68-15,939

MAKOKIAN, Cynthia Natalie, 1939-

VERBAL CONDITIONING AS A FUNCTION OF DRIVE, INCENTIVE AND PRE-EXPERIMENTAL SUBJECT-EXPERIMENTER INTERACTION.

The City University of New York, Ph.D., 1968
Psychology, experimental

University Microfilms, Inc., Ann Arbor, Michigan

VERBAL CONDITIONING AS A FUNCTION OF DRIVE, INCENTIVE AND PRE-EXPERIMENTAL SUBJECT-EXPERIMENTER INTERACTION

by

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A dissertation submitted to the Graduate Faculty in Psychology in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York.

1968

This manuscript has been read and accepted for the University Committee in Psychology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

April 24
date

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April 16, 1968
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Acknowledgement

The author wishes to express her appreciation to the people who helped in some way with this dissertation.

I am particularly grateful to Dr. Gertrude Schmeidler and Dr. Harold Proshansky for their guidance and assistance; and wish to thank Miss Gertrude Leon and Dr. Donald Mintz for their kindness. I am also indebted to Dr. Solomon Weinstock who advised me as to the statistical procedures to use; to Dr. Sr. Gabrielle Jean who edited this dissertation, to my husband Michael, who helped me compute some of my statistics, and to Carmine Iacono who helped me program and run other statistics in computer analysis, and Cynthia Davis who typed this dissertation.

This study could not have been accomplished without the help of my former colleagues at Newark State College who administered the TMAS to their classes: Dr. Eva Bond Wagner; Dr. William Sullivan; Dr. Joseph Errington; Prof. Will Stodt; and Mrs. Miller and Mrs. Schockley secretaries who assisted by taking messages from Ss unable to keep appointments.

This dissertation is dedicated to my husband, Michael Makokian who provided the necessary understanding and moral support.

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CHAPTER I

INTRODUCTION

The classical approach to verbal behavior is that it represents the "report" of an unseen response, underlying feeling, attitude. Skinner's (1957) descriptive behaviorism, departing from this view, considers the verbalization itself as the response to be investigated and experimentally manipulated. Accordingly, Skinner (1957) maintains that speaking is a form of operant behavior, a repertoire of emitted verbal responses, the forms and probabilities of which are contingent upon the consequences they effect on the environment, i.e., upon the reinforcement. He further contends that since these contingent stimuli which shape and maintain verbal behavior are usually the responses of others, an individual's language usage would represent verbal conditioning mediated, at least in part, by verbal reinforcement. If Skinner's contentions are valid, verbal behavior should be subject to the same laws of conditioning as any other operant.

Verbal Conditioning

A systematic investigation of verbal conditioning with verbal reinforcement is reported by Greenspoon (1955). In his study, S was instructed to say words and was reinforced by E saying either "mm-hmm" or "huh-uh" after emitting plural nouns (for one group of Ss) or any word other than plural nouns (for the other group). Except for the group receiving "huh-uh" after plural nouns, Greenspoon successfully conditioned those groups as opposed to a control group receiving no contingent stimulus.

The verbal conditioning, verbal reinforcement paradigm has been subsequently utilized successfully as a human analogue to animal operant conditioning. Employing a variety of conditioning procedures, as well as different verbal reinforcers, experimenters have shown that rate of emission of several different emitted verbal response classes[1] have been significantly increased in experimental groups receiving no reinforcement. Furthermore, verbal conditioning experiments investigating parameters of conditioning such as generalization, negative

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[1]A response class consists of a number of different responses which are similar to each other in the sense that they share some specified property.

(verbal) reinforcement, extinction and the affects of drive and of intermittent reinforcement, have yielded data comparable to results obtained from other kinds of responses and organisms.

Procedural Variations

One need only point to the diversity of successful methodologies employed in verbal conditioning experiments to support Skinner's contention regarding verbal behavior. Many, of course, have used the free responding "Greenspoon-type" procedure, wherein Ss are instructed to emit words spontaneously (not sentences, phrases, or counting); the first 100 words usually represent the operant level, after which verbal reinforcement is introduced for the correct response (Cox and Cox, 1956; Kanfer, 1958; Mander and Kaplan, 1956; Matarazzo, Saslow and Pareis, 1960; Sidowski, 1954). Numerous innovations, however, have been employed by other investigators.

Such varied procedures have also been used as conditioning certain Rorschach responses (Gross, 1959; Wickes, 1956), "TAT-like" story telling (Krasner, et. al, 1961; Krasner, 1958; McNair, 1957), attitude and opinion surveys (Hildum and Brown, 1956; Sullivan and Calvin, 1959;

Verplanck, 1955), and even the amount of movement of light in an autokinetic-effect situation (Kanfer, 1954).

A procedure described by Taffel (1955) utilizes 3x5 stimulus cards on which there is a verb in the middle and six pronouns on the bottom. Ss are instructed to create sentences starting with any one of the six pronouns and containing the verb on each card. The response class reinforced is "I" or "We" used to start a sentence (Barnett, Pryer and Ellis, 1959; Cohen, Kalish and Thurstone, 1954; Kanfer and Karas, 1959; Levin, 1961; Sapolsky, 1960; Taffel, 1955; Timmons, et. al., 1961). Modifications of the Taffel procedure wherein only the pronoun appears on the middle of the stimulus card and two or three verbs on the bottom also yielded successful conditioning results. The response classes conditioned in these studies have ranged from hostile verbs (Binder, McConnell and Snoholm, 1957; Buss and Durkee, 1958; Ferguson and Buss, 1950; Simkins, 1961), to verbs pertaining to verbal activity, i.e., "talking" (Sarason, 1961), and muscular activity, i.e., "hopping" (Eysenck, 1959).

It should be added that although the overwhelming majority of subjects in these experiments have been either college students or psychotic and neurotic patients, successful conditioning has also been attained with children

(Cox and Cox, 1956; Erickson, 1962; Walters and Karel, 1960), and mentally retarded adults (Barnett, Preyer and Ellis, 1959).

Extinction of a Conditioned Verbal Response

That verbal conditioning is subject to the same conditioning laws as other operant behavior has been demonstrated by extinction data. First, that extinction takes place when reinforcement is withheld is supported by data derived with the Greenspoon procedure (Cox and Cox, 1956; Matarazzo, et. al., 1960; Mandler, et. al., 1956), the autokinetic method (Kanfer, 1954; Spivak and Papajohn, 1957), the story telling method (McNair, 1957), as well as free responding with numbers (Fattu and Mech, 1955), and an interview method (Salzinger and Pisoni, 1958).

Secondly, the usual effect of greater resistance to extinction following conditioning under intermittent reinforcement vs. continuous reinforcement, has similarly been obtained (Fattu, et. al., 1955; Kanfer, 1954; McNair, 1957; Spivak, et. al., 1957). In addition, it has been shown that the greater the number of reinforcements in conditioning, the greater the number of verbal responses emitted in extinction trials (Kanfer, 1954; Salzinger, et. al., 1958).

Finally, the usual effects of shifts in differential reinforcement hastening extinction and secondary reinforcement retarding extinction have also been observed in human verbal conditioning (Cohen, Thurstone and Kalish, 1954).

The Effects of Drive on Verbal Conditioning

The effects of motivation on learning may be considered a "classical" interest of learning theorists. Subsumed under this topic, and of particular importance, is the nature of the process or processes which mediate or contribute to the phenomenon of differential learning curves obtained under different levels of "drive" and/or with different magnitudes of reinforcement.

The Hull-Spence (1943, 1951, 1956) construct, generalized drive (D), represents a non-specific systemic state which energizes and activates the organism to behave. Hull's generalized D is a condition to which all specific need states contribute and is capable of energizing any member of the organism's response repertoire. Exactly which response will be manifested under a given D level will depend upon the strength of the associative factor (Habit strength sHr) of each of the existing responses. Since D has the cpacity to activate all responses, the one with the greatest sHr will usually be performed.

Drive, therefore, is the basic variable in the Hull-Spence model which acts together with sHr in the determination of response evocation (reaction potential; sEr). Hull (1952) further postulates that D and sHr exert their joint influences on sEr in a multiplicative fashion, i.e., they interact (sEr = D x sHr). Thus, the performance curves for Ss conditioned under different levels of D grow increasingly different across trials owing to the multiplying effect of the D variable. Accordingly, Spence (1956) interprets the differential curves yielded by subjects conditioned at disparate D levels as performance, (sEr) rather than associative (sHr) variations.

Traditionally, level of drive or motivation has been definitionally determined by depriving the S of various goal objects for varying periods of time, or by applying different levels of some noxious stimulus to the S (i.e., shock). More recently, however, response oriented definitions of Drive have become more common, utilizing scores on various psychometric instruments. Among these psychometric procedures is a scale which attempts to gauge the level of emotionality of the S on the assumption that highly anxious Ss "react emotionally in a chronic manner to all situations, whether stressful or not" (Spence, 1956, p. 127), so that even mild, non-threatening situations would engender a differential level of D in Ss classified high vs. low anxious.

Accordingly, the Taylor Manifest Anxiety Scale (MAS) (Taylor, 1951) was specifically designed to obtain an objective index of Drive, thus enabling the classification of Ss into high and low D groups on the basis of extreme scores. The MAS measures anxiety level by Ss admission to manifesting symptoms of anxiety defense. This test has been subject to empirical validation. Typically high and low anxiety Ss have manifested the significantly different conditioning behavior usually obtained after other differential drive-establishing operations.

High vs. low anxious (A) Ss condition significantly better in both simple (Spence and Farber, 1953; Spence and Taylor, 1951; Taylor, 1951) and differential eyelid conditioning (Spence and Farber, 1954) as evidenced not only by acquisition differences, but also by the higher response level of high A Ss in extinction (Spence and Farber, 1953).

The assumption that anxiety level differences may be considered drive differences has also been investigated in complex conditioning. A number of studies have yielded superior conditioning of high Anxiety Drive Ss in paired associates learning when competition among the responses was low, and poorer conditioning in High A Ss when competing responses were maximized (Spence, 1956; Spence, Taylor and Ketchel, 1956; Spence, Farber and McFarin,

1956). With a minimum of competing response tendencies, High D would be beneficial since the sEr to which it would contribute most would be the correct (conditioned) response. Correlatively, with many super-threshold competing responses to energize, the effects of high D on conditioning are more complex.

The role of anxiety-drive in energizing verbal responsivity has been illustrated in two separate experiments. Benton, Hartman and Sarason (1955) measuring verbal responsivity to TAT cards, found that High A Ss, as measured by the MAS showed a higher word count when compared to low A Ss ($p. \doteq .06$) and manifested a significantly shorter latency of onset of verbalization. Kanfer (1958) using a free responding (nonreinforcement) situation, during which Ss were given a one minute tone, co-terminal with a one second shock, found a marked increase of verbal rate following the onset of the tone vs. the control groups who received only shock, only tone, or neither. That this verbal increase was due to the drive effects of anxiety, was substantiated by the fact that it occurred simultaneously with an increase in heart rate, which is usually considered a symptom of manifest anxiety.

The pioneer experiment investigating verbal conditioning in groups differing in anxiety drive, as measured

by the MAS, was performed by Taffel (1955). Using the verbal reinforcer "good" and the Taffel procedure, he obtained significant differences between Low A group vs. the Medium and High A groups in the expected direction of high anxiety drive facilitation conditioning. Similarly, Sarason (1958) using a modified Taffel design, found that Ss scoring medium and high in Test Anxiety, as measured by the Autobiographical Survey personality inventory, conditioned significantly better than Low Test Anxiety Ss.

Two studies in which anxiety drive differences, as measured by the MAS, bore no significant relationship to verbal conditioning are worth mentioning. Buss and Gerjouy (1958) employed the same procedure as Taffel, and the same cut-off scores on the MAS, except that half of each anxiety group was reinforced with poker chips, cigarettes and candy, the other half with the verbal reinforcement "good". Their negative results might be explained by the fact that in an anxiety group comparison, they combine both the material and the verbal reinforcer. Their negative results may very well be attributable to their combination of conditioning scores for all Ss per anxiety group, regardless of reinforcement.

Similarly, Rogers (1960) using MAS scores to differentiate anxiety drive level in conditioning either positive

or negative self-reference statements obtained no significant differences. Rogers pointed out, however, that his results may be discrepant with Taffel's because Taffel's Ss probably had a much higher anxiety drive level, whereas Rogers' Ss level of anxiety may have been too low for a validating effect.

The Effects of Magnitude of Reinforcement, and Fractional Anticipatory Goal Responses on Verbal Conditioning

Incentive motivation (K) in the Hull-Spence paradigm is another variable which, like D, interacts with sHr, i.e., sEr = K x sHr. This motivational factor is a goal variable, the level of which is determined by several parameters related to the S's experience with the goal object (Spence, 1956). Hull (1952) attributes the value of K to the magnitude of the "incentive used in reinforcement". Extending this, Spence's (1956) interpretation stresses the role of fractional anticipatory goal responses (the rg--sg mechanism) in mediating the effects of magnitude of reinforcement on the level of K, as follows:

The component goal responses (rgs) are in conflict with the conditioned response, thereby creating heightened tension which would cause an increase in the existing generalized D. The greater the magnitude of the goal object, the more intense the organism's unconditioned

consummatory responses are likely to be. Because rgs are assumed to be classically conditioned in the "goalbox" (Spence, 1956), a greater amount of reinforcement, and therefore more intense unconditioned consummatory responses, should provide for more vigorous rgs, yielding more conflict with the CR and thus a greater increase in K.

The amount of reinforcement is but one of the variables determining the value of K (Spence, 1956). The others include the number of times the organism responds to (consumes or sees) the goal object, as well as any other variables which may influence the intensity of the consummatory response. These variables may encompass such properties of the goal object as its quality (sweetness, desirability) and/or perhaps the amount of effort required to consume it.

Verbal behavior may be under the control of several variables such as the past experience of the individual, etc. Perhaps, the most important among such controlling stimuli in the verbal conditioning situation is the general effect of E in this interpersonal situation i.e., his prestige, attitude toward S, physical characteristics. These E variables appear to meet the requirements of "...any property of the goal object that produces consummatory responses of different intensity or vigor", which Spence (1956 p. 136) maintains "...will presumably determine the value of K."

In the verbal-conditioning paradigm, E not only provides the contingent stimulus but establishes himself as a source of reinforcement per se to S. It would follow, therefore, that pre-conditioning procedural differences, which could effect S's subsequent perception of or attitude towards E, would alter the strength and/or subjective quality (K) of the contingent goal stimulus for S.

Solley and Long (1958) discovered that the verbal reinforcement "uh-huh" was effective in a perceptual learning experiment for one E who spoke in a soft voice and not for the other who said it loudly. When both Es, however, spoke comparably softly, they obtained the same results. The function of pre-conditioning differences was more dramatically revealed in these perceptual learning experiments, due to serendipity (Solley and Long, 1958). Before training, one E forgot his glasses and excused himself to fetch them. To occupy time, the other E chatted with S about her unusual name and where she lived. When the first E returned, he "took over" but failed to condition S. Thereafter, this casual conversation became part of the pre-training procedure. However, the E who conversed with S, also delivered the reinforcement "uh-huh" resulting in successful conditioning. Presumably, the casual conversation prior to conditioning affords E an

opportunity to establish himself as a positive social reinforcer.

Direct prior interaction with E, and/or perception of E (which may be considered indirect prior interaction) has been similarly shown to influence the effectiveness of a verbal reinforcing stimulus in the verbal-conditioning paradigm.

Kanfer and Karas (1959) and Simkins (1961) performed almost identical studies of the effect of specific types of direct prior subject-experimenter interaction on verbal conditioning. Both gave Ss a series of tasks after which Ss were either berated for the task performance (Failure Group), complimented (Success Group), or given no information after the task. This was followed in both experiments by a Taffel procedure in which all groups received the same reinforcement. The specific results of the two experiments were different, yet both demonstrated the role of prior interaction in reinforcement effectiveness.

In the Kanfer and Karas (1959) study, although all three prior-experience groups conditioned significantly better than a no-prior-experience control group, there were no significant differences between the Success, Failure and No-information groups. In the Simkins study, however, the Success group's conditioning scores were not

significantly different from a no-information control group receiving no reinforcement during verbal conditioning, whereas the Failure group conditioned significantly better than the No-information group who were verbally reinforced.

A reasonable explanation of these different results lies in the "minor" procedural differences between the two experiments. First, Kanfer and Karas used a 4½ minute standardized IQ test whereas Simkins used a 20 minute "fake" aptitude test, in which the problems were practically insoluble. Further, while Kanfer and Karas employed the usual Taffel procedure, conditioning "I" and "We", Simkins employed a modified Taffel design conditioning "hostile verbs". Surely, the twenty minutes of "stress" with the insoluble tasks, followed by insults from E, could have caused S to perceive E as a discriminative stimulus providing the occasion for the emission of hostile verbs (in the Failure group). On the other hand, any hostility to E may have been drastically reduced when E provided positive social reinforcement by approving of S in the Success group. Thus, the emission of hostile verbs for the Success group were most likely suppressed because of the reinforcement history of these Ss in emitting hostile words in other interpersonal situations.

