

UNCLASSIFIED

AD

405 932

DEFENSE DOCUMENTATION CENTER

FOR

SCIENTIFIC AND TECHNICAL INFORMATION

CAMERON STATION, ALEXANDRIA, VIRGINIA



UNCLASSIFIED

NOTICE: When government or other drawings, specifications or other data are used for any purpose other than in connection with a definitely related government procurement operation, the U. S. Government thereby incurs no responsibility, nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use or sell any patented invention that may in any way be related thereto.

63-36

405 932 405932

COGNITIVE DETERMINANTS OF ROLE PLAYING¹

O. J. Harvey²

University of Colorado

Boulder, Colorado

1963

DDC
RECEIVED
JUN 7 1963
RECEIVED
TISIA B

Technical Report No. 3

Contract Nonr 1147(07)

O. J. Harvey Principal Investigator

Abstract

Ten representatives of each of the four major levels of concreteness-abstractness posited by Harvey, Hunt and Schroder (1961) were required to argue in opposition to their own belief concerning whether or not philosophy should be required as a minor for all college undergraduates. Subjects presented their arguments under either a private condition, in which they were erroneously assured no one would ever know the arguments they presented, or under a public condition, in which they were advised that their tape-recorded arguments would later be heard by a university curriculum committee. In addition to the This I Believe Test, scored for abstractness in two ways, each of the 80 Ss was also administered Rokeach's (1960) scales of dogmatism and opinionation as well as the F Scale, Gough and Sanford's Rigidity Scale (1952), the Doodlebug Problem (Denny, 1945) and the WAIS intelligence test. Subjects' tape-recorded arguments were scored on 18 variables of role playing.

Role playing in the private situation was superior to that in public. The more abstract Ss played the role better than did the more concrete ones and levels of concreteness-abstractness interacted with the public-private variation. Dogmatism and rigidity failed to correlate significantly with role performance as did most of the sub-tests of the WAIS. However, performance on the Doodlebug Problem, Authoritarianism and opinionation right, as well as Verbal I.Q., Vocabulary and Information related significantly and consistently to the ability to argue effectively against own belief.

In the past few years several studies concerned with the effectiveness of role playing in changing opinions have been reported (e.g., Janis & King, 1954; King & Janis, 1956; Scott, 1957; Harvey & Beverly, 1961). Little attention has been given, however, to factors surrounding the differential ability to play a role that entails the advocacy of a position that runs counter to the actor's own beliefs. It is with this latter question that this study was concerned. Individuals differing on several cognitive, personality and intelligence measures were required to present under two situational variations the best arguments they could muster in favor of a stand that contradicted their own opinions. The performance on such a task was assumed to reflect differential abilities to change set and to behave creatively, issues which were of greater specific concern to this study than was role playing per se.

Effective argumentation against one's own stand would seem to demand, among other things, a cognitive structure or conceptual system that could tolerate high conflict since it may be assumed that active participation in such a role would place the actor in the position of maintaining logically inconsistent premises. It would seem that either a compartmentalized structure of varyingly differentiated cognitive elements or a highly differentiated and integrated system would permit the simultaneous existence of conflicting elements without any strong motivation to resolve the dissonance.

The basis of tolerance for conflict would be very different however in the two kinds of structures.

In the more compartmentalized or unintegrated structure the inconsistent elements would be more likely to exist without subject awareness since it is only through some degree of integration or bringing the

elements into functional relationships that gaps or inconsistencies are detected. This might be illustrated anecdotally by an avid racist who also subscribes to the tenet that man is his brothers' keeper without any experience of inconsistency or conflict. Hence the person with a less integrated structure appears to tolerate unknowingly high inconsistency between cognitive dimensions or domains. But within domains, or when single evaluative dimensions are involved, the same person seemingly can tolerate only minimal dissonance, being highly sensitive in such an instance to even slight incongruities and highly motivated toward consistency or balance. Thus persons of simpler cognitive structures were found, to a significantly greater extent than the more complex individuals, to perceive themselves as being liked by persons they liked (Campbell, 1960) and to perceive their friends as possessing the same values claimed for themselves (Scott, 1961). Kindred results have been obtained by Harvey (1963b). Employing one of Asch's (1952) techniques, Ss were first presented a list of three adjectives purportedly describing Person A of whom they were to write their impressions. After repeating this for Person B, Ss were instructed that the two sets of adjectives, which conveyed opposite impressions, in reality described a single person about whom they were now to write their impressions. The more cognitively complex individuals, those termed as being more abstract, were more capable of reconciling or integrating the conflicting impressions than were the persons of the simpler or more concrete structures.

In contrast to the more concrete or cognitively simple individual the person with a more abstract or integrated conceptual system, because of having functionally related more of the elements within his cognitive field, should have detected more of the gaps and inconsistencies and consequently to be more aware of existing logical conflicts. Owing, however,

to a more complex set of dimensions for ordering his world, such a person is less committed to either-or conceptions of reality and is more likely to construe events multidimensionally. This could result in the same object knowingly being attributed dissimilar characteristics. In fact, evidence is beginning to accrue to suggest that in the presence of overly consistent or homogeneous inputs the more abstract individual tends to generate his own dissonance and complexity. As a result he appears to be less adversely affected by such sensory "depriving" situations than the more concrete persons (Harvey, 1963). Moreover, the more abstract person has been found to prefer more complex or asymmetrical paintings and to be able to provide better solutions to more complex and novel problems than the more cognitively simple individual (Harvey, 1963).

In addition to necessitating high tolerance for dissonance, the effective presentation of opinions running counter to one's own would also seem to demand the abilities to change set, to think relativistically and in a make-believe fashion, abilities that preclude the role player from overcommitment to any single position as the only vantage point from which to evaluate a situation. The more cognitively complex and/or abstract individuals should possess these requisite abilities to a greater degree than individuals less endowed with these attributes.

Of the several works that are theoretically consistent with this position, this study borrowed mainly from two, from Rokeach (1960) and from Harvey, Hunt and Schroder (1961). While differing in certain assumptions and emphases, these books have a common concern with effects of variation in differentiation and integration. The more differentiated and integrated system is assumed by Rokeach to be more "open" and by Harvey, et al, to be more "abstract" while the less differentiated and integrated conceptual organization is termed as being more "closed" and

more "concrete" by these respective authors. Measures indicated by these two theoretical works were employed in this study for two reasons: to provide independent measures of cognitive complexity and to provide comparisons of the predictive utility of the two theories for common behavior.

Although it was considered likely that effective playing of the assigned role would demand flexibility and openness of the total conceptual system more than of a single domain or concept within the system, measures aimed at assessing openness or abstractness of both total and sub-systems were utilized. Instruments aimed at measuring the openness of the total system included: Rokeach's (1960) Dogmatism Scale and Opinionation Scale; Form 40-45 of the California F Scale; Denny's (1945) Doodlebug Problem; and This I Believe (TIB) Test, devised by the present writer. On the basis of Rokeach's assumption (1960, p. 183) the Rigidity Scale of Gough and Sanford (1952) was used to measure the openness or resistance to change of single beliefs, sets or habits.

