapes have been combined. Thus, these frequencies are three times the magnitude of those for the other objects.

## DISCUSSION

With regard to the three questions of major concern in this study, the data have provided the following information: (1) young adults scored significantly higher than old adults on a test of the ability to decenter (or, in a reverse sense, young adults were lower than old adults on a measure of egocentrism); (2) the accuracy of performance of young adult pairs and old adult pairs on a verbal communication efficiency task did not significantly differ, although old adults required twice the time to complete the task as did young adults; (3) pairs formed on the basis of their members' egocentrism scores differed neither systematically nor significantly in their performance on the communication efficiency task. Additional findings were that young adults tended more often than old adults to use efficient, systematic strategies in the communication task, that young adult pairs tended more often than old adult pairs to engage in some form of initial strategy discussion (metacommunication), and that pair combinations formed on the basis of individual Ss' egocentrism scores produced no differential results on any of the measures studied. Also, it was demonstrated that the objects used in the SI Task seemed to differ in difficulty of being labeled or described and/or the likelihood of being selected first for employment in the task.

Obviously this study did not provide a definitive

delineation of the factor called "egocentrism". The ten-item egocentrism test was similar to tests employed originally by Piaget and later by Cowan; these tests were designed to measure the ability of the child to shift perspectives, to "take the point of view of someone else." It is possible that this ability may be better regarded as some form of perceptual skill, or, in the case of adults and the elderly, perhaps the concepts of rigidity or disengagement are more useful. This kind of question calls for a factor analytic study cast into the cross-sequential model for developmental research proposed by Schaie (1965; Schaie & Strother, 1968c) and Baltes (1968). Nevertheless, it was demonstrated quite clearly in the present study that this Piagetian test of egocentrism, heretofore employed only with children, markedly differentiates groups of young and old adults. It is of interest to note that not a single elderly S in the present study obtained the full score of ten, while this was a frequent score among the young adults. (Only two old adults achieved a score of nine.) The most frequent kind of error on the Egocentrism Task, for both young and old, was that in which the individual selected the pattern that was a replica of his own perspective (the pattern would have to be rotated 180 degrees to be correct). However, older Ss also tended to make many more errors that are best described as random, while this kind of error was essentially non-existent in younger Ss.

The finding that Ss' egocentrism scores were not related

to their performance in the SI Task merits further consideration. As stated earlier, the combination of pairs of children on the basis of egocentrism scores produced marked effects in the social tasks of Cowan's studies (1966, 1967). Apparently, therefore, adults displaying a low level of decentering ability are not hindered by the same deficiency in such tasks as the communication dyad employed in the present study. Perhaps an adult's long experience in verbal communication situations is too powerful an effect to be significantly countered by poor decentering ability, at least as the latter factor is measured in an individual setting. In the Egocentrism Task, in which S was requested to pick out the pattern illustrating the examiner's point of view, whatever response S gave was accepted without question. (It might be mentioned that many Ss looked up expectantly at the examiner after making a response, apparently hoping for some sort of confirmation.) In the SI Task, however, the verbal interaction quickly brought into focus any conflict in viewpoints, and the following interchange generally resolved the disparity. This situation would seem to be similar to everyday interactions in social settings. It may be that, for the adult (whether young or old), the experience of many years in communicating with other persons develops basic abilities of recognizing another's point of view and of defending one's own point of view with logic and clarity. In situations where social interchange and correction do not take place, more primitive modes of functioning may be allowed

to operate.

The highly egocentric child, as opposed to an adult who scores poorly on a test of egocentrism, has not yet learned that other people are not as tolerant of his inconsistencies as he is himself. The nonegocentric child, on the other hand, is likely to perform well in the SI Task because of his comparatively more advanced stage of mental functioning and, consequently, because of his greater awareness of the workings of social interchange. It could follow that an adult, regardless of his performance on an individual test of egocentrism, has learned to rely on various forms of feedback from his receiver in order to assess the effectiveness of his communication. In contrast, an egocentric child has not yet learned to develop these dependencies on his communication partner, nor has he developed a concern over his communication effectiveness.

This line of reasoning provides an explanation, however adequate, as to why an egocentrism measure obtained in an individual situation is related to the performance of a child in social situations, but not to that of an "egocentric" adult. To an egocentric child, these situations are not different in any important sense. The present study, in combination with similar studies with children, gives strong support to the notion that apart from the more commonly stressed affective side of social interaction, there is an important cognitive component.

The results of the SI Task appear to be in line with much of the bulk of gerontological research: Old adults, in comparison with young adults, perform at about the same level of accuracy but at a much slower pace. As Botwinick (1970) has pointed out in his recent discussion of "geropsychology," the older literature that emphasized increasing deficit with age in verbal learning and many other sorts of functioning has been increasingly called to challenge. The basis of this challenge is the growing evidence indicating that the observed deficit may have been one of performance rather than something more basic to the individual, such as learning ability. The general technique used to test this challenge consists of varying stimulus presentation rates and comparing Ss under conditions varying in pace. The central idea behind this technique is that the commonly used rates of stimulus presentation unfairly impose performance limitations on the elderly. Botwinick (1970) has cited several recent studies that have supported this speed-performance notion.