As Kanfer and Karas so sogently pointed out, not

only may S's susceptibility to reinforcement vary as a function of his perception of E based on direct prior experience, but also by previous experience with people whom E resembles in some way. Indeed, an aggressive 6'5", 220 lb., former marine captain, experimenter was unable to condition hostile verbs whereas with a very petite, soft-spoken, young-lady experimenter, conditioning was successful in the same experiment (Binder, McConnell and Sjoholm, 1957). Parenthetically, Ferguson and Buss (1960) replicating Binder, et. al's (1957) experiment revealed that it was the aggressiveness of E and not E's sex which retarded the conditioning of hostile words. Surely, these Ss' previous experience in emitting hostile words to large, aggressive people, was usually followed by punishment, which tends to suppress the punished response (Skinner, 1957).

Krasner, Weiss and Ullmann (1961) in two separate studies (Weiss, Krasner and Ullmann, 1960) also found that hostile atmosphere induced by E after several conditioning trials, decreased the emission of the response class "emotional words", as much as withholding reinforcement did in another group in which the atmosphere remained neutral. The control group, continuing to receive the same reinforcement as the "induced hostile group", however, in a neutral atmosphere, continued to increase in their conditioned-response rates.

There are, therefore, substantial experimental data to support the contention that prior interaction with E may exert an influence in determining the subjective magnitude of a reinforcement, i.e., the K variable (incentive motivation) in the Spence learning theory.

It will be recalled that according to Spence (1956) the value of K is determined by the strength of the fractional anticipatory goal responses i.e., the rg--sg mechanism. Reynolds and Pavlik (1960) suggest that the rg--sg mechanism may be present prior to conditioning, the strength of which would be a function of the nature of the pre-training handling and habituation. The "prior subject-experimenter interaction" studies most certainly lend support to Reynolds and Pavlik's notion. The results indicate that S most likely manifests fractional anticipatory goal responses to the goal object (E) before formal training actually begins. These pre-conditioning rg--sgs probably influence the magnitude of K, as seen by the differential effectiveness of the same reinforcer in Ss differing in pre-training procedures, attitudes towards E, as well as differential experience with E or persons resembling him.

The somewhat unusual results of the effects of prior manipulation of Ss on verbal conditioning, reported by

Walters and Karal, (1960), lend credence to the plausibility of interpreting the prior experience data along the lines suggested by Spence (1956): (K via rg--sg) and Reynolds and Pavlik (1960): (pre-training rg--sg) lines. Ss in this experiment were either placed alone in a bare room for twenty minutes and told to wait until the E's equipment was repaired (Deprivation Group), or left in a room with two graduate assistants who engaged in casual conversation with S (Satiation Group). After twenty minutes E took S into the laboratory and S was told to discuss his impressions of University life, "opinion statements" being the reinforced response class. Satiated Ss conditioned more rapidly when reinforcement was introduced as compared to satiated controls (without reinforcement). Deprived Ss, however, showed more of an increase in responding above their initial operant level during a further period without reinforcement than did deprived Ss who subsequently received the contingent verbal stimulus.

The Deprivation-Satiation x Reinforcement-Non-Reinforcement interaction F was significant and may be considered analagous to Prior Interaction x Reinforcement. These unusual results may be explained by Reynolds' and Pavlik's interpretation of S's manifesting rg--sgs prior to conditioning. Perhaps social isolation increased S's anticipation of future interaction with E so that the

rg--sgs were manifested prior to conditioning. (Indeed, an individual made to wait in a completely bare room, save for one chair, while E was repairing equipment, would most likely become annoyed or mildly angry with E). Merely interacting with E (Deprivation Control Group) probably served as reinforcement and since Ss were told to give their impressions of the University, opinion statements were specifically cued and may not have been difficult to condition in the absence of the contingent verbal stimulus. For those Ss who received reinforcement (Deprivation Group), the rg--sgs from E's delivery of the contingent stimulus may have been incompatible with those already established towards E as a goal object, prior to conditioning, thereby resulting in slower conditioning than non-reinforced deprived Ss. Recall Spence's assumption that the rg--sg mechanism mediates the effects of K because the fractional anticipatory goal responses compete with the conditioned response thereby resulting in conflict (a state of heightened drive) which heightened drive facilitates performance.

As previously discussed, however, if the heightened drive state results in responses which are highly incompatible with the conditioned responses, conditioning is retarded i.e. reaction potential is lowered, (Spence, 1956). In the Walters (1960) study, the Ss in the Deprivation-Reinforcement Group may have established rg--sgs prior to

conditioning. Since rg--sgs of a different nature were likely made after the introduction of the contingent stimulus, the state of heightened drive resulting from these reinforcement rg--sgs combined with the possible D effects of the two conflicting types of rg--sgs, most likely retarded conditioning.

One of the most important variables which appear to influence the strength of reinforcement (K) is differential prior conditioning experience (such that all sorts of verbal reinforcers: "um-hmm", "good", "that's fine" "I agree" could have the same or different effects depending upon both the S and E). However conditioning differences could be attributable solely to the verbal contingent stimuli themselves if experimental conditions are kept constant across all Ss and Es, and a relatively homogeneous population of Ss is sampled with only the verbal reinforcement differing. For example, Buss, et.al., (1956 a, b) found that the verbal reinforcement combination "right-wrong" led to faster conditioning than "right" contingent upon a correct response with no reinforcement for an incorrect response. In addition, since the reinforcement combination of "nothing" for the correct response, "wrong" for the incorrect one, yielded acquisition curves which did not differ significantly from those where the "right-wrong" combination was used Buss and Buss (1956), Buss et. al., (1956 a,b) concluded that "wrong" was a stronger negative

reinforcer than "right", a weaker positive reinforcer, and vice versa. If "right" and "wrong" have differential conditioning effectiveness (weight) as reinforcers, as one may infer from the above, it is suggested that they are among the variables which provide for differential levels of incentive motivation (K).

The Relationship Between Drive and Incentive Motivation

One of Spence's (1956) major modifications of Hullian (1951) theory is his assumption that K and D exert their influences on reaction potential (E) independently of one another. Whereas Hull postulates an interaction between D and K ($sEr=sHr \times D \times K$), according to Spence they combine additively i.e. $E = H \times (D + K)$.

Spence's D and K additive combination law has been supported by Reynolds and Pavlik (1960). In their multiple analysis of variance, an insignificant F was obtained for the D x K interaction term, although differences in performance were, indeed, significantly related to differences in D and K individually.

Although these experimental data reveal that D and K do not interact in asymptotic performance, Reynolds and Pavlik (1960) suggest that they may combine in a manner more complicated than additivity. They consider that other factors operating during the early stages of

conditioning may affect the D and K relationship. For example, the faster responding, and location and consumption of the goal object, with less extraneous behavior by High D vs. Low D Ss may be a factor. It will be recalled that Reynolds and Pavlik also speculate about the existence and strength of the rg--sg mechanism before conditioning begins. The presence and strength of this pre-conditioning rg--sg mechanism, which would subsequently affect K, would be a "function of the nature of pre-training handling and habituation." However, the influence of these variables (if any) on the D and K combination law, remains unexplored.

Furthermore, to date, there have been no verbal conditioning - verbal reinforcement experiments in which level of drive (D), strength of incentive motivation (K) and pre-conditioning subject-experimenter interaction have been systematically varied together.

This experiment has been designed, therefore, to explore the Drive, Incentive, and Prior Interaction variables utilizing subjects as different as humans are to rats, a response as different as human verbal emission is to running; by manipulating anxiety drive rather than hunger drive, and verbal reinforcements differing in conditioning effectiveness and direction as opposed to food reinforcement differing in physical weight.

CHAPTER II

METHOD

Subjects

Some weeks prior to experimentation, approximately 500 male and female freshmen and sophomores at Newark State College, were administered the Taylor Manifest Anxiety Scale interspersed with 50 filler items taken from other MMPI scales. This was accomplished in the students' psychology and physical education classes by their regular instructors, one of whom, E, administered the scale to her own 120 students. The title page for the MAS booklet (see Appendix A) was headed "College Student's Attitudes Towards Self and Others Scale" to reduce the probability of social desirability response sets. The prospective Ss were simultansously given a schedule sheet (Appendix B) on which they were to indicate their free hours. They had been told by their instructors that on the basis of their scores on the attitude scale, some would be selected to participate in an experiment on "sentence creativity" for no more than one hour, at some future date.

Except for E's own students, none of the Ss were aware of E's role in the experiment until they met her for the first time in the laboratory, immediately prior to

participating in this research. Forty (40) males and forty (40) females were subsequently selected to participate as Ss on the basis of their MAS scores and whether or not they had any previous experience interacting with E. Those selected were notified by an unsigned, neutrally toned, but courteous letter (Appendix C) to report to the laboratory at an hour previously indicated by S as "free", or to notify one of the secretaries at the lab building of their inability to keep the appointment. Of 80 Ss notified to participate in this research, 72 Ss (38 F, 34 M) reported and were tested.

After MAS score and prior interaction with E had been taken into consideration, the Ss were then assigned to one of the 8 treatment groups described below. E then scheduled the Ss so that no one treatment group would be tested in any one day or week with a greater frequency than any other, in order to cancel out any effects of Experimenter, weather changes, extraneous stimuli, etc. (see Appendix D).

Apparatus and Procedure

A Taffel procedure was used with 80 3 x 5 stimulus cards, each having a different verb in the past tense typed in capitals in the center, and the pronouns I, WE, HE, SHE,

THEY and YOU similarly typed and evenly spaced on the bottom. The same six pronouns appeared on each of the 80 cards in a different order from first to last. The cards were randomly arranged in order of presentation from 1-80. However, in order to avoid the appearance of any pronoun first on the card for a succession of cards, if any random number appeared for the third time, it was disregarded and we went on to the next (see Appendix E). The eight verbs which were believed to have some emotional overtones i.e., felt, neglected, appeased, feared, defended, hit, amused, laughed, were also deliberately interspersed among the cards so that they were well separated from one another.

Independent Variables

Drive

Group High Drive (HD) -- this group consisted of males and females (36 Ss) whose MAS scores were 24 or over.

Group Low Drive (LD) -- these 36 Ss, male, and female, were those whose MAS scores were 0 - 7.

Reinforcement

Wrong - for this group, E delivered the contingent stimulus "wrong" after S emitted a sentence which did not start with I or We, and nothing for those starting with I or We.

Right - these Ss received the reinforcement "right" after every sentence starting with I or We, and nothing for those not starting with I or We.

Subject-Experimenter Interaction

Prior Interaction (PI) - Ss in this group, some of whom had been in E's classes, were given a Data Sheet (see Appendix F) to fill out in E's presence, immediately prior to conditioning. While doing so, E engaged in casual conversation with S for fifteen minutes prior to Trial I. For example, when S was filling in his address, E said, "How do you like living in that neighborhood?"; "How long does it take you to go to school?"; "Do you drive?"; etc., E refrained from answering S with "right" or "wrong" but did intersperse "I see"; "Really?"; "Oh!"; "Yes"; etc., frequently.

No Prior Interaction (NPI) - None of these Ss had any previous interpersonal experience with E. They were given the same data sheet to fill out as was PI, however, E left S alone in the test-room for fifteen minutes to complete the data sheet, and then returned and began conditioning.

Each of the 36 LD Ss, and each of the 36 HD Ss were randomly assigned to one of the four treatment groups

in this 2 x 2 x 2 factorial design as seen in Table I so that there were 9 Ss in each of the 8 groups. However, since Ss who were E's own students had to be assigned to the PI group, they were randomly assigned only to a particular reinforcement subgroup.

TABLE I

EXPERIMENTAL DESIGN

High Drive (HD)				Low Drive (LD)			
Reinforcement "wrong"		Reinforcement "right"		Reinforcement "wrong"		Reinforcement "right"	
PI	NPI	PI	NPI	PI	NPI	PI	NPI

Conditioning

Response Class - I and We at the beginning of a sentence was the conditioned response class.

After filling out the data sheet, either in E's presence (PI), or absence (NPI), S was told that this is an experiment investigating variables pertaining to simple sentence creativity. E then said "I am going to present to you a number of cards, one at a time. Each card contains a verb in the center and six pronouns on the bottom. Using any one of the pronouns as the first word, all you have to do is create a simple sentence, using the verb in the middle as the verb of the sentence. Don't spend time thinking about it, but say the first sentence which comes to your

mind for each card. Okay, let's begin."

E then handed S the first stimulus card and each subsequent card after S had completed his sentence.
Trials 1-20 (Operant Level: E said nothing to S before or after each sentence had been emitted, i.e. no reinforcement.
Trials 21-80 (Reinforcement): Prior to commencing trial 21, E said to Ss in groups receiving the reinforcement "wrong":

"From now on I'll let you know if your sentences meet the criterion of a simple creative sentence. If they do; I'll say nothing, if they don't, I'll say "wrong". Remember to keep responding just the way you have been, with the first sentence which comes to mind." At this point (or at any time after this) if S asked any questions regarding the criterion of a simple creative sentence, or anything else related to the experiment, E just repeated the instructions.

Prior to commencing trial 21, E said to Ss designed to receive the reinforcement "right":

"From now on I'll let you know if your sentences meet the criterion of a simple creative sentence. If they do, I'll say "right"; if they don't, I'll say nothing. The rest of the instructions to S were the same as for the Ss receiving the reinforcement "wrong".

Scoring

After each sentence was emitted, E made a stroke in the appropriate trial number box on the scoring sheet (see Appendix G). The strokes went from right to left for an incorrect response and from left to right for the correct response. In no case did S see the direction, merely that E made a mark after each sentence. This reduced the probability of secondary reinforcement and differential reinforcement which could have resulted from E recording only those trials on which a correct R was emitted.

RESULTS

A X^2 analysis was performed on the operant level emission rate of "I" and "We" for each of the eight treatment groups. The null hypothesis was that the probability of "I" and "We" in the operant level is p=1/3. A summary of this analysis is presented in Table II.

TABLE II

CHI^2 ANALYSIS of the EMISSION OF I and WE at the OPERANT LEVEL for EACH TREATMENT GROUP (Ho: p=1/3)

GROUP	X^2	P
HA PI RW	4.50	> .50
HA PI RR	19.28	> .05
HA NPI RW	15.02	= .09
HA NPI RR	16.84	= .05
LA PI RW	7.76	> .50
LA PI RR	9.49	> .30
LA NPI RW	16.06	= .06
LA NPI RR	2.63	> .50

From Table II it is noted that the null hypothesis was true for most treatment groups. However, both HA groups who subsequently received reinforcement "right" (RR) manifested an operant level significantly different from chance (Ho:p=1/3). Further, the LA NPI group which was to receive reinforcement "wrong" (RW) was almost within the confidence limits (p.=.06) of a result significantly different from chance.

In Table III are contained the raw score totals, in

blocks of ten trials, commencing with the operant level (trials 1-10, 11-20). These scores represent Ss compared along the main effects dimensions; HA vs. LA (D); PI vs. NPI; RR vs. RW. For each major subdivision i.e. HA vs. LA, 36 Ss per group are being compared, for a total possible raw score of 360 correct responses in each block of ten trials.

TABLE III

RAW SCORE TOTALS OF THE CORRECT RESPONSES, IN BLOCKS OF TEN TRIALS, FOR EACH OF THE MAIN EFFECTS SUB-GROUPS

TRIALS	PI	NPI	HA	LA	RW	RR
1-10	151	145	144	152	151	145
11-20	136	137	137	136	122	149
21-30	155	185	169	168	139	198
31-40	179	203	192	190	168	214
41-50	208	209	209	208	177	240
51-60	194	223	208	209	185	232
61-70	215	239	224	230	197	257
71-80	216	262	239	239	219	259
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CR EMISSION RATE OVER LAST 30 TRIALS	625	724	671	678	601	748

Table IV presents the raw score totals of the CR in blocks of ten trials. Commencing with the operant level (trials 1-10, 11-20) each of the eight treatment groups is represented for a possible total of 80 correct responses per group, in each block of ten trials.

TABLE IV

RAW SCORE TOTALS OF THE CORRECT RESPONSES IN BLOCKS OF TEN TRIALS FOR EACH OF THE EIGHT TREATMENT GROUPS

TRIALS	HA				LA			
	PI		NPI		PI		NPI	
	RW	RR	RW	RR	RW	RR	RW	RR
1-10	33	42	34	35	43	33	41	35
11-20	31	35	28	43	32	38	35	31
21-30	33	44	31	50	29	46	35	58
31-40	45	48	45	54	37	49	41	63
41-50	57	57	41	54	37	57	42	72
51-60	52	54	45	57	36	52	52	69
61-70	53	63	47	61	37	61	60	71
71-80	60	59	54	66	36	61	69	73
	--	--	--	--	--	--	--	--
CR EMISSION RATE OVER LAST 30 TRIALS	165	176	146	184	109	175	181	213

The raw data summarized and presented in Tables III and IV will be discussed further as it is incorporated into statistical analyses, and graphically depicted.

A multivariate analysis of variance was performed on the operant level (Trials 1-20) rates of emission of "I" and "We". Table V presents a summary of the operant level analysis of variance.