Exactly what the prevailing I.Q. tests measure is open to considerable debate. From the point of view of evolution and survival doctrine, out of which some of the concern with intelligence testing emerged, intelligence would consist of a general ability to adapt to complex and threatening environments. This would mean, among other things, the ability to detect and utilize appropriately various cues emanating from a novel, complex or shifting environment, to change set and engage in new and more adaptive courses of action. To the extent this conception of intelligence is embodied in I.Q. measures, intelligence test scores should also relate highly to the ability to tolerate cognitive conflict, to be flexible and to perform well the tasks encompassed in the role playing assignment. Yet much of our own unpublished research, as well as findings of others (e.g., Rokeach, 1960; Getzel & Jackson, 1962;

Gochman, 1962) suggest that I.Q. tests are inferior to indices of cognitive differentiation and integration in the prediction of such behavioral outcomes. To gain further comparative information on the power of I.Q. tests and certain cognitive measures to account for differences in flexibility, adaptability and the capacity to "act as if" by assuming alien roles the Wechsler Adult Intelligence Schedule was also administered to all Ss.

Role playing, the arguing against one's own stand on an issue from premises or assumptions assigned by E, was carried out in either a public or private condition. In the public condition Ss were led to believe that their arguments, recorded by means of a tape recorder, would later be heard by a university curriculum committee whereas Ss in the private condition were erroneously assured that no one, including E, would ever hear their arguments. Under the assumption that possible evaluation by the curriculum committee would generate anxiety and arousal in excess of the optimal for effective performance of the difficult role assignment, it was expected that role playing attainment would be lower in the public than in the private condition. This was not offered as a formal hypothesis, however, because of lack of precise knowledge of task difficulty, which would determine the optimal level, and because of possible interactions between the public-private variation and conceptual systems that might result in some persons performing higher in public and masking out the public-private difference in role performance.

METHOD

Independent Variables

These included measures of conceptual structure, personality and intelligence. Based upon the assumption of Rokeach (1960), the Gough and

Sanford Rigidity Scale (1952) was administered as a measure of openness or flexibility of single beliefs within the conceptual system. Rokeach's Dogmatism and Opinionation Scales (1960), Form 40-45 of the California F Scale (Adorno, et al, 1950), the Doodlebug Problem (Denny, 1945) and the This I Believe (TIB) Test devised by the present author were included as measures of openness or abstractness of the total conceptual system. The Opinionation Scale was scored for left and right opinionation as well as for opinionated acceptance and rejection. The TIB test was also scored in two ways, according to four conceptual systems assumed to represent different levels of concreteness-abstractness and according to 14 cognitive attributes that were assumed to represent somewhat independent dimensions of concreteness-abstractness.

The Wechsler Adult Intelligence Schedule, about which no assumptions were made concerning its relationship to the openness of either total systems or single beliefs, was included to gain further information on the comparative powers of prevailing I.Q. tests and cognitive variables in predicting performance on tasks involving such factors as creativity and adaptability.

The absence of prior publication on the TIB Test makes it necessary to discuss its underlying rationale and nature at some length. This is one of several tests devised specifically to measure structural features of the different conceptual systems posited by Harvey, et al, (1961). This test, found by the author and his students in several unreported studies to have high predictive and construct validity³, requires the subject to indicate his beliefs about a number of socially and personally significant concept referents by completing in two or three sentences the phrase: "This I believe about _____," the blank being replaced by one of the following: friendship, the American way of life, guilt,

marriage, myself, religion, sin, majority opinion people and compromise.

The concept referents, one to a page, are, along with questions of subject identification, presented in a small booklet under the title "Opinion Survey." The front page instructs the subject:

In the following pages you will be asked to write your opinions about several topics. You will be timed on each topic at a pace that will make it necessary for you to work rapidly.

You must write on the topics in the order of their appearance. Wait to turn each page until the experimenter gives you the signal (every two minutes). And once you have left a page, do not turn back to it.

Please do not open this booklet until you are instructed to begin.

In the present study the TIB completions are scored in two different ways for variation in concreteness-abstractness of the mediating conceptual systems. One way consisted of categorizing an individual as a primary representative of one of four conceptual systems or assumed levels of abstractness. The other consisted of rating the TIB responses on the following 12 attributes which were assumed to represent dimensions or sub-facets of the more generic conceptual property of concreteness-abstractness: (1) novelty, (2) appropriateness, (3) clarity (differentiation or articulateness), (4) integration, (5) contradiction (internal consistency), (6) implications (meaning and information that went beyond specific statements), (7) evaluativeness (good-bad, approval-disapproval), (8) tautologicalness (self-evident, circular), (9) platitudinousness (trite, highly conventional), (10) categoricalness (either-or, absolute), (11) multifacetedness (use of different approaches) and (12) quality (total impact or impression). Each TIB completion of each S was rated on each of these dimensions on a 1-4 scale by two independent judges. In addition to each TIB completion being scored separately on these 12 dimensions each S's total completions treated as a unit were scored for

overall quality and variation in themes. The mean rating on each of these 14 dimensions was determined for each S by combining the obtained rating values for the two judges on all of the TIB completions. It was the means of the dimensions, collapsed across judges and TIB referents, that were treated in the statistical analysis.

The basis for categorizing an S as a primary representative of one of the conceptual systems or stages of cognitive development posited by Harvey, et al, (1961) is considerably more involved than ratings on the preceding dimensions. To omit a detailed discussion of the assumed levels and stages involved in such development, suffice it to indicate that Ss are categorized as representing predominantly Stage 1, a more concrete kind of conceptual functioning, if their responses to the concept referents in the TIB booklet manifest such characteristics as: high absolutism of assertions with a minimum of qualifications and contingencies; high positive dependence on, or cathexis with, external authorities; high frequency of platitudes or normative statements; and high ethnocentrism or strong assertions of American superiority. In many respects this kind of conceptual system disposes toward behavior identical to the syndrome of authoritarianism. In fact, a high score on authoritarianism is generally included as an additional criterion for classifying a person as representative of a more concrete, Stage 1, system.

Stage 2, the next assumed level of abstractness, is characterized by a high degree of negativism and rebellion against external authority, a low score on the F-Scale and a high drive toward autonomy and avoidance of dependency on authority, including God, tradition and most of the other authority cues which serve as positive guidelines for the Stage 1 kind of individual. Thus in terms of directionality the overt responses of individuals arrested at Stage 2 level of development tends to be

opposite to that of the System 1 representatives. While directionally opposite, at least in relation to authority referents, structurally representatives of these two systems or stages of development are assumed to be quite similar in that they tend toward high absolutism in their construal of certain referents.

Individuals emerging from a Stage or System 3 kind of training environment are assumed not to display the strong avidity, of either approach or avoidance, as do representatives of the preceding systems. Because of presumed over-protection and over-indulgence by the training agent, individuals at the Stage 3 level tend more to view the world and people in a considerably undifferentiated positive glow. Especially characteristic is the concern of such persons with fostering dependency relationships with others and in establishing intimate friendships that prevent aloneness and social isolation. These individuals, in a sense, may be said to be more person oriented than authority, rule or convention focused. On the TIB referents Ss categorized as representing Stage 3 speak less absolutistically about systems of social control and tend instead to extol the merits of people and to stress the importance of friendship.

Subjects are categorized as representing Stage or System 4 functioning, the highest level of abstractness described by Harvey, et al, (1961), if their responses to the TIB referents indicate: a high degree of novelty and appropriateness; independence without negativism; high relativism and contingency in thought; and the general usage of multi-dimensional rather than undimensional interpretive schemata.

Some of the clearer and more representative differences among representatives of the four systems in their responses to referents in the TIB booklet are presented in Table 1.

(Table 1 About Here)

In categorizing an S into a particular conceptual system or stage responses to all of the TIB referents are considered in totality and one overall score assigned instead of each response to each referent being scored independently and an additive numerical value taken to represent the conceptual stage. While this more holistic approach violates certain precepts in tests and measurement theory, as well lacking mathematical precision, we have found it to produce a higher reliability and validity than single item analysis because a context or yardstick is provided against which a single response can be interpreted. Many of the responses, if treated singly and in isolation, might be scored as representing almost any of the conceptual levels. When such an item is interpreted against the comparative backdrop of all the other responses, however, its meaning is made clearer and it can be coded more accurately.