The present study was not directly concerned with learning ability, but it was concerned with performance in a situation where speed was not crucial in the completion of the task. (The time required to complete the task was recorded without the Ss' awareness of this fact.) It thus may be assumed that Ss worked at their natural, preferred "operating speeds." To speak in generalities, young Ss tended to attack the problem with great vigor and a sense of certainty as to how the task

was to be achieved. In fact, a number of the younger Ss displayed what appeared to be impulsive behavior in their own placement decisions and in responding to the decisions made by their partners. This seemed especially true for the younger Lo-Lo Ss (note that these pairs recorded the fastest mean times to completion). The older S pairs, on the other hand, seemed far less certain as to what the task was all about and what was expected of them. They certainly were not "test wise," which the younger college S unquestionably were. (In considering the great time differential between the two groups, it is well to keep in mind that many of the college adults had taken part in several psychological experiments. For the most part, they constituted a well-trained group of research participants.) Thus, the behavior of the typical older pair could be characterized as cautious and uncertain. Furthermore, this indecisiveness was prominent not only in the initial stages of their work, but also it carried through to the last of the 16 object placements. They never seemed quite sure what the task was all about.

The slow responding of older Ss is suggestive of the response characteristic of "cautiousness," discussed and researched in recent years by Botwinick (1966, 1969) and Silverman (1963). This factor is essentially one of disinclination toward making decisions and taking actions. Botwinick (1969) has further suggested that what at first may appear to be cautiousness in actuality may be an interest in avoiding the

need to make decisions in the first place (and the need to avoid making decisions in the first place may be conceptualized as an aspect of disengagement). At any rate, the older Ss' general approach to the SI Task in the present study was certainly conservative and cautious. Nevertheless, the author believes it is important to underscore the fact that, despite the two markedly different approaches to the problem displayed by the two age groups, the objective performances were essentially the same.

The behavioral patterns established by individual pairs in the SI Task were, for the most part, complex interchanges that defied objective recording. Certainly the peculiarities and unique aspects of the communication system established between the members of a pair were not reflected in such measures as "total number of identical object placements" and "time required for completion of task." Because of the behavioral richness existing in interactions such as those occurring in this study, it may be worthwhile to describe a number of specific observations taken from individual pairs. It is hoped that such comments will provide greater insight into the kinds of behaviors displayed. These observations have been listed by number, but the listing is not intended to imply that these comments constitute the totality of unique behaviors exhibited. The following are only some of the more notable incidental observations recorded by the investigator.

- (1) One pair of older Ss decided to arrange the objects in the cell rows according to categories of objects. The categories employed were "paper things," "metal things," "red and white things", and "odds and ends." This strategy produced a low score because a check was not made to ascertain which objects were in which cells within each row. Only these groups of objects were discussed, never individual objects.
- (2) A few members of the older pairs appeared to get quite upset with their partners. This was typically due to their partners' slowness, lack of feedback comments (such as "OK," "I understand you," etc.), incomprehension of instructions, and refusal to place objects in corresponding places. One pair of older male Ss came to the realization that they did not agree on several of their placements. One of the men suggested to his partner to change his in order that correspondence would be achieved. The partner offered the counter suggestion that he (the first man) change his instead. Both sat silently and stubbornly after that exchange, and the needed changes were never made.
- (3) Several instances of "verbal pointing" occurred in both young and old pairs. This amounted to making gestures in the air with one's hands or giving

vague, nondirectional instructions. Flavell (1966) and Glucksberg and Krauss (1967) have commented on the frequency of the verbal-pointing phenomenon in young children when addressing a listener not visible. The present study suggested that it is not uncommon in adults as well. A number of Ss employed elaborate hand gestures to "describe" the various random shapes to their partners. One older female S often held up an object over her shoulder and asked her partner: "Do you have one of these?" or "Is this the one you mean?" Other representative comments were the following: "Take the piece with the horizontal line on the edge....on the edge"; "Put it right down there."

- (4) The investigator gained the impression that older Ss, as a rule, found it more difficult to describe many of the objects than did younger Ss. Younger adults seemed to be much more able to produce a verbal label which would be sufficient for partners to quickly recognize the referent object. Furthermore, older Ss tended to take greater pains in describing each object in elaborate (and generally unnecessary) detail. This, of course, partially accounted for the much longer time needed by older pairs to complete the task. Younger pairs engaged in far less discussion of the task in general and the objects in

particular; these people appeared to be more certain that their partners understood the strategy and the referents.

