VERBAL CONDITIONING, TRANSFER AND OPERANT LEVEL "SPEECH STYLE" AS FUNCTIONS OF COGNITIVE STYLE

by

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CHAPTER I

Discussion of the Problem

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The main emphasis of the behavioristic approach to verbal conditioning has been the identification and control of "observables", among them the effectiveness of reinforcing stimuli (Simkins, 1961; Adams and Frye, 1964), task requirements (Krasner, Knowles and Ullmann, 1965; Kanfer and Marston, 1961) and subject-experimenter interaction (Sapolsky, 1960; Kanfer and Karas, 1959). Generally opposed to this approach has been the "cognitive" school of verbal conditioning which has tended to focus primarily on covert or underlying processes such as the role of awareness as a mediating variable in verbal learning (Spielberger, 1965; Spielberger and DeNike, 1966; and others).

Years of controversy over a number of theoretical and methodological issues have tended to polarize the behavioristic and cognitive camps to the point where there is currently very little room for a meeting of minds, not merely in terms of what direction verbal conditioning research should take, but in relation to broader practical considerations, as well. The present investigation proposes to show that there are some grounds for compromise and cooperation between these opposing views. It will do so by demonstrating that certain cognitive variables not only play an important part in verbal conditioning and transfer, but may be operationally defined, measured and controlled in a manner that is consistent with the most rigorous standards of behavioristic methodology.

The cognitive variables which have received attention in the present study have been defined by a number of writers as "cognitive style". Put simply, cognitive style refers to the self-consistent ways in which individuals function in perceptual and conceptual

activities (see Witkin, 1965; also reviews by Wiggins, 1968, and Klein, Barr and Wolitzky, 1967). Because cognitive styles can be evaluated by controlled laboratory procedures, they provide an objective, experimental approach to the study of behavior and personality assessment.

In the present investigation, an attempt has been made to relate what has been termed "global-articulated cognitive style" to group and individual differences in susceptibility to verbal behavior modification and transfer. In addition, some attempt has been made here to explore the apparent relationship between global-articulated cognitive style and specific verbal behaviors, such as tendency to emit many, as opposed to few, self-referred positive or negative affect statements under free operant conditions.

The remaining introductory discussion includes reviews of theoretical issues and empirical findings associated with the literature on verbal conditioning and cognitive style. This review of the literature is followed by an integration of the major issues and findings, and by the presentation of a hypothesis that was tested by the experimental procedures described in a later section here.

Theoretical Issues in Verbal Conditioning

Despite the role and influence of descriptive behaviorism in the development and employment of verbal conditioning procedures, two theoretical issues have arisen in conjunction with verbal conditioning studies. The first of these issues concerns the place of mediating mechanisms in verbal conditioning, the nature of the constructs to be used in the description of covert processes, and the theoretical

framework in which such concepts should be lodged. The second issue, which is closely related to the first, is concerned with methodology and, particularly, with the validity of post-experimental verbal reports as evidence of certain covert or "private" events which mediate learning, i.e., link S and R. For a thorough review of these issues, the reader is referred to Spielberger (1965) or Kanfer (1968). For present purposes, the following brief discussion will suffice.

Cognitive Vs. Behavioristic Position

Essentially, the cognitive position on verbal conditioning holds that processes such as reasoning, thinking and hypothesis testing, which are not directly observable, may be inferred from the experimental subject's verbal responses to interview questions. Furthermore, cognitive psychologists argue that affective and conative states are influenced by different variables and, in turn, themselves influence S's hypothesis testing behavior. In this schema, when a given response is followed by a reinforcement, S finds that his hypothesis about his behavior was correct and this confirmation leads to a strengthening of the response class.

In order to obtain information about such cognitive mediating states or variables, the cognitive approach has relied heavily on S's verbal report, usually, but not always, obtained through some post-experimental procedure such as a structured interview or questionnaire. These reports are held to be empirical, independent variables, and as such may be employed as valid indices of cognitive processes which operate during conditioning. What is learned in verbal conditioning,

according to verbal report evidence, is the correct response-reinforcement contingency. No learning takes place unless a correct or correlated hypothesis is present.

In direct contrast to the cognitive approach, the behavioristic position on verbal conditioning holds that the variables which determine performance in verbal conditioning studies can be demonstrated experimentally without recourse to complex and unobservable constructs. Consequently, the behavioristic camp has been highly critical of the status given to the verbal report by cognitive psychologists, arguing that such responses are actually verbal behaviors in their own right and, therefore, subject to the same variables as other behaviors. The essence of this criticism is that such verbal responses are not independent variables but, rather, dependent variables differing from the conditioned response only in terms of the discriminative (instructional) and historical stimuli which control their emission. Therefore, such verbal reports cannot validly be used as indices of other events; they are only valid when viewed as dependent variables related to other operations.

A second issue over which the cognitive and behavioristic conceptual systems lock horns is the issue of intermediate or intervening process in verbal conditioning. A major aim of the cognitive camp has been the identification of such processes which are held to be "cognitive" in nature, i.e., involve thinking, reasoning, problem solving, and so on. While the behavioristic position does not deny the presence of intermediate processes, it does deny that such processes are necessary conditions for learning. All that is necessary to learning

is the presence of an emitted response or response class and a relevant and appropriately timed reinforcing stimulus.

Awareness Issue: Theoretical and Empirical Considerations

Perhaps the major issue which divides the cognitive and behavioristic positions on verbal conditioning is the methodological issue of awareness. On the one hand, cognitive psychologists have argued that awareness of the correct response-reinforcement contingency in verbal conditioning is a facilitating, if not necessary, factor in the learning of a verbal response class. On the other hand, the behavioristic camp, as it might be supposed from the previous discussion, has held that awareness is not only unnecessary for learning to take place, but cannot be determined by valid methodological means.

Over the past ten years, considerable research effort has been expended by both sides in an attempt to resolve the awareness issue. In general, such research has only served to further polarize the protagonists involved in this controversy and reinforce criticism of opposing methodologies.

Two writers who have long argued that awareness in verbal conditioning experiments precedes performance increments are Spielberger and DeNike. In one study, DeNike (1964) found that Ss whom he had rated as "aware" on the basis of their thoughts during the experiment showed performance curves that registered marked increases in output of human nouns over the reinforced word blocks, while Ss rated as "unaware" failed to show any performance gains. In a somewhat related

study, Spielberger (1966) found that Ss whom he rated as "aware" showed increases in motivation to solve the problem posed to them by E, while Ss rated as "unaware" showed neither increased incentive nor performance gains in terms of producing human nouns.

Such findings as these are consistent with the hypothesis that what is learned in verbal conditioning is awareness of a correct response-reinforcement contingency. At the same time, they also appear to lend support to the conclusion that the reinforcing stimulus in verbal conditioning has both informational and incentive value and that the latter influences the degree to which Ss who are aware of the correct contingency act on their awareness (Spielberger and Denike, 1965).

Not all of the findings of studies on awareness in verbal conditioning have provided support for the cognitive position, of course. Lanyon and Drotar (1967), for instance, using an exhaustive post-experimental discussion, found that aware and unaware Ss did not differ significantly in degree of learning. Additional support for the behavioristic position comes from the work of Hare, Hislop and Lattey (1964) who found that aware Ss insisted that their awareness in no way changed their voluntary behavior during verbal conditioning; Oakes (1967) who found that aware and unaware Ss did not differ significantly in their performance on a verbal conditioned sentence completion task; and Thaver and Oakes (1967) who found that awareness of the response-reinforcement contingency during a verbal conditioning task was in no way related to amount of generalization.

An associated group of findings generally supporting the behavioristic position on awareness pertains to the issue of concurrent learning during verbal conditioning. In this connection, it has been hypothesized that concurrent, interdependent learning occurs in connection with such variables as experimenter, subject and task characteristics, singly and in combination with one another (Krasner, 1965). This hypothesis has been supported by repeated findings that experimental treatments tend to influence verbal reports in the direction of more frequent reporting of awareness in cases involving favorable experimenters, simple discriminations, non-emotional task variables, increased task relevant information and Ss who happen to be generally disposed to please E (see Kanfer and Marston, 1961; Binder and Salop, 1961; Epstein, 1946; Rosenthal, 1963; Levin, 1961; Mandler and Kaplan, 1956; also, see Kanfer, 1968, pp. 280-283).

Some Remarks on the Issues

On the basis of the issues and empirical findings described thus far, it becomes readily apparent that the equivocal nature of experimental results combined with contradicting conceptual systems that continue to generate methodological and theoretical controversies leave little room for compromise between the opposing camps. These controversies, in turn, serve to prevent the integration of important contributions made by each side.

Greenspoon (1967), summarizing the issues surrounding the cognitive-behavioristic controversy, has suggested that in order for such problems as the role of awareness in verbal conditioning to have

contemporary significance, they will have to be phrased differently so as to have relevance for current practical issues and research. The present investigator agrees with Greenwpoon on this point and will now offer his own interpretation of these issues with special consideration being given to the problem of cognitive variables in verbal conditioning studies. In the present investigator's view, the essence of the controversy is the handling of content as experimental data. May content be used for inferring unobserved process? Or must inferences about content be restricted to its relationship to outer events and observed stimulus manipulations? Neither of these questions has been answered to the mutual satisfaction of the protagonists involved in the controversy over the role of such cognitive variables as awareness in verbal conditioning.

Rephrasing the Questions

One of the frequent criticisms leveled at the behavioristic approach to verbal conditioning is its inability to account for performance variability which may be due to factors not under E's control. At the same time, the cognitive position has been criticized for inferring underlying constructs from such dependent variables as post-experimental verbal reports. A combination of factors -- among them conceptual confusion, insoluble methodological problems, and several years of futile controversy over the process-content issue -- suggest that alternate routes should be sought in the investigation of underlying variables in verbal conditioning. In this regard, it is this investigator's view that questions concerned with the treatment of

content, i.e., the handling of the data of post-experimental verbal reports, should be deferred for the time being and, in their place, new ones should be asked, for instance, the following: (1) Are there other cognitive variables presently available to the experimenter who wishes to operate within the framework of behavioristic methodology? (2) And might the control of such variables by E reduce performance variability and also provide data establishing a relationship between identifiable cognitive constructs and performance on a verbal conditioning task?

A review of the literature indicates that such cognitive variables are available for use in behavioristic methodology. Practical and empirical considerations associated with these variables -- cognitive styles -- will be discussed in subsequent sections.

Providing answers to the second question -- the one concerned with reducing variability and establishing a relationship between cognitive constructs and verbal conditioning performance -- is the principle objective of the present experiment and study.

Cognitive Style

There are a number of related advantages to using cognitive style as a variable in exploring the role of cognitive factors in verbal conditioning. First, cognitive style refers to the formal or structural aspects of cognitive functioning, i.e., to the self-consistent ways in which individuals perform on a variety of cognitive and perceptual tasks. Shifting the focus to the structural, formal aspects of cognition avoids the conceptual confusion and associated pitfalls of the content-process issue.

Second, cognitive style, unlike the so-called cognitive construct "awareness", may be operationally defined in terms of performance on highly reliable, objective measures.

Third, because cognitive style may be assessed prior to a subject's involvement in a verbal conditioning task, its status as an independent variable is unquestionable. This has not been the case where the content of verbal reports has been concerned. The status of the verbal report remains unclear.

Finally, the introduction of the structural or formal aspects of cognitive functioning brings verbal conditioning and verbal behavior in for a "fresh look" at a time when interest in these topics seems to be waning (if the diminishing number of verbal conditioning studies reported in recent years can be taken as an index). Findings of the present study to be discussed in a later section suggest that there may be some relationship between self-consistent ways of cognizing, susceptibility to verbal behavior modification and transfer, and tendency to manifest particular kinds of "speech styles" in responding to given stimuli. Data supporting the existence of such a relationship should prove both stimulating and challenging to behaviorally-oriented researchers who have long been soured on the subject of cognition by the verbal report approach of the "cognitive school".

Empirical Trends and Findings in the Study of Cognitive Styles

While at the present time, descriptive emphases and terminologies differ from one cognitive style researcher to another most of the current approaches tend to endow cognitive structures with such

steering functions as regulating, promoting, or dampening adaptive feedback and make the common assumption that people differ in systematic ways in these respects. Hierarchy is also assumed by current views with certain structural aspects of cognitive functioning exercising broad control over functions at lower levels, while other cognitive structures have more limited influence. Finally, all current approaches hypothesize an open system with inputs and outputs and steady-state requirements. Cognitive style theories, being essentially functional in nature, tend to view the regulative constancies of cognitive structures in terms of the attainment of some kind of balance between the demands of the immediate situation and motivating tendencies.

Field Dependence-Independence. The most thoroughly conceptualized and researched of the cognitive styles is field dependence-independence. Witkin's research on this dimension has stood out for years as one of the most systematic and productive applications of cognitive style psychology. In the early 1960's, Witkin broadened the concept of field dependence-independence within the framework of a generalized longitudinal conception of "differentiation", reinterpreting the well-known dichotomy as modes of articulation.

The concept of field articulation is used interchangeably in the research literature today with the concept of field-dependence. Both describe modes of perceptual functioning. Individuals who show themselves to be high in field independence on such measures as the rod and frame test or the embedded figures test are usually described as manifesting an "articulated cognitive approach" to the field while

those showing a high degree of field dependence on such measures are usually described as manifesting a "global cognitive approach".

The expansion of the field dependence-independence dimension to "psychological differentiation" provides for other, less perceptual measures of articulated versus global cognitive functioning. Global or articulated cognitive style may, for instance, be seen in the manner in which individuals construe the body image in their human figure drawings, in the manner in which they experience a sense of separate identity, as indicated by studies of social dependence, and in the manner in which they characteristically defend against ego threat, e.g., isolation versus repression and denial (Witkin, 1965).

Turning to empirical findings, it seems safe to conclude, on the basis of the research to date, that there is only one group of tasks on which field dependent Ss consistently perform at a higher level than their field independent conterparts. These tasks always involve social stimuli and, more often than not, such stimuli are irrelevant to the task at hand. Fitzgibbons, Goldberger and Eagle (1965), for example, found that field dependent Ss showed greater recall and recognition of incidentally learned social words, but not neutral words while Messick and Damarin (1964) demonstrated that field dependent Ss were better able to recognize human faces that were previously presented during a judging task without memory instructions. The sensitivity of field dependent Ss to their social environment has also been shown by Konstadt and Forman (1965) who found the letter cancellation task performance of field dependent children was more disrupted by "disapproving" adult examiners and that they tended to look more

at faces of others while under this condition than did their field independent counterparts.

Despite this "superiority", it has been shown repeatedly that it is the field independent Ss who manifest superior cognitive functioning on tasks of perception, memory, thinking and reasoning. That the active, analytic approach of field independent persons serves them well on such tasks has, for example, been demonstrated by Pressey (1967) who found that field independent Ss were significantly less susceptible to the Poggendorf Illusion than field dependent Ss; Feibert (1967) who was able to show that despite early and severe deprivation of auditory stimulation suffered by deaf field independent Ss, they nevertheless were able to demonstrate superior reading-learning ability when compared on these skills with deaf field dependent S; Stuart (1967) who found a strong positive correlation between field independence and reading grade achievement; and Kessler and Kronenberger (1967) who found field independent Ss superior to field dependent Ss on a test of perceptual synthesis.

These findings are in concert with earlier data that portray the field independent individual as superior in his capability for handling tasks requiring analysis and synthesis (Goodenough and Karp, 1961; Karp, 1963); furthermore, they lend support to contentions by Witkin and others that field dependent persons have less developed capacities for articulating their thinking and are generally less integrated in terms of how they handle stimuli than are field independent persons.

Cognitive Interference. Individual and group differences in susceptibility to distracting stimuli have been investigated in recent years and understood in terms of such concepts as "constricted-flexible control", "strong versus weak automatization", and "interference proneness". The most general label for this phenomenon, however, has been "cognitive interference" and the most widely used measure of its strength has been the Stroop color-word test. A growing body of research emerged during the 1960's, much of it in support of the proposition that cognitive interference, like field dependence-independence, is a clearly defined dimension of cognitive functioning.

In general, the research to date on this dimension has demonstrated that low interference prone Ss are superior learners on tasks of intentional learning (Amster, 1965); that low interference prone Ss tend to be more capable students than high interference prone Ss (Silverman, Davids and Andrews, 1963); that low interference prone Ss tend to retain more "meaningful" verbalizations as evidenced by their performance on tasks of immediate and delayed recall (Uhlmann and Saltz, 1965); and that strong automatizers (low in interference proneness) tend to be superior to weak automatizers in terms of job level, suggesting that they are more effective in their daily routines (Broverman, 1964).

Categorizing Behavior, Conceptual Differentiation and Cognitive Complexity. These are terms which are currently being used in reference to various dimensions of social and impersonal stimuli. Category width has been most frequently defined in terms of performance

on Pettigrew's Category Width Scale (1958) whose items purportedly tap quantitative aptitude and certain kinds of direct judgments.

Category width has been studied by Steiner and Johnson (1965) who found that Ss scoring high on Pettigrew's Scale tended to under-recall the number of interpersonal disagreements they had in an experimental conflict situation while narrow categorizers tended to conform with the behavior of E's accomplice. On the basis of this finding, it was reasoned that the broad categorizers had "assimilated" the differences of opinion that they had had with others during the experiment, whereas the narrow categorizers, being more dependent on the opinions of other persons, tended to agree with others more and better recall differences of opinion after they had occurred.

Conceptual differentiation is the new name for an older concept, "equivalence range" (Gardner, et al., 1959). In a study of differentiation and abstraction in concept formation, Gardner and Schoen (1962) determined that conceptual differentiation was a major factor and was best represented by the number of categories used in the Object Sorting Test and Behavior Sorting Test. Sloane, Gorlow and Jackson (1963) have studied the generality of this dimension as a cognitive style and have found that the greater S's conceptual differentiation, as determined by his performance on the forementioned measures, the better he is able to perform on tests of critical judgment.

Of the three cognitive styles receiving attention in this section, the last, cognitive complexity, is the most thoroughly researched to date. Bieri (1966) has defined cognitive complexity both in terms of differentiation and articulation. Using a modification of Kelly's

Repertory Grid Test (REP), a complex system for mapping a person's personal constructs based on his conceptions of significant people in his life, Bieri and Tripodi (1966) determined that high complexity Ss tended to be more certain than low complexity Ss in their judgments of incongruent compared with congruent information. Along this line, Schroder and Streufert (1966) have found that abstract (cognitively complex) Ss make consistently better information processors and social perceivers than concrete Ss, while Streufert (1966) has shown that abstract Ss tend to achieve a higher level of integration of increased input of information than concrete Ss. In addition, Suedfeld and Hagen (1966), in an investigation of information processing and information complexity have determined that abstract Ss are more effective in processing complex information than less abstract or concrete Ss and Leventhal and Singer (1964), studying a somewhat different dimension, have shown that low complexity Ss, as opposed to their high complexity counterparts, tend to be less attuned to their own inner experiences and inner psychological factors.

Scanning. The principle of cognitive scanning has been applied in attempts to understand group and individual differences in performance on conventional size estimation tasks. It was originally investigated by Schlesinger (1954) who, referring to it as "focussing", defined it as "the habitual maintenance of a narrowed attitude that favors concentration on relevancies and ignores irrelevancies ... at the other end of the continuum ... we would expect to find persons who are inclined to experience the world far more inclusively".

The most recent interpretation of scanning has been made by

Holzman (1966) who has determined that accuracy in size estimation correlates positively with amount and quality of incidental recall. Of some interest is the finding that the most articulate or "extensive" scanners are quite different, in terms of their recall of incidental stimuli in the perceptual field, from articulate and focussed field independent Ss such as those mentioned earlier who show inferior recall of such stimuli (Holzman, 1966; Gardner and Long, 1962).

Discussion

In moving towards some integration of these findings on cognitive style, it becomes readily apparent that there is considerable semantic overlap between such terms as "constricted-flexible control", "psychological differentiation", "conceptual differentiation", cognitive complexity" and "extensive scanning". All are, in one way or another, concerned with the degree to which judgment and experience are articulated. While at the present time it is difficult to determine precisely the distinction, if any, between these concepts, due to the tendency of researchers to use different instruments in their measurement, certain inferences may be drawn from the existing data which will enable us to make descriptive statements about individuals who fall at opposite ends of a dimension associated with the articulation of judgment and experience. We shall call this the "global-articulated cognitive style dimension". Theoretically, individuals falling at its extremes should typically evidence the following characteristics in responding to cognitive tasks similar to those used by cognitive style investigators.

Characteristics of the Articulated Cognitive Style Group

(1) Articulated deployment of attention; extensive scanning.

(2) Articulated approach to the perceptual field.

(3) Accurate evaluation of perceived stimuli; judgments independent of certain external cues which may either be irrelevant or misleading.

(4) Freedom from cognitive interference; low susceptibility to distraction.

(5) Differentiated thinking; distinct formation of concepts; high degree of interrelation of concepts; strong analytic ability.

(6) Highly articulated and differentiated body concept.

Characteristics of the Global Cognitive Style Group

(1) Global deployment of attention; minimal scanning.

(2) Global approach to the perceptual field.

(3) Unstable and frequently inaccurate evaluation of perceived stimuli; heavy reliance upon external cues which may be misleading or irrelevant.

(4) Susceptibility to cognitive interference; susceptibility to distraction.

(5) Minimal capacity for differentiated thinking; instability in forming and relating concepts; limited analytic ability.

(6) Poorly articulated body concept; undifferentiated thinking in relation to body.

Development of Experimental Hypothesis

Having characterized the global and the articulated individual in terms of his performance on a variety of tasks, an attempt will now be made to demonstrate, in a conceptual sense, the relevance of cognitive style to verbal conditioning and transfer task performance. In beginning this discussion, it is necessary to indicate that a particular premise is basic to the investigator's theoretical position. This premise is that the free operant conditioning paradigm results in experimental situations which involve S in a variety of information gathering, evaluating and processing functions. As such, these experimental situations may validly be defined as "partly cognitive tasks". The following observations are offered in support of this contention:

(1) In the typical free operant verbal conditioning experiment, S is confronted with a variety of novel sights and sounds to which he must first respond by deploying his attention in some manner. These variables may take the form of verbal stimuli, such as task instructions, reinforcements, or standard prods; mechanically-produced stimuli, such as the hum of a tape recorder motor, the click of a stop watch, or the flashing of a light; and social or interpersonal stimuli, such as the way E looks, talks or gestures.

In order for S to condition, it is assumed that he will focus his attention on important task relevant variables while excluding those which are essentially unrelated to his learning task.

(2) In the typical free operant verbal conditioning experiment, E provides a task which, theoretically, forces S to perceive in some manner those stimuli to which he has attended, i.e., impose

organization upon them in a manner consistent with his life experiences, learning history, and an assortment of other determining personality variables. Closely associated with this organizational process is a judgmental function, one involved in evaluating the quantitative and qualitative characteristics of a stimulus or stimulus configuration. In the verbal conditioning experiment, for instance, S is implicitly required to distinguish between "neutral" E verbalizations such as "go right on talking", and those which are intended by E to be reinforcing such as "Uh-huh" or "Yeah".