Despite the apparent subjectivism involved in this scoring procedure the interjudge reliability for three and four trained judges for the four systems or stages depicted above has been .90 or above for seven different samples of subjects. In the present study only those Ss were used which were unanimously agreed on by three independent graduate student judges as representing a particular stage or system. The use of the "pure" or "extreme" case design necessarily meant the elimination of those subjects who did not fit the theoretical categories with which we were at the time concerned.

While it is our assumption that the TIB booklet measures stereotypy or flexibility of the total conceptual system, it is obvious that the extent to which this is true is ultimately an empirical question. Several of our studies, yet unpublished, have shown that individuals representing the four different stages, as measured as above, do indeed

Table 1

Typical Sentence Completions of Representatives of the Four Conceptual Stages

Referent	Stage 1	Stage 2	Stage 3	Stage 4
The American way of life	...should be followed by all cultures everywhere	...is conducive to bigotry	...fosters closeness with our fellow man	...contributes to individuality and creativity
	...is the only sensible way of living	...fosters greediness and ultra-materialism	...is built on interpersonal respect and loyalty	...is characterized by diversity and challenge
Friendship	Friends should be chosen only from among one's equals	It is not even safe to trust your best friend	Without friends life would be meaningless	My most rewarding friendships are with persons different from myself
	Really close friendships are between persons of similar interests	Friends are often out to get you also	Friends are more important to me than anything else	Friends are wonderful but one must not sell one's self to gain them
Guilt	...is a feeling that results from evil acts	Institutions try to engender guilt to force conformity	...is a violation of personal trust	The feeling of guilt generally results from violation to one's own standards
	...results from violation of God's laws	...is a social fiction	...is hurting another person	Hopefully society will be able to substitute understanding for guilt as a deterrent to anti-social acts
Marriage	...is a divine institution for the glorification of God	...means loss of freedom	...is sharing of intimacies	...allows two people to commonly explore their world and grow in it

Table 1 (continued)

	...is a scared bond which ties two people inseparably	...is the biggest joke of our times	...creates mutual dependency	To be successful, marriage must allow for independence together with interdependence
Myself	I was put on earth for a purpose	Most people, including myself, are parasites	I like to help persons solve their problems	I find disorder enjoyably exciting
	I feel incapable of deciding what should be done with my life	I feel smothered by the shackles of society	I need to be liked	I love to explore strange foods and places
People	...are essentially helpless	...are basically animals	...are great	...as a whole like new things
	The masses need to be told what to do	...will resort to anything to get what they want	...everywhere aspire to decency	...of differing beliefs are a thing of immense interest and education
Religion	Dependence on God is the answer to the world's ills	...abolishes people's progress	Friendship gives more meaning to my life than does religion	...has often inspired aesthetic creations
	Man is nothing without divine help	...only helps people who need a crutch	The practical part of religion is its emphasis on love of fellow man	...as a philosophy of life fosters self insight
Sin	...is breaking the commandments of God	...is a manufactured tool of religions	...is the deceiving of another person	...is primarily a culture definition
	Man is innately sinful	There is no such thing as sin	...is readily forgiven and forgotten by a friend	...if it exists at all, is a transgression against oneself

Table 1 (continued)

Majority opinion	...is the basis of our democracy	...is sterile and reactionary	...is more likely to be right than is the minority	...is the conservative and not always the most efficient machinery for decision
	...protects against extreme minorities	...generally abuses the minority groups	...provides a framework for judging right and wrong	...even though often unwielding still allows for novelty to emerge from diverse opinions
Compromise	...is a poor substitute for power	...is usually a one-way affair, with the weaker giving in to the stronger	...prevents conflicts between persons and between parties	...often is a process through which extremes can be merged into a product superior to either
	...it is sinful to compromise your personal values	...a person compromises only when he doesn't have enough power to get his own way	...allows us to keep out friends and maintain our values	...doesn't insure the best solution; a middle-of-the-road approach may be an excuse for inactivity and fear of commitment

differ as they theoretically should on a wide range of tasks involving stereotypy, flexibility, creativity and self causality.

It is apparent that scoring the TIB completions more globally according to conceptual systems and more molecularly by the use of dimensions are related approaches to determining the degree of concreteness-abstractness of an individual's cognitive structure.

Procedure

Synopsis. Twenty Ss from each of the four stages argued in opposition to their initially expressed stand on the question of whether or not all students working toward undergraduate degrees should be required to minor in philosophy. Half of the Ss from each conceptual system played this role of argumentation under a private condition while the other half argued under a public treatment.

In both role playing treatments S tape-recorded his arguments while in a room by himself.

In the private condition, S was led to believe erroneously that no person other than himself, including E, would ever hear his recorded arguments. The assumption of privacy was conveyed by having S to erase his tape as he played it back to himself in isolation. In reality, a second recorder, completely unknown to S, also taped the arguments under the private condition, thus providing recordings of all the arguments for use in later analysis.

In the public condition S also recorded and played back his arguments in isolation, but unlike Ss in the private condition, he was urged strongly at the outset to exercise care that he did not erase any of his arguments since a university committee studying curriculum revision would later hear them. Following role playing, all Ss were administered the

California F Scale, Rokeach's Dogmatism Scale, Gough and Sanford's Rigidity Scale, the Weschler Adult Intelligence Schedule and the Doodlebug Problem and, as the last item, were paid for their services as Ss.

Sequential Steps: The steps of the experiment, to be elaborated below, were in the following order:

1. Selection of representatives of the four conceptual systems or stages. In order to achieve 20 clear cases in each system TIB booklets were administered to 220 college students who were attending the University of Colorado during the Summer of 1961. Subjects agreed upon independently by all three graduate student judges as representing a particular system were selected as the sample that received the other experimental treatments.

2. Determining Ss pre-role stand on the issue of a minor in philosophy. This was done by having each S check on a single item scale his degree of agreement or disagreement with the proposition that all undergraduates should minor in philosophy. By happenstance, approximately half of the Ss were in agreement with the proposition and half in disagreement. This meant, then, that in arguing in the direction opposite to their own stand roughly equal numbers argued for and against philosophy as a minor.

3. Playing the role of arguing counter to own initial position. In both the public and private conditions Ss were required to make all of their arguments from four major premises or assumptions assigned to them by E. Depending on whether S's task was to argue in favor or in opposition to philosophy as a minor, the four premises from which he had to argue were that training in philosophy either was in accord with or in opposition to: (1) religious principles; (2) the best interests of the family; (3) the advancement of freedom; and (4) the best interests of

minority groups. The assignment of premises from which to argue was aimed at creating fairly standard levels of difficulty for all Ss. Premises were selected that were assumed to be system-relevant, one premise being more relevant for each of the four conceptual systems. This affords the opportunity of either partially controlling for relevance or, if it is so desired, to analyze the effects of variation in relevance on role playing.

In order to justify the use of tape recorders, the means by which private conditions could be imposed and the data still be recorded, Ss were instructed that the study was concerned with effects of self insight into their ability to argue orally either on their own or on the opposite side of an issue. Subjects were asked to assume that in this instance they were in a college debate and it had fallen their lot to argue either in favor or in opposition to the proposition that philosophy should be required as a minor for all undergraduates. They were then given the four premises from which they had to argue orally, advised that their arguments had to be based exclusively on the assigned assumptions, which could be used in any order they chose, and told that they would have five minutes for argumentations from each premise.