TABLE V

MULTIPLE ANALYSIS OF VARIANCE ON OPERANT LEVEL OF EMISSION OF I AND WE (TRIALS 1-20)

SOURCE	SS	DF	MS	F	P
Anxiety (D)	.67	1	.67	---	>.50
PI	.34	1	.34	---	>.50
Reinf.	3.13	1	3.13	---	>.50
D x PI	.14	1	.14	---	>.50
D x Reinf.	25.68	1	25.68	3.46	=.075
PI x Reinf.	.12	1	.12	---	>.50
D x PI x Reinf.	1.13	1	1.13	---	>.50
Error	475.12	64	7.42		

From Table V note that the variance contributed by each of the main effects and interactions did not yield results significantly greater than chance. The D x Reinf. interaction term, did, however, fall just outside of the alpha level ($p=.075$).

To remove any effect the operant level may have had on the conditioning scores, and at the same time analyze the effect of the independent variables upon the dependent variable, a multivariate analysis of covariance was performed. The operant level (trials 1-20) was the covariate, and the criterion scores were the frequency of conditioned responses over trials 21-80, in three blocks of twenty trials each. In Table VI is contained a summary of the analysis of covariance.

TABLE VI

ANALYSIS OF COVARIANCE ON RATES OF EMISSION OF "I" AND "WE" WITH THE OPERANT LEVEL (TRIALS 1-20) AS THE COVARIATE, AND THE CONDITIONING TRIALS (21-80) IN THREE BLOCKS OF TWENTY TRIALS EACH, AS THE CRITERION

SOURCE	SS	DF	MS	F	P
D	0.00	1	00.00	00.00	$>.50$
PI	113.43	1	113.43	5.15	$>.05$
Reinf.	410.25	1	410.25	18.64	$<.01$
Blocks of trials	345.25	2	172.62	7.84	$<.01$
D x PI	168.82	1	168.82	7.67	$<.01$
D x Reinf.	170.23	1	170.23	7.74	$<.01$
PI x Reinf.	11.48	1	11.48	.52	$>.50$
D x Blocks of trials	.37	2	.185	.008	$>.50$
PI x Blocks of trials	11.54	2	5.77	.03	$>.50$
Reinf. x Blocks of trials	1.48	2	.740	.03	$>.50$
D x Reinf. x PI	9.52	1	9.52	.43	$>.50$
D x PI x Blocks	28.82	2	14.41	.65	$>.50$
D x Reinf. x Blocks	5.46	2	2.73	.12	$>.50$
PI x Reinf. x Blocks	23.41	2	11.70	.53	$>.50$
D x PI x Reinf. x Blocks	22.98	2	11.49	.52	$>.50$
Error	4202.89	191	22.00		

When averaged across the levels of each of the other variables, the D effect groups (HA vs. LA) do not contribute to the variance. The PI vs. NPI scores do differ significantly ($F=5.15$; $p < .05$) and the variance contributed by the effects of the RR vs. RW is also significant ($F=18.64$; p .01). Similarly, the frequency of the CR emission rates changes significantly over blocks of trials ($F=7.84$; $p < .01$).

Note from Table VI, that when the possible operant effect of D x Reinf. ($p=.075$) (cf. Table V) was removed, there still remains a significant contribution to the variance by the interaction of these variables ($F=7.74$; $p < .01$). The

D x PI interaction term also contributes variance significantly different from chance ($F=7.67$; $p < .01$). All other possible interactions could have occurred only by chance, in each case the probability being greater than .50.

It must be considered a possibility that at least one of the significant results was due to the fact that fifteen simultaneous analyses were performed with the same data. To eliminate this possibility, we would have to reset alpha at .001 (Hartley, 1955). This would, of course, render the results nonsignificant (and increase the probability of a type II error).

Since most of the significant F ratios could have occurred by chance at much less than .01, it is felt that a visual inspection of the data, as graphically depicted, may clarify and strengthen the interpretations of significant effects.[1]

In Figure 1 is a graphic representation of the total number of correct responses in eight blocks of ten trials, for the 36 Ss in the four PI groups combined, vs. the 36 Ss in the NPI groups combined. (cf. Table III for the raw data).

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[1]Each of the graphs (Figures 1-10) is presented on a separate page and interspersed within the text of this section.

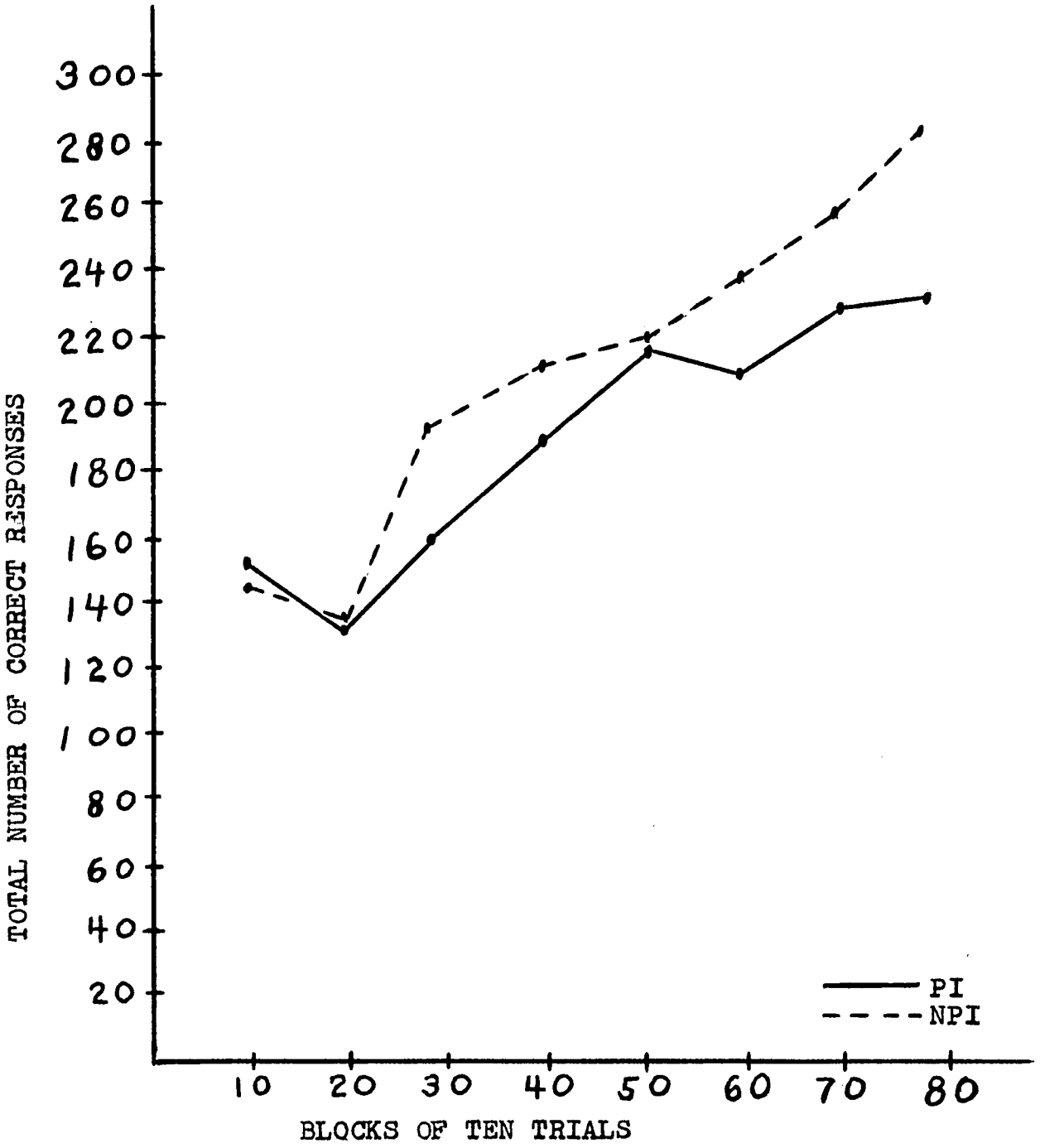

Fig. 1. Comparison of total number of correct responses for the PI and NPI groups over Eight blocks of ten trials.

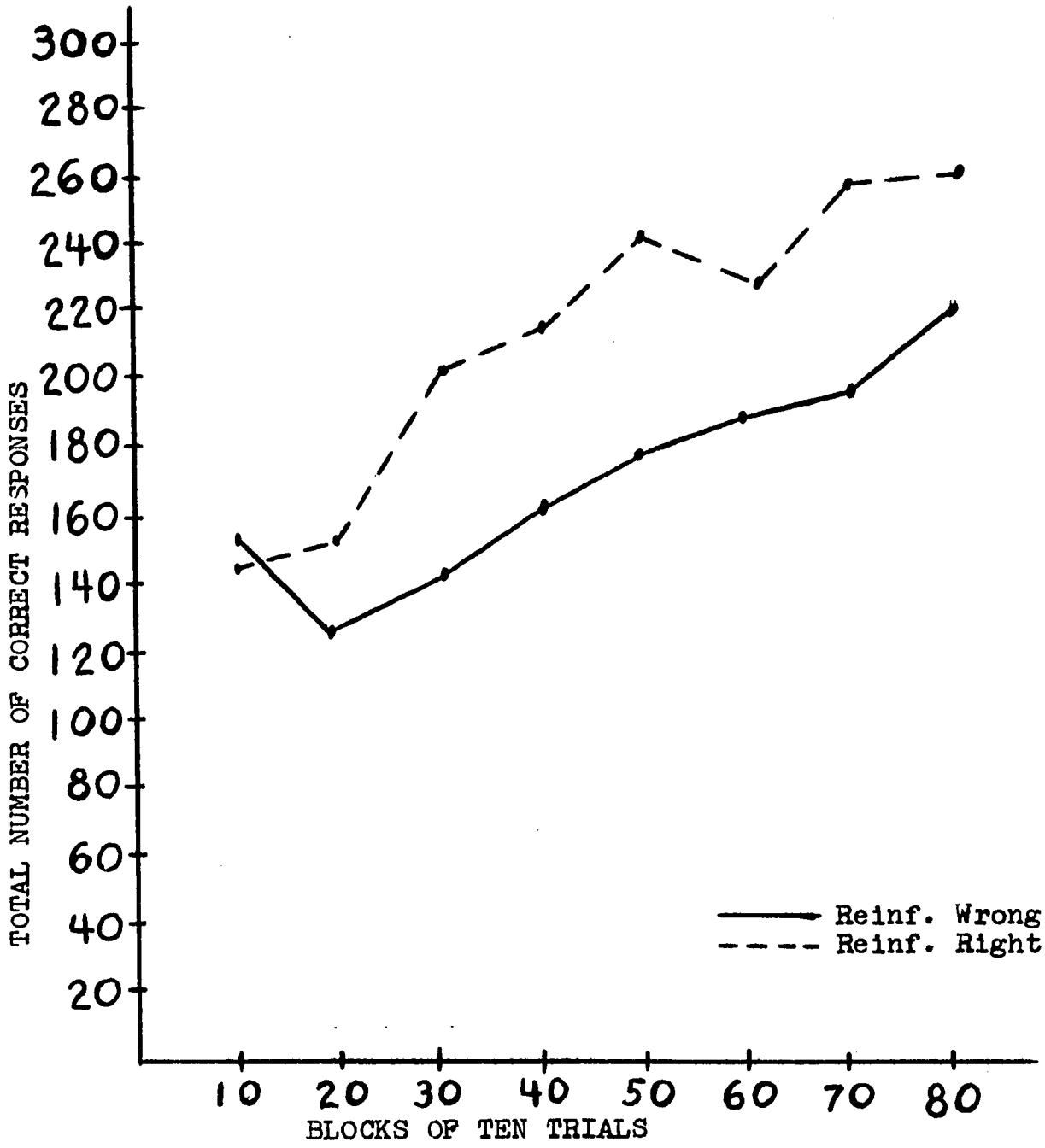

Fig. 2. Comparison of total number of correct responses for the Reinforcement "right" and "wrong" groups over eight blocks of ten trials.

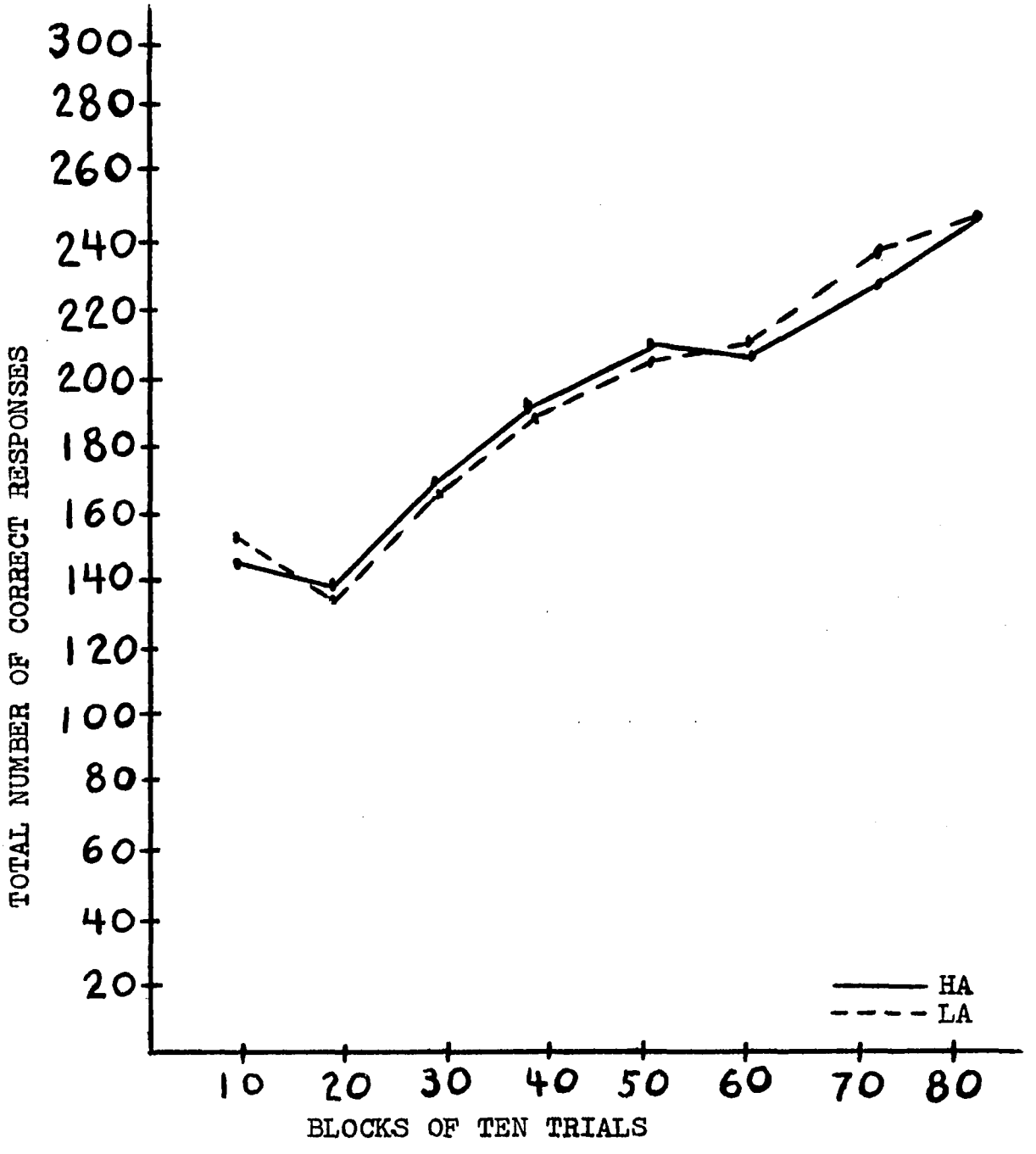

Fig. 3. Comparison of total number of correct responses for the HA and LA groups over eight blocks of ten trials.

Although PI started out at a slightly higher level of response emission than NPI (Trials 1-10) the curves cross, and in the last thirty trials, the NPI group reached a much higher level of responding than the PI group. Further, whereas PI seems to have reached asymptote in the last twenty trials, NPI does not. The difference between the PI and NPI groups in the analysis of covariance was significant ($P = < .01$).

Figure 2 presents a comparison of the total number of correct responses for the 36 Ss in the four groups receiving RR combined vs. those receiving RW combined. The RR manifests many more correct responses than the RW throughout conditioning. These differences could have occurred by chance at a rate of less than .01. Note, also, that whereas Ss receiving RR appear to be responding at an asymptotic level in the last ten trials, RW has not reached asymptote.

Finally, regarding the main effects, in Figure 3, we can see that the HA and LA groups when compared on the total number of correct responses for the four subgroups in each anxiety group combined, yield curves which almost coincide.