(3) In the typical free operant verbal conditioning experiment, S may be asked to respond to E's instructions with a kind of self-regulatory or steering behavior that results in the production of responses belonging to the same conceptual context or conceptual class specified by E. If, for example, E tells S to talk about why S is a patient "here in the hospital", S may produce a series of responses related to the same conceptual class as "hospital", for instance, "treatment", "sickness", "pain", and so on. Associated with this self-regulatory behavior is the expectation that S will engage continuously in the production of concepts in general, i.e., speech. In this connection, S is expected to rely on his memory, his associative processes and, on occasion, his imaginal processes in adapting to the requirements of task instructions.

It has not been this investigator's intention in this simplistic theoretical analysis to imply that such functions as those described above operate with S's knowledge or are subordinated to conscious control. The object of this brief discussion has simply been to provide support for the premise that such cognitive processes as

attending, perceiving, judging and conceptualizing are active during the verbal conditioning experiment and play a crucial role in determining S "inputs".

In this regard, cognitive control theory cited earlier holds that cognitive structures are involved, not only in the gathering and processing of information, but in providing such steering functions as regulating, promoting or dampening adaptive feedback. This relationship between cognitive structure or cognitive style and S "outputs" is well-documented in the research discussed previously.

On the basis of these considerations, it may be reasoned that S's "output", i.e., his performance in the verbal conditioning situation, a partly cognitive task, will reflect in some way his cognitive approach or, put in other terms, the stylistic or formal characteristics of his attending, perceiving, judging and conceptualizing. It is further reasoned that such performance will distinguish him from Ss who approach the verbal conditioning task with "opposite" or markedly different cognitive styles.

"Susceptibility" to Verbal Conditioning

As it has been pointed out here, Ss who typically manifest an articulated cognitive style in terms of attending, perceiving, judging and conceptualizing have consistently shown themselves to be superior performers on tasks which tap cognitive skills. It is therefore conjectured that these individuals, when compared with individuals who manifest a global cognitive style, will show superior performance on verbal conditioning and transfer tasks as well. It is reasoned that

in approaching the verbal conditioning situation in a cognitively articulated way, they will be more likely than their global counterparts to selectively attend to and focus in on important "task relevant" variables while excluding non-essential stimuli; perceive and evaluate more rapidly and with greater precision qualitative and quantitative characteristics of experimental variables; and, because of their greater cognitive complexity, assimilate, process, and integrate within highly differentiated conceptual systems information concerned with stimuli relationships. In the investigator's opinion, these kinds of skills predispose cognitively articulated Ss to verbal conditionability, i.e., render them more susceptible to verbal behavior modification and transfer of modified verbal behavior than individuals who tend to be less articulated in terms of their cognitive functioning.

Reducing the Variability of Performance in Verbal Conditioning

It is the viewpoint of the investigator that one of the major reasons why (1) variable performance on learning tasks, and (2), equivocal findings on transfer have plagued verbal conditioning research and limited the analogue value of the verbal conditioning paradigm for psychotherapy is because experimental and control groups which were thought to be homogeneous (in terms of age, education, intelligence, etc.), were in fact quite heterogeneous cognitively. On the basis of previous discussion here, such heterogeneity may be seen to be a confounding variable if the verbal conditioning task is indeed one that draws heavily on such skills as attending, perceiving, judging and conceptualizing. If, for instance, global and articulated

Ss should be evenly distributed within an experimental group, the effect of such heterogeneity would be to average-out real performance differences within that group in the course of statistical analysis leading to a conclusion of "no conditioning". On the other hand, if two groups should be run through the same verbal conditioning procedure, but one of them should happen to be unknowingly weighted with cognitively global Ss while the other should happen to be weighted with cognitively articulated Ss, performance differences might be so striking as to lend to the conclusion that the technique or procedure is unreliable, i.e., that it tends to produce variable and inconsistent results with seemingly homogeneous groups.

In the light of these considerations, it is suggested that such confounding could be avoided by holding cognitive style, like age, intelligence, and so on, constant during subject-selection and assignment to experimental groups. As the following experiment will demonstrate, controlling for such cognitive functioning may be one more way of reducing variable performance in verbal conditioning while enhancing the predictability of outcome.

Hypothesis

The original and major objective of the experiment described in the following pages was to test an hypothesis growing out of the previous discussion and rationale. This hypothesis may be stated as follows: In a free operant conditioning situation, Ss manifesting an articulated cognitive style will show significantly greater verbal conditioning and transfer than Ss manifesting a global cognitive style.

CHAPTER II

Test of the Hypothesis

and

Experimental Procedures

Part I

Subjects

The experimental design used in this study called for the selection of 60 Ss: 30 Ss manifesting an "articulated cognitive style" and 30 Ss manifesting a "global cognitive style". In an attempt to obtain these Ss, a total of 215 graduate nurses and student nurses, ranging in age from 18 to 24 years and either employed or in training at a county hospital, were informed by their supervisors or by E himself that E was conducting a "psychology experiment" in connection with his doctoral thesis. It was indicated that the purpose of E's experiment was to "see if there is a correlation between certain perceptual measures and certain kinds of interview behavior".

Prospective Ss were told that their participation would involve them in the taking of some short "perceptual tests" followed at some later date by a one-half hour "interview". It was pointed out that neither the interview nor the tests were aimed at eliciting any personal information about individuals. It was further indicated that E was not interested in nurses, per se, but only in obtaining certain kinds of "group data".

Of the 215 nurses and student nurses informed of the study, 196 volunteered to take the "perceptual tests". One of these tests was administered to large groups of prospective Ss by E and an assistant while the other was administered individually.

The "perceptual tests" used to assess cognitive style were the block design subtest of the WAIS and human figure drawings rated on

Witkin's Sophistication-of-body-concept scale (hereafter referred to as the Witkin Scale). Both of these measures have been shown to correlate highly with the global-articulation dimension of cognitive style (see Witkin, 1962; Witkin, 1965; Goodenough and Karp, 1961; Karp, 1963).

In the screening process used here, two scores were obtained for each S. The first of these was a Witkin Scale score. This score was determined by averaging the ratings assigned to each S's figure drawing by two independent judges.[1] With the averaging of the ratings of the two raters, it was possible for the prospective S to obtain any one of 9 scores: 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, or 5. In order to assure that two heterogeneous groups would eventually be selected for study, i.e., groups falling at the "extremes" of the global-articulated dimension, it was arbitrarily decided that only Ss scoring mean ratings of 5, 4.5 or 4 would be included in the articulated sample, while only Ss scoring mean ratings of 1, 1.5 or 2 would be included in the global sample.

39 Ss met the criteria for the global sample; 47 met the criteria for the articulated sample. The 110 nurses who received ratings of 2.5, 3 or 3.5 were excused from further participation in the study.

[1] E and an assistant E were the judges. Prior to rating drawings of prospective Ss, both E and his assistant practiced the rating technique on a pre-rated set of sample drawings provided by Witkin's associate, P. Oltman. Correlations with the sample drawings were .86 for E and .91 for E's assistant. The r obtained between E and the assistant in rating the drawings of the 196 prospective Ss was .88.

The next step was to individually administer WAIS block design subtests to the remaining 86 prospective Ss. Each S was given one score on the basis of her performance on this measure. This score was synonymous with her WAIS scaled score for block designs.

Once the two scores were obtained -- the Witkin Scale score and the block design score -- prospective Ss comprising the global sample and the articulated sample were matched with other members in their respective samples. Matching was made primarily on the basis of Witkin Scale scores and, secondarily, on block design scores. For example, all global sample prospective Ss who had received Witkin Scale scores of 2 and block design scores of 6 were designated "matches"; all global sample prospective Ss who had received Witkin Scale scores of 2 and block design scores of 7 were designated "matches"; all global sample prospective Ss who had received Witkin Scale scores of 2 and block design scores of 9 were designated "matches"; and so on. When matching was completed, prospective Ss were randomly drawn, 3 at a time, from each group of matches in preparation for random assignment to one of 3 experimental treatments.

Experimental Design

The three experimental treatments to which Ss were assigned were as follows: Affect reinforcement; Fixed interval reinforcement; and Non-reinforcement. Ten Ss from each of the 2 samples were assigned to each of the 3 treatments. This produced a total of 6 experimental groups which were designated as follows:

Articulated Affect Reinforcement Group -- (n=10)

Global Affect Reinforcement Group -- (n=10)

Articulated Interval Reinforcement Group -- (n=10)

Global Interval Reinforcement Group -- (n=10)

Articulated Non-Reinforcement Group -- (n=10)

Global Non-Reinforcement Group -- (n=10)

Following assignment to experimental treatments, Ss were run individually through a free operant verbal conditioning procedure followed by a transfer task. The particulars of these procedures were as follows:

E set up an individual appointment with each S in order to complete the "interview portion" of his study. He greeted each S and asked her to be seated opposite him at his desk. On the desk was a Tandberg tape recorder and microphone. Between E and S, also on E's desk, stood a 2' x 3' screen constructed from an ordinary cardboard desk blotter mat. When E and S were seated, this screen effectively blocked their view of one another. The tape recorder was on E's side of the screen while the microphone was placed on S's side in plain view about 6 inches from the front edge of E's desk.

Upon being seated, S was told by E, "We're going to begin the interview I told you about when you came in for those tests. Let me turn on my tape recorder at this point and begin with a few of the usual biographical questions." S was then asked where she was from, how long she'd been in school, whether or not she had any siblings, what her father did for a living, and so on. Aside from such

questioning, E was generally silent during this period. No intentional verbal reinforcement was given. At the end of 3 minutes, E interrupted, saying, "That's fine. Now, would you please begin to talk about experiences that you've had since entering nursing. I am going to give you a list of possible topics that you might want to talk about, although you don't have to stick to these topics if you can think of others."

E then read aloud from an 8" x 11" sheet of plain white paper on which the following topics were listed in large type:

Ward Experiences

Dorm Life

Classes and Instruction

Patients

Living away from home

After reading this list of topics, E passed the paper on which they were printed around the screen to her and after a 10-second pause said: "Okay. You can begin now."

The interview was divided into three periods: An operant level, a conditioning period, and a transfer task.

The Operant Level consisted of the first 5 minutes of the interview. During this period, in which no verbal reinforcement was given by E, a base rate of self-referred affect (as defined later on here) was obtained for each S.

The "Conditioning" Period began at the end of the 5th minute of the interview and consisted of the administering of the experimental treatments referred to earlier. For Ss assigned to the

Articulated and Global Affect Reinforcement Groups, this treatment involved the reinforcement of self-referred affect statements. When an S in these groups had received 15 reinforcements, her conditioning period was terminated. A maximum of 25 minutes was allotted for obtaining the specified 15 reinforcements. Ss who failed to meet this criterion were excused from further participation in the study.[2]

For Ss assigned to the Articulated and Global Interval Reinforcement Groups, the procedure was somewhat different. The "Conditioning" period for these groups was also marked by the administering of 15 reinforcements to each S. However, these reinforcements were delivered at equal temporal intervals and depended in no way upon

[2]Six Ss assigned to the Articulated Affect Reinforcement Group and one S assigned to the Global Affect Reinforcement Group were excused from the study for failing to meet this criterion. This tendency to fail to meet the 15 to 25 criterion presented something of a problem in terms of comparability of groups. Because no such criterion for "weeding out" low affect statement producers had been built into the control conditions, it was conjectured that, in the long run, the affect reinforcement groups might no longer be equivalent to their respective control groups. In effect, the "remainers" in the affect reinforcement groups would all be high affect producers while Ss in the control groups would be a mixture of both high and low affect producers.

In an attempt to balance out these potential differences, the interview tapes of excused and remaining affect reinforcement Ss were examined and compared. It was determined that all of the Ss who had met the 15 to 25 criteria had emitted at least two self-referred affect statements each during Operant Level, while only one out of the seven who had been excused from the study had emitted two or more. On the basis of these findings, it was decided that a minimum of two self-referred affect statements emitted during Operant Level would be required of each control S in order for her to remain in the study. The effect of this criterion was to eliminate four Ss from the Articulated Interval Reinforcement Group, four from the Articulated Non-Reinforcement Group, two from the Global Interval Reinforcement Group and one from the Global Non-Reinforcement Group. Each was eventually replaced by an S who met the two affect statement criteria.

what S might be saying at the time. This treatment was included as a control procedure in order to determine the possible influence of reinforcement of speech in general upon the specific response class of self-referred affect. The method for determining the length of the interval between reinforcements was as follows:

In order to make this treatment as much like the treatment received by the affect reinforcement Ss (with the exception of "time interval" as the basis for reinforcement), 10 Ss from the affect reinforcement groups (5 articulated and 5 global) were first run through the entire interview. The mean time needed by these 10 Ss to obtain their 15 respective reinforcements was then used as the length of the "Conditioning" Period for the interval reinforcement groups. This mean time was found to be 15 minutes, 15 seconds.

In order to determine the intervals at which the 15 reinforcements for these Ss should be delivered, 15 (the number of reinforcements) was simply divided into the mean time of 15 minutes, 15 seconds and the intervals were thus set at 61 seconds.

For Ss assigned to the non-reinforcement groups, the "Conditioning" Period was equal to the mean time of 15 minutes, 15 seconds discussed above.

Upon termination of the "Conditioning" Period, all S's immediately began the Transfer Task. The Transfer Task in this study involved (1) an alteration of the original task (interview) instructions accompanied by (2) a change of interviewer (i.e., the removal of the reinforcing stimulus).

At the conclusion of the "Conditioning" Period, each S was told by E, "Let's stop there for a moment. Now, there's a second part to

the interview." At this point, E left the office briefly and returned with his assistant who had been waiting in an adjoining office. E then announced, "This is my associate, Mr. B____. He's going to conduct the second part of the interview with you." E then left, closing the door behind him.

E's assistant, Mr. B_____, then sat down in E's chair behind the screen and told S, "As a continuation of the first part of the interview, would you kindly begin to talk about experiences that you had prior to coming into nursing which helped you decide on nursing as a career. I am going to give you a list of possible topics that you might want to talk about, although you don't have to stick to these topics if you can think of others."

The assistant then read aloud from an 8" x 11" sheet of plain white paper, on which the following topics were listed in large type:

Family experiences

Things you read

Nurses you knew

Things you saw

Being sick yourself

After reading this list of topics, E passed the paper on which they were printed around the screen to S and, after a 10-second pause, said: "Okay. You can begin now."

No reinforcement was given during the Transfer Task. The Transfer Task was terminated at the end of 10 minutes.

Standard Prods

Whenever S ceased talking for more than 15 seconds, E employed

one of the following 3 standard prods:

(1) "Please go right on talking."

(2) "Perhaps you could give more details."

(3) "Perhaps you could go on to a different topic."

The choice of prod employed following a given silence or pause was generally left to the discretion of E or his assistant. "Appropriateness" was the major guideline for selection. For example, if S had spoken at length about one particular topic, then ceased talking, E suggested that she go on to another. If, however, she had merely touched on one of the listed topics before stopping, it was suggested that she give more details.

Reponse Classes

In terms of the mechanics of identifying self-referred affect statements in the present study, E relied heavily on lists of such statements used in previous verbal conditioning research by Salzinger, Portnoy and Feldman, 1964. In general, E reinforced only those words which were clearly expressions of affect, e.g., "I liked it", "we hated it", "I felt angry", etc. "Borderline" or ambiguous words and phrases such as "I'm looking forward to it" and "I would like to go there" were not reinforced.

Besides self-referred affect statements, three additional response classes were scored in the present study. The first of these was general self-references, i.e., all statements beginning with the pronouns "I" or "We".

The second response class scored was number of words, that is, the number of words said by S per minute.

The third response class scored here was 15-second silences, i.e., cessation of speech followed by a standard prod.

Selection of Self-Referred Affect as the Major Response Class

The purpose of selecting self-referred affect statements for reinforcement was threefold.

(1) The integrity of self-referred affect as a verbal response class has been demonstrated in a series of studies by Salzinger and Pisoni (1958, 1960, 1961); Salzinger and Portnoy (1964); Salzinger, Portnoy and Feldman (1964); and Portnoy and Salzinger (1964).

(2) Reinforcing self-referred affect statements, as opposed to affect statements in general (such as "it made me feel good", "he liked it", etc.) has the double value of narrowing the verbal response class while at the same time providing an additional measure of verbal conditioning. In regard to the latter, reinforcement of any self-referred affect statement is also a reinforcement of a general self-reference (since a self-referred affect statement is, in effect, a sub-class of general self-referred statements). Because general self-references tend to occur with considerably greater frequency in the course of conversation, continuous reinforcement of self-referred affect during a given period has the effect of partially or intermittently reinforcing general self-references during that period.

In light of these considerations, verbal conditioning in the present investigation was assessed not only on the basis of increasing self-referred affect following its reinforcement but on the basis of increases in general self-references as well.

(3) Clinical psychologists tend to be concerned with broad patterns of patient verbalizations. From the standpoint of behavior change, the expression of affect is generally believed to be of great import for the occurrence of therapeutic progress. Because it can be empirically demonstrated that reinforcement of verbalized affect leads to additional expressions of such verbalizations, one is presumably in a position to accomplish systematic control of this important response class in therapy.

Findings supporting the present hypothesis would suggest that individuals highly susceptible to such conditioning might be selected on the basis of objective test procedures.

Reinforcement

The reinforcement employed was "uh-huh" or "yeah", said by E immediately following each of the first 15 self-referred affect statements produced by each S in the affect reinforcement groups during the "Conditioning" Period. This reinforcement was also given by E at the end of each 61-second interval during "Conditioning" to Ss in the interval reinforcement groups.

On the basis of findings of earlier research (Salzinger and Pisoni, 1961), it was decided that minimum of 15 reinforcements should be administered, in order to facilitate conditioning and transfer. In the study cited, it was found that only Ss who received 10 reinforcements or more for verbal affect statements showed conditioning. It was hoped that adding 5 reinforcements to this minimum would enhance conditioning in the present study.

Card Sort and Questioning

At the termination of the transfer task, the assistant left E's office and E returned. E removed the screen on his desk and presented S with a deck of 40 3" x 5" index cards on which were printed statements describing possible thoughts or feelings that S might have had in the course of such an experiment. S was told to draw the cards from the deck two at a time, read both, then tell E which of the pair she agreed with most. Cards were paired in such a way that S was forced to choose between relatively incompatible statements. For example: "I think I might have done a little better during the interview if the interviewer had told me at times just how I was doing" as opposed to "I don't think it made much difference one way or the other that the interviewer didn't tell me how I was doing during the interview." Or, "I think I might have done a little better during the interview if I'd been able to see the interviewer's facial expressions while I was talking" as opposed to "I don't think it made any difference as to how I did that I couldn't see the interviewer's face while I was talking."

Twenty statements of this nature, i.e., dealing essentially with the interviewer-interviewee relationship or "social" aspects of the experiment, comprised the first half of the deck, while another twenty statements aimed at eliciting information associated with possible hypothesis testing behavior comprised the second half. These statements were ordered in such a manner as to minimize suggestions of the nature of the experimental task. For instance, early statements included "I had the feeling that what I was saying

was being influenced during the interview in some way by the interviewer" as opposed to "During the interview itself, I don't recall feeling influenced by the interviewer in any way." On the other hand, latter statements regarding hypothesis testing were more direct. For example, "I developed a theory about why the interviewer was responding to what I was saying" as opposed to "If the interviewer was indeed responding to what I was saying, I didn't develop any theory about it."

If S selected the card cited first in the last example, E said to her when she had completed sorting the entire deck, "I see that you picked the card with the statement on it 'I developed a theory about why the interviewer was responding to what I was saying'. Can you tell me why you picked that card?" If S replied that she had indeed had a "theory", E then asked, "What was your theory?" If, however, S was vague about why she had selected the "theory" card, E instead asked, "Did you or did you not have a theory?" If the answer was affirmative, E then went on to ask what the theory was.

The rationale underlying this card-statement approach was that cognitive style group differences might be manifested in choosing contradictory statements from the deck. The cognitive style-related studies reviewed earlier, for instance, suggested that global individuals tend to respond more to the social aspects of cognitive tasks, whereas articulated individuals are better geared to those stimuli which have been described as "task relevant". Therefore, in the present study, it was expected that not being able to see E due to the screen on his desk might be more disturbing to global Ss than

to articulated Ss. It was reasoned that such disturbance might be reflected in card choosing behavior, for example in Global Ss tending to select statements such as the one mentioned earlier, "I think I might have done a little better during the interview if I'd been able to see the interviewer's facial expressions while I was talking".

The rationale for including the hypothesis-testing statements in the deck was essentially the same. As the research cited earlier has indicated, articulated individuals tend to be more cognitively complex and show themselves to be superior to global individuals in terms of their performance on conceptual tasks. It was therefore anticipated that articulated Ss, more than global Ss, would tend to select cards bearing statements such as the one mentioned earlier, "I developed a theory about why the interviewer was responding to what I was saying".

Part II

As a result of certain findings which will be presented in detail in the next section, the following procedures were added to the study approximately two months after the previous experiment had been completed.

Reliability

Because the Articulated and Global Samples were found to be significantly different from one another in terms of quantity of self-referred affect emitted during Operant Level, suggesting the

presence of what might be referred to as group "speech styles", it was decided that some effort should be made to determine the consistency or reliability of this tendency. In this connection, E was able to elicit the cooperation of 26 Ss who had previously taken part in the experiment some 3 to 6 months earlier. These Ss (6 from the Articulated Affect Reinforcement Group, 4 from the Articulated Interval Group, 3 from the Articulated Non-Reinforcement Group; 3 from the Global Affect Reinforcement Group, 6 from the Global Interval Group and 4 from the Global Non-Reinforcement Group) were contacted by E and were told that an attempt was being made to establish the "reliability of certain findings" from the experiment they had taken part in during the fall of 1969.

Ss were asked to come to E's office individually. Once there, they were given the same interview instructions and topic sheet they had been given prior to Operant Level previously. The procedures for the "second interview" were identical to those of the first with the exception that this time, the interview was terminated at the end of five minutes (the length of Operant Level).

The response measure used to compare performances in this test-retest procedure was self-referred affect/words.

Verbal Intelligence

As an added check against the possibility that intellectual factors had contributed to significant group differences in emitted affect or performance on experimental tasks, each of these 26 Ss was given the Information, Similarities and Vocabulary subtests of the WAIS. Group differences on these subtests were found to be non-significant.

Additional Analysis of Data

One effect of the discovery of significant group differences in amount of emitted self-referred affect was to turn attention to the verbal behavior-in-general of articulated and global Ss. In this connection, questions were raised about certain qualitative and content aspects of the interview data obtained in the course of the study. The first of these pertained to the nature of the affect verbalized: Had there perhaps been differences in amounts of positive and negative affect expressed, and had these perhaps been group differences?

A second question raised pertained to the presence in the data of other response classes: Would a content analysis of the interview transcripts perhaps reveal group differences in some discernible class of statements and what would the quality of such verbalizations be?