- (5) Older Ss appeared to be more concerned that both members of the pair took part in the decision making. Frequently they insisted that each member alternate in deciding where to place the next object. In contrast, younger pairs often allowed one person to dominate and make all decisions; this procedure was generally the fastest and most efficient. (One pair of older women spent a considerable amount of time arguing as to whose turn it was to make the next decision.)
- (6) A number of older pairs held the idea that the task of "making the boards end up looking the same" required that each object also had to be oriented in a certain way within each cell on the matrix. This, of course, also tended to consume much more time. Concern about within-cell orientation of objects was displayed by none of the young adult pairs.
- (7) The labels supplied to many of the objects were intriguing and, in many cases, surprisingly effective. This held true especially for the random shapes. For example, Shape #1 (see Appendix C) was occasionally labeled a "king's crown," and Shape #2 even more

frequently was called a "staircase." On one occasion Shape #2 was called a "bat." Shape #3 was never supplied with a label; it was usually placed after the other two were accounted for. It is interesting to note that most all pairs, both young and old, were able to place successfully all three random shapes.

- (8) The performance of one of the older female Ss (a "Hi" S) suggested that egocentric behavior was not necessarily limited to those who scored low on the test of egocentrism. This woman had several years of graduate education, was a former university faculty member, and appeared to be exceptionally alert. She was paired with a woman of considerably less education and general ability (according to the WAIS Vocabulary scores) and whom she knew very well. In describing the random shapes to her Lo partner, this Hi S employed such descriptive comments as the following: "This strange piece has two rather acute angles -- oh, about 75 degrees in each. And this other piece has two angles on the side opposite the right angle, and these are about 120 degrees each." If the ability to decenter implies that the individual recognizes the informational needs of his partner and acts accordingly, then this particular Hi S was behaving in a decidedly egocentric manner.

The complete transcription of the recorded dialog from a young adult Lo-Lo pair engaged in the SI Task appears in Appendix E.

The incidental finding in this study of a significant difference favoring young adults over old adults on the WAIS Vocabulary measure deserves further comment. Longitudinal data (e.g., Bayley & Oden, 1955; Owens, 1966) generally indicate a maintenance or even an increase with increasing age in vocabulary and other stored-information kinds of abilities. Cross-sectional studies, comparing groups of young adults with groups of older adults, have frequently demonstrated higher performance on vocabulary tests by older Ss (cf. Fox & Birren, 1950; Kamin, 1957; Reed & Reitan, 1963). Cross-sectional studies have not been uniformly in agreement, however. Riegel (1959) found that a young group (mean age around 19) had a higher mean vocabulary score than an older group (over 65). The reason for the significant difference favoring the younger group in the present study can be accounted for by a number of factors. The most salient factor appears to be the low scores of the community-residing old adults. An examination of the scores reveals that the retirement-center group performed more nearly like the young adults than did the community residents. The investigator gained the general impression that the members of the retirement-center group were generally more able than the community-residing group. The difference in educational level, of course, also suggested this possibility.

The initial ability level of the individual appears to be a crucial factor in the maintenance of ability over the life span. At least two studies (Birren & Morrison, 1961; Foulds & Raven, 1948) have demonstrated that, at least into the middle of the seventh decade of life, the initially more able person continues to be more able than his contemporaries of similar age. Other factors contributing to this vocabulary difference are likely to be the unrepresentativeness of the young adult group, qualitative educational differences between the two age groups, and the restrictions of the Vocabulary subtest of the Wechsler scale.

As a final note on the present study, a comment should be made concerning the representativeness of the S samples used. It would appear that all research in psychology, regardless of the phylum under study, suffers from this problem. In human gerontological research, however, problems of sample representativeness are amplified to seemingly monumental proportions. What, for example, is the typical 80-year-old sample like? [At a recent conference on life-span psychology the implication was made in one paper that the typical 80-year-old human being is dead (Comalli, 1969).] Riegel and his associates (1967) have illustrated quite convincingly that the composition of samples of old adults changes systematically in test-retest situations. The initially less able tend to drop out and be unavailable for retests; consequently, the more able are over-represented in the higher age brackets. It is impossible to determine the

extent of the dropout problem in studies such as the present, but it may be assumed to exist at least to a comparable extent.

The samples for the present study were obtained on the basis of expediency only. In this respect, this study is no different than the great majority of gerontological research endeavors. Nevertheless, it is important to recognize that expediency generates several obvious, and probably several not so obvious, questions. To list a few: Ss' level of health and its effect upon test performance; geographic stability and its relation to S availability; the relationship between cooperativeness (or the lack of it) and volunteerism in elderly Ss; differences among persons residing in institutions, retirement homes, and the general community; and the unevenness of aged individuals in functioning (i.e., the measured extent of deficit is a function of the specific abilities assessed). Obviously, the items in the preceding list are neither orthogonal nor exhaustive.

One more question suggests itself: What effect does the age of the investigator have upon the results of testing people of greatly different ages?