To insure that all Ss had the same amount of time to use in argumentation they were told, following instructions in the use of the recorder, to wait until all arguments from all four premises had been made to play back their arguments to themselves. Subjects were assured in both the public and private treatments that while recording their arguments and playing them back to themselves they would be heard by no one but themselves. In the private condition they were instructed to erase their tape as they played it back so that it could never be heard by anyone else while in the public treatment they were cautioned not to erase their tape in playback in order that the curriculum committee could

later hear it.

During the role playing and tape playback, S, in both public and private conditions, sat alone in a lighted and sound-proofed room. By means of an intercom system he could ask questions of procedural clarification from E, seated in an adjoining room, and could be instructed by E at the end of five minute intervals to begin arguments from a new premise. In keeping with the aim of convincing each S that he would be unheard by E while making his arguments and playing them back to himself, he was led incorrectly to believe that the intercom carried his voice only when he depressed the transmitter switch. In reality, however, the transmitting channel from S to E always remained open in order that E could determine if any S departed from the prescribed procedure, which none did owing to the clarification given to those who asked questions. Subject's depression of the transmitter switch activated a small light in front of E in the adjoining room. To strengthen S's belief that he was heard by E only when the transmitter button was pushed, E responded only when the light appeared. In addition to serving as a monitoring device, the open intercom, transmitting into a microphone concealed in E's room, also provided the means by which a second recording of S's arguments and comments was surreptitiously made in the private condition.

All indications, from taped remarks and post-experimental comments, suggested that Ss accepted the instructions and procedure as genuine and valid.

4. Administration of other tests. Immediately following role playing, Ss were administered the F Scale, Rokeach's Dogmatism Scale and Gough and Sanford's Rigidity Scale, all of which were presented as a single test under a common format and set of instructions, with the items from each scale fairly well randomized throughout the combined scale.

The Wechsler Adult Intelligence Schedule was administered next, followed by the Doodlebug Problem as the last test.

Because of the rather unusual and involved nature of the last problem, its procedure as described by Rokeach (1960), along with our modifications, is presented separately and in some detail.

5. The Doodlebug Problem. S and E were seated across from each other at a table. S was given a pencil and scratch paper on which he could doodle, draw diagrams, etc. as aids in solving the problem. He was not permitted, however, to write out the information or hints which were given verbally by E at various times during solution of the problem. At the outset E instructed S:

This testing session is concerned with how people go about solving a problem. In this case the problem is similar to a "Who Dunit" mystery question, where you are given the final conclusion or situation and asked to describe how this situation evolved or conclusion was reached. While you are solving the problem, please think out loud so that it will be possible for me to understand the procedures you are using and the path you are following in arriving at your solution.

This is a difficult problem and it generally takes people quite awhile to solve it. So don't become discouraged. We have intentionally made it difficult in order to slow down the problem solving processes so they can be observed. If it were a simple problem, you would solve it so rapidly that neither you nor I would be aware of the steps you had gone through in arriving at your solution.

This is not an I.Q. test.

First I will read to you the set of conditions that govern or restrict the situation and give you the problem that you are to solve. Then I will start the stop watch and you are to begin your attempt to solve the problem. You are free to ask any questions. Usually I will answer them by rereading from the set of conditions (stated below) those statements that are relevant. (Rereading, rather than additions, was meant to enhance the commonality of information to which subjects were exposed.) Some of your questions I will not be able to answer because my answer would be too close to the solution of the problem. Every five minutes I will give you a hint. These hints will not consist of entirely new

material but will be a clarification or reorganization of aspects of the problem that seem to be giving you trouble.

(Then the conditions or "rules which govern Joe Doodlebug's situation (Rokeach, 1960, p. 172) were read to S and the problem was presented.)

The problem we will be concerned with exists in a hypothetical world. The hero is a little creature named Joe Doodlebug. Joe is a strange sort of bug.

1. He can jump in only four directions: north, south, east, or west--not just diagonally.
2. Once he starts in any direction, he must jump four times in that direction before he can switch directions.
3. He cannot crawl, fly or walk--he can only jump.
4. Any jump may be large or small, that is, it can be of any size.
5. He cannot turn around.
6. Joe is hungry and will immediately go and eat any food that is placed in his environment.
7. Joe's master places some food, larger in diameter than Joe, three feet directly west of Joe.
8. Joe stops dead in his tracks, facing north.
9. After contemplating the situation, Joe concludes that he will have to jump four times to get to the food.
10. Joe's solution is correct. He must take exactly four jumps, no more, no less.

Your task is to describe the circumstances Joe must have been in which led him to reach this conclusion, and to describe the path Joe must follow in order to reach the food.

At this point the stop watch was started and E began recording comments, questions, etc. made by S and the time at which the comment was made (i.e., number of minutes from beginning of solution period). Every five minutes S was given a hint. It was here that the present procedure differed most from that used by Rokeach (1960). The hints used by Rokeach related to "new beliefs" which he felt must replace "old beliefs" before S could solve the problem. In a pre-test for the present study, however,

it was discovered that there was more than one solution to the problem and at least one of these solutions did not require all of the "new beliefs" set forth by Rokeach. It therefore seemed inappropriate to indicate these beliefs in the hints.

A second reason for deviating from Rokeach's procedure in giving hints was that it appeared preferable for our purposes to restrict the hints to the conventional sense of the term "hint" in that (1) the hint be of aid to S in his immediate difficulty with the problem, and (2) that the hint only suggest new lines of thinking or stress certain information that S should consider and not give him a total or package "belief" thus leaving most of solution-related work to the S. Formulating the hint in this way allowed E to observe how willing S was to accept help in working out the problem and how capable he was of using the help that he was given (i.e., the tendency for S to see the relevance of the hint to his difficulty and to integrate it with other hints as well as with the original information). Also, since S was allowed up to 45 minutes to solve the problem it seemed quite likely that in many cases more hints than the three used by Rokeach would be necessary if a hint was given every five minutes.

In the present study four standard hints were used:

1. Joe operates at maximum efficiency and will not take more jumps than is absolutely necessary. He would not take four jumps if he could reach the food in fewer jumps.
2. Since we are told that he can jump any distance, and that he will go directly to the food by the shortest route, it would seem that Joe would have taken one jump west to reach the food. However, we are told that his solution of four jumps is correct. Therefore, it seems that Joe was not free to choose to go west at the time the food was placed down.
3. Is there any relationship between the condition that states that once Joe starts in any direction he must jump

four times in that direction before he can switch directions and hints 1 and 2? That is, will the condition that he must jump four times before he can change directions have any effect on what the fewest number of jumps will be? And will this condition affect whether or not Joe was free to go west at the time the food was placed down?

4. Let's reread the part that describes the time when the food was put down. "Joe's master places some food, larger in diameter than Joe, three feet directly west of Joe. Joe stops dead in his tracks, facing north." Does that suggest anything about Joe's behavior immediately before the food was put down?

These four hints were generally given at 5, 10, 15 and 20 minutes respectively from the beginning of the solution period. Exceptions to this standard order occurred when the comments of S indicated that he was already aware of the information in a particular hint. In such situations the next hint was given instead of the one originally scheduled. Additional hints, given at five minute intervals following the first 20 minutes, depended on the specific difficulty S was having at that time. In all cases the hints were aimed at clarifying or reorganizing certain aspects of the problem, or in some cases just repeating some information that S seemed to have forgotten.

The procedure of questions, answers, comments, hints, etc., continued until S arrived at a correct solution or used up the allotted 45 minutes. After solution or termination of the problem E asked numerous informal questions of S and tried to reassure those that expressed displeasure at their performance.