In addition to these questions about already gathered data, it was suggested that clinical assessment procedures might be used to gather information about Ss who had distinguished themselves by emitting either very high or very low rates of affect during Operant Level in order to determine if identificable personality variables might be associated with this tendency.

In an effort to deal with these considerations, the following procedures were undertaken.

Quality of Affect

All self-referred affect statements emitted during Operant Level by the 60 Ss who had participated in the experiment were listed

in type on sheets of 8" x 11" paper. A complete list, consisting of 13 pages stapled in booklet form was then rated by E and his assistant. Statements were rated either "Positive affect"; "Negative affect"; or "Ambiguous affect". Guiding these ratings were a set of categories taken from Tomkin's (1966) listing of positive and negative affects (In Spielberger, 1966, p. 91). Those used were: interest-excitement; enjoyment-joy; shame-humiliation; distress-anguish; fear-terror; anger-rage, and contempt-disgust.

The agreement between E and his assistant on this task was $r = .86$.

Additional Response Class

During the interview, E had noticed that numerous statements had been made by Ss in reference to parents, instructors, nursing school administrators and physicians. Many of these statements were complimentary and many were neutral. But it seemed to E that at least an equal number could be characterized as quite critical or openly hostile, while several suggested fearfulness or feelings of discomfort in response to such individuals.

For present investigative purposes, statements about parents, instructors, nursing school administrators and physicians were grouped under the heading "dependency-authority figures", a response class of questionable integrity, but, nonetheless, of clinical interest. The transcripts and tapes of a subsample of 15 global and 15 articulated Ss were then examined with respect to such statements emitted during Operant Level. All such statements were listed and then rated by E in regard to their positive, neutral or negative

content.

Clinical Study of Certain Ss

The fact that some Ss had emitted as many as 20 affect statements during Operant Level while others had emitted no more than two was a finding of considerable interest and mystery. Ten Ss, 5 at one extreme of affect emission and 5 at the other, were asked by E to return for "some additional questioning". These Ss, most of whom were cooperative and relatively open, were individually interviewed by E with regard to family background, interests, attitudes, emotionality, and so on. In addition, each S was administered the Rorschach inkblots.

These procedures were undertaken in an effort to determine whether or not identifiable personality factors might be associated with the type of verbal behavior described above. Despite the fact that it had been specified several months earlier that E was not interested in obtaining personal information about Ss, no resistance to clinical study was evidenced.

CHAPTER III

Results

of the

Experimental Procedures

Part I

Conditioning and Transfer Hypothesis

In order to test the hypothesis that the articulated Ss would show significantly greater conditioning and transfer than global Ss, speech samples of the 60 Ss successfully completing the experiment were transcribed and the following types of word counts were made for each S:

(1) Total number of words said per minute.

(2) Total number of self-referred affect statements made per minute.

(3) Total number of general self-references made per minute.

When these counts were completed, the data was scored in relation to the three response measures delineated below. These were:

(1) Total Words

(2) Self-Referred Affect/Words

(3) General Self-References/Words

A single score was obtained for each S on each of these measures for each of the following time segments:

(1) First five minutes of interview (Operant Level).

(2) Last five minutes of "Conditioning".

(3) Last five minutes of Transfer.

These scores represented cumulative output for the five-minute speech segments cited, e.g., total number of self-referred affect statements made by S during Operant Level/total number of words said by S during Operant Level, or total number of general self-references made by S during the last five minutes of Transfer/total number of

words said by S during the last five minutes of Transfer. It was believed that by scoring and organizing the data in this manner, comparisons of performance at significant points during the interview could be made and that these comparisons would be the most relevant available from the standpoint of testing the hypothesis under investigation. In this connection, the following comparisons were seen to have the most direct bearing on the question of differential conditioning and transfer as functions of cognitive style:

Comparison I. Each group's performance during Operant Level compared with its performance during the last five minutes of "Conditioning".

The purpose of this comparison was to determine the effect of reinforcement or non-reinforcement on a given group's performance by way of repeated measures. Each group's Operant Level functioning served as a base rate against which its "Conditioning" performance could be tested, thus providing a measure of the effects of the three experimental treatments (affect reinforcement, reinforcement of speech-in-general, and non-reinforcement).

Comparison II. Affect reinforcement groups' performance compared with the performance of their respective control groups for each of the three time segments, Operant Level, last five minutes of "Conditioning", and last five minutes of Transfer.

The purpose of this comparison was to assess the effects of reinforcement and non-reinforcement on Ss manifesting the same cognitive style. By comparing the performance of the Articulated Affect Reinforcement Group with the performances of the Articulated Interval

Reinforcement and Non-Reinforcement Groups, and the performance of the Global Affect Reinforcement Group with the performances of the Global Interval Reinforcement and Non-Reinforcement Groups, it was also possible, while holding cognitive style constant, to (1) obtain some measure of the comparability of experimental and respective control groups by comparing their base rates during Operant Level on the various response measures; (2) assess the effects of reinforcing speech-in-general on the response class, self-referred affect, and (3) determine base rates for Transfer Task performance against which transfer effects of the reinforcement groups could be measured.[3]

Comparison III: Each articulated group's performance compared with the performance of its global counterpart group for each of the three time segments, Operant Level, last five minutes of "Conditioning", and last five minutes of Transfer.

These comparisons provided the most direct test of the hypothesis. By comparing the Articulated Affect Reinforcement Group with the Global Affect Reinforcement Group on each of the three response

[3]While operant level performance is sometimes used as the base rate with which transfer task performance is compared, it was believed that such a practice in the present investigation would have been conceptually unsound. For one thing, such a comparison implicitly equates the transfer task with an extinction procedure. Quite clearly, the transfer task used in the present study bears little resemblance to an extinction procedure in that it (1) introduced at its outset a whole new set of stimuli to which S had to respond and (2) was not temporally continuous with conditioning. In the light of these considerations, it was conjectured that the most valid base rate for the Transfer Task in the present study was the Transfer Task performance of each of the non-reinforcement groups since -- on the one hand -- it had been elicited by the same instructions used to elicit performance from the reinforcement groups but -- on the other -- had not itself been "contaminated" by reinforcement during "Conditioning".

measures for each of the three time segments, findings relevant to the question of differential conditioning and transfer as possible functions of cognitive style were obtained. These, along with findings based on the other comparisons discussed, are presented below.

Findings associated with Comparison 1 (each group's performance during Operant Level compared with its performance during the last five minutes of "Conditioning"). Figure 1-a shows that all 6 treatment groups tended to say fewer words during the last five minutes of "Conditioning" than during the first five minutes of the interview or Operant Level. In only one case, however, was this decrease in word output over time statistically significant. Table 1 indicates that the Global Non-Reinforcement Group's drop from a mean of 671 words for Operant Level to 508 for "Conditioning" is significant at the .01 level ($F = 17.09$, d.f. = 1/18). This finding suggests that the absence of verbal reinforcement (or social approval) may have had a differential effect of the speech rate of global Ss in the present study.

Figure 1-b shows that of all 6 treatment groups, only the Articulated Affect Reinforcement Group increased its proportion of self-referred affect to words as it moved from Operant Level through the last five minutes of "Conditioning". While this increase fails to reach statistical significance, it is, nevertheless, noteworthy in that it runs counter to the verbal response tendency of the other five treatment groups (which was to give fewer and fewer self-referred affect statements to words as the interview went on). Of

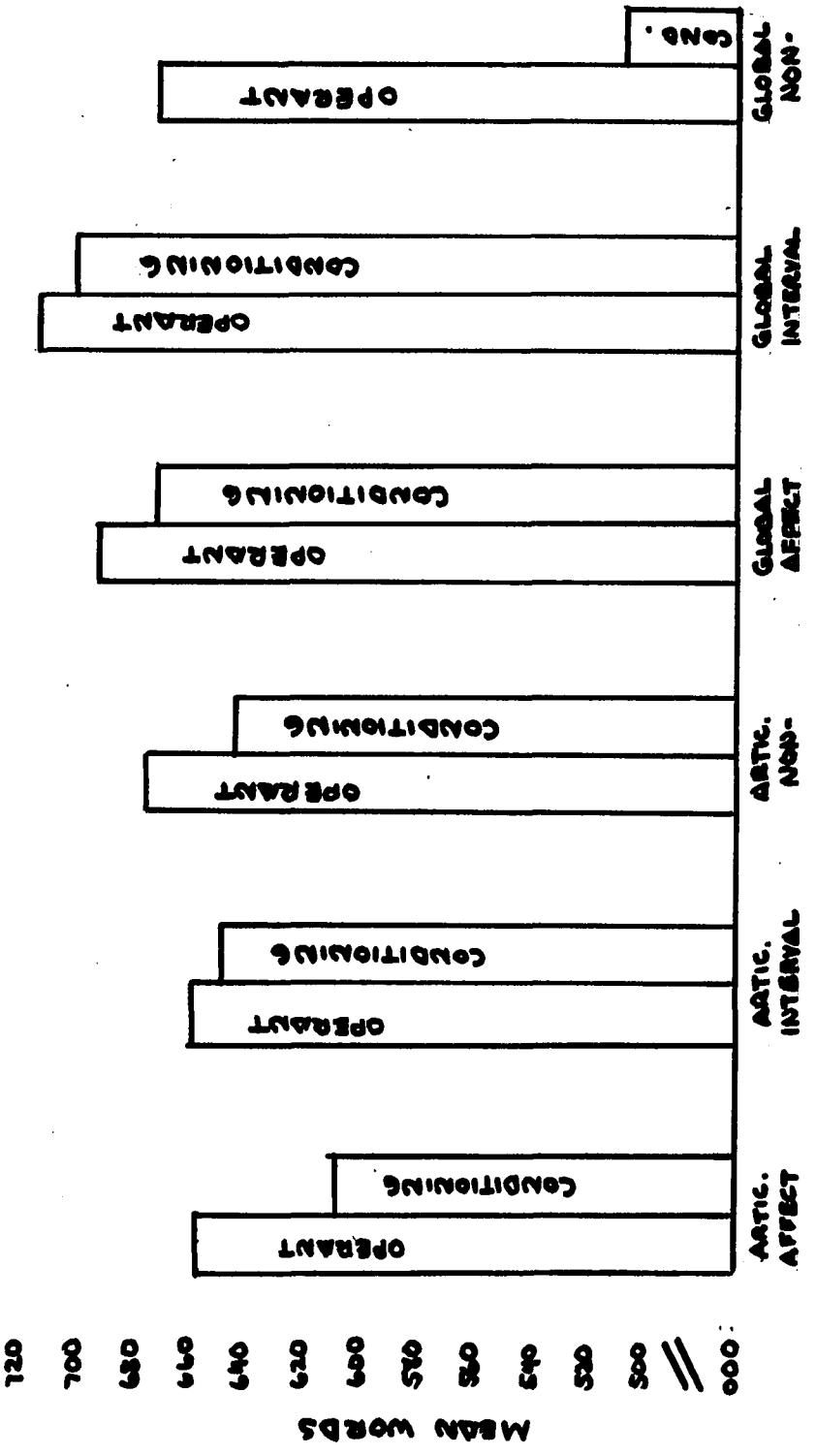

Fig. 1-a. Mean words per treatment group for Operant Level and the last five minutes of Conditioning.

TABLE 1

EACH GROUP'S PERFORMANCE DURING OPERANT LEVEL COMPARED WITH ITS PERFORMANCE DURING THE LAST FIVE MINUTES OF CONDITIONING: MEANS OF EACH GROUP AND SUMMARIES OF ANALYSES OF VARIANCE FOR THE THREE RESPONSE MEASURES.

Response Measure	Groups	Oper. M	Cond. M	Oper. Cond. MS	df	Error MS	df	F
WORDS	Artic. Affect	655	609	1.040	1	.883	18	1.178
	Artic. Interval	657	649	.033	1	1.064	18	.031
	Artic. Non-Rein.	673	644	.423	1	1.037	18	.408
	Global Affect	693	671	.249	1	.643	18	.387
	Global Interval	713	700	.083	1	.487	18	.170
	Global Non-Rein.	671	508	13.400	1	.784	18	17.092**
SRA WORDS	Artic. Affect	.010	.014	.006	1	.004	18	1.500
	Artic. Interval	.009	.005	.008	1	.003	18	2.667
	Artic. Non-Rein.	.009	.005	.009	1	.003	18	3.000
	Global Affect	.016	.011	.013	1	.002	18	6.500*
	Global Interval	.012	.007	.013	1	.003	18	4.333
	Global Non-Rein.	.013	.005	.038	1	.002	18	19.000**
SRG WORDS	Artic. Affect	.058	.068	.057	1	.027	18	2.111
	Artic. Interval	.059	.055	.007	1	.048	18	.146
	Artic. Non-Rein.	.057	.043	.103	1	.031	18	3.323
	Global Affect	.074	.048	.332	1	.022	18	15.090**
	Global Interval	.066	.050	.135	1	.029	18	4.655*
	Global Non-Rein.	.061	.047	.096	1	.026	18	3.692

* p .05
** p .01

NOTE: Abbreviations: SRA = Self-Referred Affect; SRG = General Self-References; Artic. = Articulated; Oper. = Operant Level; Cond. = Conditioning; Rein. = Reinforcement.

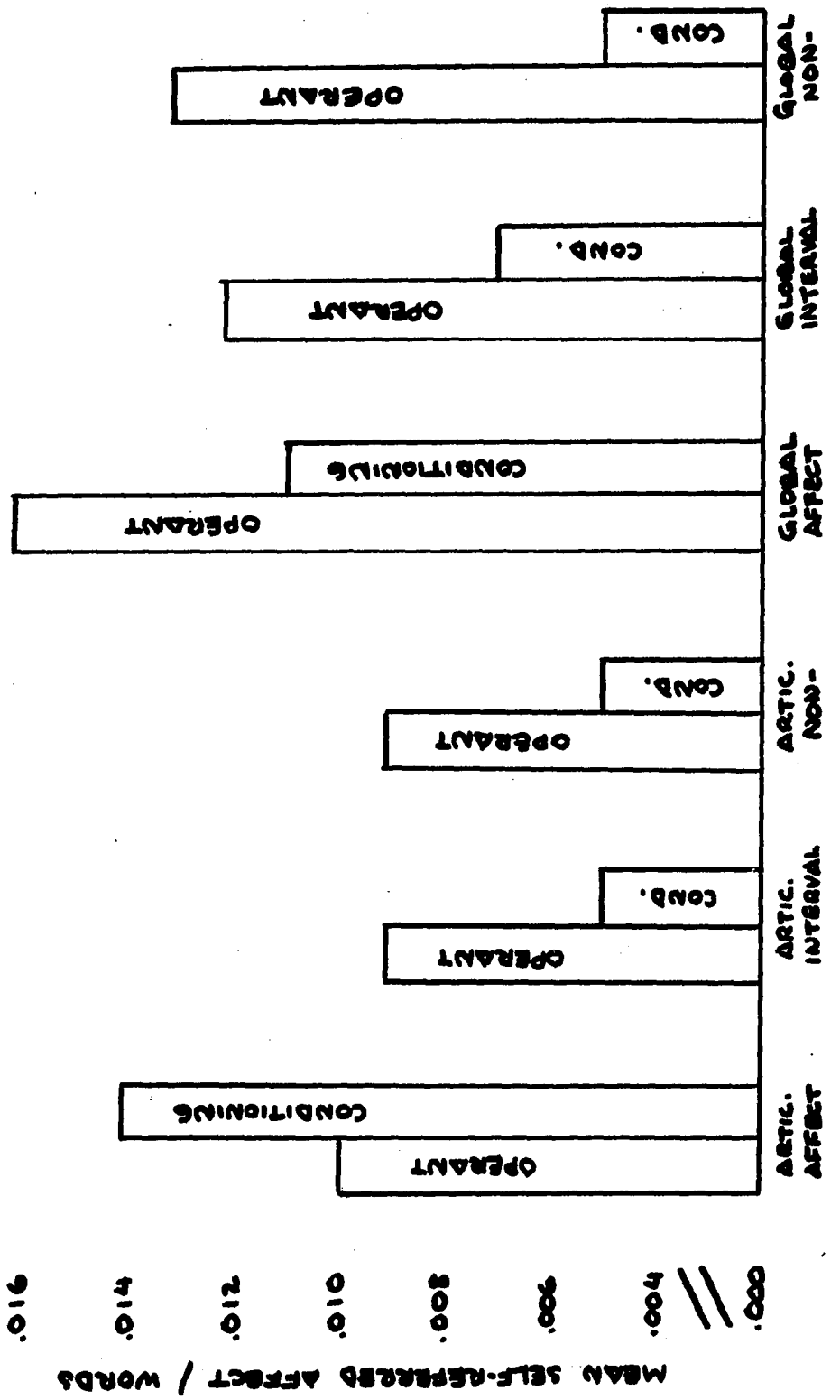

FIG. 1-b. Mean Self-Referred Affect / Words per treatment group for Operant Level and the last five minutes of Conditioning.

equal interest is the finding that the Articulated Affect Reinforcement Group's counterpart, the Global Affect Reinforcement Group, produced 16 self-referred affect statements per 1,000 words during Operant Level, but 11 per 1,000 during the final minutes of "Conditioning". Table 1 indicates that this decrease is significant at the .05 level ($F = 6.50$, $df = 1/18$). Also showing a statistically significant decrease in self-referred affect to words is the Global Non-Reinforcement Group dropping from an Operant Level mean of .013 to a "Conditioning" mean of only .005. This difference in means is significant at the .01 level ($F = 19.00$, $df = 1/18$).

These data appear to indicate that affect reinforcement had a differential effect on articulated and global Ss, at least in terms of the response measure, Self-Referred Affect/Words. The comparison of Operant Level performance with performance during the last five minutes of "Conditioning" suggests that articulated Ss who were reinforced for giving verbal affect statements responded to such reinforcement by producing proportionately more self-referred affect. On the other hand, global Ss who received affect reinforcement tended to perform much in the same manner as global and articulated Ss who received no affect reinforcement, i.e., they tended initially to produce a relatively high rate of self-referred affect statements followed soon by a decreasing proportion of self-referred affect to words.

Figure 1-c shows that the same type of speech patterning occurred in relation to the third response measure, General Self-References/Words. Once again, of the 6 treatment groups only the

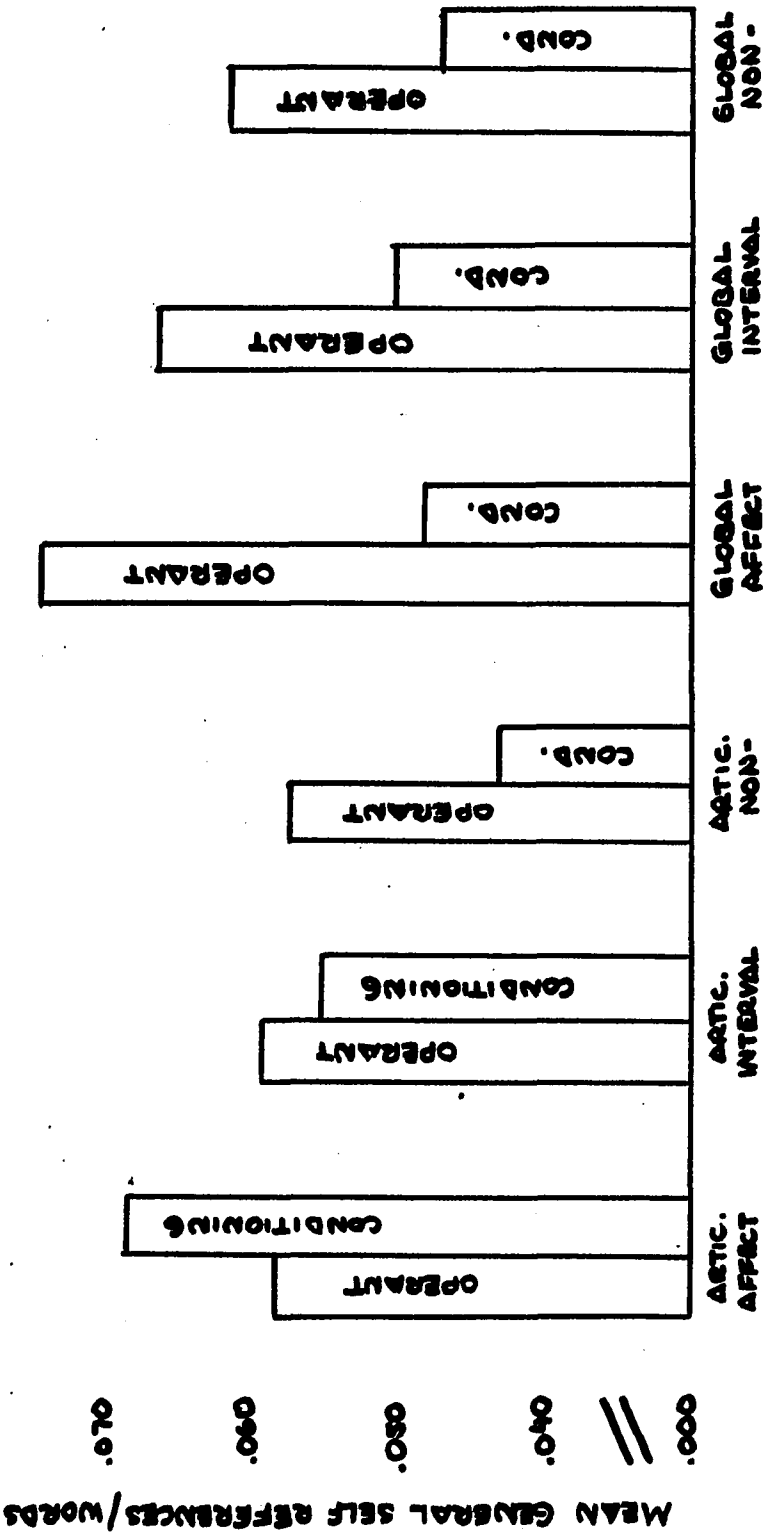

FIG. 1-c. Mean General Self-References / Words per treatment group for Operant Level and the last five minutes of Conditioning.

Articulated Affect Reinforcement Group increased its performance from Operant Level to the last five minutes of "Conditioning". All of the other groups show a decrease in the proportion of general self-references over time with the Global Affect Reinforcement Group's mean dropping from 74 general self-references per 1,000 words during Operant Level to 48 per 1,000 during "Conditioning". Table 1 shows this decrease to be significant at the .01 level ($F = 15.09$, $df = 1/18$). Also statistically significant is the decrease shown by the Global Interval Reinforcement Group ($p < .05$, $F = 4.66$, $df = 1/18$).

As noted earlier, the reinforcement of self-referred affect statements results in the intermittent reinforcement of general self-references. The findings described above suggest that the Articulated Affect Reinforcement Group responded to such intermittent reinforcement by increasing its output of general self-references to words during "Conditioning". The Global Affect Reinforcement Group, on the other hand, showed an opposite trend, dropping sharply in its output of general self-references to words. These findings would seem to support the previously stated observation that affect reinforcement had a differential effect on articulated and global Ss in the present study.