## REFERENCES

- Alvy, K. T. Relation of age to children's egocentric and cooperative communication. Journal of Genetic Psychology, 1968, 112, 275-286.
- Baltes, P. B. Longitudinal and cross-sectional sequences in the study of age and generation effects. Human Development, 1968, 11, 145-171.
- Bayley, N., & Oden, M. H. The maintenance of intellectual ability in gifted adults. Journal of Gerontology, 1955, 10, 91-107.
- Berlyne, D. E. Recent developments in Piaget's work. British Journal of Educational Psychology, 1957, 27, 1-12.
- Birren, J. E. The psychology of aging. Englewood Cliffs, N. J.: Prentice-Hall, 1964.
- Birren, J. E., & Morrison, D. F. Analysis of the WAIS subtests in relation to age and education. Journal of Gerontology, 1961, 16, 363-369.
- Botwinick, J. Cautiousness in advanced age. Journal of Gerontology, 1966, 21, 347-353.
- Botwinick, J. Cognitive processes in maturity and old age. New York: Springer, 1967.
- Botwinick, J. Disinclination to venture response versus cautiousness in responding: Age differences. Journal of Genetic Psychology, 1969, in press.
- Botwinick, J. Geropsychology. Annual Review of Psychology, 1970, 21, in press.
- Brown, R. Social psychology. New York: The Free Press, 1965.
- Burns, N., & Cavey, L. Age differences in empathic ability among children. Canadian Journal of Psychology, 1957, 11, 227-230.
- Cameron, P. Introversion and egocentricity among the aged. Journal of Gerontology, 1967, 22, 465-468.
- Chown, S. M. Age and the rigidities. Journal of Gerontology, 1961, 16, 353-362.
- Church, J. Language and the discovery of reality. New York: Vintage, 1961.

- Cohen, B. D., & Klein, J. F. Referent communication in school age children. Child Development, 1968, 39, 597-609.
- Comalli, P. F. Age changes in perception. Paper presented at the Conference on Life-span Developmental Psychology, Morgantown, West Virginia, April 30, 1969.
- Cowan, P. A. Cognitive egocentrism and social interaction in children. American Psychologist, 1966, 21, 623. (Abstract)
- Cowan, P. A. The link between cognitive structure and social structure in two-child verbal interaction. Paper presented at a symposium on language development for the Society for Research in Child Development, New York, March, 1967.
- Cowan, P. A. Personal communication, 1969.
- Cumming, E., & Henry, W. E. Growing old. New York: Basic Books, 1961.
- Davis, E. A. The development of linguistic skill in twins, singletons with siblings, and only children from age five to ten years. Institute of Child Welfare Monograph, Serial No. 14. Minneapolis: University of Minnesota Press, 1937.
- Dennis, W. Regression to childhood concepts in old age. American Psychologist, 1948, 3, 308. (Abstract)
- Dennis, W., & Mallinger, B. Animism and related tendencies in senescence. Journal of Gerontology, 1949, 4, 218-221.
- Elkind, D. Piaget's conceptions of right and left: Piaget replication study IV. Journal of Genetic Psychology, 1961, 99, 269-276.
- Elkind, D. Egocentrism in adolescence. Child Development, 1967, 38, 1025-1034.
- Elkind, D., & Scott, L. Studies in perceptual development: I. The de-centering of perception. Child Development, 1962, 33, 619-630.
- English, H. B., & English, A. C. A comprehensive dictionary of psychological and psychoanalytic terms. New York: David McKay, 1958.
- Feffer, M. The cognitive implications of role-taking behavior. Journal of Personality, 1959, 27, 152-168.

- Feffer, M. Symptom expression as a form of primitive decentering. Psychological Review. 1967, 74, 16-28.
- Feffer, M., & Gourevitch, V. Cognitive aspects of role-taking in children. Journal of Personality, 1960, 28, 383-396.
- Feffer, M., & Suchotliff, L. Decentering implications of social interaction. Journal of Personality and Social Psychology, 1966, 4, 415-422.
- Flapan, D. Children's understanding of social interaction. New York: Teachers College Press, 1968.
- Flavell, J. H. The developmental psychology of Jean Piaget. Princeton, N. J.: Van Nostrand, 1963.
- Flavell, J. H. Role-taking and communication skills in children. Young Children, 1966, 21, 164-177.
- Flavell, J. H., Beach, D. R., & Chimsky, J. M. Spontaneous verbal rehearsal in a memory task as a function of age. Child Development, 1966, 37, 283-299.
- Flavell, J. H., Botkin, P. T., Fry, C. L., Wright, J. W., & Jarvis, P. E. The development of role-taking and communication skills in children. New York: Wiley, 1968.
- Foulds, G. A., & Raven, J. C. Normal changes in the mental abilities of adults as age advances. Journal of Mental Science, 1948, 94, 133-142.
- Fox, C., & Birren, J. E. The differential decline of subtest scores of the Wechsler-Bellevue Intelligence Scale in 60-69 year old individuals. Journal of Genetic Psychology, 1950, 77, 313-317.
- Fry, C. L. Training children to communicate to listeners. Child Development, 1966, 37, 675-685.
- Gage, N. L., Leavitt, G. S., & Stone, G. C. The intermediary key in the analysis of interpersonal perception. Psychological Bulletin, 1956, 53, 258-266.
- Glucksberg, S., & Krauss, R. M. What do people say after they have learned how to talk? Studies of the development of referential communication. Merrill-Palmer Quarterly, 1967, 13, 309-316.
- Glucksberg, S., Krauss, R. M., & Weisberg, R. Referential communication in nursery school children: Method and some preliminary findings. Journal of Experimental Child Psychology, 1966, 3, 333-342.