The administration of the several tests and tasks of this study was carried out by the combined efforts of three experimenters. To minimize possible contamination of results by experimenter variance, the administrator of particular tests and/or tasks was common for all Ss.

Dependent Variables

These consisted of a set of dimensions in terms of which the role playing arguments were content analyzed. From rather extensive pretesting the following abstracted role variables were found to result in ratings of sufficiently high interjudge agreement to be included in a rating scale: (1) number of minutes of inappropriate silence during the 20 minutes, (2) number of different themes contained within the total of arguments, (3) number of variations in the themes, (4) novelty of themes, (5) appropriateness of themes, (6) vocabulary usage, (7) logic of the arguments, (8) interest in the task, (9) diction, (10) cooperation, (11) use of proof, (12) use of examples, (13) effectiveness of examples, (14) attainment of a main point, (15) convincingness of arguments and, (16) overall quality of the arguments. In addition, from the four cells of high-low novelty and high-low appropriateness, the number of themes high in both novelty and appropriateness and low in both were also included, resulting in 18 role playing variables. All of the variables that did not involve frequency count were scored by use of a 1-4 rating scale from high to low or from good to bad.

Subjects' arguments were scored on these 18 dimensions by three graduate students who had not participated in the data gathering phase of the study and who, as a consequence, possessed no information regarding Ss' scores on any of the independent variables. While all three judges were present during the playback and scoring of the taped responses, each made his ratings independently. The interjudge reliability for the three judges on the 18 role playing variables to be reported here was .86.

With the exception of the amount of time silent, which was recorded by a stopwatch, the role playing scores used in the analysis were based on the average rating of each dimension by the three judges.

Results

Public vs. Private Condition of Role Playing

Several studies have indicated that the optimal level of anxiety arousal or mobilization for flexibility, change of set and creative behavior is quite low, being lower for more difficult than less difficult task demands. If the role playing task in this study were assumed to be of high difficulty, it would be reasonable to hypothesize that the additional anxiety generated by the likelihood of authority scrutiny in the public condition would suffice to surpass the optimal and to result in depression of role performance as a consequence of heightened inability to change set and to disengage from commitment to own beliefs of counter tendencies. This was not offered as a specific hypothesis, however, owing to absence of information on the exact level of task difficulty and to anticipated interactions between the role conditions and conceptual systems which could result in the mean attainment of some systems being depressed and others not being affected or even being facilitated by the public treatment.

(Table 2 About Here)

Results in Table 2, based on the mean role performance in the public and private conditions without regard to conceptual systems, show the achievement to be lower in the public than in the private treatment on 15 of the 18 role variables (P , sign test, = .004), and significantly so on eight of the dimensions considered individually. Only diction and vocabulary were higher in public, as they well might be expected to be because of the anticipation of the arguments being heard later by members of the university curriculum committee. Be this as it may, it is nonetheless apparent that the conditions of the public treatment, presumably the potential of being evaluated by authorities, resulted in

Table 2

Mean Achievement on the Role Playing Variables
Under the Private and Public Conditions

Role Variables	Private (N=40)	Public (N=40)	Private- Public	t
Number of Minutes Silent †	5.7	5.8	-.14	-.13
Number of Themes	14.7	15.1	-.42	-.38
Number of Theme Variations	20.6	18.6	2.01	.96
% High Novel Themes	40.5	29.0	11.54	2.08**
% High Appropriate Themes	44.8	38.0	6.79	1.05
% High Novel-High Appropriate Themes	23.0	14.9	8.03	1.75*
% Low Novel-Low Appropriate Themes †	36.9	44.9	-8.00	-1.29
Vocabulary	2.6	3.0	-.34	-.60
Logic in Arguments	1.9	1.7	.24	1.57
Interest in Task	1.9	1.6	.29	1.97*
Diction	2.5	2.6	-.08	-.08
Cooperation	2.7	2.3	.37	2.06**
Effectiveness of Proof	1.8	1.7	.16	1.08
Use of Examples	2.0	1.8	.23	1.73*
Effectiveness of Examples	1.8	1.6	.10	.67
Attainment of Main Point	1.9	1.7	.24	1.75*
Overall Convincingness	1.9	1.6	.24	1.76*
Overall Quality	1.8	1.3	.55	2.34**

† Lower values mean better performance, opposite to other variables

* P < .10, 1 tailed test

** P < .05, 1 tailed test

lower attainment on all of the more substantive role dimensions.

Conceptual Systems

Only one hypothesis was offered for the effects of systems on role playing without regard to their interaction with the public-private variation: System 4 Ss will role play better than Ss of the other three systems in both the public and private conditions.

(Table 3 About Here)

The results in Table 3 confirm this hypothesis. System 4 representatives out-performed Ss from each of the other systems on all 18 of the role variables in both private and public, and significantly so on all (all P's < .05) but vocabulary usage. The fact that System 4 Ss were not judged as superior in vocabulary usage strengthens the other results. It means that their higher achievement on the other role playing variables cannot be attributed to contamination of judges' ratings by Ss' vocabulary usage.

All of the other anticipated effects of conceptual systems posited interactions between them and the public-private variation. It was assumed that impairment or facilitation of role performance by the public condition, in comparison to the private, would be a direct function of Ss' attitudes toward the authorities represented by members of the Curriculum Committee who were depicted as likely to later read the role arguments made under the public treatment.

Owing to their assumed fear, distrust and hostility toward representatives of authority, especially those who in some remote way might be able to affect their grades and hence their fate, System 2 was hypothesized as the conceptual group that would be most adversely affected in role playing by the public condition.

Table 3

Mean Achievement of the Four Conceptual Systems on the Role Playing Variables Under the Private and Public Conditions

Role Variables	System 1		System 2		System 3		System 4	
	Private	Public	Private	Public	Private	Public	Private	Public
Number of Minutes Silent†	5.2	6.7	6.0	9.4	8.8	4.3**	2.5	3.2
Number of Themes	14.9	13.7	14.2	13.3	13.3	13.9	16.7	18.8
Number of Theme Variations	18.6	15.6	18.6	16.4	17.1	15.4	29.2	25.3
% High Novel Themes	32.2	27.9	43.6	20.3**	41.6	28.2	45.4	39.1
% High Appropriate Themes	35.0	21.9	49.9	30.6	33.6	36.0	64.2	57.3
% High Novel - High Appropriate Themes	8.8	3.9	29.6	8.0**	19.9	12.9	35.8	30.6
% Low Novel - Low Appropriate Themes†	41.3	52.1	34.3	48.0	43.6	48.7	26.3	34.0
Vocabulary	2.5	2.2	2.6	2.1*	2.2	2.3	2.7	2.5
Logic in Arguments	1.8	1.5	1.9	1.4*	1.5	1.6	2.6	2.2**
Interest in Tasks	1.9	1.3**	1.8	1.3*	1.5	1.6	2.6	2.3**
Diction	2.3	2.4	2.7	2.4	2.1	2.5	3.1	2.7*
Cooperation	2.6	2.2	2.7	2.0*	2.5	2.3	3.3	2.9*
Effectiveness of Proof	1.6	1.4	1.9	1.4	1.5	1.6	2.5	2.2
Use of Examples	2.1	1.8	1.7	1.5	1.9	1.7	2.3	2.1
Effectiveness of Examples	1.7	1.5	1.5	1.2	1.5	1.5	2.4	2.3
Attainment of Main Point	1.8	1.4**	1.9	1.4**	1.5	1.7	2.5	2.2
Overall Convincingness	1.8	1.4**	2.0	1.3*	1.5	1.6	2.6	2.2
Overall Quality	1.5	1.0	1.8	1.8**	1.2	1.7	3.0	2.1*

† Lower values mean better performance, opposite to other variables

* t for difference between private and public <.10, 1 tailed test

** t for difference between private and public <.05, 1 tailed test

Owing to an assumed early history of overindulgence and reward from authorities, especially for public performances, System 3 was hypothesized as the conceptual group that would be least adversely affected in role playing by the public situation. In fact, it was anticipated that the chance to perform for the curriculum committee would, instead of making System 3 Ss anxious, enhance their interest in the role assignment and tend to result in higher achievement in role playing.