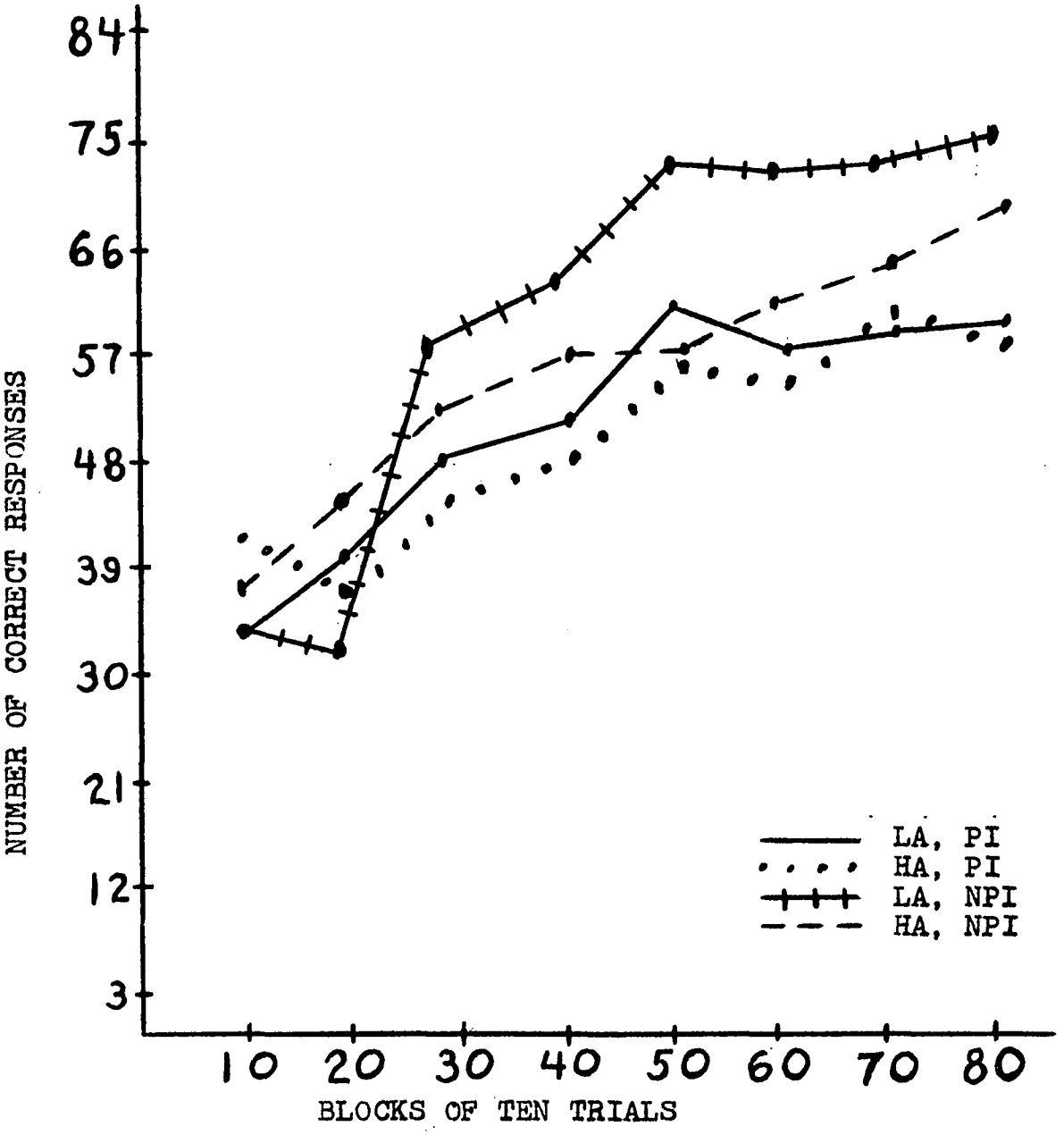

Fig. 4. Comparison of number of correct responses for HA PI and NPI as well as LA PI and NPI subgroups across eight blocks of ten trials, plotted for the Reinforcement "right" (RR) condition.

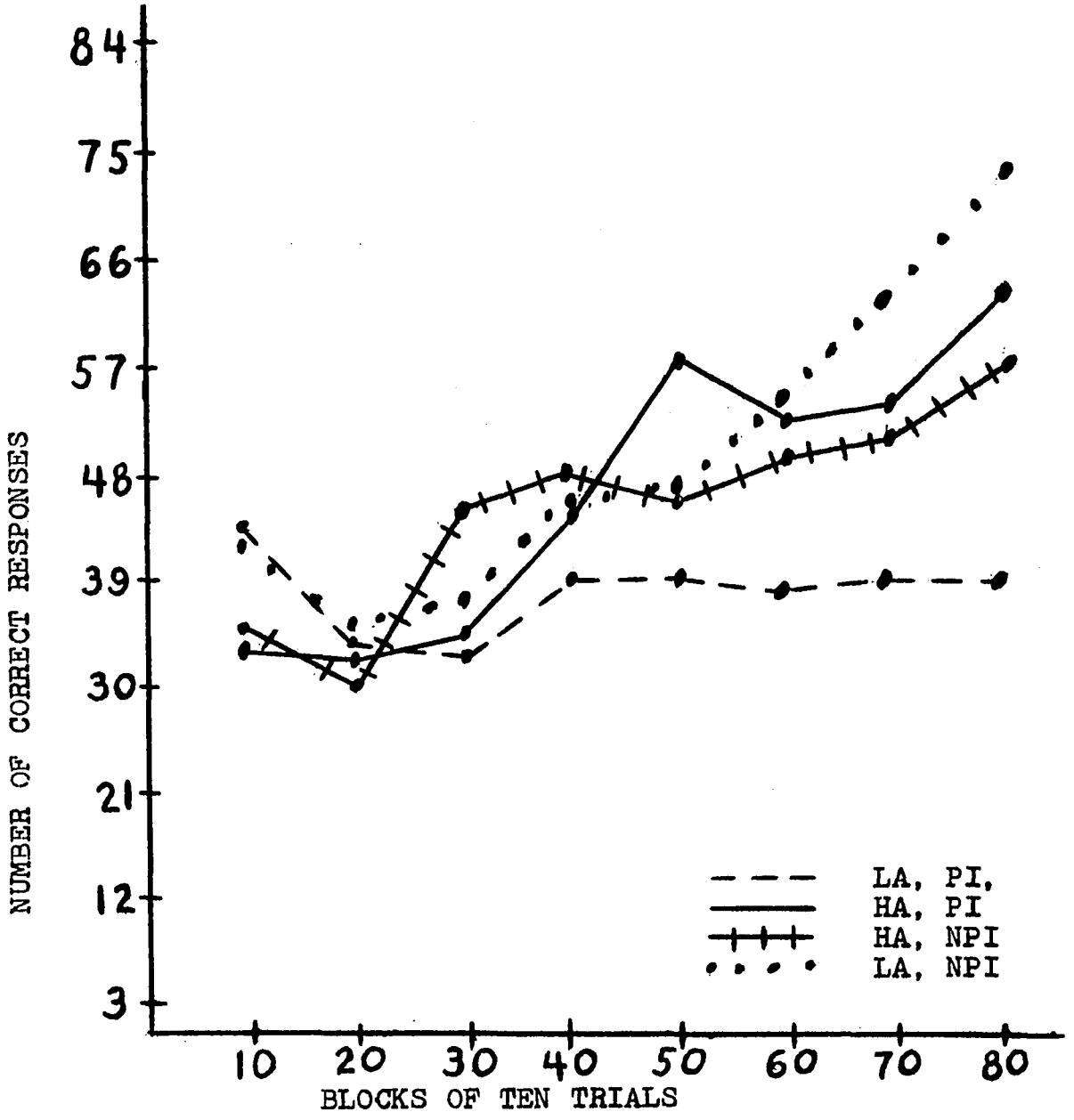

Fig. 5. Comparison of number of correct responses for the HA PI and NPI as well as LA PI and NPI treatment groups across eight blocks of ten trials, plotted for the Reinforcement "wrong" (RW) condition.

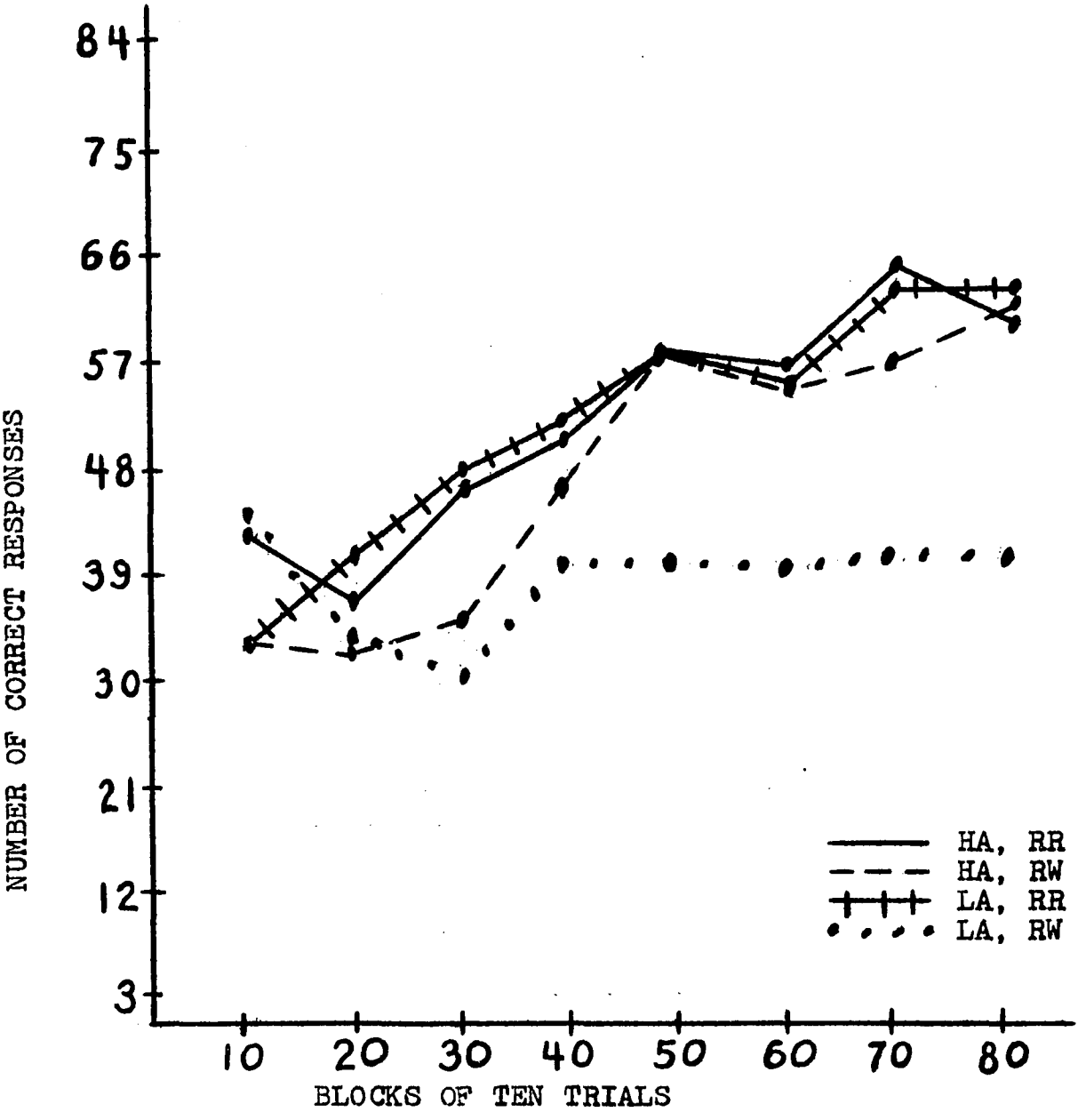

Fig. 6. Comparison of number of correct responses for the Reinforcement "wrong" HA and LA, and Reinforcement "right" HA and LA groups across eight blocks of ten trials, plotted for the PI condition.

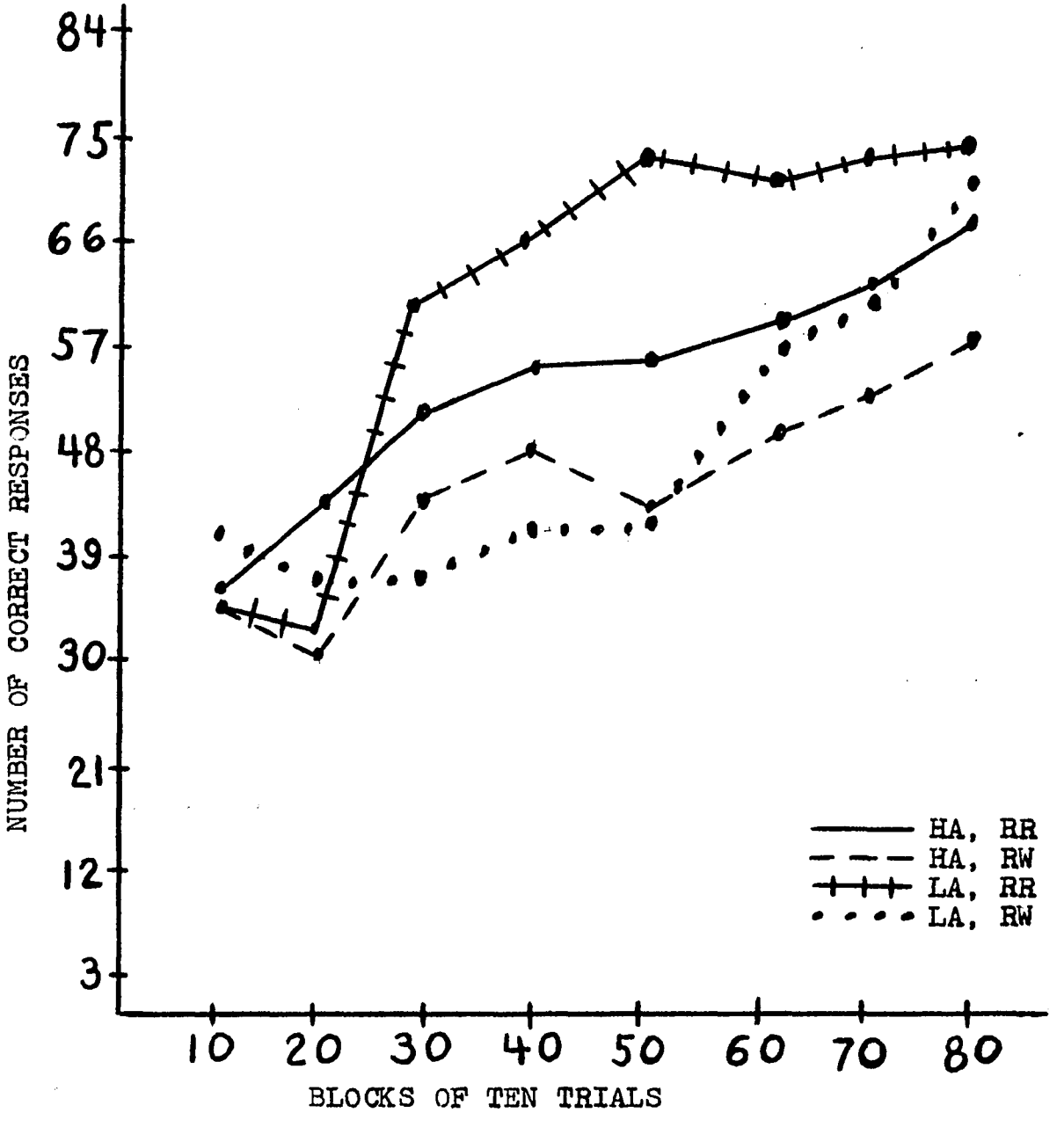

Fig. 7. Comparison of number of correct responses for RW HA and LA and RR HA and LA groups across eight blocks of ten trials, plotted for the NPI condition.

Figure 4 compares the number of correct responses for the four treatment groups in the RR condition. The same comparisons are made in Figure 5 plotted for the RR condition. In both reinforcement conditions (Figures 4 and 5), the LA NPI groups conditioned much better (Trials 61-80) than the others. In RW, the LA PI does not manifest conditioning, whereas in RR, LA PI seems comparable to HA PI. The differences between both HA groups (Figure 4) given RR, are small. However, whereas HA NPI seems to be conditioning further, HA PI appears asymptotic. In RW, HA PI manifests a much higher rate of responding than LA PI and the opposite results for the LA NPI being greater than HA NPI (Figure 5). Again with "right" (RR) the same pattern recurs i.e. LA NPI greater than HA NPI. Further, in the RW condition none of the treatment groups except LA PI have approached asymptote.