- Goldstein, K. Concerning rigidity. Character and Personality, 1943, 11, 209-226.
- Hall, G. S. Senescence. New York: Appleton, 1922.
- Heglin, H. J. Problem solving set in different age groups. Journal of Gerontology, 1956, 11, 310-317.
- Houssiadas, L., & Brown, L. B. The coordination of perspectives by mentally defective children. Journal of Genetic Psychology, 1967, 110, 211-215.
- Hunt, J. McV. Intelligence and experience. New York: Ronald, 1961.
- Inhelder, B., & Piaget, J. The growth of logical thinking from childhood to adolescence. New York: Basic Books, 1958.
- Kamin, L. J. Differential changes in mental abilities in old age. Journal of Gerontology, 1957, 12, 66-70.
- Katz, D., & Katz, R. Gesprache mit kindern. Berlin: Springer, 1928.
- Klein, W. L. An investigation of the spontaneous speech of children during problem solving. Dissertation Abstracts, 1963, 25, 2031.
- Kohlberg, L., Yaeger, J., & Hjertholm, E. The development of private speech: Four studies and a review of theories. Child Development, 1968, 39, 691-736.
- Kounin, J. S. Experimental studies of rigidity. Character and Personality, 1941, 9, 251-282.
- Krauss, R. M. Language as a symbolic process in communication. American Scientist, 1968, 56, 265-278.
- Krauss, R. M., & Glucksberg, S. The development of communication: Competance as a function of age. Child Development, 1969, 40, 255-266.
- Krauss, R. M., Vivekananthan, P. S., & Weinheimer, S. "Inner speech" and "external speech": Characteristics and communication effectiveness of socially and nonsocially encoded messages. Journal of Personality and Social Psychology, 1968, 9, 295-300.

- Krauss, R. M., & Weinheimer, S. Changes in the length of reference phrases as a function of social interaction: A preliminary study. Psychonomic Science, 1964, 1, 113-114. (a)
- Krauss, R. M. & Weinheimer, S. The effect of feedback on changes in reference phrases. Paper read at the meetings of the Psychonomic Society, Niagara Falls, Ontario, 1964. (b)
- Maclay, H., & Newman, S. Two variables affecting the message in communication. In D. K. Wilner (Ed.), Decisions, values and groups. New York: Pergamon, 1960. Pp. 218-229.
- McCarthy, D. The language development of the preschool child. Institute of Child Welfare Monograph, Serial No. 4. Minneapolis: University of Minnesota Press, 1930.
- McCarthy, D. Language development in children. In L. Carmichael (Ed.), Manual of child psychology. (2nd ed.) New York: Wiley, 1954. Pp. 492-630.
- Mead, G. H. Mind, self, and society. Chicago: University of Chicago Press, 1934.
- Murphy, L. B. Social behavior and child personality. New York: Columbia University Press, 1937.
- Owens, W. A. Age and mental ability: A second adult follow-up. Journal of Educational Psychology, 1966, 57, 311-325.
- Piaget, J. Language and thought of the child. London: Routledge and Kegan Paul, 1926.
- Piaget, J. Judgment and reasoning in the child. New York: Harcourt, Brace, 1928.
- Piaget, J. The psychology of intelligence. New York: Harcourt, Brace, 1950.
- Piaget, J. Comments on Vygotsky's critical remarks concerning The Language and Thought of the Child, and Judgment and Reasoning in the Child. Attachment to L. S. Vygotsky, Thought and language. New York: Wiley, 1962.
- Piaget, J. Six psychological studies. New York: Random House, 1967.
- Piaget, J., & Inhelder, B. The child's conception of space. New York: Humanities Press, 1956.