Owing to their assumed task orientation, general feeling of competence and lack of fear of authorities, System 4 Ss were hypothesized to perform the role assignment equally well under the public and private treatments.

The results in Table 3 relate to these hypotheses. Before suggesting the comparisons directly relevant to them, however, the general relationship of conceptual systems to role playing should first be noted. As indicated earlier, the mean achievement of System 4 was significantly higher than that of each of the other systems in both public and private on all role variables but vocabulary usage. The relative standing of the other systems on role performance vary, on the other hand, with the public-private variation. In private the mean performance of System 2 was higher than that of either System 1 or 3 on 12 or 16 variables respectively, while the mean achievement of System 3, in addition to being lower than System 4, was lower than that of Systems 1 and 2 on 16 and 17 role variables respectively. In public much of the picture became reversed, with System 3 Ss out-performing System 2 Ss on 16 role variables and out-achieving System 1 Ss on 17 variables.

Of direct relevance to the hypotheses, it can be inferred from Table 3 that in terms of differences between role achievement in public and private System 2 was more adversely affected by the public condition

than any of the other three systems; more than Systems 1 and 4 on 14 role variables (P, sign test, = .015) and more than System 3 on all 18 variables. Further, while the mean achievement of Systems 1, 2, and 4 was higher in private than in public on 17, 18 and 16 role variables respectively (P, sign test, = .001), the mean achievement of System 3 was higher in public than in private on 11 of the variables. This difference, between the number of role variables on which System 3 was higher in public and the number on which the other three systems were higher in private, is clearly significant (P, sign test, = .001) whether System 3 is compared with the other three systems separately or with the three combined.

While the hypotheses concerning the differential effects of the public-private variation on Systems 2 and 3 are thus confirmed, the hypothesis concerning the relative achievements of System 4 Ss under the two situational conditions was not. Like Systems 1 and 2, System 4 Ss did better on almost all (16) of the role variables in private, although on none of the variables was this difference for System 4 significant at the .05 level. Hence in frequency but not in magnitude were System 4 Ss affected by differences in the public-private variation.

The fact that System 4 Ss were affected negatively by the public condition on a significant number of role variables probably is attributable to the fact that some of these persons, instead of being "Pure" System 4 in conceptual makeup, also possessed some characteristics of System 2 functioning. While no doubt lying at least partially in the lack of complete theoretical clarity, the possibility of some confusion between System 2 and System 4 functioning also lies in the not infrequent difficulty in determining whether a response on the TIB completions indicates independence and autonomy without negativism, as it should to be representative of System 4, or whether it expresses negative

independence and anti-authority attitudes, which would be more indicative of System 2. As we have argued elsewhere (Harvey, et al, 1961), it appears that in order to establish independence and autonomy of self-structure some degree of rebellion and negativism is necessary. Presumably, however, System 4 individuals pass through this whereas System 2 representatives are more likely to become arrested at this stage. The relevance of this possibility for the present case is that many of the Ss categorized as System 4 in this study may, because of their youth, still be in the process of moving through rebellion but not yet be completely out of it.

Additional Measures of Concreteness-Abstractness from This I Believe Test

All TIB completions, in addition to being scored according to their assumed expression of one of four conceptual systems, were also scored on 14 dimensions that were presumed from a theoretical basis to relate to concreteness-abstractness or conceptual openness-closedness. Each S's average score was determined on each of the following dimensions of belief expression: (1) novelty, (2) appropriateness, (3) clarity, (4) integration, (5) contradiction, (6) implications, (7) evaluativeness, (8) tautologicalness, (9) categoricalness, (10) categoricalness, (11) multifacetedness, and (12) quality. In addition to these scores based on the means of TIB referents scored singly, two scores based on overall evaluation of the completions were obtained: (13) overall quality and (14) overall variation in themes.

In order to test for interactions between conceptual dimensions and the public-private variation each of the preceding conceptual dimensions was divided at the median, providing higher and lower divisions of each attribute, and in a two-way analysis of variance run against

role playing achievement partitioned according to the public and private conditions. A separate analysis of variance was carried out for each of the 14 conceptual dimensions on each of the 18 role playing variables.

The means of the role performance, without regard to the public-private variation, are presented in Table 4 for the higher and lower scorers on those eight conceptual dimensions that accompanied significant variation in attainment on five or more role variables. Contradiction and integration, ~~which~~ ^{which} failed to relate to role performance on any variable, together with clarity, novelty and appropriateness, each of which related significantly to attainment on but three variables, are omitted from Table 4.

(Table 4 About Here)

Higher overall quality, higher overall variation in themes, higher multifacetedness and higher implications accompanied significantly higher achievement (10 or better) on from three to 14 of the role playing variables. At the same time, higher tautologicalness, higher evaluativeness, higher platitudinousness and higher categoricalness of the TIB completions accompanied significantly lower scores on from five to fifteen of the role playing variables. Of the role playing variables, only vocabulary usage was unaffected by variation in the conceptual dimensions, further evidence that Ss' vocabulary during role playing did not overly influence the judges' ratings of the other role variables.

The F values for none of the interactions between conceptual dimensions and the public-private variation were significant above the chance level, the effects of the conceptual dimensions on role playing being similar in both the public and private conditions.

Table 4

Mean Role Attainment of Higher and Lower Scorers on Eight Conceptual Dimensions
(Non-Significant Values Omitted)

Role Variables	Conceptual Dimensions																
	Overall Quality		Overall Variation		Multifacetedness		Implications		Tautologicalness		Evaluativeness		Platitudinousness		Categoricallness		
	Higher	Lower	Higher	Lower	Higher	Lower	Higher	Lower	Higher	Lower	Higher	Lower	Higher	Lower	Higher	Lower	
Number of Minutes Silent†																	
Number of Themes	22.3	18.0	22.8	18.0*	21.9	17.5*	22.0	17.4*	13.3	16.1*				13.4	15.9*	13.5	16.0*
Number of Theme Variations																	
% High Novel Themes																	
% High Appropriate Themes	53.4	32.9**					49.2	32.9*									
% High Novel - High Appropriate Themes																	
% Low Novel - Low Appropriate Themes†	29.3	12.3*	25.9	14.8*			25.6	12.4**	16.6	22.5**	12.9	22.4*	17.0	22.2*	16.8	22.5**	
Vocabulary	33.2	47.9*					36.1	47.2									
Logic in Arguments	2.1	1.6***	2.0	1.7	2.0	1.6*	2.1	1.6***			1.6	1.9		1.6	2.0*	1.6	2.0*
Interest in Task	2.2	1.5***	2.0	1.6*	1.9	1.6*	2.0	1.5***	1.6	2.0**	1.6	1.9		1.6	2.0*	1.5	2.0***
Cooperation	2.8	2.3**					2.7	2.3*									
Effectiveness of Proof	2.8	2.4*	2.8	2.4*	2.7	2.4	2.7	2.4	2.4	2.7	2.0**	2.0**		1.6	1.9*	1.5	2.0**
Use of Examples	2.2	1.6**	2.0	1.6*	1.9	1.6	2.0	1.5**									
Effectiveness of Examples	2.1	1.7*	2.1	1.8			2.0	1.5**									
Attainment of Main Point	2.1	1.4***	2.0	1.5*			1.9	1.5*								1.4	1.9*
Overall Convincingness	2.1	1.6**	2.0	1.7			2.0	1.6*								1.6	2.0*
Overall Quality	2.1	1.5***	2.0	1.6*			2.0	1.5**								1.6	2.0**
	3.1	2.2***	1.8	1.4			1.9	1.2**	1.3	1.8*	1.6	2.0	1.6	1.3	1.8	1.2	1.9**