Figure 6 compares the number of correct responses for the four treatment groups in the PI condition. The same comparisons are made in Figure 7 plotted for the NPI condition. In the PI condition (Figure 6) it is the LA RW group which is very much below the other three, whereas in the NPI condition it is the HA RW which has the fewest responses (Figure 7). In the PI condition, LA RR is very close to HA RR; however, it is considerably greater in the NPI condition. Note also that except for HA EW in the PI, the other groups seem to have reached asymptote, whereas NPI groups except

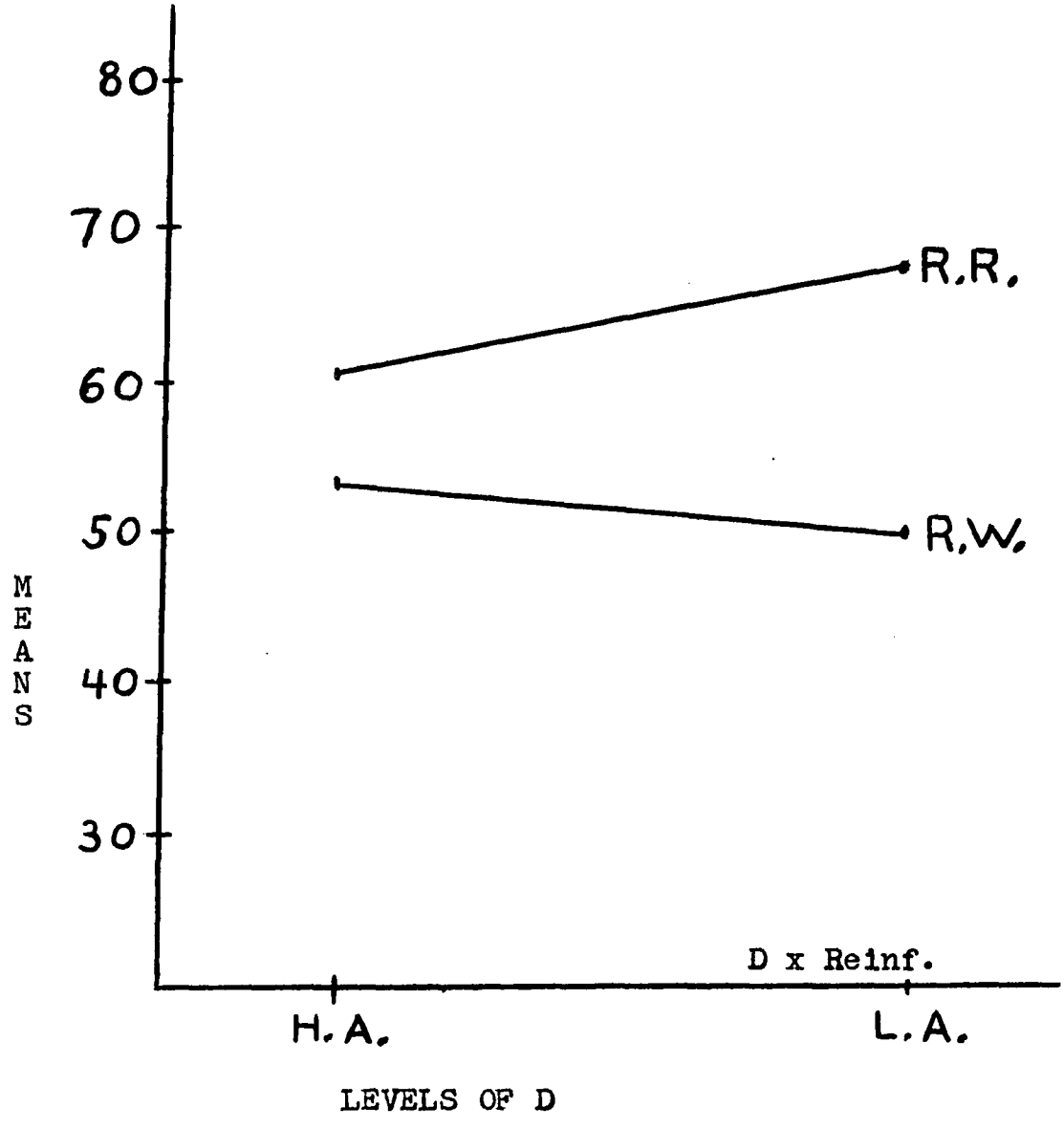

Fig. 8. Mean number of CR's of last 30 trials for both levels of D (HA and LA), at both levels of Reinforcement (RR and RW).

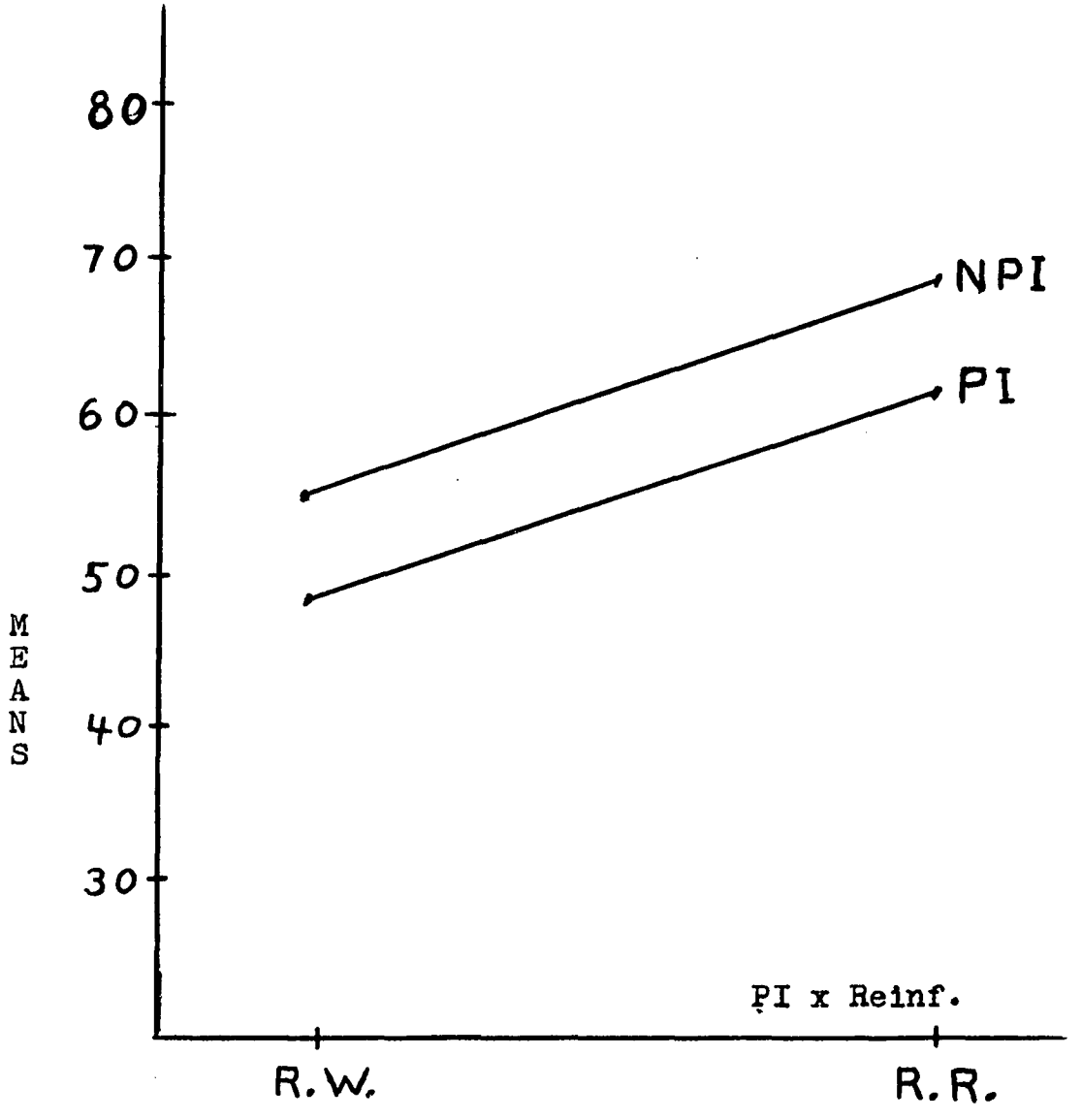

Fig. 9. Mean number of CR's of last 30 trials for both levels of reinforcement (RR and RW) at both conditions of prior interaction (PI and NPI).

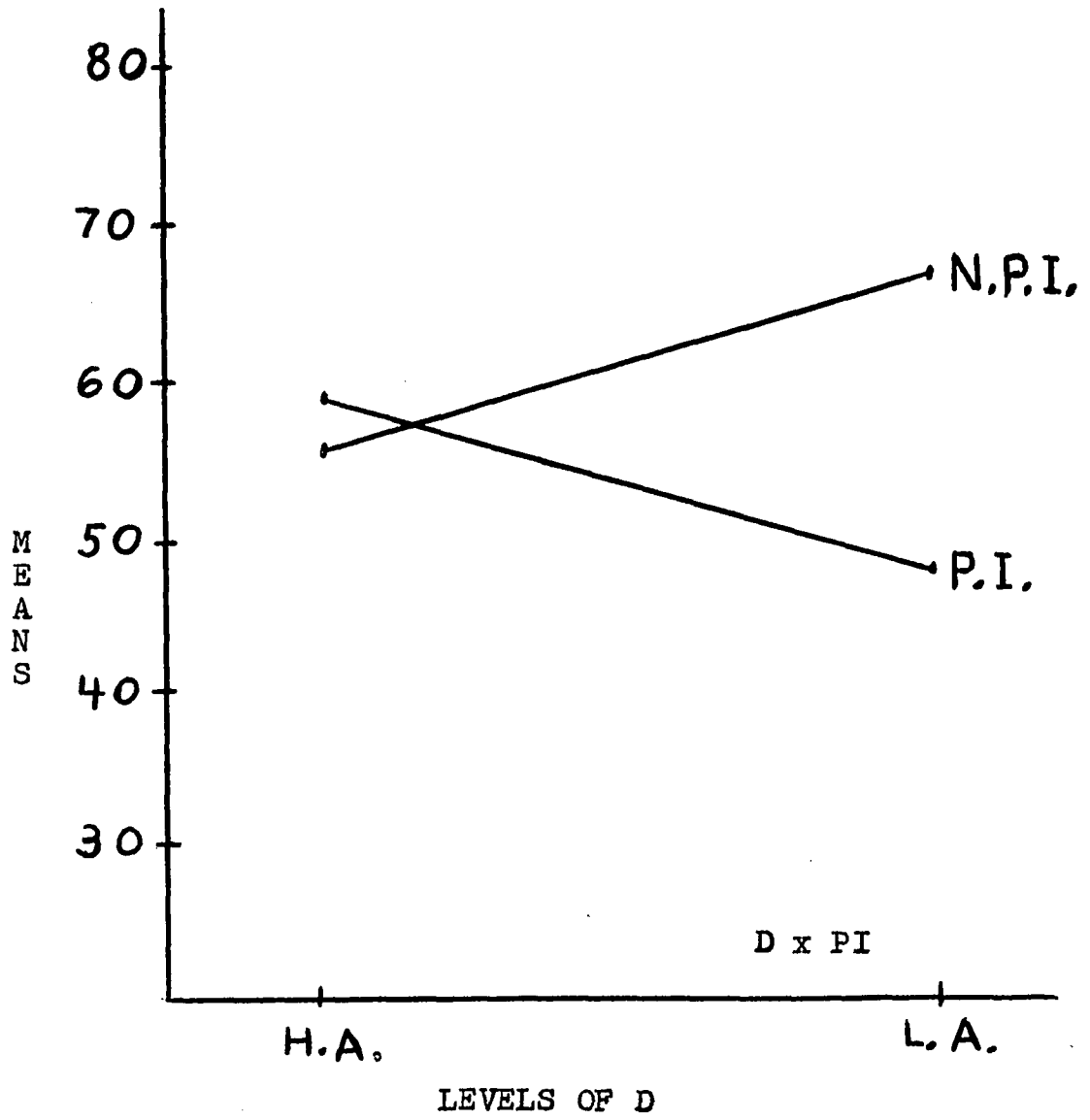

Fig. 10. Mean number of Cr's of last 30 trials for both levels of D (HA and LA), at both levels of prior interaction (PI and NPI).

perhaps for LA RR, have not. Recall (Table VI) that the D x PI interaction effect was significantly different from chance ($p < .01$).

Figures 8, 9 and 10 present graphic representations of the possible interaction effects between the variables. Fig. 9, in which the mean scores of trials 51-80, of the PI variables are plotted against the two levels of reinforcement, illustrates that these variables do not interact; the curves are almost parallel. The PI x Reinf. term in the covariance analysis, is, indeed, nonsignificant (cf. Table VI; $p > .50$).

From Fig. 10, in which the mean scores of trials 51-80, of the PI variables are plotted against the levels of D note a definite interaction (the curves intersect). Indeed, the probability that these variables interact by chance was less than .01.

In Fig. 8 the D x Reinf. variables do appear to interact. The curves are certainly not parallel, and these variables interact by chance at less than the .01 level (cf. Table VI). Finally, mention should be made of the fact that these highly significant results occurred in spite of a very large within group variability. This can be clearly seen in Figs. 11, 12, and 13, in which there are plotted the operant levels and CR emission rates (trials 21-80) for three different individual Ss each. In Fig. 11 the three Ss are from group HA PI RR; in Fig. 12 from LA PI RW and in Fig. 13, group HA, NPI RR. This sample is representative of the intragroup variability seen in the eight treatment groups.

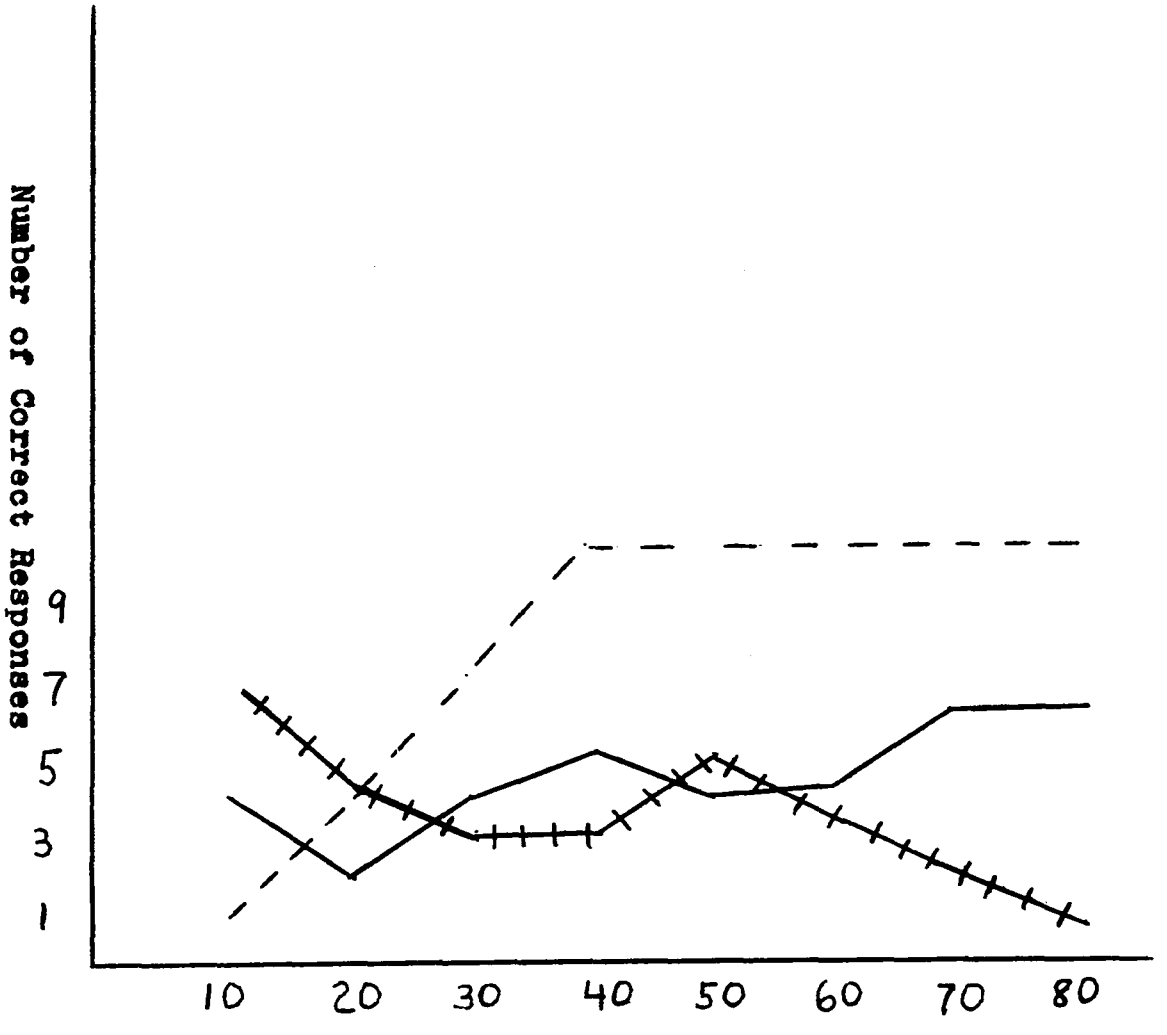

Fig. 11 Comparision of number of correct responses for three individual Ss in group HA PI RR across eight blocks of ten trials.