Findings associated with Comparison II (affect reinforcement groups' performance compared with the performance of their respective control groups). The multiple comparisons of group means to be described in this section were made by way of Duncan's New Multiple Range Test. These data appear in Table 2.

Table 2 indicates, first of all, that no significant differences

TABLE 2

AFFECT REINFORCEMENT GROUPS' PERFORMANCE COMPARED WITH THE PERFORMANCE OF THEIR RESPECTIVE CONTROL GROUPS FOR EACH OF THE THREE TIME SEGMENTS, OPERANT LEVEL, LAST FIVE MINUTES OF CONDITIONING AND LAST FIVE MINUTES OF TRANSFER: MEANS OF EACH GROUP FOR THE THREE RESPONSE MEASURES.

		Treatment Group					
		Articulated			Global		
Response Measure	Period	Affect Rein.	Interval Rein.	Non-Rein.	Affect Rein.	Interval Rein.	Non-Rein.
WORDS	Operant	655	657	.673	693	713	671
	Conditioning	609	649	644	671[N]	700[N]	508
	Transfer	602	544	649	641	669	595
SRA WORDS	Operant	.010	.009	.009	.016	.012	.013
	Conditioning	.014[IN]	.005	.005	.011[N]	.007	.005
	Transfer	.012[IN]	.004	.006	.005	.005	.005
SRG WORDS	Operant	.058	.059	.057	.074[N]	.066	.061
	Conditioning	.068[IN]	.055[N]	.043	.048	.050	.047
	Transfer	.072	.072	.070	.060	.052	.065

[N] Indicates mean is significantly greater than that of respective non-reinforcement control group, p .05, Duncan's New Multiple Range Test.

[IN] Indicates mean is significantly greater than that of respective interval and non-reinforcement groups, p .05, Duncan's New Multiple Range Test.

Note--Abbreviations: SRA=Self-Referred Affect; SRG=General Self-References; Rein.=Reinforcement.

existed between either affect reinforcement group and its respective control groups in terms of number of words said during Operant Level. Nor are significant differences found between the Articulated Affect Reinforcement Group and its two control groups during "Conditioning" or Transfer. On the other hand, there are indications that both the Global Affect Reinforcement Group and the Global Interval Reinforcement Group said significantly more words during the last five minutes of "Conditioning" than the Global Non-Reinforcement Group. According to the Duncan Test, these differences are significant at the .05 level.

This discrepancy between the global reinforcement groups and the Global Non-Reinforcement Group is not due to an increase in word output during "Conditioning" on the part of the reinforcement groups as Figure 2-a clearly indicates. Rather, it was the tendency of the Global Non-Reinforcement Group to drop significantly in terms of its output of words during the last five minutes of "Conditioning" which accounts for the differences between it and the two global reinforcement groups.

In regard to performance on the response measure, Self-Referred Affect/Words, Table 2 indicates that no significant differences existed between either of the affect reinforcement groups and their respective interval and non-reinforcement controls during Operant Level. During "Conditioning" and Transfer, however, the articulated group reinforced for producing self-referred affect statements shows means that are significantly higher than those of its control groups.

Figure 2-b suggests that these statistically significant

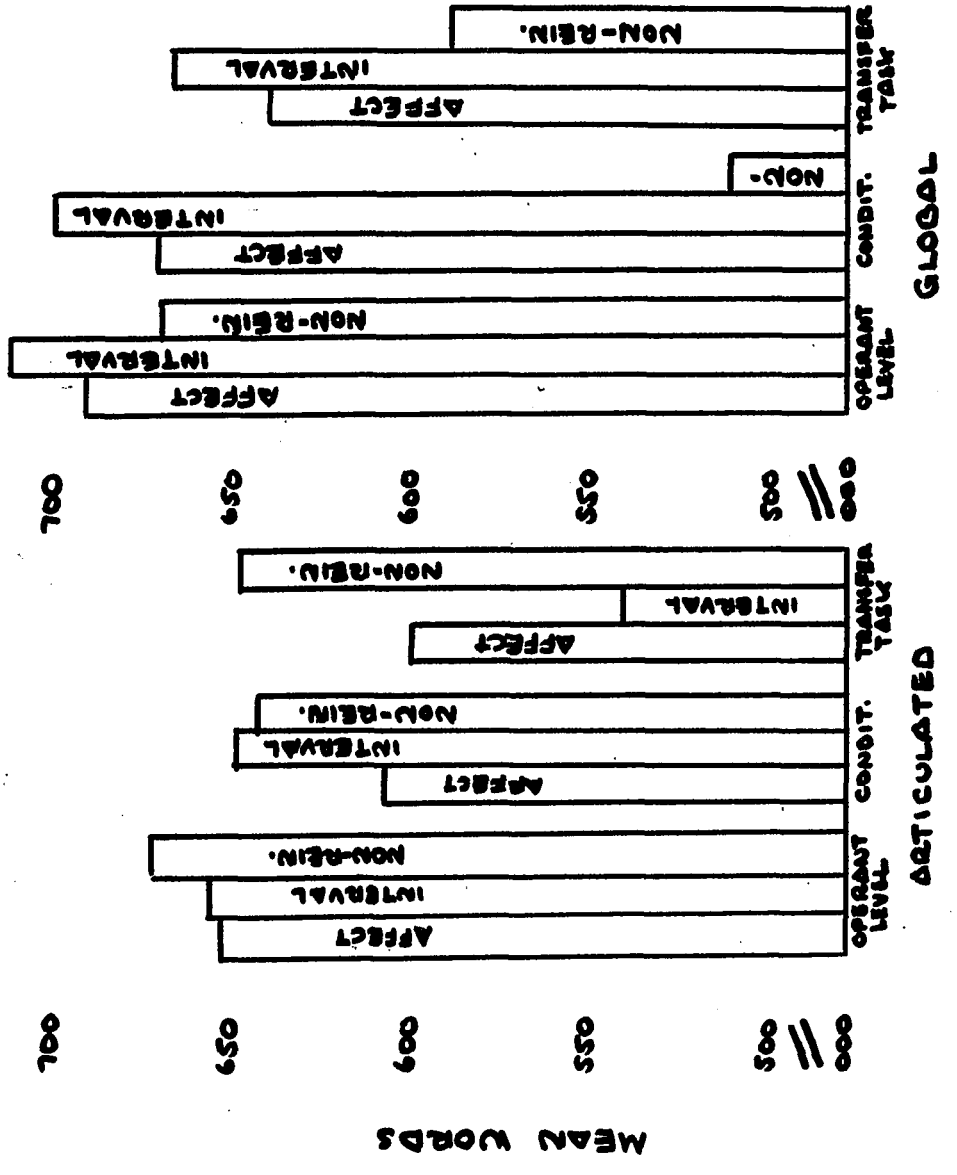

Fig. 2-a. Affect Reinforcement Groups compared with their respective control groups: Mean Words for Operant Level and the last five minutes of Conditioning, and Transfer.

differences were due a tendency on the part of the Articulated Affect Reinforcement Group to increase its affect to word production during "Conditioning" while, at the same time, the Articulated Interval and Non-Reinforcement Groups were decreasing theirs.

The finding that the two articulated control groups which were not reinforced for producing self-referred affect tended to decrease their output of affect to words indicates that articulated cognitive style, in and of itself, is not sufficient to account for the increases during "Conditioning" and Transfer shown by the Articulated Affect Reinforcement Group. Rather, these increases on the response measure, Self-Referred Affect/Words would appear to be most directly associated with the continuous reinforcement of self-referred affect statements emitted by that group.

Further examination of Table 2 with regard to this response measure reveals that, during "Conditioning", the Global Affect Reinforcement Group produced significantly more self-referred affect to words than the Global Non-Reinforcement Group. Figure 2-b suggests that this difference was not due to an increase in production of self-referred affect during "Conditioning" on the part of the Global Affect Reinforcement Group for, in fact, this group shows a significant decrease in output of affect to words for that period. Instead, the forementioned finding appears to be a function of certain notable, but not statistically significant, differences observed between the Global Affect Reinforcement Group and its control groups at the outset of the interview. In this regard, Figure 2-b shows that the Global Affect Reinforcement Group started out during Operant Level with a higher output of self-referred affect to words than either of

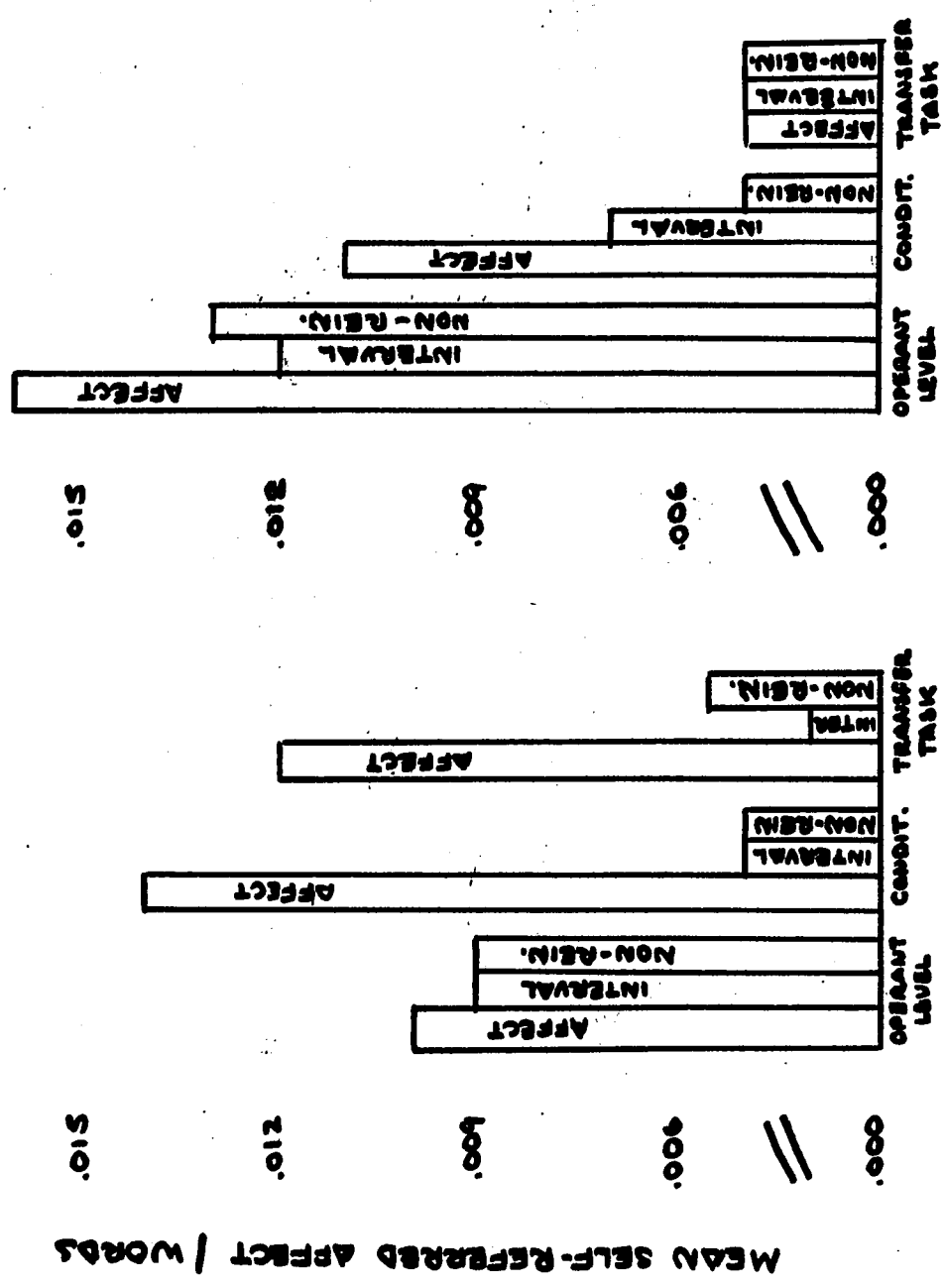

Fig. 2-b. Affect Reinforcement Groups compared with their respective control groups: Mean Self-Referred Affect / Words for Operant Level and the last five minutes of Conditioning and Transfer.

its controls, but during "Conditioning" evidenced the same downward trend as the others. As indicated earlier (Table 1, Figure 1-b), the losses manifested by two of three global groups during "Conditioning" are statistically significant. The significant difference seen between the Global Affect Reinforcement Group and its non-reinforcement control during "Conditioning" appears then to be due to the fact that the non-reinforcement group showed a greater loss for that period than the affect reinforcement group.

Of particular interest is the finding that all three global groups had identical means during Transfer. Using the mean of the Global Non-Reinforcement Group as the global's Transfer Task base rate, we may infer that reinforcing the affect statements produced by the Global Affect Reinforcement Group had little or no effect on this group's performance during Transfer, insofar as the response measure Self-Referred Affect/Words is concerned. The global group reinforced for producing self-referred affect showed itself to be no different on this measure from the global groups <u>not</u> reinforced for producing self-referred affect.

Examination of Table 2 with regard to the response measure, General Self-References/Words, indicates that no significant differences existed between the articulated groups in terms of performance during Operant Level. During "Conditioning", however, the Articulated Affect Reinforcement Group produced significantly more general self-references to words than either of its control groups. Once again, it must be pointed out that this difference appears to be associated with a combination of factors, notably, the Articulated Affect Reinforcement Group's tendency to increase at the same time

that its controls are decreasing in terms of the response measure.

This finding suggests that the increase in general self-references to words shown by the articulated group which received reinforcement of self-referred affect during "Conditioning" was not simply a function of that group's articulated cognitive style for, indeed, the two articulated groups which did not receive affect reinforcement show decreases in the production of general self-references to words during that period (see Figure 2-c). The intermittent reinforcement of general self-references given to the Articulated Affect Reinforcement Group, thus, appears to be the variable responsible for the increase in general self-references to words shown by that group during "Conditioning". Articulated cognitive style, in and of itself, seems not to be associated with such increases.

Further perusal of Table 2 reveals that the Global Affect Reinforcement Group produced significantly more general self-references to words during Operant Level than its non-reinforcement control group. The reasons for this are not clear. Nevertheless, there are no carryover effects of this difference into "Conditioning". During "Conditioning", there are not significant differences between any of the three global groups. Nor are there significant differences between any of the global groups during Transfer. In general, these findings suggest that the intermittent reinforcement of general self-references produced by the Global Affect Reinforcement Group had little or no effect on the production, by that group, of general self-references to words during "Conditioning" or Transfer. In fact, both the Global Affect and Interval Reinforcement Groups showed

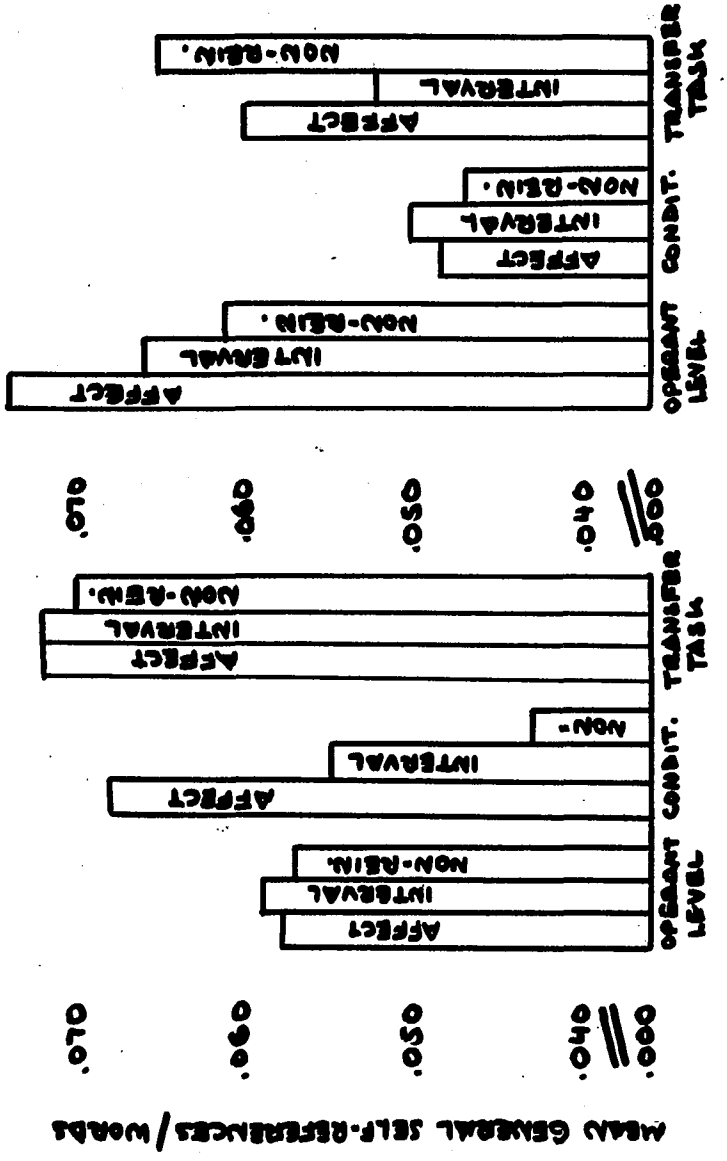

Fig. 2-c. Each Affect Reinforcement Group compared with its respective control group: General self-References / Words for Operant Level and the last five minutes of Conditioning and Transfer.

significant losses on this response measure during "Conditioning", a phenomenon nearly demonstrated, as well, by the Global Non-Reinforcement Group. (See Table 1).

Another finding which emerges from these data pertains to the question of reinforcement of speech-in-general, i.e., at fixed intervals. Table 2 indicates that for both articulated and global Ss, interval reinforcement groups not only produced less self-referred affect to words than their respective affect reinforcement groups, but produced roughly the same proportions of self-referred affect to words as their respective non-reinforcement groups during both "Conditioning" and Transfer. This would strongly suggest that the reinforcement of speech-in-general had no effect whatsoever on the response class, self-referred affect, in the present study.

Findings associated with Comparison III (each articulated group's performance compared with the performance of its global counterpart group). As indicated earlier, these comparisons provided the most direct test of the conditioning and transfer hypothesis.

Reference to Table 3 indicates that no significant differences occurred between the Articulated Affect Reinforcement Group and its counterpart, the Global Affect Reinforcement Group, in terms of number of words said during Operant Level, "Conditioning" or Transfer. Significant differences in word output were found, however, between the control groups. During "Conditioning", the Articulated Non-Reinforcement Group said significantly more words than the Global Non-Reinforcement Group (a function of the latter's significant drop from Operant Level), while during Transfer, the Global Interval Reinforcement Group said significantly more words than its

TABLE 3

EACH ARTICULATED GROUP'S PERFORMANCE COMPARED WITH THE PERFORMANCE OF ITS GLOBAL COUNTERPART GROUP FOR EACH OF THE THREE TIME SEGMENTS, OPERANT LEVEL, LAST FIVE MINUTES OF CONDITIONING AND LAST FIVE MINUTES OF TRANSFER: MEANS OF EACH GROUP FOR THE THREE RESPONSE MEASURES.

		Treatment Group					
		Affect Reinforcement		Interval Reinforcement		Non-Reinforcement	
Response Measure	Period	Artic.	Global	Artic.	Global	Artic.	Global
WORDS	Operant	655	693	657	713	673	671
	Conditioning	609	671	649	700	644*	508
	Transfer	602	641	544	669 *	649	595
SRA / WORDS	Operant	.010	.016*	.009	.012	.009	.013
	Conditioning	.014	.011	.005	.007	.005	.005
	Transfer	.012*	.005	.004	.005	.006	.005
SRG / WORDS	Operant	.058	.074	.059	.066	.057	.061
	Conditioning	.068*	.048	.055	.050	.043	.047
	Transfer	.072*	.060	.072*	.052	.070	.065

* Indicates that mean is significantly greater than that of counterpart, $p < .05$, Duncan's New Multiple Range Test.

Note--Abbreviations: SRA=Self-Referred Affect; SRG=General Self-References; Artic.= Articulated

counterpart, the Articulated Interval Reinforcement Group. Figure 3-a suggests that the latter difference was also due to a sizable decrease in word output, though in this case on the part of the articulated group.

With regard to the response measure, Self-Referred Affect/ Words, we find that the Global Affect Reinforcement Group produced significantly more self-referred affect to words during Operant Level than the Articulated Affect Reinforcement Group. This finding is suggestive of a cognitive style-associated differential in the emission of such affect statement, a possibility explored in greater depth later on here.

While Figure 3-b indicates that the Articulated Affect Reinforcement Group was increasing its output of self-referred affect to words at the same time the Global Affect Reinforcement Group was decreasing, the difference between the two groups fails to reach statistical significance for "Conditioning". This failure appears in part to be a function of the significant difference between the two groups during Operant Level. Had they started with roughly equivalent base rates, there is little doubt that their respective trends would have placed them significantly apart by the end of "Conditioning".

In an attempt to test this contention, the data for the two affect reinforcement groups was submitted to trend analysis. The findings of this analysis are summarized in Table 4.

As Table 4 reveals, the overall trial (Operant, "Conditioning") means, averaged over cognitive style, differ significantly ($p < .01$, $F = 10.44$, d.f. = 1/18). This indicates that the trends for the two

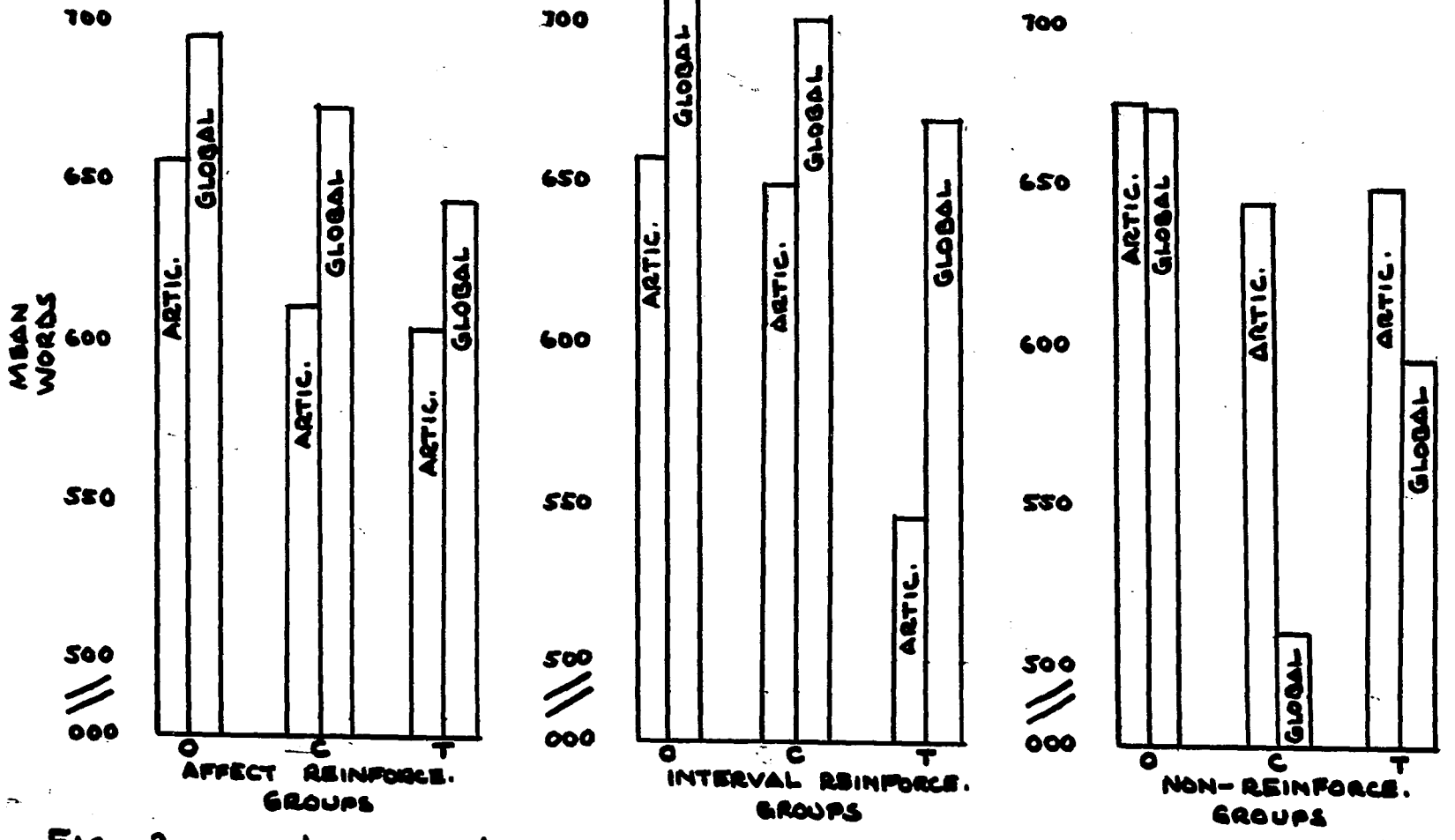

FIG. 3-a. Articulated groups compared with Global counterpart groups: Mean Words for Operant Level and last five minutes of Conditioning and Transfer.