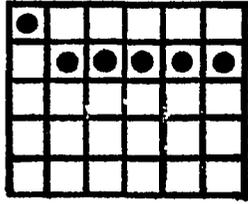
- Piaget, J., & Inhelder, B. Le développement des quantités physiques chez l'enfant. Paris: Delachaux and Niestlé, 1962.
- Reed, H. B., & Reitan, R. M. Changes in psychological test performance associated with the normal aging process. Journal of Gerontology, 1963, 18, 271-274.
- Riegel, K. F. A study of verbal achievements of older persons. Journal of Gerontology, 1959, 14, 453-456.
- Riegel, K. F., Riegel, R. M., & Meyer, G. A study of the drop-out rates in longitudinal research on aging and the prediction of death. Journal of Personality and Social Psychology, 1967, 5, 342-348.
- Rokeach, M. Generalized rigidity as a factor of ethnocentrism. Journal of Abnormal and Social Psychology, 1948, 43, 259-277.
- Sanders, S., Laurendeau, M., & Bergeron, J. Aging and the concept of space: The conservation of surfaces. Journal of Gerontology, 1966, 21, 281-286.
- Sarbin, T. R. Role theory. In G. Lindzey (Ed.), Handbook of social psychology, Vol. 1. Cambridge, Mass.: Addison-Wesley, 1954. Pp. 223-258.
- Schaie, K. W. A test of behavioral rigidity. Journal of Abnormal and Social Psychology, 1955, 51, 604-610.
- Schaie, K. W. Rigidity-flexibility and intelligence: A cross-sectional study of the adult life span from 20 to 70 years. Psychological Monographs, 1958, 72 (9, Whole No. 462).
- Schaie, K. W. A general model for the study of developmental problems. Psychological Bulletin, 1965, 64, 92-107.
- Schaie, K. W., & Strother, C. R. Cognitive and personality variables in college graduates of advanced age. In G. A. Talland (Ed.), Human aging and behavior. New York: Academic Press, 1968. Pp. 281-308. (a)
- Schaie, K. W., & Strother, C. R. Limits of optimal functioning in superior old adults. Interdisciplinary Topics in Gerontology, 1968, 1, 132-150. (b)
- Schaie, K. W., & Strother, C. R. A cross-sequential study of age changes in cognitive behavior. Psychological Bulletin, 1968, 70, 671-680. (c)

- Schneidman, E. S., & Farberow, N. L. Clues to suicide. New York: McGraw-Hill, 1957.
- Silverman, I. Age and the tendency to withhold response. Journal of Gerontology, 1963, 18, 372-375.
- Smith, M. E. A study of some factors influencing the development of the sentence in preschool children. Journal of Genetic Psychology, 1935, 46, 182-212.
- Soskin, W. F., & John, V. P. The study of spontaneous talk. In R. Barker (Ed.), The stream of behavior. New York: Appleton-Century-Crofts, 1963. Pp. 228-281.
- Stuart, R. B. Decentration in the development of children's concepts of moral and causal judgment. Journal of Genetic Psychology, 1967, 111, 59-68.
- Sullivan, E. V., & Hunt, D. E. Interpersonal and objective decentering as a function of age and social class. Journal of Genetic Psychology, 1967, 110, 199-210.
- Vygotsky, L. Thought and language. Cambridge: M. I. T. Press, 1962.
- Vygotsky, L., & Luria, A. The function and fate of egocentric speech. Proceedings of the Ninth International Congress of Psychology, 1930, 9, 113-124.
- Weinberg, N. H. Conceptual level, self-centering, and Piaget's egocentricity. Paper presented at the meeting of the Eastern Psychological Association, Atlantic City, New Jersey, 1959.
- Weinberg, N. H. Relativism, self-centering, and conceptual level. Child Development, 1963, 34, 443-450.
- Weir, R. Language in the crib. The Hague: Morton, 1962.
- Werner, H., & Kaplan, B. Symbol formation. New York: Wiley, 1963.
- Wertheimer, M. Productive thinking. London: Tavistock, 1961.
- Wolpert, E. A. A new view of rigidity. Journal of Abnormal and Social Psychology, 1955, 51, 589-594.

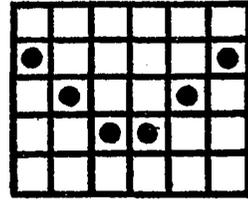
## ACKNOWLEDGMENTS

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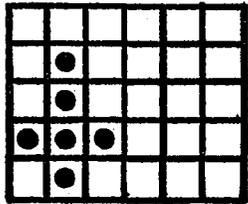
APPENDIX A  
TEST PATTERNS FOR EGOCENTRISM TASK



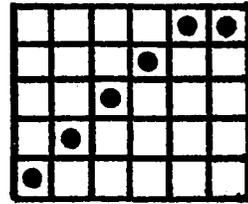
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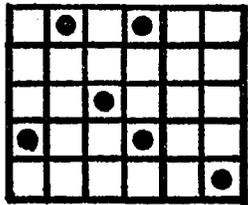
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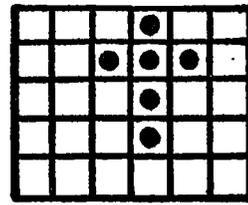
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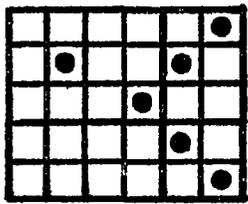
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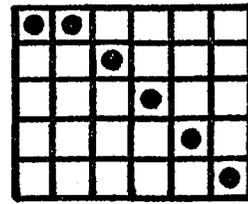
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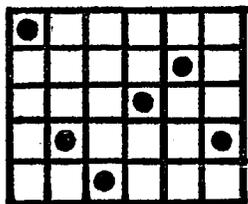
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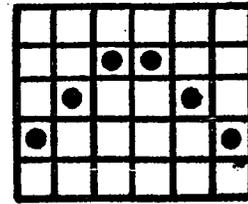
Pattern 7