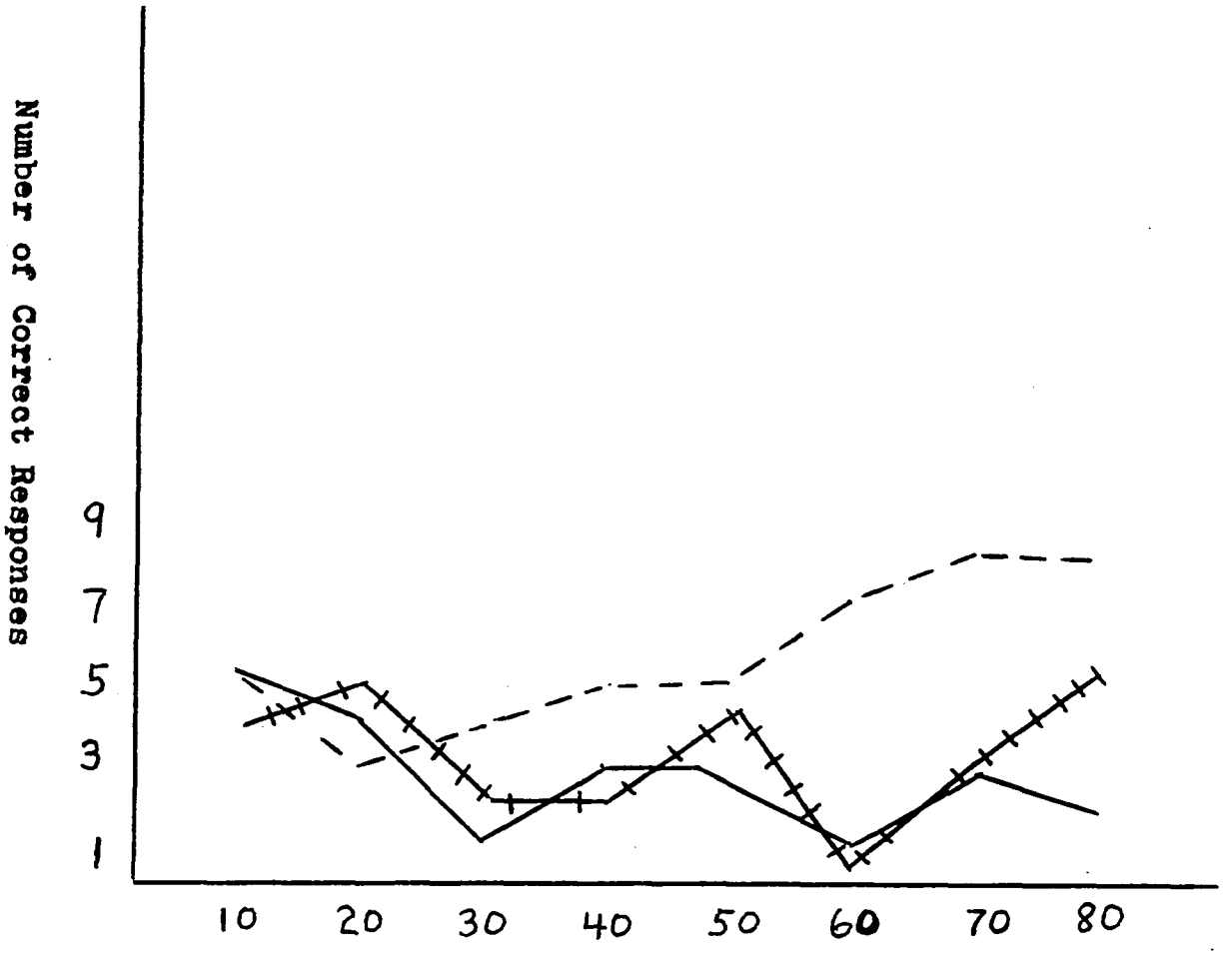

Fig. 12. Comparison of number of correct responses for three individual Ss in group LA PI RW across eight blocks of ten trials.

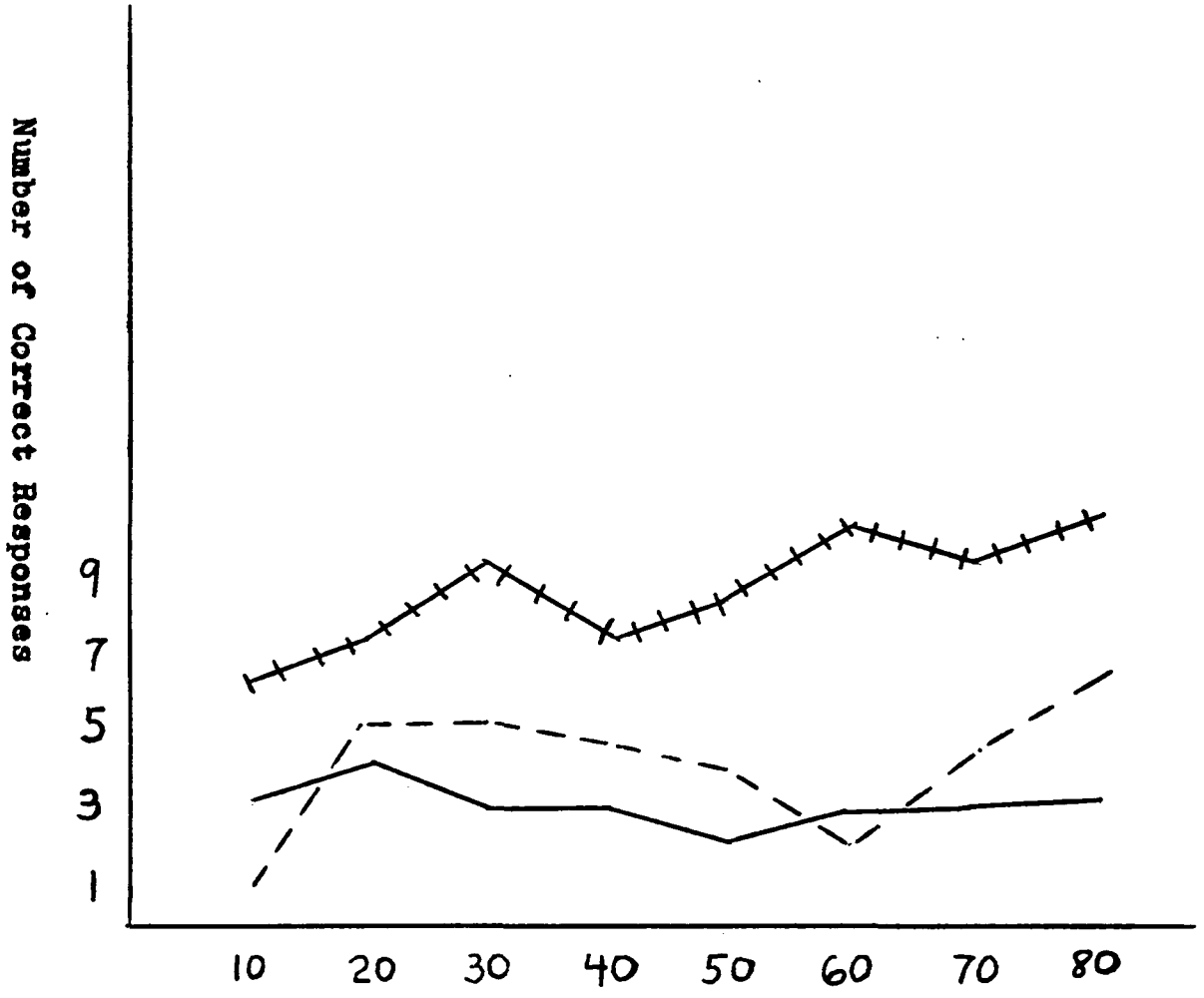

Fig. 13. Comparison of numbers of correct responses for three individual Ss in group HA NPI HR across eight blocks of ten trials.

CHAPTER IV

DISCUSSION
DRIVE (D)

It was the purpose of this research to provide D level differences between Ss by selection of HA and LA Ss as indicated by scores on the MAS. One may, perhaps, interpret the MAS scores as merely reflecting an individual's willingness to reveal very personal and/or emotionally toned information about himself, and not as a measure of anxiety per se. Witness, however, the apparent emergence of and conformity to an adolescent norm especially prevalent among college students, namely: "soul-searching", self- revalation and frankness.[1] Therefore, it may be that the degree of Ss' willingness to disclose such intimate information would not be the factor to significantly differentiate one group of Ss from another on a scale such as the MAS.

The operant level emission rates (Table II) X^2 analysis, do provide some support that the MAS score differences by which Ss were selected were valid.

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[1]Indeed, it was for this reason that E re-titled the MAS booklet "College Student's Attitude Towards Self and Others Scale", to avoid the social desirability response set which the still-present negative connotation of "anxiety" may have engendered.

Recall (Table II), that two HA treatment groups manifested an operant level of "I" and "WE" significantly different from chance expectation of 6 and 7 out of 20 trials ($p=1/3$). Some of the Ss in each group were above and some below this chance level. Further, there was a trend for the third (of the four) HA groups to manifest operant level emission rates different from chance expectation ($p=.09$).

Comparing these to the LA treatment groups, three of the four manifest "I" and "WE" at a chance level ($p > .50$; $p > .50$; $p > .30$).

It would seem that HA individuals may be so obsessed by their problems as to make statements of self- reference at a significantly greater frequency; or, on the other hand, their feelings of guilt, inadequacy, self-hate, etc., may contribute to their reluctance to make self-referent statements.

D level, however, as an independent variable, was not uniform in magnitude or direction of influence on conditioning. In other words, anxiety drive differences as measured by the MAS were not mirrored by consistent verbal conditioning differences between HA and LA Ss. Although this research originally was guided by the "chronic anxiety" interpretation (Spence, 1956; Taylor, 1958) of the MAS, that the D level

differences between HA and LA Ss remain fairly constant throughout various situations, the "reactive anxiety hypothesis" may actually be more appropriate.

Spence, (1960), in offering the "reactive" view as an alternative to the "chronic" interpretation, considers that the MAS scores may represent an index of anxiety-reactivity, thereby providing measures of D differences in individuals when they are subjected to the same noxious stimulation (stress).

The change in theoretical orientation was prompted by the results of this study in which response rates across Ss were not significantly different when compared solely on the basis of D differences (HA vs. LA). However, when Ss are compared in treatment groups, on the basis of a combination of D and type of Subject-Experimenter interaction, they do, indeed, manifest differences in performance. It will be recalled that with RW, the HA Ss achieved a higher response rate vs. LA Ss in the PI condition, whereas the opposite differences were recorded in the NPI groups. (Figs. 6 and 7). Also, whereas the LA RR conditioning curve is much higher than HA RR in NPI (Fig.7), these curves almost coincide in the PI condition (Fig. 6).

Much of Spence's work, in which the MAS was a useful indicator of drive level, involved noxious stimulation, i.e., air puffs to the eye or shock, inclassical conditioning situations. In more complex situations, however, i.e., paired associates learning, the MAS was similarly useful. However in these situations it appears that no intentional stress was provided by E.

In light of the non-significant difference in conditioning, between the HA and LA groups, when D is the only variable analyzed, considered together with the differences between the HA vs. LA sub-groups (in the PI vs. NPI conditions) it would appear that the "reactive" hypothesis may be more fruitful than the "chronic" hypothesis. To speculate further, whereas the experimental situation probably was mildly threatening to all Ss, it may have represented a more stressful situation to the HA Ss.

It was reassuring after having reached these conclusions, to have been directed to an article in which Spence (1964) supports these interpretations. Spence (1964) indicates that in those "non-stressful" conditioning experiments, where the MAS was a valid predictive instrument of anxiety drive differences, i.e., paired associates learning, the pre-experimental

S-E interaction was designed to elicit "some degree of emotionality" in S. "Thus the experimenter was instructed to be impersonal and quite formal in greeting S and in giving the necessary instructions .... To say the least, these conditions were unusual and strange for Ss. Furthermore, in order to maximize the likelihood that they should have a tendency to arouse some degree of apprehensiveness, only individuals who had no previous experience as a S in psychological laboratory experiments were used in all but one...studies" (Spence, 1964, p. 135).

In the PI group of this study, interaction with E before conditioning would have served to alleviate some of the anxiety, leaving enough, however, so that the HA PI Ss may have performed under a higher drive level than the relatively "relaxed" LA PI Ss. Although in this experimental procedure E's formality and impersonal attitude towards Ss were not intended to elicit anxiety reactions, it is clear that it was somewhat comparable to Spence's (1964) procedure in which the experimental situation was designed to provide stress for naive Ss.

In the NPI situation, however, E's leaving the HA Ss alone for fifteen minutes to complete the questionnaire, and then returning to commence conditioning (without first offering any "Sociable Salutory" remarks) may have further increased the anxiety level of these Ss to a degree which is

detrimental to conditioning. Further, observe the better performance of both LA NPI as compared to HA NPI and the absence of conditioning in one LA PI group (Figs. 7 and 6). That conditioning differences due to drive level were dependent upon prior interaction variations, is further supported by the covariance analysis (Table VI) where D x PI p .01 and the non-parallel interaction curves (Fig. 10).

It will be recalled that Spence's (1956) research on paired associates learning showed a high A drive to have a facilitative effect only when competing R's were minimized, but a detrimental effect when they were maximized. This, of course, follows from Spence's assumption that D can energize any member of the organism's response repetoire. A very high level of anxiety may, therefore, according to Spence (1956) activate responses in S which are incompatible with the CR. As noted by Spielberger, DeNike and Stein (1965), the high positive correlation between the MA and P scales of the MMPI, as well as empirical observation, illustratesthe obsessive and intellectualizing tendencies of HA college students. These responses may be considered as "competing" in the verbal conditioning paradigm, since the obsessive HA student may make the situation into a problem solving one and perseverate incorrect response tendencies in a "trial-and-error" attempt at solution. This would result in poorer conditioning in HA Ss.

Results similar to those of this study have been reported by Winkel and Sarason (1964). In comparing high test-anxiety

(TA)[1], Ss vs. low in a verbal learning task, they found that low TA Ss performed significantly better than high TA Ss, but only when the Ss were given "high achievement motivation" instructions. These Ss were informed by E that the experimental procedure was an intelligence test. Those Ss in the group given no specific pre-conditioning instructions, and the group told "not to worry about mistakes", manifested no significant conditioning differences when compared along the high vs. low TA condition. It would appear that the high motivation instructions may have constituted a "stress situation," serving to increase the anxiety level of the high TA Ss to a degree detrimental to conditioning, whereas the reassuring "don't worry" instructions served perhaps to decrease anxiety. The achievement motivation Ss may be compared to the NPI condition which similarly provided for more stress to HA Ss vs. the PI condition.

The reverse results of the HA and LA sub-groups in the PI and NPI conditions may have cancelled out any performance differences between Ss when analyzed only along the D dimension. Conditioning differences, however, were obtained in Ss differing in level of D, when the PI variable was taken into account, as would be expected.

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[1]Although their definition of anxiety differs from that of the MAS used in this study, it is felt that both definitions are neither mutually exclusive nor incompatible.

INCENTIVE MOTIVATION (K)

In dealing with the D and K combination law, the plan for providing Ss with K value differences was to give half of them the reinforcement "right" for a correct response (nothing for an incorrect response), and half the reinforcement "wrong" for an incorrect response (nothing for a correct response). In so doing E was guided by the research data of Buss et. al. (1956 a,b) from which they concluded that "right" was a weaker positive reinforcer than "wrong" was a negative reinforcer. In their conceptual learning situation in which Ss received "wrong" for an incorrect response, nothing for a correct one; or "right" for a correct response, nothing for an incorrect, they did not consider "nothing" as having reinforcing properties.

Other research literature has shown that the absolute reinforcement values[1] of "right" and "wrong" are not significantly different. However, when used in combination with "nothing" for an incorrect (correct) response, "right" and "wrong" do differ significantly because "nothing" acquires reinforcing properties, the strength of which differs depending upon whether it is combined with "right" or "wrong". For example, Buchwald (1959 a,b), utilizing

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[1] "The term reinforcement value refers to the effect of a particular event used as a reinforcer i.e. to a parameter which determines the change in response probability when the event follows a response". (Buchwald, 1959, p. 351).

both acquisition and extinction data, has shown that during Ss exposure to a "right"-"nothing" combination, "nothing" becomes a negative reinforcer, but if reinforcement is "wrong"-"nothing", "nothing" acquires positive reinforcing properties.

Although Spence and Lair (1964) obtained the same results as Buss et. al (1956 a,b), i.e. Ss receiving "wrong"-"nothing" conditioning significantly better vs. "right"-"nothing", their additional statistical analysis on individual trials led to their conclusion that "...the results were primarily due to "nothing" having less reinforcement (information) value in the R condition, than "wrong". Buchwald (1962), obtained the opposite results. In his paired-associates conditioning experiment, Ss were informed that "right" would indicate a correct response, for one group, and "wrong" an incorrect response, for the other group; Ss were also told that when E said nothing it would mean that S was being given no information. Buchwald (1962) interprets these opposite reinforcement values of the same reinforcement combinations as due to difference in the conditioning techniques in which they were used. He believes that although "right"-"nothing" may be more effective in promoting learning of single responses to a single stimulus (as in his research), most experiments dealing with reinforcement combinations have been like concept formation tasks involving not one, but classes of stimuli. Since S must learn

which stimuli belong to a given class, a clear indication of an incorrect response allows S to reclassify stimuli, while information about a correct response does not (Buchwald 1962). This, of course, would provide for "wrong"-"nothing", as a more effective (stronger) reinforcer than "right"-"nothing", in a "Taffel" verbal conditioning method, unless the reinforcement on every trial allowed for complete identification of the correct response (Spence et. al. 1963).