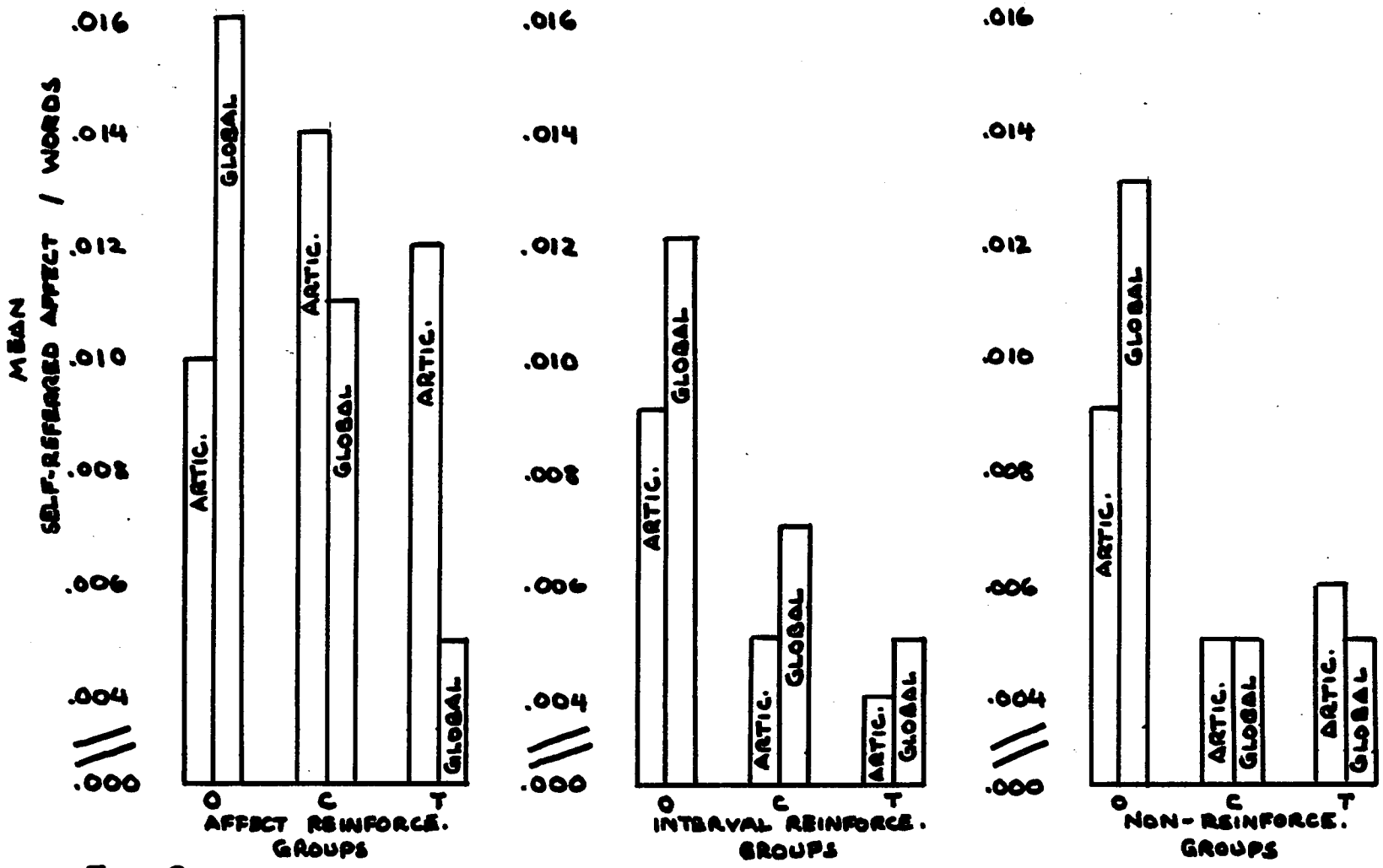

FIG. 3-b. Articulated groups compared with Global counterpart groups: Mean Self-Referred Affect / Words for Operant Level and last five minutes of Conditioning and Transfer.

TABLE 4

SUMMARY OF TREND ANALYSIS: ARTICULATED AFFECT REINFORCEMENT GROUP VS. GLOBAL AFFECT REINFORCEMENT GROUP, FROM OPERANT LEVEL TO LAST FIVE MINUTES OF OF CONDITIONING (SELF-REFERRED AFFECT/WORDS).

Source	df	MS	F
Cognitive Style (A)	1	16	.22
Error (a)	18	72	
Trials (B)	1	2	.01
A X B	1	188	10.44*
Error (b)	18	18	

* $p < .01$

groups are not of the same form going from Operant Level to the last five minutes of "Conditioning". As seen in Figure 3-b, the plot of the Articulated Affect Reinforcement Group rises from Operant Level to "Conditioning" while the plot of the Global Affect Reinforcement Group falls markedly.

In general, these findings support the first part of the present hypothesis which, as stated previously, holds that in a free operant situation, Ss manifesting an articulated cognitive style would show significantly greater verbal conditioning than Ss manifesting a global cognitive style. As predicted, the articulated Ss, in this study, showed increases in terms of learning the response class, self-referred affect, while their global counterparts showed little, performing in a manner not significantly different from that of control group Ss.

Table 3 gives evidence which supports the second part of the present hypothesis, namely that articulated Ss would show significantly greater transfer of verbal learning than their global counterparts. In this regard, the data indicate that the mean for the Articulated Affect Reinforcement Group on the response measure, Self-Referred Affect/Words, was significantly greater than the mean produced by the Global Affect Reinforcement Group during the last five minutes of the Transfer Task.

Finally, Table 3 reveals that the Articulated Affect Reinforcement Group produced significantly more general self-references to words than the Global Affect Reinforcement Group during <u>both "Conditioning" and Transfer</u>, thus lending additional support to the

hypothesis that there would be a cognitive style-associated differential in terms of verbal conditioning and transfer. Not only was there a cognitive style associated differential in response to continuous reinforcement, but in response to intermittent reinforcement, as well. (See Figure 3-c)

15-Second Silences

Just as number of words and various classes of words are considered to be responses to internal and external stimuli, so, too, the absence of speech in the presence of stimuli may be similarly viewed as a response.

The purpose of including 15-Second Silences as a response measure in the present study was twofold. First, it was hoped that such a measure would help explain differences in speech rate between groups. Logically, the massing of 15-second silences would tend to reduce word output.

Second, certain research findings reviewed here earlier suggested the possibility of a cognitive style-associated differential in terms of responding to the social stimuli of the free operant conditioning paradigm (E's facial expressions, social approval by way of verbal reinforcement, etc.). In general, previous research has indicated that global individuals tend to respond more to the social aspects of experimental tasks while articulated individuals make responses that are more "task relevant".

On the basis of these considerations, it was conjectured that global Ss would tend to produce more 15-second silences than articulated Ss. While both samples would be receiving the same amount of

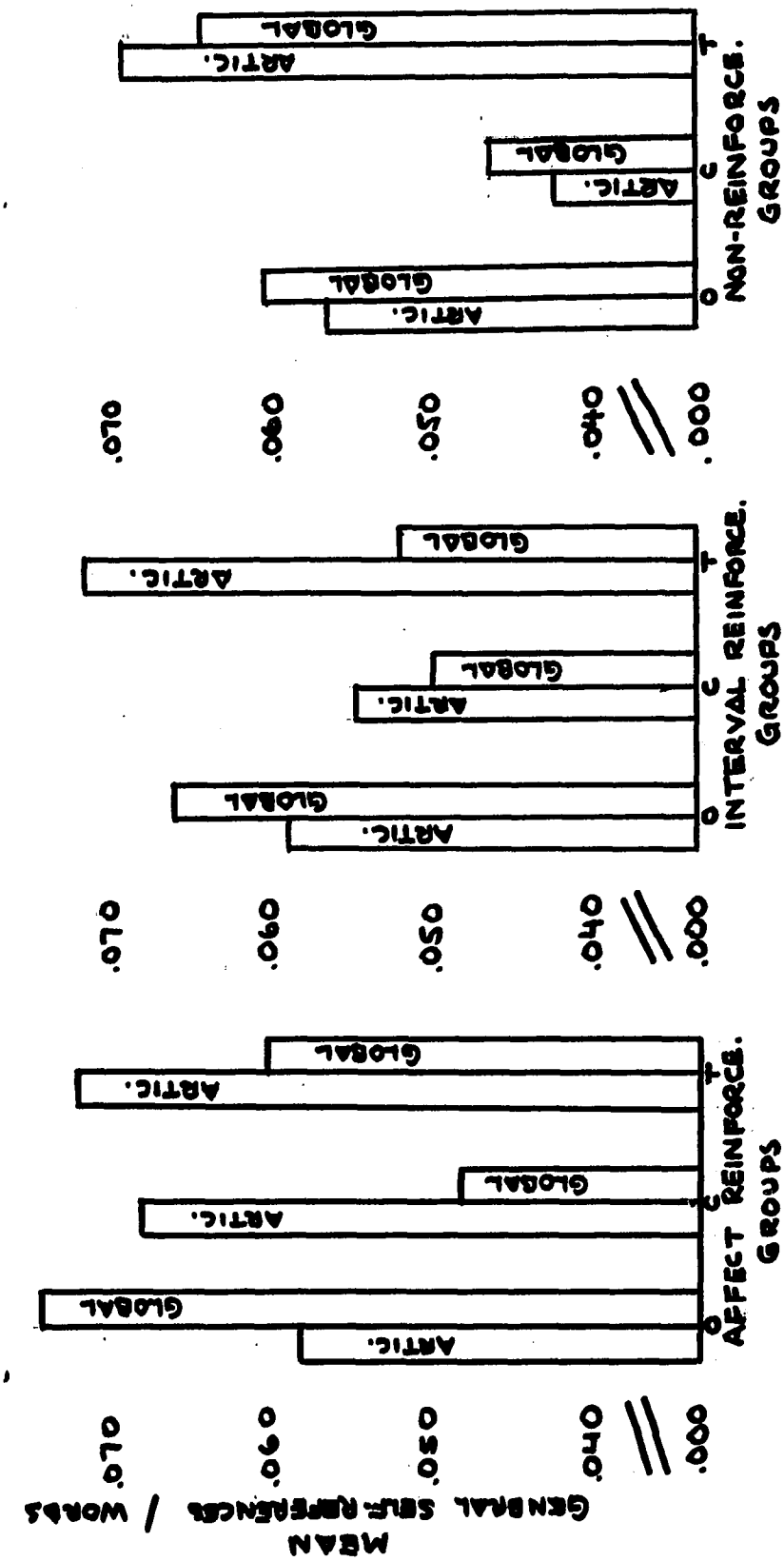

Fig. 3-c. Articulated groups compared with Global counterpart groups: Mean General Self-References / Words for Operant Level and last five minutes of Conditioning and Transfer.

verbal reinforcement (150 for affect, 150 for speech-in-general), it was believed that the global groups would be more demanding in terms of social approval. Furthermore, it was felt that the placing of a screen between E and S so that S could not see E's face would have a more constricting effect on the word production of the global Ss.

To test this reasoning, the number of standard prods (given following each 15-second silence) was tabulated for each S, grouped, then submitted to analysis of variance and Duncan's New Multiple Range Test. Results of this procedure indicated that there were no significant differences between any of the 6 groups during Operant Level or Transfer. Nor was there a significant difference between the Articulated and Global Samples for the interview as a whole. As Table 5 indicates, however, the Global Non-Reinforcement Group produced significantly more 15-second silences during "Conditioning" than all other groups, with the exception of the Articulated Affect Reinforcement Group. This finding is of some interest in the light of an earlier finding described here. As indicated, the Global Non-Reinforcement Group showed a significant loss in word output during the last five minutes of "Conditioning" when that segment was compared with its Operant Level performance. It would appear that word loss and relative (15-second) long silences were related for this group.

In addition to this interpretation of the data, the finding of a significant difference between the Articulated and Global Non-Reinforcement Groups on the measure, 15-Second Silences, further

TABLE 5

DUNCAN'S NEW MULTIPLE RANGE TEST APPLIED TO THE DIFFERENCES BETWEEN THE MEANS OF THE SIX TREATMENT GROUPS FOR THE LAST FIVE MINUTES OF CONDITIONING: FIFTEEN SECOND SILENCES.

	Artic. Non-	Artic. Interv.	Global Affect	Global Interv.	Artic. Affect	Global Non-	
Mean	1.3	1.9	2.1	2.4	3.2	4.5	SSR
Artic. Non-		.6	.8	1.1	1.9	3.2*	1.9
Artic. Interv.			.2	.5	1.3	2.6*	2.0
Global Affect				.3	1.1	2.3*	2.0
Global Interv.					.8	2.1*	2.0
Artic. Affect						1.3	---

* Indicates that difference between means exceed SSR and that Global Non-Reinforcement Group's mean is significantly greater than mean of the Articulated Non-Reinforcement Group, mean of the Articulated Interval Reinforcement Group, mean of the Global Affect Reinforcement Group, mean of the Global Interval Reinforcement Group, and mean of the Articulated Affect Reinforcement Group.

suggests the possibility that there is a cognitive style-associated differential in terms of how individuals respond verbally to the absence of verbal reinforcement.

Card Sort and Questioning

As indicated earlier, the rationale underlying the card sort and related questioning at the end of the interview was, first, to see if the choosing of statements regarding social aspects of the experimental task would differentiate global and articulated Ss and, second, to determine whether there might be cognitive style-associated differences in terms of hypothesis testing behavior. It was conjectured that global Ss would tend to agree more often with statements identified with interpersonal elements of the experimental task, while articulated Ss would agree more often with statements suggesting that some sort of hypothesis testing behavior had been a part of their mental repertoire during the interview. The data for the card sort was tested by way of Chi Square. Group differences which reached statistical significance are summarized in Tables 6 through 11.

Table 6 indicates that the Articulated and Global Samples were significantly different in terms of how they selected cards 1 and 2 from the card sort. Twenty-four global and 16 articulated Ss agreed with the statement, "It would have been easier during the interview if the interviewer had simply asked me questions rather than made me think up things to talk about", while 14 articulated and 6 global Ss agreed with the statement, "It really didn't make

TABLE 6

NUMBER OF SUBJECTS AGREEING WITH OR DISAGREEING WITH CARD SORT ITEMS 1 AND 2: "WISH FOR E TO ASK QUESTIONS."

	Agree	Disagree	Totals
Articulated	16	14	30
Global	24	6	30
Totals	40	20	60

$p < .05$

much difference to me that I had to think things up to talk about during the interview. Things came to mind fairly easily without my being asked specific questions by the interviewer". These differences in card selection or agreement are significant at the .05 level ($X^2 = 4.80$, d.f. = 1).

Significant differences in card selection were also found in relation to cards 5 and 6. In response to this pair, 23 articulated Ss and 15 global Ss agreed with the statement, "I don't think it made much difference one way or the other that the interviewer didn't tell me how I was doing during the interview", while 7 articulated and 15 global Ss chose the statement, "I think I might have done a little better during the interview if the interviewer had told me at times just how I was doing". These differences in card selection are also significant at the .05 level ($X^2 = 4.58$, d.f. = 1) as Table 7 indicates.

In interpreting these data, it behooves one to be mindful of the content-process controversy discussed at some length in the introduction of this paper. While there are clearly statistically significant differences in how global and articulated Ss tended to select cards with which they presumably agreed at the end of the interview, the question remains as to whether or not the content of the statements printed on the cards in fact reflected S's cognitive state or processes <u>during</u> the interview or, for that matter, at the close of it. If one is willing to take the content of the cards at face value, then one may infer that the statistically significant differences just described suggest that global Ss, more than articulated Ss in the present study, tended to wish that E would provide

TABLE 7

NUMBER OF SUBJECTS AGREEING WITH OR DISAGREEING WITH CARD SORT ITEMS 5 AND 6: "WOULD HAVE DONE BETTER IF E HAD TOLD S HOW SHE WAS DOING."

	Agree	Disagree	Totals
Articulated	7	23	30
Global	15	15	30
Totals	22	38	60

$p < .05$

greater structure and guidance for them throughout the interview by telling them what to talk about and by reassuring them that what they were saying were the "right" things.

Tables 8, 9 and 10 deal with responses to the statements of cards 3 and 4. Table 8 indicates that 6 Ss from the Articulated Non-Reinforcement Group and only 1S from the Global Non-Reinforcement Group agreed with the statement, "During the interview, I often found myself waiting for the interviewer to say something that would help me understand what kind of information I was supposed to provide", while 4 articulated Ss and 9 global Ss selected the statement, "During the interview, I often found myself waiting for the interviewer to say something just to reduce the awkwardness of the situation". These differences are significant at the .02 level ($\chi^2 = 5.5$, d.f. = 1).

Once again, if we can take the content of the cards as a valid indicator of what S was thinking or feeling during the interview, then we may infer that global Ss who were not receiving verbal reinforcement tended to wish that E would say something so that they might feel more comfortable while articulated Ss who were not receiving reinforcement looked to S to assist them in the making of task relevant responses.

Tables 9 and 10 compare the responses to cards 3 and 4 made by the Global Non-Reinforcement Group with those made by the two global groups which did receive verbal reinforcement during the interview. It is interesting to note that where 9 Ss from the

TABLE 8

NUMBER OF SUBJECTS AGREEING WITH OR DISAGREEING WITH CARD SORT ITEMS 3 AND 4: "WISH FOR E TO SAY SOMETHING TO REDUCE THE AWKWARDNESS OF THE SITUATION" (NON-REINFORCEMENT GROUPS).

	Agree	Disagree	Totals
Articulated	4	6	10
Global	9	1	10
Totals	13	7	20

$p < .05$

TABLE 9

NUMBER OF SUBJECTS AGREEING WITH OR DISAGREEING WITH CARD SORT ITEMS 3 AND 4: "WISH FOR E TO SAY SOMETHING TO REDUCE THE AWKWARDNESS OF THE SITUATION" (GLOBAL AFFECT REINFORCEMENT VS. GLOBAL NON-REINFORCEMENT GROUP).

	Agree	Disagree	Totals
Affect Rein.	3	7	10
Non-Rein.	9	1	10
Totals	12	8	20

$p < .01$

TABLE 10

NUMBER OF SUBJECTS AGREEING WITH OR DISAGREEING WITH CARD SORT ITEMS 3 AND 4: "WISH FOR E TO SAY SOMETHING TO REDUCE THE AWKWARDNESS OF THE SITUATION" (GLOBAL INTERVAL REINFORCEMENT VS. GLOBAL NON-REINFORCEMENT GROUP).

	Agree	Disagree	Totals
Interval Rein.	1	9	10
Non-Rein.	9	1	10
Totals	10	10	20

$p < .01$

global group which did not receive reinforcement chose the card indicating a feeling of "awkwardness" during the interview, only 1 from the Global Interval Reinforcement Group and 3 from the Global Affect Reinforcement Group did so. Both of these differences are significant at the .01 level (d.f. = 1, X^2 = 12.80 and 7.50, respectively).

On the basis of these findings, it may be inferred that global non-reinforcement Ss tended to feel more uncomfortable and were less task-interested than articulated non-reinforcement Ss in the present study. However, these same global Ss also tended to feel more uncomfortable and were less task-interested than other global Ss who did receive verbal reinforcement in the course of the interview.

In a sense, these findings parallel the data described previously which indicated that the Global Non-Reinforcement Group had performed quite differently from other groups both in terms of producing words and 15-second silences. The correlation of this group's card 3 and 4 card sort performance with its performance on these other measures appears to be a positive one, although the nature of the relationship remains unclear. If one is willing to accept the content of the two cards most recently discussed here as a valid indicator of Ss internal state during the interview, then one might argue that in the absence of verbal reinforcement (social approval or positive feedback), global Ss tended to feel anxious and uncomfortable and, on that basis, said less and were silent for longer periods than other Ss. This point will be taken up in greater depth later on in the Discussion section.

Table 11 is associated with another pair of statements, those on cards 9 and 10. Table 11 indicates that 8 Ss in the Articulated Affect Reinforcement Group and 3 in the Global Affect Reinforcement Group agreed with statement 9, which read, "Knowing or not knowing if the interviewer was listening to me didn't make much difference as to how I did in the interview. I simply followed the instructions he gave me at the beginning of the interview", while 2 articulated and 7 global Ss from these same groups selected card 10, "I would have done a little better during the interview if I'd been more certain that the interviewer was really listening to what I was saying". This difference in card selection is significant at the .05 level ($X^2 = 5.06$, d.f. = 1).

This finding is of interest inasmuch as both of these affect reinforcement groups received exactly the same amount of feedback from E (150 reinforcements each). Nevertheless, significantly more of the global Ss seemed to have doubts that E was "really listening" to what it was that they were saying. On the other hand, articulated Ss showed a preference for a statement which indicated some degree of independence from E, one, in fact, which dissociated E from Ss performance during the interview. Exactly why the choices were made in this manner is not clear. But there are suggestions that global and articulated Ss had a somewhat different perception of E, his role, and how they themselves should relate to him.

At this point, we turn to the other end of the card sort continuum and deal with statements aimed at eliciting information about hypothesis testing behavior on the part of Ss during the interview.