Unmarked = F for difference between role performance of higher and lower scorers < .10

* = F for difference between role performance of higher and lower scorers < .05

** = F for difference between role performance of higher and lower scorers < .01

*** = F for difference between role performance of higher and lower scorers < .001

Dogmatism, Right and Left Opinionation, Opinionated Acceptance and Rejection, Authoritarianism and Performance on the Doodlebug Problem

On the basis of Rokeach's work (1960) it was hypothesized that with the exception of speed in grasping the Doodlebug Problem all of these measures, presumed to tap the openness of the total conceptual system, would correlate negatively with role playing. This hypothesis as applied to dogmatism, right and left opinionation, opinionated acceptance and rejection was not confirmed. While the relationship of these variables to role playing was in the predicted negative direction, none of them correlated significantly with more than three role playing variables and the ones that did barely reached significance. Hence they are omitted from Table 5.

(Table 5 About Here)

On the other hand, as can be seen from Table 5, opinionation right and authoritarianism, which correlated .65 with each other, related negatively to all of the role variables but vocabulary; significantly so with 11 and 16 role variables respectively. Also performance on the Doodlebug Problem related to the dependent variables pretty much as predicted. Time to solution of the Doodlebug Problem and request for help from E in solving it correlated negatively with role playing, the latter variable at a more consistent and higher level, while speed in grasping the problem correlated significantly positively with all of the role variables but vocabulary and diction.

Rigidity

Rigidity failed to correlate significantly with any of the role variables, although again, the direction of the relationship was in the predicted negative direction. It is also omitted from Table 5.

Correlations Between Role Playing and Authoritarianism:
Opinionation Right and Performance on the Doodlebug Problem
(Non-Significant r's Omitted)

Role Variables	Authori- tarianism	Opinion- ation Right	Doodlebug Problem		
			Time to Solution	Speed in Grasping Problem	Request for aid from E
Number of Minutes Silent †	.21	.19		-.24	.26
Number of Themes	-.19			.24	-.19
Number of Theme Variations	-.32			.24	-.26
% High Novel Themes			-.21	.24	-.26
% High Appropriate Themes	-.34	-.22	-.22	.38	-.32
% High Novel - High Appropriate Themes	-.36	-.22	-.21	.35	-.31
% Low Novel - Low Appropriate Themes †	.19	.28		-.23	.25
Vocabulary	.20				
Logic in Arguments	-.29	-.22	-.20	.38	-.38
Interest in Task	-.31		-.17	.39	-.35
Diction	-.25	-.24			
Cooperation	-.28	-.27		.23	-.23
Effectiveness of Proof	-.32	-.36	-.19	.35	-.31
Use of Examples				.23	-.25
Effectiveness of Examples	-.19		-.21	.37	-.32
Attainment of Main Point	-.31	-.37		.30	-.26
Overall Convincingness	-.29	-.21	-.21	.35	-.35
Overall Quality	-.37	-.34	-.19	.38	-.34

† Direction of interpretation opposite from r's of the other role variables
r for P.05, 1 tailed test, 79 d.f. = .18
r for P.01, 1 tailed test, 79 d.f. = .26

In addition to the correlations between the preceding personality measures and role playing, each of these personality factors was also tested for interaction with the public-private role conditions for each of the 18 role variables by two-way analyses of variance based on the median split (higher and lower) of each personality measure under the public-private variation. Nothing above chance interaction was established.

Intelligence

As it has long prevailed in regard to other prominent intelligence tests, controversy exists over whether the WAIS measures general intelligence, which might possibly be more nearly equated to the openness or abstractness of the total conceptual system, or whether it measures specific skills, which might be more comparable to openness or resistance to change of single beliefs or domains within the total system. Seemingly the better known intelligence tests, including the WAIS, measure both general and specific intelligence. Partially due to this, but due more to intelligence tests so often being set up by psychologists as a kind of yardstick against which other tests are gauged and accepted or rejected, the relationships of scores on the WAIS to the role playing variables are presented separately.

The assumption was that to the extent the scores on the various subtests of the WAIS related to role playing they would correlate positively.

(Table 6 About Here)

In Table 6 are presented the correlations between the role playing variables and those subtests of the WAIS that related significantly to five or more of them. The correlations for Similarities, Digit Symbol,

Table 6

Correlation Between Role Attainment and Subtests of the WAIS
(Non-Significant r's Omitted)

Role Variables	Verbal	Vocab- ulary	Infor- mation	Arith- metic	Digit Span	Full Scale
Number of Minutes Silent [†]						
Number of Themes						
Number of Theme Variations	.20	.31				.20
% High Novel Themes				.19	.19	
% High Appropriate Themes	.43	.50	.35	.23	.27	.35
% High Novel - High Appropriate Themes	.40	.32	.32	.23	.34	.31
% Low Novel - Low Appropriate Themes [†]	-.22	-.31		-.22		
Vocabulary						
Logic in Arguments	.27	.40	.24		.19	.19
Interest in Task	.32	.43	.28		.26	.24
Diction	.28	.34	.20		.20	.19
Cooperation		.25				
Effectiveness of Proof	.38	.41	.31		.30	.30
Use of Examples		.22				
Effectiveness of Examples	.20	.35	.19			
Attainment of Main Point	.29	.40	.23		.22	
Overall Convincingness	.26	.43	.24		.20	
Overall Quality	.32	.40	.22	.21	.27	.22

[†] Direction of interpretation opposite from r's of the other role variables
r for P.05, 1 tailed test, 79 d.f. = .18
r for P.01, 1 tailed test, 79 d.f. = .26

Picture Completion, Picture Arrangement, Block Design and Object Assembly, which related significantly to none of the role variables, and for Performance and Comprehension, which related to no more than four of the role indices, are omitted from Table 6. Vocabulary correlated highest and most consistently with role playing, followed fairly closely by Verbal I.Q., Digit Span and Full Scale I.Q., in that order.

In the same way as for the conceptual and personality variables, the interaction between the higher and lower medians of each WAIS subtest and the public-private variation was also tested for each of the role playing dimensions. Vocabulary interacted significantly with the public-private variation on 13 role variables, Information on 11 variables, Verbal I.Q. on four and the remaining subtests interacted significantly with the public-private conditions on none of the role variables. The pattern of the significant interactions was the same in all cases. Subjects categorized as lower on these three subtests tended to perform the role slightly better in the public condition while those categorized as higher tended to play the role appreciably better in the private situation. This difference between the more and less intelligent subjects on these subtests is probably attributable to a difference in interest in the role playing task under the public and private conditions. The upper-median Ss displayed greater interest in the task in the private condition whereas the lower-median subjects showed a greater task interest in the public condition. While it is little more than conjecture, one of the many possible explanations for this difference may be that the individuals of higher intelligence found the task less difficult and of more intrinsic interest while the persons of lower intelligence found it more difficult and of less intrinsic interest. This would likely result in

the more intelligent subjects performing considerably better in private, where there was no likelihood of external rewards or punishments from the evaluations of authority figures, and the less intelligent individuals performing better in the public condition, where they were goaded into a degree of interest by the perceived likelihood of subsequent evaluation by members of the curriculum committee. Another possibility, of course, is that the more intelligent Ss were more disturbed in the public condition and hence suffered in performance more than in the non-surveillance condition whereas the less intelligent Ss were not so differentially affected by the public-private variation.