In line with the above data, it may be inferred that differences in information value of different reinforcers i.e., "right"-"nothing" vs. "wrong"-"nothing", provide for differences in reinforcement value. These differences could be subsumed under Spence's (1956) X... Xn variables which supposedly contribute to K level, so that "right"-"nothing" as reinforcement for one group, and "nothing"-"wrong" for the other, could operationally be defined as K level differences between these two groups.

Contrary to expectations, the RR group in this experiment conditioned significantly better (Fig. 2; Table VI p .01) than RW. The results parallel Buchwald's (1962) in which "right" was significantly more effective than "wrong", compared to Spence's et. al. (1963) in which there were no significant differences between "right" vs. "wrong". In both of those experiments, although "right" and "wrong" were combined with "nothing", in Buchwald's, Ss were told that "nothing" meant E was giving

S "no information", but in Spence's, the correct response was completely identifiable on every trial. Although Spence's et al's (1963) instructions were identical to those used in this experiment i.e. that nothing would indicate a correct (incorrect) response when combined with "right" (or "wrong") their method involved only one correct and incorrect response, while in this experiement there was a response class (personal pronouns) which was correct, and a response class (all other pronouns) which was incorrect.

An inspection of Fig. 2 will reveal that whereas RR seems to have reached asymptote, RW seems to be increasing. It seems likely that the results of RR vs RW in this experiment may have been due to the unique combination of instructions and methods, but may have been different if many more conditioning trials were given.

Spence's rg--sg Mechanism

Although the main purpose of this research was to investigate the D x K postulate, it was also of interest to see whether differences in prior S-E interaction would effect this combination law. It was believed that manipulation of the PI variable would produce differences in the fractional anticipatory goal responses (rg--sg) since E not only delivered the reinforcement, but simultaneously had reinforcing properties for S. If such rg--sg differences were established prior to conditioning, it was felt that they would have exerted their differential influence on sEr via K. This thinking was in line with Spence's (1956) interpretations that the rg--sg mechanism mediates the effects of several reinforcement parameters in the determination of the level of K.

When analyzed along the PI vs. NPI dimension, in the last thirty conditioning trials, CR emission rate differences between Ss were, indeed, significant (Table VI, p .05).

When, however, PI was plotted in combination with D (Figs. 6 and 7), LA Ss did better in the NPI condition compared to HA Ss; and in the PI condition, one LA group did

not even manifest conditioning. This was attributed to the probability that the pre-conditioning S-E interaction heightened the anxiety level for the NPI groups and lowered it for the PI groups. In other words, the different fractional anticipatory goal responses (operationally defined here as PI vs. NPI) differentially attenuated the effect of drive level on the conditioned response rate.

Spence's (1956) suggestion, however, considered the K, and not the D level, effect on sEr to be dependent on the strength of the rg--sg mechanism. In other words, in line with Spence's theory one would not expect an interacting between the rg--sg variables and D. Since the assumed competition between the rg--sg and the CR "might" according to Spence (1956) contribute to an increase in the existing state of generalized D level, and since D and K combine additively (Spence 1956) a relationship between the effects of the rg--sg mechanism and those of D level would be additive.

Contrary to Spence's assumptions, our covariance results (Table VI) revealed that the D and PI variables interact by chance at p .01. Further, the D x PI curves (Fig. 10) intersect.

The results, however, do lend some support to Bolles' (1958) suggestion, that the role of the rg--sg mechanism is

similar to that of D level, which may be interpreted to imply that D and the rg--sg mechanism interact in the determination of sEr.

After performing the statistical analysis, it appears that a reinterpretation of the literature (reviewed earlier, in the introduction of this thesis) on the effects of prior SE interaction, is now necessary. The earlier suggestion that pre-conditioning rg--sgs influenced the magnitude of K, was guided by the various experiments in which Ss receiving the same reinforcer manifested conditioning differences after exposure to different pre-training procedures and/or attitudes towards E.

We now feel that the conditioning differences were not due to the pre-conditioning procedures influencing the subjective magnitude of the reinforcer. We suggest that the pre-training variables contributed to differential D levels between the experimental sub-groups, by heightening anxiety for some Ss and perhaps lowering it for others. For example, Ss berated after a task and performing better than non-berated controls (Simkins, 1961); or Ss who manifested much poorer conditioning of hostile verbs in the presence of an aggressive 6'5 male experimenter *vs.* Ss conditioned by a petite female (Binder *et. al.*, 1957); or Ss whose emission of the CR decreased after exposure to a "hostile atmosphere"; could very well have experienced an increase or decrease in anxiety

due to the pre-conditioning differences which influenced their conditioning

Supportive of this interpretation is research reported by Sarason (1961), the results of which are similar to our D x PI significance. In his design, high and low test anxiety Ss were compared in performance on an anagrams test, after half of each anxiety group had been given different pre-test instructions. For one group, the instructions were intended to provide stress and for the other group, to make the experimental situation non-threatening. Their results yielded a significant Instructions x Test Anxiety Score interaction comparable to our D x PI. These differences in instruction may be interpreted as providing differences in the rg--sg mechanism between the "threat" and the "non-threat" instruction groups.

D + K

Although Spence (1956) "tentatively" assumed the additive combination of D and K and reflected upon the possibility that it may have to be changed to some non-linear function (Spence 1960), it will be recalled that Reynolds and Pavlik's (1960) results did support D + K. In this research, however, the Ss were humans, who were operantly conditioned under different levels of anxiety drive (D), and reinforced verbally for the correct verbal response with incentive motivation (K) differing by virtue of differences in information value between two reinforcers. Although this experiment paralleled the Reynolds and Pavlik study, their CR was running; the rats were conditioned under hunger drive, and reinforced with food, the K values of which differed by virtue of physical weight differences.

In this research, contrary to Reynolds and Pavlik's (1960) statistical analysis revealed that D and K do not interact by chance (cf. Table VI, p .01). Similarly, Iwahara and Tandbe (1963) recovered Hull's D x K law in a human verbal coding task in which K was manipulated by the same reinforcement combinations as used in this research, and D differences defined as HA vs. LA.

Three possible avenues of explanation of these

apparently contradictory results (D + K vs. D x K) remain open. First, of course, consider that the laws of behavior may not be constant across species. Secondly, it may be that HA vs. LA is not homologous to differences due to hours of deprivation; and "right-nothing" "nothing-wrong" may not parallel 1.0 gms v. 2 gms of food.

Finally, there remains the possibility that the Reynolds and Pavlik (1960) data may have failed to reveal a truly significant D x K combination law. Consider that six of their nine treatment groups do not appear to have approached asymptote at the termination of conditioning. Also, their analysis of variance on only the final twenty trials may not have been as sensitive as possible.

These three alternative interpretations of D + K in one situation and D x K in others do leave open the possibility of further exploration of the D and K combination law.

A Stimulus Sampling Model

Although the theoretical orientation of this dissertation has been within the framework of the Hull-Spence theories, the results may be alternatively interpreted within Estes' "stimulus sampling model", (Estes, 1958).

According to Estes, drive variables influence conditioning not by virtue of energizing effects, but as a major variable-stimulus source to which a response may be conditioned. Since the conditioning stimuli (relevant control variables) are assumed to remain constant across stimulus samples, another important source of stimulus variation to which a response may be conditioned would be extraneous stimuli. These occur randomly and are usually conditioned to heterogeneous responses, competitive to the CR. Further, it is the last response made within a stimulus configuration to which all of the stimuli become conditioned.

Within such a framework, one may consider that in the PI condition the HA group conditioned better than the LA group because there were many more drive stimuli to which a homogeneous response class (the CR) was conditioned, thereby increasing the probability that any momentary stimulus sample will be associated with the CR. In the LA group,

however, the lack of drive stimuli, allows for more of an influence of extraneous stimuli to which several heterogeneous responses rather than the CR may be made. This in effect lowers the probability of the CR to the available stimulus samples in the LA groups (vs. HA) yielding better conditioning in HA vs. LA PI.

To handle the reversed results (LA HA) in the NPI condition along these lines, one may consider the possibility of the HA Ss manifesting a homogeneous class of "anxiety-reducing" responses in the 15 minutes prior to conditioning. These anxiety defensive responses may have been conditioned in the past to the organismic stimuli correlated defined as "high anxiety". In effect, this response class would be conditioned to the stimuli which were also present during the verbal conditioning trials which followed. HA Ss, therefore, may have conditioned more poorly compared to the LA Ss in the NPI condition, and to the HA Ss in the PI condition, because of the increased probability of their making another previously conditioned response (class) which competes with the CR.

Finally, the fact that those Ss receiving RR conditioned significantly better vs. RW may be handled in stimulus sampling terms if one postulates that the RR condition immediately removes the organism from the stimulus sample and of course, his last response was the CR.

On the other hand, when no overt positive reinforcement was delivered by E to Ss in RW for the correct response, this may not have terminated the trial and S may have made other implicit, competing responses.

SUMMARY AND CONCLUSION

An experiment in verbal conditioning with verbal reinforcement was performed on college students. D level, K level and the rg--sg mechanism were manipulated in a factional design. The study was undertaken and designed to investigate Spence's contention that drive (D) and incentive motivation (K) combine additively in the determination of reaction potential (sEr), and to see whether fractional anticipatory goal responses (the rg--sg mechanism), if established prior to conditioning, would affect the D + K combination law. These variables were manipulated as follows: D level differences were attributed to Ss scoring high (HA) vs. low (LA) on the TMAS; rg--sg's were different for Ss having prior interaction (PI) with E vs. no prior interaction (NPI); and K differences were intended to be effected by using the positive verbal reinforcement "right" for one group and the negative verbal reinforcement "wrong" for another.

From the results it may be concluded that given certain prior rg--sgs, these interact with D in the determination of sEr. D and K were also found to interact significantly. Other theoretical interpretations of these results were also explored.

DO NOT OPEN UNTIL TOLD TO DO SO

BOOKLET FOR THE

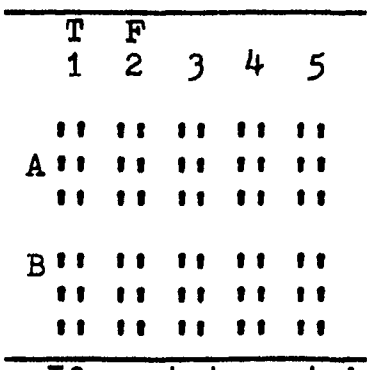
C O L L E G E S T U D E N T ' S A T T I T U D E S

T O W A R D S

S E L F A N D O T H E R S S C A L E

APPENDIX A

This inventory consists of numbered statements. Read each statement and decide whether it is true as applied to you or false as applied to you.



You are to mark your answers on the answer sheet you have. Look at the example shown at the right. If a statement is TRUE or MOSTLY TRUE, as applied to you, blacken between the lines in the column headed T. (See A at the right.) If a statement is FALSE or NOT USUALLY TRUE, as applied to you, blacken between the lines in the column headed F. (See B at the right.) If a statement does not apply to you or if it is something that you don't know about, make no mark on the answer sheet.

Remember to give YOUR OWN opinion of yourself. Do not leave any blank spaces if you can avoid it.

In marking your answers on the answer sheet, be sure that the number of statements agrees with the number on the answer sheet. Make your marks heavy and black. Erase completely any answer you wish to change. Do not make any marks on this booklet.

Remember, try to make some answer to every statement.

NOW OPEN THE BOOKLET AND GO AHEAD.

DO NOT MAKE ANY MARKS ON THIS BOOKLET

---

1. I have never felt better in my life than I do now.
2. I do not tire quickly.
3. I have never had a fainting spell.
4. My parents and family find more fault with me than they should.
5. I am often sick to my stomach.
6. Peculiar odors come to me at times.
7. The sight of blood neither frightens me nor makes me sick.
8. I have a good appetite.
9. I am about as nervous as other people.
10. I have very few headaches.
11. I have never been in love with anyone.
12. I work under a great deal of strain.
13. I am always disgusted with the law when a criminal is freed through the arguments of a smarter lawyer.
14. My relatives are nearly all in sympathy with me.
15. I cannot keep my mind on one thing.
16. I worry over money and business.
17. It takes a lot of argument to convince some people of the truth.
18. I often feel as if things were not real.
19. Most people will use somewhat unfair means to gain profit or an advantage rather than lose it.

GO ON TO NEXT PAGE.

20. I frequently notice my hand shakes when I try to do something.

21. I blush as often as others.

22. I have diarrhea (the runs) at least once a month or more.

23. Children should be taught all the main facts of sex.

24. I would like to be a journalist.

25. I worry quite a bit over possible troubles.

26. I never worry about my looks.

27. At times I have very much wanted to leave home.

28. I commonly wonder what hidden reason a person may have for doing something nice to me.

29. I practically never blush.

30. I am often afraid that I am going to blush.

31. I have nightmares every few nights.

32. I wish I were not bothered by thoughts of sex.

33. My hands are usually warm enough.

34. Sometimes some unimportant thought will run through my mind and bother me.

35. I do not like to see women smoke.

36. I should like to belong to several clubs or lodges.

37. I sweat very easily even on cool days.

38. My way of doing things is apt to be misunderstood by others.

39. I am easily downed in an argument.

GO ON TO THE NEXT PAGE.

40. I get mad easily and then get over it.

41. I am very seldom troubled by constipation.

42. When embarassed I often break out in a sweat which is very annoying.

43. I have no difficulty in keeping my balance in walking.

44. I believe that my home life is as pleasant as that of most people I know.

45. I do not often notice my heart pounding and I am seldom short of breath.

46. I like to flirt.

47. I feel hungry almost all of the time.

48. I like to read newspaper articles on crime.

49. I find it hard to make talk when I meet new people.

50. Often my bowels don't move for several days at a time.

51. I can be friendly with people who do things I consider wrong.

52. I don't blame a person for taking advantage of someone who lays himself open to it.

53. I have a great deal of stomach trouble.

54. I have bad periods in which I lost sleep over worry.

55. I enjoy detective or mystery stories.

56. Once a week or oftener I become very excited.

57. Sometimes when I am not feeling well I am cross.

58. My sleep is restless and disturbed.

GO ON TO THE NEXT PAGE.

59. I often dream about things I don't like to tell other people.

60. I must admit I am a pretty fair talker.

61. I enjoy planning things and deciding what each person should do.

62. I am easily embarassed.

63. Usually I would prefer to work with women.

64. My feelings are not hurt easier than most people.

65. I often find myself worrying about something.

66. My daily life is full of things that keep me interested.

67. I like tall women.

68. I pray several times every week.

69. I am likely not to speak to people until they speak to me.

70. I am usually calm and not easily upset.

71. I cry easily.

72. I feel anxious about something or someone almost all of the time.

73. I am happy most of the time.

74. In walking I am very careful to step over sidewalk cracks.

75. It makes me nervous to have to wait.

76. At times I am so restless that I cannot sit in a chair for very long.

77. At times I feel like swearing.

GO ON TO THE NEXT PAGE.

78. My speech is always the same.

79. Sometimes I become so excited that I find it hard to get to sleep.

80. I have often had to take orders from someone who did not know as much as I did.

81. I have often felt that I faced so many difficulties, I could not overcome them.

82. I feel that I have often been punished without cause.

83. At times I have been worried beyond reason about something that didn't matter.

84. I have very few fears compared to my friends.

85. I have been afraid of things or people that I know couldn't hurt me.

86. I certainly feel useless at times.

87. It wouldn't make me nervous if any members of my family got into trouble with the law.

88. When I get bored I like to stir up some excitement.

89. I sometimes keep on at a thing until others lose their patience with me.

90. I find it hard to keep my mind on a task or job.

91. I am more self-conscious than most people.

92. I am a very nervous person.

93. I am the kind of person who takes things hard.

94. Life is often a strain for me.

95. I do not mind being made fun of.

96. I am certainly lacking in self-confidence.

GO ON TO THE NEXT PAGE.

97. At times I feel that I am going to crack up.

98. I enjoy many different kinds of play and recreation.

99. I shrink from facing a crises or difficulty.

100. I am entirely self-confident.

101. At times I am full of energy.

102. At times I think I am no good at all.

APPENDIX B

INSTRUCTIONS: a) KINDLY FILL IN THE INFORMATION REQUIRED BELOW, i.e. Name, etc.
b) PLEASE INDICATE IN THE BOXES WHICH ARE NOT MARKED BY AN X THOSE HOURS IN WHICH YOU ARE FREE AND WILL BE ABLE TO PARTICIPATE IN THIS RESEARCH.

THANK YOU.

NOTE: YOU WILL BE REQUIRED TO PARTICIPATE FOR ONLY ONE HOUR DURING THIS SEMESTER

LAST NAME, FIRST, MIDDLE _____ MAIL BOX NUMBER (IN SCHOOL) _____

Course Title, Number & Section of Class in which you are filling this out. _____ Instructor of course _____

PERIOD	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:00 A. M.					
8:45 A. M.					
9:30 A. M.					
10:15 A. M.					
11:00 A. M.					
11:45 A. M.					

APPENDIX C

Dear _____,

Some weeks ago, in your class you filled out the College Student's Attitudes Towards Self and Others' Scale. On the basis of your response, you have been selected to participate in our research on Simple Sentence Creativity. Would you therefore, kindly report to the Child Study Center, Room N-12, on _____, _____, 1965, at _____M., one of the hours which you indicated on the schedule sheet as "free".