TABLE 11

NUMBER OF SUBJECTS AGREEING WITH OR DISAGREEING WITH CARD SORT ITEMS 9 AND 10: "WOULD HAVE DONE BETTER IF S HAD KNOWN THAT E WAS REALLY LISTENING TO HER" (ARTICULATED AFFECT REINFORCEMENT VS. GLOBAL AFFECT REINFORCEMENT GROUP).

	Agree	Disagree	Totals
Articulated	2	8	10
Global	7	3	10
Totals	9	11	20

$p < .05$

Once again, the question of content-process arises and once again, it is suggested that inferences made in relation to the type of data under consideration are subject, and rightly so, to the kinds of criticisms previously discussed in the introduction to this paper.

Cards 35 to 40 presented S with statements that dealt directly with the purpose of the experiment. Cards 35, 37 and 39 stated in the following sequence: "At some time during the interview, I began to develop a 'theory' about the interview in general"; "I developed a 'theory' about why the interviewer was responding to my statements"; and "The 'theory' that I developed about why the interviewer was responding to my statements tended to have some influence on what I said during the interview".

On cards 36, 38 and 40, the following statements appeared: "I would have to say that I didn't develop any particular 'theory' about the interview"; "If the interviewer was indeed responding to my statements, I neither noticed it nor developed any 'theory' about it"; and "I didn't develop any 'theory' during the interview".

It was reasoned that the massing of affirmative responses to the "theory" cards, 35, 37 and 39, might indicate that a given treatment group or cognitive style sample had engaged in some kind of problem solving or hypothesis testing behavior during the interview. On the other hand, the massing of affirmative responses to the "non-theory" cards, 36, 38 and 40, might indicate that a given treatment group or cognitive style sample had not engaged in such problem solving or hypothesis testing behavior during the interview. As suggested earlier, articulated individuals have been found to be more

prone than global individuals to engage in this kind of cognitive activity. Furthermore, articulated individuals have been shown to be better at it.

To test this reasoning, the number of agreements and disagreements with card sort items 35-36, 37-38 and 39-40 were recorded for the Articulated and Global samples and submitted to Chi Square. These data, presented in Tables 12 to 14, show no significant differences between the two samples with respect to sorting the "theory" cards. The suggestion that articulated Ss would tend more than their global counterparts to engage in theorizing or hypothesis testing was not supported. Furthermore, only about one in three Ss from either group indicated, by way of card sort, a tendency to engage in theorizing at all during the interview. Evidently, such behavior cannot account for the group differences in conditioning and transfer noted previously.

With regard to the question of "correctness" of hypotheses or "theories" thought up by Ss during the study, Ss affirming "theory" cards were queried at the conclusion of the card sort. Information acquired during this inquiry revealed that only <u>one</u> S out of the 20 who received reinforcement for self-referred affect statements was correct in her analysis of the conditioning procedure (i.e., identified the right response-reinforcement contingency). In general, the remaining Ss who had affirmed "theory" cards indicated that they thought E was simply attempting to make them feel more comfortable with his "uh-huh's" and was conducting his experiment to obtain information about nurses and the nursing program at the hospital. None

TABLE 12

NUMBER OF SUBJECTS AGREEING WITH OR DISAGREEING WITH CARD SORT ITEMS 35 AND 36: "HAD A THEORY."

	Agree	Disagree	Totals
Articulated	10	20	30
Global	11	19	30
Totals	21	39	60

$p > .05$

TABLE 13

NUMBER OF SUBJECTS AGREEING WITH OR DISAGREEING WITH CARD SORT ITEMS 37 AND 38: "HAD A THEORY."

	Agree	Disagree	Totals
Articulated	11	19	30
Global	10	20	30
Totals	21	39	60

$p > .05$

TABLE 14

NUMBER OF SUBJECTS AGREEING WITH OR DISAGREEING WITH CARD SORT ITEMS 39 AND 40: "HAD A THEORY."

	Agree	Disagree	Totals
Articulated	12	18	30
Global	11	19	30
Totals	23	37	60

$p \geq .05$

of these Ss verbalized what in other research has been interpreted as awareness of a correct response-reinforcement contingency or even an awareness that E was trying to manipulate their speech in some way, other than through his original instructions to them at the outset of the interview.

Part II

Part II of the Results section deals primarily, though not exclusively, with certain "content" features of the data obtained during the interview. The decision to investigate such features was made on the basis of two findings: First, that the production of self-referred affect statements during Operant Level seemed to be associated quantitatively with cognitive style and, second, that this association appeared to be reliable over time.

Number of Self-Referred Affect Statements and Cognitive Style

As indicated earlier, it was determined that the Global Affect Reinforcement Group produced significantly more self-referred affect to words during Operant Level than its counterpart, the Articulated Affect Reinforcement Group. In this connection, the globals produced 113 self-referred affect statements, the articulated Ss only 65. It was also found that the Global Interval Reinforcement Group produced 88 self-referred affect statements during Operant Level, the Articulated Interval Reinforcement Group 55, while Global Non-Reinforcement Ss also produced 88, Articulated Non-Reinforcement Ss, 64.

These totals were summed and an analysis of variance was used

to test the difference between the means of the two samples on the measure Self-Referred Affect/Words. Table 15 indicates that the Global Sample produced significantly more self-referred affect to words than the Articulated Sample ($F = 7.50$, d.f. = 1.54, $p < .01$).

This finding suggests that tendency to make many, as opposed to relatively few, self-referred affect statements, was in some way a function of cognitive style in the present study.

Reliability of the "Speech Style"

The reliability of the apparent "speech style" described above was tested by way of the procedures discussed here previously. A t-test analysis of the data obtained through these procedures reveals that the mean for global Ss was significantly greater again, on the response measure Self-Referred Affect/Words, than the mean for articulated Ss (Table 16). This finding ($t = 21.8$, $p < .005$)suggests that the verbal response tendency to give many as opposed to relatively few self-referred affect statements in describing personal experiences, is not only associated with cognitive style on a transitory basis, but has some consistency over time, as well, and thus may reflect a heretofore unexplored dimension of cognitive functioning; one, for instance, associated with stylistic differences in responding, subjectively or objectively, to one's own thoughts and memories. More will be said about this in the Discussion section later on here.

Positive Vs. Negative Affect Statements

The Operant Level self-referred affect statements of the 60 participating Ss were scored as to negative and positive content in the manner described earlier. Data were then tested by way of Chi

TABLE 15

SUMMARY OF ANALYSIS OF VARIANCE FOR ARTICULATED VS. GLOBAL SAMPLES: SELF-REFERRED AFFECT/WORDS. (OPERANT LEVEL).

Source	df	MS	F
Between Groups	5	.0074	2.06
Within Groups	54	.0036	
Artic. Vs. Global	1	.0270	7.50*

* $p < .01$

TABLE 16

t-TEST COMPARISON OF ARTICULATED AND GLOBAL SUBSAMPLES: RETEST OF OPERANT LEVEL (SELF-REFERRED AFFECT/WORDS).

	Mean	t	df
Articulated	.005	21.87	24
Global	.012		

,$p < .005$

Square. A summary of the findings of this test are outlined in Table 17.

Table 17 shows that the self-referred affect statements of 11 articulated and 19 global Ss were rated as predominantly positive, while the statements of 19 articulated and 11 global Ss were rated as predominantly negative.[4] These differences are significant at the .05 level ($X^2 = 4.27$, d.f. = 1). This finding indicates that in the present study, the self-referred affect statements of articulated Ss tended to be negative in content while the self-referred affect statements of global Ss tended to be positive. Apparently, cognitive style was not only associated with the quantity of self-referred affect verbalized, but with its quality, as well.

In light of these considerations, an attempt was made to assess the range of affect words produced by the two samples. To facilitate this assessment, a frequency count of identifiable affect statements was made. These frequencies appear in Table 18.

First of all, Table 18 reveals that both groups used considerably more types of negative affect words than positive affect words. For example, the articulated Ss used a total of 11 different positive affect words but 30 different negative affect words, while global Ss produced 16 positive and 29 negative words. Offhand, this finding suggests that the individuals who took part in the present investi-

[4]Designations of "predominantly positive" and "predominantly negative" were derived in the following manner: All of S's Operant Level self-referred affect statements were rated. If better than 50% of these were rated as positive, S's statements were designated "predominantly positive". If better than 50% were rated as negative, Ss statements were designated as "predominantly negative".

TABLE 17

NUMBER OF SUBJECTS WHOSE SELF-REFERRED AFFECT STATEMENTS WERE RATED EITHER PREDOMINANTLY POSITIVE OR PREDOMINANTLY NEGATIVE (OPERANT LEVEL).

	Positive	Negative	Totals
Articulated	11	19	30
Global	19	11	30
Totals	30	30	60

$p < .05$

TABLE 18

FREQUENCIES OF IDENTIFIABLE SELF-REFERRED AFFECT WORDS SAID BY ARTICULATED AND GLOBAL SUBJECTS DURING OPERANT LEVEL.

Articulated Sample		Global Sample	
Positive Affect	f	Positive Affect	f
1. like	38	1. like	73
2. enjoy	20	2. enjoy	42
3. glad	3	3. love	15
4. love	2	4. glad	8
5. excited	2	5. happy	4
6. happy	2	6. excited	2
7. pleased	1	7. worthwhile	2
8. grateful	1	8. feel good	2
9. relieved	1	9. feel well	2
10. kick out of	1	10. feel rewarded	2
11. felt rewarded	1	11. appreciated	1
		12. excited	1
		13. felt okay	1
		14. care for	1
		15. feel at home	1
		16. feel helpful	1
Negative Affect	f	Negative Affect	f
1. don't like	16	1. don't like	21
2. scared	12	2. scared	16
3. sorry	6	3. missed	13
4. nervous	5	4. nervous	9
5. homesick	5	5. afraid	6
6. upset	4	6. hated	6
7. hated	4	7. sorry	5
8. can't take	4	8. frightened	3
9. missed	4	9. homesick	3
10. petrified	3	10. can't stand	3
11. afraid	3	11. didn't enjoy	2
12. shook up	3	12. mad	2
13. felt helpless	2	13. apprehensive	2
14. depressed	2	14. don't care for	2
15. felt bad	2	15. embarrassed	2
16. can't stand	2	16. shocked	1
17. didn't enjoy	1	17. concerned	1
18. frightened	1	18. lonely	1
19. apprehensive	1	19. disappointed	1
20. anxious	1	20. unhappy	1

(Continued)

(Table 18--Continued)

21.	shocked	1	21.	sad	1
22.	repulsed	1	22.	depressed	1
23.	miserable	1	23.	petrified	1
24.	felt dead	1	24.	discouraged	1
25.	like dying	1	25.	panicked	1
26.	ill at ease	1	26.	angry	1
27.	out of it	1	27.	like a fool	1
28.	felt faint	1	28.	felt lost	1
29.	felt for	1	29.	didn't appre-ciate	1
30.	regretted	1			

gation tended to have at their command, a markedly greater range of negative affect words than positive affect words.

Secondly, Table 18 indicates that for both groups, words such as "like" and "enjoy" were selected for use most often, while "don't like" and "scared" were runners-up in the negative category.

Finally, the data in Table 18 suggest that global and articulated Ss were roughly equivalent in terms of the quality of the affect words they produced. Both groups produced an abundance of common types such as "I love" and "I like", but limited numbers of less frequently used words ("apprehensive", "relieved", "felt worthwhile", and so on).

Additional Response Class: "Dependency-Authority Figures"

As indicated earlier, E had noticed that a number of statements made by Ss during the interview in regard to instructors, supervisors, parents, physicians, etc., could be classified as either openly hostile or critical, while others suggested fearfulness or submissiveness.

In order to ascertain whether or not there were group differences in producing one type of statement or the other, statements of 15 global and 15 articulated Ss (5 selected at random from each group) reflecting attitudes toward "dependency-authority figures" were rated as to their critical, fearful or neutral content. A frequency count of these ratings, made by E, was then compiled. These frequencies appear in Table 19.

In general, the data indicate that articulated Ss tended to make statements regarding dependency-authority figures which were

TABLE 19

FREQUENCIES OF CRITICAL, FEARFUL AND NEUTRAL COMMENTS MADE ABOUT DEPENDENCY-AUTHORITY FIGURES BY 15 ARTICULATED AND 15 GLOBAL SUBJECTS DURING OPERANT LEVEL.

	Critical	Fearful	Neutral
Articulated	22	4	11
Global	4	17	13

hostile, critical or competitive, while global Ss tended to make statements that suggested fear, submissiveness or unquestioned acceptance of authority and discipline. These findings suggest that there might be cognitive style-associated differences in terms of affective response and attitude to perceived power. The investigator's interpretation of the trend reflected in the data is that articulated Ss sampled seemed to view themselves as equal, if not superior, to individuals in their environment who have power and authority. Furthermore, articulated Ss tended to see their major role as nurses as one of reconstructing or overhauling the patient care system, a task they didn't feel their superiors were equal to. Global Ss, on the other hand, seemed to view themselves as being in need of frequent supervision and, while sometimes fearful of authority, appeared to accept their own dependency roles. With regard to nursing itself, these Ss expressed many altruistic motives with respect to patient care, seemed very concrete, conceptually, about what it means to be a "good nurse", and appeared to have little desire to change the system, serve in supervisory capacities themselves, or challenge the competence of their instructors. Where many articulated Ss seemed to be ambivalent about their budding careers in nursing, either because they felt frustrated working within a system that they regarded as second rate, or were "turned off" by having to perform menial nursing cares, almost all global Ss expressed enjoyment and satisfaction with what they referred to as "bedside nursing". Whether or not they were simply reflecting a social stereotype, i.e., of the "good person -- good nurse", or were merely rationalizing away an inability to climb the status ladder

in nursing to specialty areas, such as working in the operating room, cardiac unit, or in some supervisory capacity, is a question worth considering.

Clinical Study of Selected Subjects

Some data was obtained by way of Rorschach testing and interviewing in the hope of turning up other variables that might be associated with, or even account for, some of the group differences in verbal behavior previously cited. Ss selected for study were extreme cases from each of the samples, specifically the five highest affect statement producing global Ss (mean = 15.6 for Operant Level) and the five lowest affect producing articulated Ss (mean = 2.6 for Operant Level).[5]

Table 20 and Figure 4 present the findings with respect to Rorschach determinants.

[5]In retrospect, this appears to have been an inadequate design, attributable in part to the cursory manner in which the clinical study was planned. As it happened, the decision to clinically evaluate certain Ss was made after the speech samples from the conditioning interview were all transcribed, scored and statistically analyzed. The completion of these procedures, which turned out to be an enormous and tedious clerical task, came several months after the actual experiment had been concluded. In the interim, a large number of the student nurses who had participated in the study had graduated from the nursing program and moved on to other hospitals, thus limited the subsample that could be used in the proposed clinical evaluation. In addition, the investigator had made other commitments which tended to limit the time that he was able to see selected Ss individually. Were there the opportunity to do the clinical study over again, an additional 10 Ss would probably be added to the subsample: These would include the five highest affect-producing articulated Ss and the five lowest affect-producing global Ss. This type of design would allow for a wider range of comparisons; for instance, low vs. high articulated Ss, low vs. high global Ss, high articulated Ss vs. high global Ss, and so on.

TABLE 20

RORSCHACH DETERMINANTS FOR FIVE ARTICULATED AND FIVE GLOBAL SUBJECTS: GROUPED DATA (TOTAL DETERMINANT/TOTAL RESPONSES).

Determinant	Articulated	Global
M	.20	.11
FM	.14	.16
Fm	.07	.02
mF	.01	.02
FC'	.04	.08
C'F	.00	.02
F	.26	.38
Fc	.05	.04
cF	.04	.02
K	.02	.02
FC	.08	.05
CF	.08	.07
C	.01	.00
C Symb	.01	.02

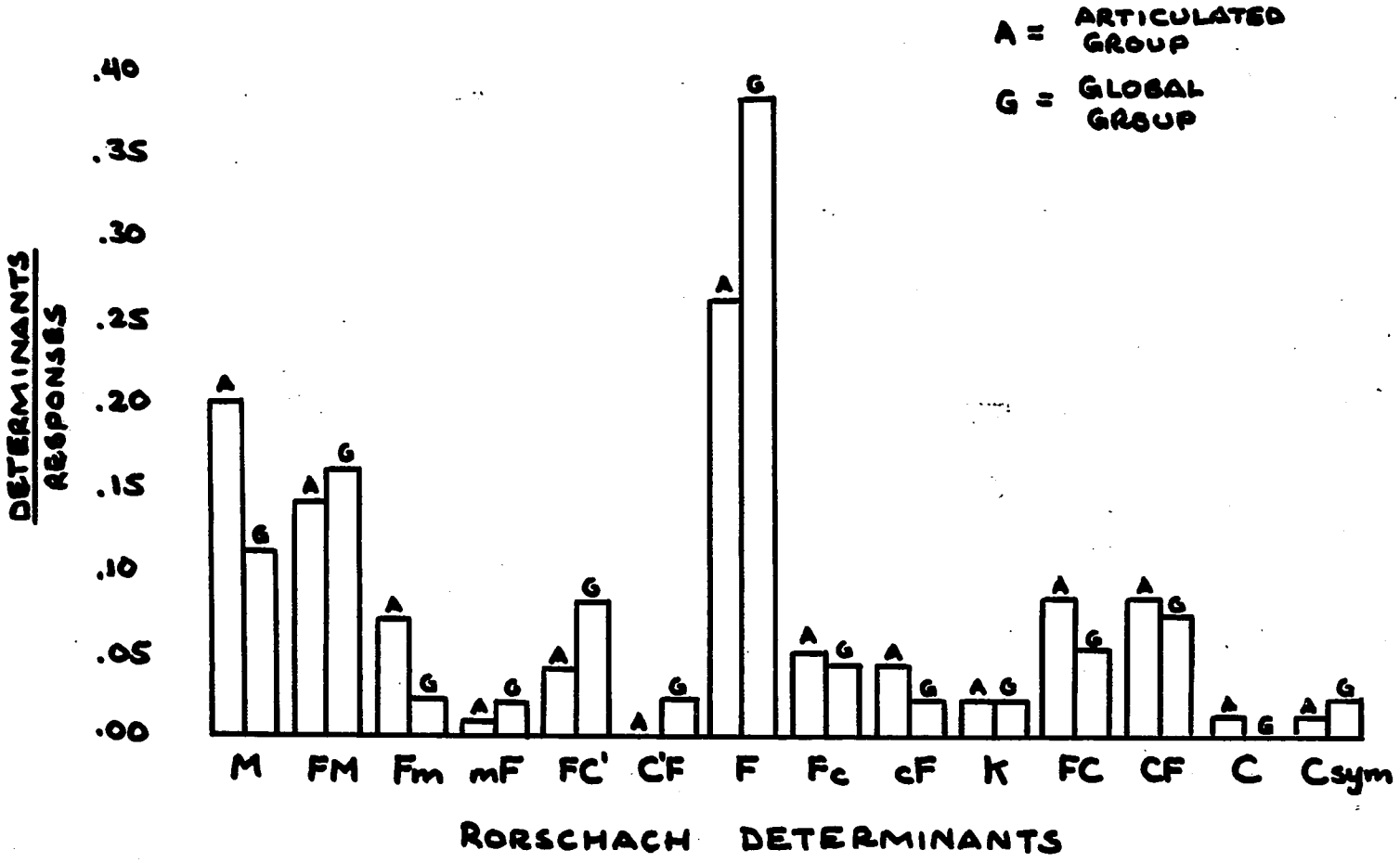

FIG. 4 GRAPH OF RORSCHACH DETERMINANTS FOR 5 ARTICULATED AND 5 GLOBAL Ss: GROUPED DATA (TOTAL DETERMINANTS / TOTAL R)

As noted, the articulated group tended to produce more human movement (M) and inanimate object movement (m) responses than did the global group. On the other hand, global Ss tended to produce somewhat more form or shape (F) responses and achromatic color (C') responses than did the articulated group. Differences with respect to other determinants are less noteworthy. The experience balance for the articulated group is 20:15; for the global group, 11:13.5.

In general, these data suggest that the low affect producing articulated Ss tended to be more prone to fantasy and imaginal activity, more prone to tension, and less given to emotionality and impulsiveness than their global counterparts. These findings are grossly consistent with what has been observed with respect to articulated and global Ss in other cognitive style research.

In regard to the content features of the Rorschach data, articulated Ss tended to produce more differentiated, elaborated responses and more responses that could be described as "aggression laden" than did their global counterparts. That is, they saw more aggression being acted out (e.g., "birds fighting"), more aggression-associated objects (e.g., "a fighter plane") and more competition (e.g., "men in karate positions"). Furthermore, their associations appeared to reflect a greater capability for differentiated thinking in relation to what seems to have been aggressive tension (e.g., "a boat coming through the water ... like an armored ship, something used for fighting", as opposed to "an atomic explosion").

In general, the interview material and Rorschach data give no clearcut indication as to why there were group differences in affect production, production of negative and positive affect statements or

comments about dependency-authority figures. The data, limited though they are, do suggest that the articulated Ss tended to be more identified with verbalized hostility, aggression and competitiveness. Whether this simply is another manifestation of the verbal response tendencies noted in the interview or is in some way associated with the reasons for the interview behavior is a matter for speculation which will not be taken up here.

At any rate, certain questions arise which may be worth taking up in future research, among them: Is there some relationship between tendency to perceive aggression in an ambiguous stimulus field, such as a Rorschach inkblot, and tendency to verbalize negative affect or make critical statements generally? Is there some connection between negative or affect-laden responses made to specific Rorschach cards (e.g., Cards IV and VII) and tendency to make negative or affect-laden statements about individuals in authority? And is there some relationship between tendency to use given Rorschach determinants and tendency to produce few or many affect statements (e.g., many color responses, many affect words)?

CHAPTER IV

Discussion
of
Results and Implications
for
Research and Practice

Part I

Conditioning and Transfer Hypothesis

Due to the complex and detailed nature of the experimental results, a brief summary of the earlier reported findings is in order at this point. As noted:

(1) When each treatment group's performance for Operant Level was compared with its performance for the last five minutes of "Conditioning", it was found that only the articulated group which was reinforced for producing self-referred affect statements increased its production of self-referred affect and general self-references over words. The remaining five groups showed marked, if not significant, drops on these measures over time, regardless of whether or not they had received reinforcement.

(2) When each affect reinforcement group's performance was compared with the performance of its respective control groups, it was found that the articulated affect reinforcement group which had received reinforcement for producing self-referred affect statements produced both significantly more self-referred affect and general self-references to words than either of its controls during the last five minutes of "Conditioning". It was also found that this group produced significantly more self-referred affect to words than either of its controls during the last five minutes of Transfer.

On the other hand, the "Conditioning" and Transfer Task performance of the global group which had received affect reinforcement was found to be not significantly different from that of either of its respective control groups.

(3) When each articulated group's performance was compared with that of its global counterpart, it was demonstrated by way of trend analysis that the two groups which had received reinforcement of self-referred affect statements differed significantly in terms of the form of their Operant Level-"Conditioning" plots. Where the articulated group showed a rising plot on the measure Self-Referred Affect/Words, the global group showed one that fell sharply.