Summary and Conclusions

This study investigated in an interactional design the effects of situational and dispositional factors on the ability to play a role, the effective performance of which demanded the ability to tolerate conceptual conflict and inconsistency, to change set and to behave creatively. Ten representatives of each of the four nodal conceptual systems or levels of abstractness posited by Harvey, et al, (1961) were required to argue in opposition to their own belief concerning whether or not philosophy should be required as a minor for all recipients of bachelors degrees. Subjects presented their arguments under either a private condition, in which they were erroneously assured no one would ever hear or know the arguments they presented, or under a public condition, in which they were advised that their tape-recorded arguments would later be heard by members of the university curriculum committee. In addition to the This I Believe Test, scored for both conceptual systems and for other dimensions of concreteness-abstractness, each of the 80 Ss was also administered Rokeach's (1961) scales of dogmatism, opinionation left and right, opinionated acceptance and rejection as well as the F Scale, Gough and Sanford's (1952) Rigidity Scale, the Doodlebug Problem (Denny, 1945) and the Wechsler Adult Intelligence Schedule. The tape-recorded arguments of all Ss were scored on the following 18 variables of role playing: time silent, number of themes, number of theme variations, per cent of high novel themes, per cent of high appropriate themes, per cent of high novel-high appropriate themes, per cent of low novel-low appropriate themes, vocabulary, use of logic, interest, diction, cooperation, effectiveness of proof, use of examples, effectiveness of examples, attainment of a main point, overall convincingness and overall quality.

It was found that:

1. Role attainment, without regard to dispositional factors, was significantly higher in the private than in the public condition.

2. The more abstract, System 4, Ss significantly out-performed representatives of the other three systems on 17 of the role playing variables under both the public and private conditions.

3. Most of the additional dimensions of concreteness-abstractness derived from the TIB completions also related to quality of role playing. Subjects scored as higher in clarity, novelty, appropriateness, multifacetedness, implications, variation in themes and overall quality achieved significantly higher than did Ss scored as lower on these dimensions on from three to 14 of the role variables. Subjects scored as higher on tautologicalness, evaluativeness, platitudinousness and categoricalness performed significantly lower than Ss scored as lower on these dimensions on from five to 15 of the role playing variables.

4. Conceptual systems, but not the other dimensions of abstractness derived from the TIB completions, (i.e., clarity, tautologicalness, etc.) interacted significantly with the public-private conditions of role playing. System 2 Ss were most adversely affected by the public condition, in comparison to the private. Systems 1 and 4 were also negatively affected by the public treatment, while System 3 Ss actually performed somewhat better in public than in private. These results show clearly that most of the Ss in this study were more flexible, more open and more creative in the private condition, where they were free of potential evaluation and surveillance, than in the public conditions, in which existed the potential of evaluation by university authorities.

5. Of Rokeach's scales, only opinionation right correlated significantly (negatively) with any appreciable number of the role

variables. Dogmatism, opinionation left, opinionated acceptance and rejection failed to relate. If our assumption was correct that playing the assigned role involved openness and flexibility of the total conceptual system and not just some single belief within it, then Rokeach's scales appear, in contradistinction to his assumption, to be inadequate measures of system openness.

6. Authoritarianism (which correlated .65 with opinionation right) correlated significantly negatively with most of the role variables.

7. Two measures from the Doodlebug Problem, time to solution and request for help from E, especially the latter, correlated significantly negatively, while a third measure, speed in grasping the Doodlebug Problem, correlated significantly positively with an appreciable number of role playing variables.

8. Rigidity, as measured by the Gough and Sanford scale, failed to correlate significantly with any of the role variables. The failure of this measure of rigidity to correlate with role playing may, if Rokeach's assumption that it measures closedness or resistance to change of single beliefs is correct, be construed as further evidence that effective playing of the assigned role demanded openness and flexibility of the total system.

9. All of the above measures of Rokeach, as well as authoritarianism, performance on the Doodlebug Problem and rigidity failed to interact with the public-private role conditions.

10. Of the sub-tests of the WAIS, only Verbal I.Q., Vocabulary, Information and Digit Span correlated significantly with half or more of the 18 role variables. Similarities, Digit Symbol, Picture Completion, Picture Arrangement, Block Design and Object Assembly correlated significantly with none of the role variables.

11. Performance on the WAIS subtests of Information and Vocabulary interacted significantly with the public-private variation, with the Ss who scored lower on these subtests tending to perform the role slightly better in the public condition and the Ss who scored higher tending to play the role appreciably better in private.

Footnotes

1. This study was supported by the Group Psychology Branch, Office of Naval Research, under contract Nonr 1147(07) with the University of Colorado. Reproduction of this study in whole or part is permitted for any purposes of the United States Government.
2. Thanks are extended to ONR for its support and to the students who served as subjects. I wish especially to thank the several persons who were instrumental in the design, execution and analysis of this study: Jerry Felknor, Cathy Felknor, Robert Wyer, Robert Ware, Ronald Gerber, Darrel Adams, Jack Hautaluoma, John Reich, and William Carlock.
3. The relationship of this measure to a wide range of behavioral indices as well as to several established testing instruments will be detailed in a monograph, System Structure and Adaptability, in preparation by the present author.

References

- Adorno, T. W., Frenkel-Brunswik, Else, Levinson, D. J., & Sanford, R. N.
The authoritarian personality. New York: Harper, 1950.
- Asch, S. Social psychology. New York: Prentice-Hall, 1952.
- Campbell, V. Assumed similarity, perceived sociometric balance and social influence. Unpublished Ph.D. Dissertation, University of Colorado, 1960.
- Denny, M. R. The Doodlebug Problem, 1945, as referred to by M. Rokeach,
The open and closed mind. New York: Basic Books, 1960.
- Getzels, J. W. & Jackson, P. W. Creativity and intelligence. New York: Wiley, 1962.
- Gochman, D. S. System theory and adaptability. Unpublished Ph.D. Dissertation, University of Colorado, 1962.
- Gough, H. G. & Sanford, R. N. Rigidity as a psychological variable. Unpublished manuscript, University of California, Institute of Personality Assessment and Research, 1952.
- Harvey, O. J. Current status of the incongruity hypothesis. In O. J. Harvey (Ed.) Motivation and social interaction - cognitive determinants. New York: Ronald Press, 1963(a).
- Harvey, O. J. System structure and adaptability. Monograph in preparation, 1963 (b).
- Harvey, O. J. & Beverly, G. D. Some personality correlates of concept change through role playing. J. abnorm. soc. Psychol., 1961, 63, 125-130.
- Harvey, O. J., Hunt, D. E. & Schroder, H. M. Conceptual systems and personality organization. New York: Wiley, 1961.

- Janis, I. L. & King, B. T. The influence of role playing on opinion change. J. abnorm. soc. Psychol., 1954, ~~49~~, 211-218.
- King, B. T. & Janis, I. L. Comparison of the effectiveness of improvised versus non-improvised role playing in producing opinion change. Hum. Relat., 1956, 9, 177-186.
- Rokeach, M. The open and closed mind. New York : Basic Books, 1960.
- Scott, W. A. Attitude change through reward of verbal behavior. J. abnorm. soc. Psychol., 1957, 55, 72-75.
- Scott, W. A. Cognitive complexity and cognitive flexibility. Sociometry, 1962, 25, 405-414.