Should you be unable to keep this appointment, kindly notify Mrs. Miller or Mrs. Shockley, secretaries at the Child Study Center, and we will arrange for another appointment.

Thank you.

APPENDIX D

SCHEDULE OF SUBJECTS

FIRST WEEK

PERIOD	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8 A.M.	Jane Doe HA, PI, RR	John X LA, PI, RW	ETC.	ETC.	ETC.
8:45 A.M.	Jane Smith LA, PI, RW	Jane X HA, NPI, RR	"	"	"
9:30 A.M.					
11 A.M.	John Smith LA, PI, RR	John Y HA, PI, RR	"	"	"
11:45 A.M.	Joan Doe LA, NPI, RR	John Q LA, NPI, RW	"	"	"

APPENDIX E

Verbs Appearing on the 3 x 5 Stimulus Cards in order of their presentation

FILLED	HURRIED	SKATED	AMUSED
SUCCEEDED	OPENED	APPEARED	REACHED
TIED	ADDED	PEARED	PROCEEDED
REMOVED	SUPPOSED	COMPLETED	USED
CARRIED	AWOKE	STEERED	CALLED
RESPONDED	NEGLECTED	RETURNED	PUT
LOADED	FORGOT	ASSISTED	FOLLOWED
DIRECTED	PREPARED	EMPLOYED	DEFENDED
LOST	TURNED	THREW	TRIED
PURSUED	OBSERVED	READ	TWISTED
LEFT	APPEASED	WONDERED	KNEW
ASKED	ACQUAINTED	MADE	BELIEVED
LIVED	DISCOVERED	THOUGHT	LAUGHED
CAME	RAN	KEPT	STUCK
HIT	WENT	JUMPED	TOOK
HEART	ATE	DRESSED	DROVE
PLAYED	BECAME	REMAINED	CLEANED
LEANED	SPOKE	LOOKED	SECURED
CLEARED	SAT	SWAM	DREW
REMAINED	BOUGHT	SAW	RAISED

APPENDIX F

PLEASE PRINT

LAST NAME, FIRST, MIDDLE, MAIDEN _____ TELEPHONE NUMBER _____

STREET ADDRESS _____ CITY _____ STATE _____ ZIP CODE # _____

DATE OF BIRTH _____ PLACE OF BIRTH _____ SEX _____

HEIGHT _____ WEIGHT _____ COLOR OF EYES _____

FATHER'S NAME _____ MOTHER'S MAIDEN NAME _____

COLLEGE NOW BEING ATTENDED _____ CLASS _____ EXPECTED DATE OF GRADUATION _____

FAVORITE AUTHOR _____ FAVORITE NOVEL _____

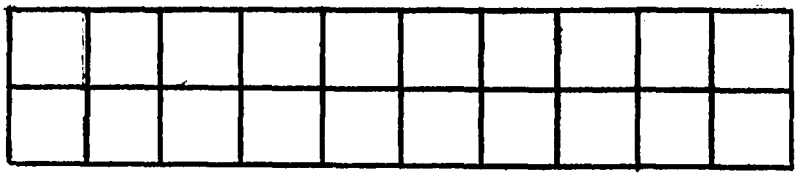
TYPE OF LITERATURE PREFERRED _____

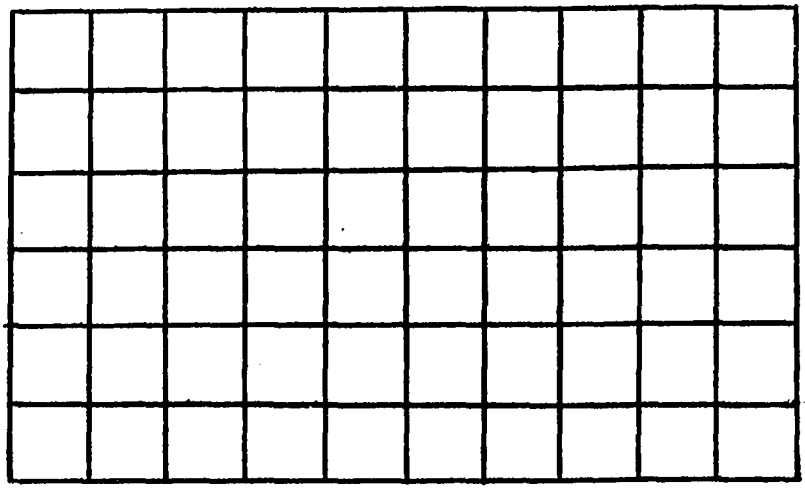
FAVORITE COMPOSER _____ FAVORITE MUSICAL COMPOSITION _____

TYPE OF MUSIC PREFERRED _____

APPENDIX G

NAME





REFERENCES

Adams, N. J. Laboratory studies of behavior without awareness. Psychol. Bull., 1957, 54, 383.

Barnett, C., Pryer, Margaret & Ellis, N., Experimental manipulation of verbal behavior. Psychol. Rpts., 1959, 5, 593-6.

Benton, A., Hartman, C. and Sarason, I., Some relationships between speech behavior and anxiety level, J. abn. & soc. Psychol., 1955, 51, 295-7.

Binder, A., McConnell, D., and Sjoholm, Nancy, Verbal conditioning as a function of experimenter characteristics. J. abn. & soc. Psychol., 1957, 55, 309-15.

Bolles, R.C., The usefullness of the drive concept in Neb. Symp. on Motiv., 1958, Univ. of Neb. Press.

Buchwald, A. M., Extinction after acquisition under different verbal reinforcement combinations. J. exp. Psychol., 1959, 43-8.

Buchwald, A. M., Experimental alterations in the effectiveness of verbal reinforcement combinations. J. exp. Psychol., 1959, 351-61.

Buchwald, A. M., Variations in the apparent effects of "right" and "wrong" on subsequent behavior. J. verbal Learn. verbal Behav., 1962, 71-8.

Buss, A., Broden, W., Orgel, A., & Buss, E., Acquicition and extinction with differential verbal reinforcement combinations. J. exp. Psychol., 1956 a 52, 288.

Buss, A., and Buss, E., The effect of verbal reinforcement combinations on conceptual learning. J. exp. Psychol., 1956 b, 52, 283.

Buss, A. & Durkee, A., Conditioning of hostile verbalizations in a situation resembling a clinical interview. J. consult. Psychol., 1958, 22, 415-18.

Buss, A. & Gerjouy, Irma, Verbal conditioning and anxiety, J. abn. & soc. Psychol., 1958, 57, 247-

Cohen, B., Kalish, H., Thurstone, J. & Cohen, E. Experimental manipulation of verbal behavior. J. exp. Psychol., 1954, 47, 106-110.

Cox, F. & Cox, Marjorie, Unconscious reinforcement of a verbal response in children. J. Psychol., 1956, 8, 140-51.

Dixon, T., The effect of pre-experimentally acquired verbal habits upon verbal conditioning. J. Psychol., 1965, 59, 335-41.

Edwards, A., Experimental Design in Psychol. Research., Holt, Rinehart & Winston, N.Y., 1950.

Eysenck, H.J., Personality and verbal conditioning, Psychol. Reports, 1959, 5, 570.

Farley, J. & Hokanson, J., The effect of informational set on acquisition in verbal conditioning. J. verbal Learn. verbal Behav., 1966, 14-17.

Fattu, N. & Mech, E., Resistence to extinction of verbal responses following two patterns of reinforcement. J. gen. Psychol., 1955, 53.

Ferguson, D. & Buss, A., Operant conditioning of hostile verbs in relation to experimental and subject characteristics. J. consult. Psychol., 1960, 24, 324-32.

Ganzer, J. & Sarason, I., Interrelationships among hostility, experimental conditions and verbal behavior. J. abn. soc. Psychol., 1964, 79-84.

Green, E., Concept formation; a problem in human operant condition. J. exp. Psychol., 1955, 49, 175-80.

Greenspoon, J., The reinforcing effect of two spoken sounds on the frequency of two responses. AM. J. Psychol., 1955, 68, 409-17.

Gross, L., Effects of verbal and non-verbal reinforcement in the Rorschach, J. consult. Psychol., 1959, 23, 66-8.

Hartley, H.O., Some recent developments in analysis of variance. Communications on Pure and Applied Mathematics, 1955, 8, 47-72.

Hidum, D. & Brown, R., Verbal reinforcement and interviewer bias. J. abn. & soc. Psychol., 1956, 53, 108-11.

Hull, C. L., A Behavior System, Yale Univ. Press, New Haven, 1952.

Hull, C. L., Essentials of Behavior, Yale Univ. Press, New Haven, 1951.

Hull, C. L., Principles of Behavior, Appleton-Century-Crofts, N. Y., 1943.

Jeffrey, W., New techniques for motivating and reinforcing children. Sci. 1955, 121, 371.

Kanfer, F., The effect of practical reinforcement on acquisition and extinction of a class of verbal responses. J. exp. Psychol., 1954, 48, 424-32.

Kanfer, F., Effect of a warming signal proceeding a naxious stimulus on verbal rate and heart rate. J. exp. Psychol., 1958, 55, 73-80.

Kanfer, F., Verbal conditioning; reinforcement schedules and experimenter influences. Psychol. Rpts., 1958, 4, 443-52.

Kanfer, F., Verbal rate and adjustment ratings in experimentally structured interviews. J. abn. & soc. Psychol., 1959, 58, 305-11.

Kanfer, F. & Karas, Shirley, Prior experimenter-subject interaction and verbal conditioning. Psychol. Rpts., 1959, 5, 345-53.

Kintz, B. L. & Pappas, J., Scaling evaluation of the effectiveness of verbal reinforcers. J. Psychol., 1965, 320-4.

Krasner, L. A., technique for investigating the relationship between the behavior cues of the examiner and the verbal behavior of the patient. J. consult. Psychol., 1958, 22, 364-6.

Krasner, L., Weiss, R. & Ullman, L., Responsivity to verbal conditioning as a function of awareness. Psychol. Rpts., 1961, 8, 523-38.

Krieckhaus, E., & Eriksen, C. A., A study of awareness and its effects on learning and verbalization. J. Persy., 1960, 28, 503---17.

Lachman, R., The rg-sg mechanism. Controversial Issues in Learning. Goldstein, H., Krantz, D., & Rains, E., Appleton-Century-Crofts, N. Y., 1965.

Levin, S., The effects of awareness on verbal conditioning. J. Exp. Psychol., 1961, 60, 61, 67-75.

Mandler, G. & Kaplan, ., Subjective evaluation and reinforcing effects of a verbal stimulus. Sci., 1956, 124, 582-3.

Matarazzo, J., Saslow, G. & Pareis, E., Verbal conditioning of two response classes. J. abn. & soc. Psychol., 1960, 61, 190-208.

McNair, D., Reinforcement of verbal behavior. J. exp. Psychol., 1957, 53, 40-46.

Nuthman, A., Conditioning a response class on a personality test. J. abn. & soc. Psychol., 1957, 54, 19-/.

Philbrick, Emily, & Postman, L., A further analysis of "learning without awareness". AM. J. Psychol., 1955, 68, 117-24.

Rechschaffen, H. & Mednick, S., The autokinetic word technique. J. abn. & soc. Psychol., 1955, 51, 346.

Reynolds, W. & Pavlik, W., Running speed as a function of deprivation period and reward magnitude. J. & Physiol. Psychol., 1960, 615-.

Rogers, J., Operant conditioning in a quasi-therapy setting. J. abn. & soc. Psychol., 1960, 60, 247-.

Ryan, T., Multiple Comparisons in Psychological Research, Psychol. Bull., 1959, 26-47.

Salzinger, K. & Pisoni, Stephanie, Reinforcement of affect responses of schizophrenic during the clinical interview. J. abn. & soc. Psychol., 1958, 57, 64-90.

Salzinger, K. & Pisoni, Stephanie, Reinforcement of verbal affect responses of normal Ss during the interview. J. abn. & soc. Psychol., 1960, 60, 127-.

Sapolsky, A., Effect of interpersonal relations upon verbal conditioning. J. abn. & soc. Psychol., 1960, 60, 241-6.

Sarason, I., Interrelationships among individual difference variables, behavior and psychotherapy in verbal conditioning. (undated article.)

Sidowski, J., Influence of reinforcement on verbal conditioning. J. exp. Psychol., 1954, 48, 355-60.

Siegel, S., Nonparametic Statistics For the Behavioral Sciences. McGraw-Hill Book Co. Inc., N. Y., 1956.

Simkins, L., Effects of experimenter attitudes and type of reinforcement on the conditioning of hostile verbs. J. Persy., 1961, 29, 380-95.

Skinner, B. F., Verbal Behavior. Appleton-Century-Crofts, Inc., N. Y., 1957.

Solley, C. & Long, J., When is "uh-huh" reinforcing? Percpt. & Mtr. Sks., 1958, 8, 277.

Solley, C. & Santos, J., Perceptual learning with partial reinforcement. Percept. & Mtr. Sks., 1958, 8, 183-93.

Spence, Janet, Verbal discrimination performance under different verbal reinforcement combinations. J. exp. Psychol., 1964, 195-7.

Spence, Janet, Lair, C. & Goodstein, L., Effects of different feedback conditions in verbal discrimination learning in schizophrenic and nonpsychiatric subjects. J. verbal Learn. Verbal Behav., 1963, 339-45.

Spence, Janet & Lou, C., Effects of different verbal reinforcement combinations on the verbal discrimination performance of schizophrenics. J. exp. Psychol., 1964, 245-9.

Spence, K., Behavior Theory and Conditioning, Yale Univ. Press, New Haven, 1956, p. 164.

Spence, K.W., A theory of emotionally based drive (D) and its relation to performance in simple learning situations. Am. Psychol., 1958, 131-45.

Spence, K. & Farber, I., Conditioning and extinction as a function of anxiety. J. exp. Psychol., 1953, 116-119.

Spence, K. & Farber, I., The relationship of anxiety to differential eyelid conditioning. J. exp. Psychol., 1954, 47, 127-34.

Spence, K. & Taylor, J., Anxiety and strength of the unconditioned stimulus as determiners of eyelid conditioning. J. exp. Psychol., 1951, 42, 83-8.

Spence, K., Taylor, Janet & Ketchel, Rhoda, Anxiety (drive) level and degree of competition in paired associates learning. J. exp. Psychol., 1956, 52, 306-10.

Spielberger, C., DeNike, I. & Stein, L., Anxiety and verbal conditioning. J. Persy. soc. Psychol., 1965, 229-35.

Spivak, M. & Papajohn, J., The effect of the schedule of reinforcement on operant conditioning of a verbal response in the autokinetic situation, J. abn. & soc. Psychol., 1957, 54, 213-17.

Sullivan, M. & Calvin, A., Further investigating of verbal conditioning. Psychol. Rpts., 1959, 5, 79-82.

Taffel, C., Anxiety and the conditioning of verbal behavior. J. abn. & soc. Psychol., 1955, 57, 496-501.

Taylor, Janet, Drive theory and manifest anxiety. Psychol. Bull., 1956, 53, 303-20.

Taylor, Janet, The relationship of anxiety to the conditioning of eye-lid response. J. exp. Psychol., 1951, 41, 81-92.

Thorndike, E. & Rock, R., Learning without awareness of what is being learned or intent to learn it. J. exp. Psychol., 1934, 1-19.

Timmons, E., Noblin, C., Adams, H. & Butler, J., Generalization of verbal responses following two methods of reinforcement. Am. Psychol., 1961, 16, 404.

Verplanck, W., The control of the content of conversation; reinforcement of statements of opinion. J. abn. & soc. Psychol., 51, 668-76.

Walters, R. and Karal, Pearl, Social deprivation and verbal behavior. J. Persy., 1960, 28-89-107.

Walters, R., Marshall, W., & Shooter, J., Anxiety, isolation and susceptibility to social isolation. J. Persy., 1960, 28, 518-29.

Walters, R. & Ray, E., Anxiety, social isolation and reinforcement effectiveness. J. Persy., 1960, a, 28-358-67.

Weiss, R., The influence of 'set for speed' on 'learning without awareness'. Am. J. Psychol., 1955, 68, 425-31.

Weiss, R., Krasner, L. & Ulman, L., Responsivity of psychiatric patients to a verbal conditioning "success" and "failure" conditions and pattern of reinforced trials. Psych. Rpts., 1963, 12, 423-426.

Weiss, R., Krasner, L. & Ulman, L., Responsivity to verbal conditioning as a function of atmosphere and pattern of reinforcement. Psych. Rpts., 1960, 415-26.

Weiss, R., Ulman, L. & Krasner, L., On the relationship between hypnotizability and response to verbal operant conditioning. Psychol. Rpts., 1960, 59-60.

Wickes, Thomas, Examiner influences in a testing situation. J. Consult. Psychol., 1956, 20, 23-6.

Winer, B. J., Statistical principles in experimental design. McGraw-Hill Book Co., Inc. N. Y., 1962.

Winkel, G. & Sarason, I., Subject experimenter and situational variables in research on anxiety. J. abn. soc. Psychol., 1964, 601-7.

Wilson, W. & Verplanck, W., Some observations on the reinforcements of verbal operants. Am. J. Psych., 1956, 69, 448-51.