These interrelated findings are viewed by the investigator as lending strong support to the hypothesis which was developed earlier here: That in a free operant conditioning situation, Ss manifesting an articulated cognitive style would show significantly greater verbal conditioning and transfer than Ss manifesting a global cognitive style.

The establishment of a relationship between certain cognitive variables and the operant conditioning of verbal behavior has implications both for research and the practical application of learning principles. Before considering such implications, however, some attempt will be made here to explain the present findings.

Certain Theoretical Considerations

Previous attempts to explore the function of cognitive variables in the operant conditioning paradigm have emphasized such concepts as awareness and hypothesis testing in an effort to explain desired changes in verbal behavior following reinforcement. Such attempts have produced little more than controversy, however, due to confusion of concepts and a failure to resolve basic methodological

issues. The approach used in the present investigation has managed to sidestep some of these problems by focussing on cognitive variables operationally defined and reliably demonstrated in a long series of well-controlled experiments.

That such variables -- cognitive styles -- have not heretofore found their way into verbal conditioning research is something of a mystery, in the present investigator's judgment. One may conjecture that several factors have contributed to their absence, among them what Salzinger (1969) has indicated is a tendency on the part of clinicians lacking requisite training in behavior theory to focus on cognitive content variables that are either difficult to define or impossible to observe.

At the same time, it has been the present investigator's experience that experimenters who are well-versed in behavior theory tend to be generally unfamiliar with the growing body of research on cognitive processes, particularly that research which has been concerned with the structural components of cognition. In this regard, the term "cognition" appears to have become synonymous for the behaviorist with such concepts as consciousness and awareness, a limited interpretation rooted evidently in a lack of current information. Hopefully, the present investigation will help to generate some cross-interest in the research of "opposing camps", a trend anticipated by Foa and Turner (1970), who predict that future behaviorists may find "unsuspected value in their notions of stimulus and response generalization and discrimination, as avenues to the exploration of (cognitive) structures", while cognitive psychologists may move from

present expansive concepts, such as cognitive complexity, to more detailed and specific structural models.

A major finding of the present study which might be useful in providing impetus for such a trend is that cognitive variables very definitely do play a determining role in the operant conditioning of verbal behavior, though apparently it is not the role which behaviorists and "cognitive schoolists" have debated for so long in relation to the content issue of awareness. The main thrust of the present findings is that structural or stylistic cognitive variables are somehow involved in facilitating verbal conditioning and transfer, and may also be related in certain ways to verbal behavior in a more general sense. The latter point will be a major topic of discussion later on here.

Verbal Conditioning and the Discrimination of Stimulus Fields

A plausible inference that may be drawn from the conditioning and transfer data described earlier is that cognitive style was directly associated with how S deployed her attention in the course of conditioning procedures, with how she discriminated the stimulus field, with how she made critical judgments about perceived stimuli, and with how she processed or organized the information that she took in. In this regard, a rather interesting role has recently been assigned to verbal reinforcers by Heller and Marlatt (1969), one which -- in terms of theory construction -- has implications for the present discussion.

These writers conceive of verbal reinforcers as "discriminative stimuli which provide information as to the appropriate or

desired response class for the subject". In essence, the verbal conditioning situation is seen as a discriminative learning task in which such reinforcers have maximum cue value when imbedded in an ambiguous stimulus field and minimum value when embedded in a more naturally occurring verbal stimulus. An ambiguous stimulus field, as the term is used here, refers to the kind presented in the usual verbal conditioning experiment in which E is minimally responsive, i.e., is silent except when emitting reinforcers. The term "naturally occurring verbal stimulus", on the other hand, refers to an experimental procedure in which E emits his reinforcers while carrying on a running conversation with S.

Little success has been had with this latter type of procedure. Only where E has been minimally responsive, thus providing an ambiguous stimulus field, has verbal conditioning been demonstrated with any consistency.

The simplest explanation for the findings of the present study, growing out of these theoretical concepts, is that articulated Ss were better able than their global counterparts to discriminate those stimuli which provided information as to the appropriate or desired response class to be strengthened. This reasoning is consistent with what is well-known on the basis of the research discussed earlier: That articulated individuals tend to demonstrate superior performance on tasks tapping discriminative abilities, such as the rod and frame test, embedded figures test and other perceptual measures. A common interpretation of such findings has been that highly articulated individuals are more adept than poorly articulated individuals at

separating foreground from background characteristics of the perceptual field. This concept -- separation of foreground from background characteristics -- seems to be the essence of Heller and Marlatt's position on ambiguous and naturally-occurring verbal stimulus fields. The implication is that the verbal reinforcer, a foreground characteristic, will contrast more sharply with general silence on E's part, a background characteristic, than with a background comprised of many other emitted stimuli; for example, words used in conversation. The greater the contrast, the simpler the discrimination. The simpler the discrimination, the more readily S acquires information regarding the appropriate response class and is thus able to demonstrate the desired change in verbal behavior (which may, for instance, be an increase in the rate of producing the appropriate response class).

This conceptualization brings us to a pair of related issues which need to be clarified before any explanation of the present findings can have validity. The first of these issues pertains to the structure and complexity of the verbal conditioning task; while the second pertains to such questions as motivation and deployment of attention in the learning of verbal responses.

Degrees of Ambiguity in the Stimulus Field. There is an argument against the use of a discrimination hypothesis in attempting to explain the group differences in conditioning found in the present study. It derives from the proposition that the free operant verbal conditioning paradigm produces such an ambiguous stimulus field, due to E's general silence, that little if any discriminative challenge is presented to S. Stated differently, all of the informational

cues as to the correct response class are "right out in the open". This being the case, it may be argued that the free operant paradigm results in an experimental task that is simply too easy to differentiate high power (articulated) from low power (global) discriminators. Thus, Global, as well as articulated Ss, should be able to discriminate the obvious cues to the correct response class and demonstrate learning. Nevertheless, only articulated Ss gave evidence of verbal conditioning in the present study. In the light of the argument that the task itself is too easy, from the standpoint of a discriminative challenge, how do we account for such a discrepancy in performance?

A closer look at the free operant paradigm used in the present study suggests that the argument itself is erroneous. The free operant paradigm, in fact, presented S with a highly complex stimulus field, not one that could, in Heller and Marlatt's terms, be described as ambiguous. To make this point, we need only compare what Heller and Marlatt refer to as "the typical verbal conditioning experiment", the Taffel or Greenspoon procedure, with one which elicits, as in the present study, continuous speech from S.

In the Taffel or multiple choice procedures, not only is E generally silent, but S is, too, except when reading brief phrases or tacking verbs on to personal pronouns such as "I" or "We". Under such conditions, the auditory stimulus field remains relatively ambiguous in that it (1) remains generally uncluttered by S's own verbalization and (2) allows for the termination of a discrete phrase followed by a brief period of silence into which the verbal reinforcer is inserted by E. Furthermore, S's verbal productions

are directly elicited by E and do not make demands on such cognitive functions as memory, concept formation or organization of concepts into response classes.

Comparatively speaking, the free operant paradigm, in which S emits continuous speech, presents a more complex auditory stimulus field. First, S, throughout the conditioning task, is listening to self-produced stimuli, i.e., his own words. There is no break between his own verbal response and the reinforcing stimulus emitted by E. Second, related to the first point, is the fact that E's reinforcer frequently occurs simultaneously with a word which S is saying, often in the middle of a phrase or sentence. In such a case, S must attend to and perceive and input at the same instant he is producing an output. Third, the mechanics of reinforcing a given response class in a free operant paradigm frequently results in a temporal separation between the emission of the correct response class and the delivery of the reinforcer during which other words or response classes are emitted. As often as not, the reinforcer is delivered immediately after, or simultaneously with, "incorrect" words and response classes.[6] This, theoretically, should have the effect of weakening the cue or information value of the reinforcing stimulus by (1) placing it at some distance from the correct response class and (2) attaching it to a response other than the correct one.

[6]For example, where S is speaking rapidly, it is almost impossible for E to consistently deliver his reinforcer, "Uh-huh", immediately after the emission of the correct response class. Thus, at one point, he may reinforce "I didn't like the doctor who (Uh-huh)," at another, "I love to (Uh-huh)" and, at still another, "we felt good after working with the (Uh-huh)".

It is interesting that, despite this phenomenon, Ss did show an increase in the production of the correct response class, evidently due to some higher level organizational tendency in which inconsistencies in attaching reinforcing stimuli to correct response classes somehow get balanced out over time with repeated reinforcement. Theoretically, this balancing-out occurs at some information processing level in which the similarities between the contexts in which reinforcers have been presented are weighed, analyzed and conceptually tied together, resulting in an isolation of the correct response class from others.

The fourth and final point to be made in this comparison of Taffel or multiple choice procedures with those deriving from the free operant model pertains to the multiplicity of cognitive acts which S is required to perform in the latter paradigm. As indicated earlier, S's task in the multiple choice paradigm is a rather simple one, from the standpoint of cognitive functioning. The stimulus field is primarily an external one consisting of a printed stimulus card from which S reads. S is usually reinforced for reading 1 to 2 out of 4 to 6 personal pronouns in conjunction with a verb. This, of course, is not the case in the free operant conditioning paradigm where S, as in the present study, receives a set of instructions at the outset of the experiment and then must attend to external and internal stimulus fields in the performance of his task. The internal stimulus field is primarily a cognitive one associated with the eliciting of memory functions, the organization of ideas, conscious thinking and reasoning, and the perceiving of inner events and experiences. In complying with the instructions and engaging in such

cognitive functions as these, S, in essence, is engaging in a self-guiding, self-regulatory activity that is not demanded in the multiple choice paradigm where his speech is closely controlled by E through the use of printed cards.

In the present writer's view, these four points suggest that the free operant conditioning paradigm, which requires S to pick informational cues as to a correct response class out of the stimulus field while engaging simultaneously in cognitive activity and continuous speech does, in fact, produce a highly complex discrimination task, one sufficiently difficult to separate individuals with well-developed discrimination skills from those who have less developed discriminatory powers. Such considerations lend support to the theory that articulated Ss in the present study differed from global Ss, in terms of performance, because they were better able to discriminate the very complex stimulus field imposed by the free operant paradigm. Given a less complex, more ambiguous stimulus field (such as that produced in a Taffel task), significant differences between global and articulated Ss might not have been found.

A Question of Motivation and Deployment of Attention. Despite such reasoning, the present study has provided secondary data which suggest that the answer to the question of group differences may not be so simple. The significant differences found for card sort items described earlier, for instance, point to the possibility of a cognitive style-associated differential with respect to how Ss responded to E and the experimental task. These data suggest that global Ss tended to be particularly sensitive to certain social or interpersonal aspects of the interview situation such as whether or not E, hidden

from view by a screen, was really paying attention to what they were saying. In addition, there appears to have been some tendency on the part of global Ss to wish that E would guide their behavior more than he did during the interview and reassure them that their performance was acceptable. This type of behavior is more or less consistent with that reported elsewhere in regard to the interpersonal behavior of global individuals, for example, when such behavior is manifested in response to psychotherapists (see Witkin, 1965).

These considerations suggest that global and articulated Ss might have come into the experiment with different kinds of psychological sets, expectancies or task orientations. On the one hand, global individuals appear to have been more concerned than articulated individuals with certain interpersonal aspects of the experimental situation and with acquiring feedback on their performances. Furthermore, they appeared to react somewhat uncomfortably when such feedback was not forthcoming. Articulated Ss, on the other hand, seem to have been concerned less with the social context in which the experiment was occurring and more with the quality of their performance vis-a-vis the interview instructions. It is also the investigator's impression that articulated Ss tended to view E's role somewhat differently. Whereas global Ss appeared to expect or wish that E would provide guidance, structure and reassurance, articulated Ss seemed to regard E simply as a means to an end, i.e., as a dispenser of information that might allow them to meet the requirements of the task, as they saw it, more fully. In a sense, this type of approach to E could be defined as "task oriented", while that which was

hypothetically characteristic of global Ss in the present study could be termed "self-" or "self-stutus" oriented. The latter definition is based on the interpretation that global S behavior in the interview was highly associated with interpersonal discomfort.

Assuming that these observations are essentially valid, it is reasonable to conjecture that such orientations, associated with underlying motives or reinforcement histories, might have influenced or directed deployment of Ss attention to specific types of cues or stimulus patterns during the interview. It is posited that global Ss tended to deploy attention primarily to characteristics of the stimulus field typically thought to provide information about where one stands in the estimation of others. Articulated Ss, it is conjectured, attended more to cues which provided information as to the accuracy of their performance. Specifically, global Ss attended to social cues while articulated Ss attended to a broader range of cues, some having social connotations, but many being "neutral" or "non-personal" in nature.

With regard to the role of the reinforcing stimulus in this theoretical model, we may assume that articulated Ss attended to those components of it which were important <u>to them</u>. Hypothetically, this was the relationship of the reinforcer to other verbal stimuli arising within temporal proximity. On the other hand, it is posited that global Ss deployed their attention primarily to aspects of the reinforcing stimulus that provided information that was important <u>to them</u>, namely, social cues bearing on the acceptance or rejection of their interview behavior by E. Examples of such social cues

might be the tone of E's voice, his inflections, the strength of his "Uh-huh", and the number of times reinforcement was delivered.

The first type of attention deployment referred to, with respect to articulated Ss, might be termed "non-personal data gathering", i.e., the gathering of information that does not bear directly on one's self-worth or reflect one's status. The second type of attention deployment referred to, with respect to global Ss, might be termed "social information seeking", i.e., the tendency to actively search for clues as to how one is regarded by others (presumably for the purpose of reducing anxiety or discomfort arising in connection with a poorly differentiated self-image or lack of confidence when performing in a social situation).

Developing the present argument a bit further, it is conceivable that these attention-deployment styles have perceptual correlates. With regard to the interview situation, it is conjectured that global Ss tended to interpret the reinforcing stimulus as "social approval" and little else. Furthermore, it is conjectured that the reinforcer was viewed by these Ss as a response to the self <u>as a whole</u>, rather than to some specific act which the self had performed. On the other hand, it is reasoned that articulated Ss tended to interpret the reinforcing stimulus as a differentiated response not only to themselves as persons, but to discrete acts as well. Such reasoning is consistent with research findings that articulated individuals tend more than their global counterparts to articulate what they experience, differentiating components of the stimulus field and analyzing the relationships between them (Witkin, 1965).

On the basis of these considerations, it is theorized here that the significant differences in verbal conditioning and transfer found between global and articulated groups in the present study were not due simply to an underlying difference in ability to discriminate the stimulus field. Instead, it is argued that a combination of factors account for the forementioned findings. The first of these factors is the psychological or task orientations cited earlier. These orientations, associated with underlying motives or reinforcement histories, may have predisposed Ss to approach the experimental situation and E in different ways perceptually and in terms of attention deployment. In this connection, the perceived task for the two groups may have been quite different. For global Ss, the perceived task may have been to perform in a manner that would win E's approval and acceptance. For articulated Ss, however, the perceived task may have been to perform in a manner that would allow for control of the reinforcing stimulus.

The second theoretical factor involved in producing the cognitive style associated differential in conditioning and transfer is the ability to discriminate the stimulus field. As indicated earlier, it is generally believed, on the basis of other research, that articulated Ss are superior with respect to this ability. It is thus proposed here that such a skill, combined with the tendency to attend to a wide range of stimuli within the interview situation allowed for the intake of information necessary for learning the correct response class. It is hypothesized that the attention style and discriminatory skills of articulated Ss was instrumental in getting such information "into S"

where it was then processed or analyzed at some higher cognitive level. It is also hypothesized that the attention style and limited discriminatory skills of global Ss tended to reduce or even preclude the likelihood of such information reaching cortical centers for further analysis or processing.

Research and Practical Implications

The implications of the present findings regarding conditioning and transfer take two forms: Those that pertain to methodology and those that pertain to subject matter for further investigation.

With regard to the implications of the present findings for methodology, it has generally been deemed sufficient in selecting Ss for free operant verbal conditioning studies to control for such S characteristics as age, sex, intelligence, education and psychopathology. The present findings suggest, however, that the cognitive variable, global-articulated cognitive style, may be an important factor in the operant conditioning of verbal behavior. If indeed this is the case, controlling for global-articulated cognitive style could have certain advantages for the researcher.

First of all, controlling for global-articulated cognitive style might allow E to manipulate the degree to which performance variability could occur between Ss or experimental treatment groups. For instance, E might minimize such variability by seeing that his samples were homogeneous in terms of cognitive style. Theoretically, variability would be maximized if samples were, in fact, heterogeneous on this cognitive variable, a phenomenon which presumably occurs when Ss are selected more or less at random to participate in verbal condi-

tioning research.

A second advantage of controlling for global-articulated cognitive style might be to strengthen E's power to predict the outcome of his verbal conditioning procedures, a factor of considerable importance to behaviorally-oriented researchers, who would use the free operant verbal conditioning paradigm as an analogue of verbal psychotherapy. If the present findings have generality, then E would greatly enhance his chances of demonstrating both conditioning and transfer by comprising his sample entirely of articulated Ss. Logically, randomly assigning Ss to samples, as has been the practice, would reduce the possibility of demonstrating a group effect inasmuch as such samples might be comprised of many global Ss not capable of conditioning for the reasons suggested in the previous section. Screening out such individuals should maximize the potential for conditioning effects by "screening in" those Ss who are most susceptible to verbal conditioning procedures.

Continuing with this line of reasoning, it is conceivable that a useful application of the present findings might be to psychotherapy and psychotherapy research. In a recent paper, Salzinger (1969) has argued that the operant conditioning of verbal behavior is a prevalent feature across a wide range of therapeutic techniques: In psychoanalysis, where reinforcers are dispensed unwittingly, resulting in the reporting of "private events" that may, in fact, be nothing more than conditioned suggestions made to the patient by the therapist; in Pavlovian behavior therapy such as Wolpe's systematic desensitiation where, presumably, part of what a patient does is to respond subvocally to the therapist's injunction to imagine a given scene in an anxiety

hierarchy; and in programmed psychotherapy where operant conditioning techniques are used to instate self-regulatory behaviors in a patient as well as such skills as behavioral analysis, i.e., "the analysis of the environmental conditions, present or potential, which influence his behavior".

If Salzinger's argument is indeed correct, knowing ahead of time which patients are susceptible to verbal conditioning techniques, and which are not, has obvious value, particularly if such knowledge can be obtained from some brief, reliable assessment procedure. Whether or not cognitively articulated individuals, assessed on the basis of such objective measures as the rod and frame test, would in fact be the greatest beneficiaries of therapeutic techniques which deliberately or inadvertently involve operant conditioning principles certainly is an interesting empirical question.

While the present data may have implications for patient selection, they may have even more important implications for therapy research. For some time now, the value of the free operant verbal conditioning paradigm as an analogue of the psychotherapy situation has been in question due to a failure to demonstrate generalization of effects beyond the conditioning phase of the procedure. Rogers (1960), for instance, conditioned positive and negative self-references of Ss involved in quasi-therapy sessions but found no changes in performance on personality tests following conditioning while Lanyon (1967), investigating the effects of social approval contingent upon emission of parental and emotional words found no changes in his transfer task.

One of the few reported free operant verbal conditioning studies which has been able to demonstrate a transfer effect was con-

ducted recently by Lapuc and Harmatz (1970). These investigators reinforced positive self-references of hospitalized patients during eight 30-minute weekly therapy-like sessions and found change on certain personality measures during and after conditioning procedures which were interpreted as a generalization effect. Obviously, more evidence of this type will be necessary if the free operant paradigm is to win wider confidence as an adequate model of the therapy process than it currently enjoys. More important, the massing of such findings might contribute eventually to wider acceptance of learning theory principles by conventional practitioners who, until now, have tended to view such principles as largely academic or irrelevant because of their failure to effect even temporary generalization effects within the most highly structured experimental settings.

Generality of Findings

One of the problems facing the present study is the issue of generality of findings. Questions raised in this regard pertain to the matter of the response class selected here for conditioning, self-referred affect. If an individual shows conditioning of self-referred affect, does this mean that he will also show conditioning when some other response class is designated for modification? And had some other response class been used in the present study, would cognitive style-associated differences in conditioning and transfer still have been found?

With regard to these questions, there are certain findings among the data which suggest that the present results do have generality

with respect to the conditionability of other verbal response classes. For instance, the finding that articulated Ss showed increases in general self-references with intermittent reinforcement suggests that conditioning did occur with respect to that response class, also. Had "I" and "We", rather than self-referred affect statements, been given continuous reinforcement, it seems likely that even greater increases in general self-references might have been noted.

Whether or not global Ss would have shown such increases in general self-references, had they been continuously reinforced, is difficult to determine. Nevertheless, it is the investigator's opinion that global Ss would not have performed any differently given such a change in response class. This opinion is based partly upon the observation that global Ss seemed not to respond at all to the intermittent reinforcement of "I" and "We" statements, giving fewer and fewer of them as the interview progressed just as they did for the response class, self-referred affect.

The investigator's opinion on this matter is also based to some degree on the theoretical considerations he stated previously concerning the verbal conditionability of global Ss, generally. As indicated, he holds the view that the free operant conditioning of verbal behavior in these individuals tends to be prohibited by such factors as motivation, attention style and nature of cognitive development and functioning. Theoretically, the <u>quality</u> of such characteristics in an individual is the prime determiner of that individual's conditionability: Conditioning thus is not seen, as a function of "innate" qualities of a given response class which somehow render it more or

less "conditionable" than some other response class. Therefore, it is doubtful, in the investigator's judgment, that merely changing response classes would have facilitated verbal conditioning or transfer in global Ss in the present study.

Perhaps under different experimental conditions where, for instance, greater reinforcement is given over prolonged periods, or the strength and nature of the reinforcer are altered in some way, learning could be effected. This would be an interesting area for future exploration.

Other questions arise with respect to the generality of the present findings. Are such cognitive variables as cognitive styles associated with conditionability when operating within the framework of other types of conditioning paradigms, those, for instance, that are essentially non-verbal or those which make use of classical conditioning procedures (e.g., Wolpe's systematic desensitization). Logically, cognitive processes are used in the picking up and processing of information which arises within the stimulus fields produced by these models as well.

If the present findings do have generality with respect to other conditioning paradigms, we might find that articulated Ss learn under such systems while global Ss do not. Eysenck's findings, over the years, that hysterical-extroverted individuals tend to be difficult conditioners is interesting in this regard. There is ample evidence that hysterics and those individuals whom Witkin (1965) has cited as manifesting global cognitive styles have many overlapping characteristics (e.g., repression, denial, somatic symtomatology, etc.). This leads the investigator to wonder if the limited conditionability of

Eyesenck's extroverts isn't due to some cognitive factor, such as the one explored in the present study.