Pattern 8



Pattern 9



Pattern 10

Figure 6. Test patterns employed in the Egocentrism Task

APPENDIX B

EXAMINER'S SCORING SHEET FOR EGOCENTRISM TASK

Date \_\_\_\_\_

84  
TASK 1

Subject's Name \_\_\_\_\_ Age \_\_\_\_\_ Sex: M F

Score \_\_\_\_\_ Type: Hi Lo

Pattern 1: 1 2 3 4

Pattern 2: 1 2 3 4

Pattern 3: 1 2 3 4

Pattern 4: 1 2 3 4

Pattern 5: 1 2 3 4

Pattern 6: 1 2 3 4

Pattern 7: 1 2 3 4

Pattern 8: 1 2 3 4

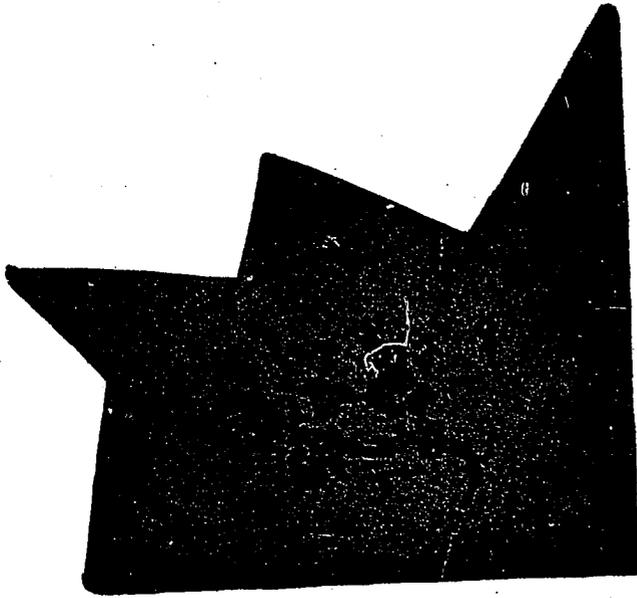
Pattern 9: 1 2 3 4

Pattern 10: 1 2 3 4

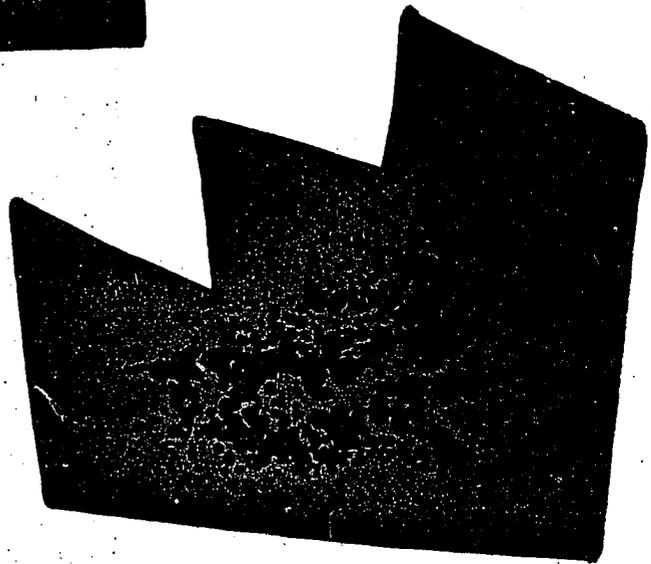
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APPENDIX C

THREE RANDOM SHAPES EMPLOYED IN SOCIAL INTERACTION TASK



SHAPE #1



SHAPE #2



SHAPE #3

Figure 7. The three random shapes employed in the Social Interaction Task

APPENDIX D

EXAMINER'S SCORING SHEET FOR SOCIAL INTERACTION TASK

**SOCIAL INTERACTION TASK**

Subjects: \_\_\_\_\_ and \_\_\_\_\_ Age: Young  
Old

Sex: M - M F - F Condition: Hi-Hi Hi-Lo Lo-Lo

First S to speak: \_\_\_\_\_

**Metacommunication:**

S suggesting plan of operation: \_\_\_\_\_ Both?