Another question occurring with respect to the generality of the present findings pertains to the samples selected. Using Ss who fall at the extremes of any dimension, theoretically, limits the generality of one's results to other Ss who fall at similar extremes on the same dimension. Thus, the present findings probably have little predictive power with respect to such individuals as those who fall between our articulated and global samples cognitively and whom, presumably, comprise a majority of the population. This fact leaves us with such unanswered questions as "Are extreme globals the only individuals who don't condition, and are extreme articulateds the only ones who do?" It is difficult to imagine that this is the case. It would be most interesting to determine whether there is a relationship between <u>degree</u> of globality-articulation and susceptibility to conditioning. In this regard, the question to answer would be, "As one moves away from the extremes of this cognitive style dimension, is more or less evidence found of conditioning and transfer?"

<u>Awareness</u>

Finally, here, the investigator would like to express a few thoughts about the question of awareness in the present study. While there was no overt intention at the outset of this project to determine what role awareness might play in the learning of verbal responses, it is difficult to conduct a lengthy conditioning study of this type without coming to some conclusions regarding that subject, particularly

since it remains such a prominent issue in the verbal conditioning research today. The following ideas are in the form of an impression and do not pretend to be based upon a careful or scientific study of this question.

It is the investigator's view that Ss who showed conditioning, or verbal behavior modification, during the experimental interview conducted here were not aware of the correct response reinforcement contingency. This conclusion was reached on the basis of card sort data and the post-sort interview. Only one S indicated awareness of the correct contingency and she was a member of the Global Affect Reinforcement Group, the group which did not show verbal conditioning. Furthermore, it should be noted that this S gave an exceptionally high rate of affect statements during Operant Level which carried over into the "Conditioning" Period. Thus, she received all fifteen of her reinforcements within a relatively brief period of time. It is possible, therefore, that such massing can account for her ability to identify the response class that was being rewarded.

A recent study by Lapuc and Harmatz (1970), referred to earlier here, shows findings which are identical to those of the present study with regard to awareness. To quote these writers, "... every S in the Experimental group and Yoked-Control group was aware of the presence of the reinforcer, 'mm-hmm', but not one S in either group could verbalize the contingency of the reinforcer". It should be noted that Lapuc and Harmatz used a free operant conditioning paradigm similar to the one used in the present investigation.

Perhaps the real question concerning the role of awareness in

verbal conditioning shouldn't be, "Is awareness a requisite for conditioning to occur?", but rather "Under what conditions are Ss likely to be able to verbalize correct response-reinforcement contingencies?" It is the present investigator's view that Ss will be less likely to verbalize (or become aware) of such contingencies where a free operant conditioning paradigm is used due to some of the factors discussed here previously (i.e., complexity of the stimulus field, difficulty of the discrimination task, inconsistencies in delivering reinforcers, etc.). The chance of verbalizing correct contingencies, however, should be greatly enhanced where Taffel Type multiple choice procedures are employed. This is due, theoretically, to the relative simplicity of the task, regularity of reinforcement following a discrete phrase or sentence, limited number of verbal members used, and so on. A more detailed analysis of this issue is provided by Salzinger (1969).

Part II

In discussing the controversy over the role of awareness in verbal conditioning earlier, it was pointed out that one of the major unresolved issues is the status of the post experiment verbal report. To some degree, questions raised in connection with that issue have relevance for certain "content" features of the present study, such as self-referred affect statements, comments about dependency-authority figures, and tendency to make general self-references in describing personal experiences. Where one stands with respect to the <u>meaning</u> of such content data could determine how he attempts to explain the group differences observed in terms of its production. If, for

instance, such content features are viewed simply as variables without "underlying" correlates, like feeling tones or attitudes, one may attempt to explain the present group differences simply by identifying those stimuli in the interview situation which might have elicited them. If, on the other hand, such verbal reports are seen as valid indicators of underlying, "non-observable" states, one might instead wish to relate such performance differences to other types of cognitive style associated differences; for instance, differences in defenses, in personality structure, in forms of pathology, and so on.

Base Rate Verbal Behavior; Emitted or Elicited?

Almost all verbal conditioning procedures employ some form of pre-experimental task instructions. In free operant paradigms, for example, certain rules or guidelines are laid down for S which generally direct his verbal behavior throughout the conditioning "interview". For instance, where Ss have been patients in hospitals, they have usually been instructed to speak about why they have been hospitalized (e.g., Salzinger and Pisoni, 1961), or been asked to describe their own personality characteristics (e.g., Lapuc and Harmatz, 1970). On the other hand, where Ss have been college students or non-hospitalized individuals, they have typically been asked to talk about things that have been on their minds (e.g., Waskow, 1962), or, as in the case of the present study, told to speak about personal experiences associated with their jobs, families or educations.

Given such methodology, it seems only logical that a certain amount of the verbal behavior which is produced at the outset of a

free operant verbal conditioning interview, during the period when an operant level or base rate is being compiled, is directly or indirectly elicited by the task instructions. Take, for example, speech rate. Whether S says a little or says a lot depends to a large degree on what he is told to speak about. If told to speak about something in which he has some personal interest, it is quite probable that he will have more to say than if told to speak about something that he is not interested in at all.

The important question, however, with respect to the present findings, pertains to the extent to which "content-type" response classes may be elicited by task instructions. Specifically, it would be helpful to know if asking Ss to talk about personal experiences, spelled out in a list of possible topics, significantly influenced the production of such verbal response classes as general self-references, positive and negative affect statements, or comments regarding what have been classified here as "dependency-authority figures".

In the present investigation, each S, it will be recalled, was instructed to speak about experiences that she had had since entering the field of nursing. In retrospect, it seems likely that such instruetions, focussing on personal experiences, went a long way in eliciting the response class, general self-references, more so, for instance, than some other kind of instructions, such as those requiring S to talk about the experiences of others or about non-personal matters of some sort. Indeed, many self-references appear in the Operant Level speech samples of all Ss, presumably because of the nature of the present instructions which specifically asked Ss to speak about themselves.

It is interesting to note, also, that the majority of self-

references produced during the study were produced during the opening minutes of the interview, i.e., close in terms of time to the pre-interview instructions, further suggesting the stimulus value of the instructions for that response class. While it may be argued that such a trend was due simply to Ss' running out of things to say, the tables and graphs presented earlier indicate that general self-references tended to show a more rapid deceleration over time than did word rate over time. This suggests that while Ss may have been running out of things to say in general as the interview progressed, they were running out of things to say about themselves at an even faster rate.

Looking at another verbal response class, it may be argued as well that the present pre-interview instructions also tended to elicit self-referred affect statements from Ss by forcing them to talk about personal experiences generally, as well as by directing their attention specifically to topics which, under the circumstances, could easily be considered "emotionally laden". For instance, it may be presumed such topics as "Living away from home" and "Ward experiences" would have considerable emotional valence for lower-middle-class adolescent girls, many of whom were, in fact, away from home for the first time, faced with the sights and sounds of the ill, the maimed and the dying in a public hospital.

While such arguments as these do suggest some relationship between task instructions and the type of response class which may appear during operant level in a verbal conditioning study, they do not account for two important features of the present findings. The first of these is the quality of the response class elicited, i.e.,

positive vs. negative content; the second, group differences in both quantity and quality of those response classes elicited. Indeed, it is difficult to see how the instructions given to Ss in the current investigation could have elicited either positive or negative statements and comments in other than a random fashion. It is equally difficult to see how the present instructions could have elicited more affect statements or more critical comments in one cognitive style group than in the other. Given these considerations, it may be concluded that differences in quantity and quality of Operant Level content responses in the present study cannot be attributed simply to the power of the pre-interview instructions to elicit given response classes. While there may be something of a parallel between such response classes and post-experiment verbal reports, in that both may be dependent variables elicited by an interviewer's verbal behavior, tendency to make many as opposed to few affect statements, and negative as opposed to positive affect statements during Operant Level, does not appear to be a dependent variable of the same order.

Self-Referred Affect Statements: Empty Words or Valid References?

Related to the issue of the verbal report as a dependent variable is the issue of its validity as an indicator of other unobservable variables. In the present case, we are faced with one of the most unobservable of all "unobservables" in psychological measurement, human emotion. While some investigators have assessed affect through the use of pencil and paper tests (Taylor, 1951, 1953), manipulated cognitions believed to be associated with its labelling (Schacter and Singer, 1962) and built complex personality theories around it

(Tomkins, 1962), little has been done to explore the relationship between felt emotion and the production "emotional words". Thus, we are left with essentially the same question that has been at the center of the "awareness" controversy for so long: May the content of a verbal report be taken as a valid indicator of an underlying or unobserved process or state? Or, in terms of the present study, may a self-referred affect statement be taken as a valid indicator of an existing or once-existing feeling tone or emotion?

Since little or no research is available which might provide answers to this question, the investigator feels some justification in attempting to answer it from his own experience and self-observation. He knows that he himself has sometimes made self-referred affect statements at moments when he has been feeling emotions, statements which he believes accurately labelled such felt emotions. However, he also knows that he has sometimes made self-referred affect statements which may not have accurately labelled the emotions he was feeling; made self-referred affect statements which deliberately misrepresented the emotions he was feeling; and made self-referred affect statements when he wasn't feeling any emotions at all. He assumes that these same contingencies are available to other individuals and, further, that they were manifested in various combinations in the verbal conditioning speech samples compiled in the present study.

Assuming the validity of such a premise, it would be of some interest to determine whether or not there are group differences in terms of tendency to manifest one contingency more than some other. For instance, it might be that the tendency to make many affect state-

ments in rapid succession, as did global Ss in the present study, is associated with the tendency to mislabel felt feelings or, perhaps, to verbalize affect when no feelings are in fact present. On the other hand, it might be that negative affect statements are more often tied to felt emotions than positive affect statements; that tendency to produce few affect statements is associated with more accurate labelling of felt emotions; or that tendency to feel negative emotion is associated with tendency to produce few self-referred affect statements or to misrepresent verbally what is actually felt.

Exploring the ways in which such contingencies may be manifested has important implications for personality theory specifically and for psychological research, generally. However, it has important implications in the practical sphere, as well. From the standpoint of verbal conditioning, attempts to modify a given affective state -- say depression -- by reinforcing the verbalization of some opposite affect, e.g., statements of "joy" or "happiness", it would pay to know to what extent the reinforced response class is or is not tied to felt emotions. It seems only logical that in a therapeutic context, reinforcing affect words that are "feeling-tied" might affect the patient quite differently than reinforcing affect words that are in a sense "empty".

Affect Statements as Expressions of Felt Emotions

Plausible hypotheses regarding the findings of group differences in the production of self-referred affect statements may be made if one takes the position that such statements did, in fact, reflect the feelings of participating Ss. One such hypothesis is that

global Ss who took part in the present investigation were simply more "feeling-oriented" or "emotional", in terms of psychological makeup, than their articulated counterparts. Thus, the more emotionally responding, the more the tendency for expressing affect in speech.

In this regard, Witkin (1965) has discussed the relationship between his concept of "psychological differentiation" and tendency to employ particular kinds of ego defenses. He has observed that well-differentiated individuals tend to use such specialized defenses as isolation and intellectualization, while poorly-differentiated individuals tend to rely on primitive repression and denial. These defenses have traditionally been linked to what are generally viewed as "opposing" personality types -- obsessive-compulsive character and hysterical character. The emotional characteristics of these personality types have frequently served as their trademark due to their contrasting nature. Obsessives are usually associated with emotional constriction or emotional "coldness" while hysterics are often associated with emotional lability or diffuse and "gushy" feelings.

Considering Witkin's observations on differentiation, defenses and forms of pathology, it will be assumed here that articulated Ss who participated in the present investigation were essentially "isolators" and that global Ss were essentially "repressors". It will also be assumed that these Ss possessed, more or less, the emotional characteristics thought to be associated with such defenses. With these assumptions serving as a premise, it may be reasoned that the relatively few self-referred affect statements produced by articulated Ss during Operant Level is accounted for on the basis of that group's tendency for isolation and emotional control while the rela-

tively large number of self-referred affect statements produced by global Ss may be accounted for on the basis of that group's tendency for repression and exaggerated emotional responsiveness.

A more direct suggestion that articulated Ss in the present investigation were somewhat more emotionally controlled than their global counterparts comes from the limited Rorschach data mentioned earlier. It was noted that articulated Ss produced proportionately more M and a higher M to Sum C ratio than did global Ss. Whether or not M, used usually as an indicator of gross tendencies for fantasy and imaginal activity, is itself linked to lessened verbalization of affect is an interesting question. At any rate, taken as a delay or inhibition factor, relatively high M suggests a "delay orientation" that may be associated with lessened C production and, perhaps, lessened "C-word" production, as well. Once again, however, this inference is based on a tiny sample and, therefore, is highly speculative.

Returning briefly to the issue of isolation and repression, it is interesting to note that the former is thought to produce a separation of ideas from affect while over-reliance on the latter is thought to result in the opposite effect, i.e., in a diffusion of ideas and feelings. If one considers the present findings in a concrete manner, it may be argued that the speech samples of global Ss reflect just such a diffusion in that many affect statements are sprinkled among emotionally neutral statements. On the other hand, the speech samples of articulated Ss may be seen as reflecting a separation of emotion from ideas, inasmuch as so few affect statements appear at all.

A second kind of "affect felt-affect expressed" hypothesis,

offered here in an attempt to explain the present findings of group differences in the production of self-referred affect, pertains to the way in which global and articulated individuals perceive their experiences. It would appear, on the basis of previous research, that global individuals tend to experience events, objects and persons largely in terms of their feelings rather than in evaluative or critical ways. Thus, what they report in describing personal experiences may be emotionally "contaminated" percepts, images or memories. In this connection, some recent research by Minard and Mooney (1970) has demonstrated the difficulty that global or poorly differentiated Ss have in separating affect from perception. These writers interpret their findings as indicating that greater differentiation is accompanied by an increased tendency to form and maintain a stable representation of a fixated stimulus.

Transferring this concept to the present data, it may be that the tendency of global Ss to use many affect words in reporting personal experiences is due in part to poorly differentiated and possibly diffuse or unstable imagery. What is recalled about an object, person or event could be a mixture of a stimulus-rooted percept and the affective response to that stimulus at the time the percept was first being formed. Where there exists, as in global individuals, poorly differentiated perceptual and conceptual systems, necessary to the imposition of structure upon new stimuli, it may be that the emotional reaction to the new stimulus becomes an overriding factor and thus is what is remembered most when the stimulus is later summoned up in memory. What is reported in the speech samples of the global Ss in the present study may therefore be overriding affective components of

memory, affect appearing in lieu of differentiated and detailed cognitions.

Negative Affect, Positive Affect and Statements about Dependency-Authority Figures

It is interesting to note that articulated Ss in the present investigation tended to make negative self-referred affect statements and, at the same time, made comments about dependency-authority figures that were judged to be predominantly critical. It is equally interesting that global Ss tended to make positive self-referred affect statements while producing verbalizations that suggested fearfulness or acquiescence in relation to dependency-authority figures. One must wonder, of course, if there is some relationship. Could it be, for instance, that global Ss tend to produce less negative affect because they are afraid of being punished by the authority figures in their lives or by persons on whom they depend? Do they develop superficially altruistic and conforming attitudes in order to win approval and avoid confrontation? Might it be that tendency to make many positive affect statements at the expense of negative affect statements is associated with repressive measures, i.e., with a tendency to "see no evil, hear no evil, speak no evil"? Of course, it may be that global individuals simply lack the critical and evaluative skills necessary for analyzing their experiences and forming diverse opinions in relation to them. Thus, their speech may reflect the "good" social stereotypes that they are taught early in life but which, due to limited cognitive and perceptual differentiation, remain basically unmodified over time.

On the other hand, it may be that articulated individuals not only have the cognitive skills that would allow for a wide range of judgments regarding experience and others, but have the social and psychological independence that would enable them to express negative feelings and attitudes without the fear of overwhelming retaliation or loss. In a recent paper, Witkin, Lewis and Weil (1968) have dealt with a somewhat related issue, the association between psychological differentiation and tendency to experience guilt as opposed to shame. These writers have suggested that less differentiated persons are more prone to shame than to guilt, to hostility directed against the self, and to both separation anxiety and diffuse anxiety. Conversely, they have suggested that differentiated individuals are more prone to guilt than to shame, are more apt to direct hostility outward, and experience anxiety as having a definite object.

The present data are generally in line with these observations. First, it is clear that articulated Ss who participated in the present investigation were better able than their global counterparts to verbalize hostility. They did this, not only in relation to personal experiences and other persons, but in response to unstructured Rorschach inkblots, as well, where they saw more aggression being acted out, more aggression-associated objects and more competition than did global Ss.

Second the verbalization of attitudes suggesting fear in relation to persons in authority, or on whom one might depend, by global Ss, is more or less consistent with Witkin, Lewis and Weil's conceptualization of shame as an affective reaction in which one is painfully aware of himself as the object of someone else's disapproval or

derision. Indeed, the verbalizations of global Ss in the present study indicated fear of failing in some way in the presence of another. For example, as one global S stated: "When we finally started working in the hospital, it was scary because the instructor was always with you. I can remember being almost scared to make a bed for fear I wasn't doing it right, even though I had done it a million times before, away from the hospital."

"Speech Style"

Where speech has been studied in previous cognitive style research, it has typically served as the basis for making inferential statements about the quality of structure of cognitive processes. For example, the verbal response, "You go to a doctor school" to the verbal stimulus, "How do you become a doctor?" has been used to infer the unobservable variable, "lack of cognitive clarity" (see Witkin, et al., 1962).

The findings of the present study suggest that it may now be fruitful for cognitive style researchers to study speech, now simply as correlate of underlying processes, but as a behavior in its own right. Just as the nature of one's defenses, the type of pathology he shows when he breaks down, and the degree to which he articulates his body concept have been shown to relate to how he approaches a perceptual field, so, too, the emphasis he gives to certain verbal response classes in reacting to specific verbal stimuli appears to be associated with his mode of perceiving or cognizing. The investigator hopes, therefore, that his findings will generate some interest in the verbal response tendencies or "speech styles" of individuals manifesting

particular cognitive styles such as those manifested by Ss in the present study.

"Speech style", as defined here, is an identifiable pattern of verbal behavior, one characterized by the production of specific verbal classes in response to specific verbal stimulus classes. Examples are "affect statements" in response to the (instructional) stimulus class "personal experiences", "critical statements" in response to the (self-emitted) verbal stimulus class "authority figures", "self-references" in response to the verbal stimulus class "personal questions", and so on. A verbal stimulus may, as the examples here suggest, be something said by someone else, such as an experimenter or interviewer, or by S himself. With regard to the latter, the relevant question would be, "When S emits a particular verbal class (e.g., "authority figures"), what kinds of verbal classes does he produce in relation to it (e.g., "critical comments", "negative affect statements", etc.)?"

The study of "speech styles" as correlates of cognitive styles has certain advantages in that it would involve only simple, objective procedures such as those used in the present investigation (i.e., counting words or verbal response classes found in transcribed speech samples). As an essentially quantitative technique, it would produce data roughly equivalent to that associated with other relatively objective measures used in cognitive style research such as human figure drawing ratings, rod and frame test scores and embedded figure test scores. Thus, the study of "speech styles" promises to produce data consistent with that of other cognitive style research while, perhaps,

adding an important feature to the growing body of information on structural aspects of cognitive functioning.

APPENDIX

Card Sort Items

1. It would have been easier, during the interview, if the interviewer had simply asked me questions rather than making me think up things to talk about.

2. It really didn't make much difference to me that I had to think up things to talk about during the interview. Things came to mind fairly easily without my being asked specific questions by the interviewer.

3. During the interview, I often found myself waiting for the interviewer to say something -- anything -- that would help me understand what kind of information he really wanted.

4. During the interview, I often found myself waiting for the interviewer to say something -- anything -- just to reduce the awkwardness of the situation.

5. I don't think it made much difference one way or the other that the interviewer didn't tell me how I was doing during the interview. It really wouldn't have influenced how I did.

6. I think I might have done a little better during the interview if the interviewer had told me at times just how I was doing.

7. I don't think that not being able to see the interviewer's facial expressions while I was talking really influenced what I said during the interview. I think I might have said the same things even if there hadn't been a screen between us.

8. I think I might have done a little better during the interview if I'd been able to see the interviewer's facial expressions while I was talking.

9. I really don't think knowing or not knowing whether the interviewer was really listening to what I was sahing made much difference as to how I did. I simply followed the instructions he gave me at the beginning of the interview.

10. I think I might have done a little better during the interview if I'd been more certain that the interviewer was really listening to what I was saying.

11. I don't think that knowing or not knowing whether the interviewer was really interested in what I was saying mattered very much. I was simply complying with the instructions that he gave at the beginning of the interview.

12. I think I might have done a little bit better during the interview if I'd been more certain that the interviewer was really interested in what I was saying.

13. One of the most important things about an interview like the one I was just involved in is to follow the instructions.

14. One of the most important things about an interview like the one I was just involved in is to give the interviewer the information that he wants.

15. I felt most comfortable during the interview when I believed that I was giving an accurate account of my experiences in nursing school.

16. I felt most comfortable during the interview when I believed that the interviewer was really listening to what I was saying.

17. I would have felt more comfortable during the interview if I could have organized and presented my thoughts a little more clearly.

18. I would have felt more comfortable during the interview if the interviewer had asked me more questions and guided what I was saying more.

19. During the interview, I found that I was listening for the interviewer to say something -- anything -- so that I could develop some theory about what I was really supposed to be saying.

20. I don't recall, during the interview, listening for the interviewer to say anything that would help me develop a theory about what I was really supposed to be saying.

21. I had the feeling that what I was saying was being influenced during the interview in some way by the interviewer.

22. During the interview itself, I don't recall being influenced in any way by the interviewer.

23. There was some change in how the interviewer responded to what I was saying during the middle part of the interview.

24. I can't say that I noticed any change in how the interviewer responded to what I was saying during the middle part of the interview.

25. I noticed that the interviewer was responding in some way to the things that I was saying.

26. If the interviewer was responding to what I was saying, I really didn't notice it.

27. I noticed the interviewer saying "Uh-huh" or "Yeah" during the interview.

28. Quite frankly, I'm not sure that the interviewer really did say "Uh-huh" or "Yeah" during the interview.

29. Hearing the interviewer say "Uh-huh" or "Yeah" during the interview made me feel a little less awkward doing all the talking.

30. If I had heard the interviewer say "Uh-huh" or "Yeah" during the interview, I might have felt a little less awkward doing all the talking.

31. It seems to me that what I was saying was somehow influenced by the way the interviewer was responding to my statements.

32. If the interviewer was indeed responding to my statements, I wasn't aware that his responses were in any way influencing what I was saying.

33. I noticed some change in the particular kinds of words that I was using at some point during the interview.

34. I didn't notice any change in the particular kinds of words that I was using during the interview.

35. At some time during the interview, I began to develop a "theory" about the interview in general.

36. I would have to say that I didn't develop any particular "theory" about the interview.

37. I developed a "theory" about why the interviewer was responding to my statements.

38. If the interviewer was indeed responding to my statements, I neither noticed it nor developed any "theory" about it.

39. The "theory" that I developed about why the interviewer was responding to my statements tended to have some influence on what I said during the interview.

40. I didn't develop any theory during the interview.

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