Left-right orientation:

Up-down orientation:

Orientation of board relative to other S's body:

Metacom: At beginning \_\_\_\_\_ After starting placements \_\_\_\_\_ None \_\_\_\_\_

Placement of objects: Systematic \_\_\_\_\_

Random \_\_\_\_\_

Other \_\_\_\_\_

First objects to be placed: \_\_\_\_\_

Last objects to be placed: \_\_\_\_\_

Dominant S: \_\_\_\_\_

Made all placement decisions? \_\_\_\_\_

Alternating placement decisions? \_\_\_\_\_

Total time elapsed: \_\_\_\_\_ Number of identical placements: \_\_\_\_\_

APPENDIX E

SAMPLE DIALOG FROM SOCIAL INTERACTION TASK

(The following is the dialog that occurred between two young females in a Lo-Lo pair. The Ss are identified by number.)

2. Um. Yeh, okay, I see.
1. We're supposed to end up exactly the same.
2. Okay.
1. Why don't we put the felt on first. That's what I have on top.
2. Okay, whereabouts?
1. Umm -- put the red block --
2. One down or one coming up? Okay.
1. Put the red on the red felt and the gold on the gold felt in the corners.
2. Okay, and then do we put the red felt on the red in the corners?
1. Okay. That's fine with me. And the gold straight up in the right hand corner above. Do you want it in the upper or lower space up there? The lower just like in the bottom?
2. Yeh.
1. Okay, then I've got some pieces of cardboard. I've got three pieces.
2. Uh huh.
1. One of them looks -- well -- two of them look alike -- no not really -- but ...
2. Yeh, I know what you mean.
1. Yeh, well -- (giggle).
2. Put the tallest one, the one with the chunk on the side -- the highest one.
1. Yeh.
2. Okay, the one that has the tallest point.

1. Yeh, that's fine.
2. Okay.
1. Is that the one that is branching off to the right? or to the left?
2. To the left.
1. Okay let's put that one right next to our red piece. I mean, well this will make it real easy.
2. Down on the bottom?
1. Yeh, at the bottom, the second square to your right. And, then put the one that is a right corner, that has three deals coming out of it -- do you understand what I'm talking about?
2. Wait a minute!
1. You've got your steps kind of going out on it. And, they are -- oh boy, this is kind of difficult to describe. Umm -- the other one is, well, more symmetrical, you know? The steps are more symmetrical --
2. Right!
1. Put that one in the corner, your left hand corner on the bottom. On the red felt and put the other one in the third space. Okay?
2. All right.
1. Now it's your turn.
2. It is -- we have another one too. Isn't there? I've got three of them.
1. Yeh, I've got that other one right next to the piece of red felt.
2. Oh, you just put them all on the bottom.
1. Right. Simpler that way.
2. All right.
1. Instead of any definite pattern.

2. Okay -- do you want to take the match next?
1. Okay, where do you want to put that?
2. Let's put it up right next to the gold piece.
1. Okay.
2. And, then the pipe cleaner.
1. Okay.
2. Put that next to the matches.
1. Okay -- umm, the poker chip, mine is blue -- let's put that next to the pipe-cleaner.
2. Okay. Now we got two rows to go -- right?
1. Two what?
2. Rows.
1. Yeh, two rows. I'm sorry I misunderstood you.
2. All right.
1. What about putting the -- now we've got two paper clips -- Let's put just for variety, let's put one on the red and one on the gold. Let's start a new row over to our right again.
2. Uh huh.
1. And put the big one on the red and the little one up on the gold.
2. Okay.
1. Then we've got a cuff link!
2. Umm.
1. And -- I don't know if this is a screw or -- do you see what I mean?
2. Yeh.
1. Well, let's put the cuff link first next to the big paper clip, and that screw dealy or whatever it is next to that.

2. To the smaller one?
1. Okay -- your choice.
2. Okay, that little wire or whatever it is.
1. That red -- Oh, okay.
2. Yeh, let's put that on the gold right next to the screw.
1. Umm -- you're putting that -- I thought that the screw -- umm okay that's fine. On the gold?
2. Yeh.
1. Uh --
2. Where did you put the screw?
1. I put the screw on the third -- well, you know our red blocks?
2. You put it on the red --
1. Yeh.
2. -- and I put the cuff link on the red. Okay.
1. Oh! I see -- do you want to change?
2. I'll change -- I put the cuff link on the gold -- right?
1. Well, I put mine down on the red part. All on the red part.
2. Both of them? Ohhh!
1. Yeh -- I started another row, in other words.
2. Okay.
1. And then I put cuff link -- well let's see -- my second row consists of a large paper clip, a cuff link, that screw and then now you said to put the wire down.
2. No, let's put the wire up by the small --
1. Okay.
2. -- paper clip. Okay? Now the penny --

1. Where do you want that?
2. Let's put it up by the wire.
1. Okay.
2. And then, put that little white thing -- let's put it on the last block of red.
1. Okay. Umm, do you want to put this pan on it too -- (giggle)
2. Yeh -- put it on -- (giggle).