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Intolerance of ambiguity and anxiety: physiological reactivity to an unavoidable noxious stimulus

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INTOLERANCE OF AMBIGUITY AND ANXIETY:

PHYSIOLOGICAL REACTIVITY TO AN UNAVOIDABLE

NOXIOUS STIMULUS

A Thesis Presented

By

Lewis Breitner

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Since Frenkel-Brunswick (1948, 1949) introduced the concept of Intolerance of Ambiguity, many investigators have tried to establish both its validity and generality as a personality variable, and its relationship to other personality variables, especially anxiety. The results have been mixed and contradictory. This study further explores the relationship between Intolerance of Ambiguity and anxiety, taking into account certain methodological difficulties in previous work.

Brim and Hoff (1957) attempted to correlate various measures of desire for certainty (i.e., intolerance of ambiguity). Operationally, desire for certainty referred to the extremeness of responses on several attitude and judgment instruments, and scores on a specially constructed test of desire for certainty. The latter consisted of estimates of the probability of various events and of certainty ratings for the estimates. Responses were scores for the tendency to make estimates approaching 0 or 100%, and to claim high certainty for these. Significant correlations were obtained between response extremity and test scores, indicating that individual differences in desire for certainty were consistent over different measures.

Messick and Hills (1960) constructed objective personality tests for two aspects of Intolerance of Ambiguity; the tendency to reach perceptual closure quickly, and the tendency to form generalizations on the basis of specific information. Reliability was adequate on both measures. Scores on both tests correlated significantly, providing evidence for the construct validity of Intolerance of Ambiguity. The authors were guarded in this conclusion, and offered a possible alternative construct.

Rushlau (1957) studied Tolerance of Ambiguity as a personality trait. He defined it as the capacity to endure and deal with situations and relationships whose structure was not clear.

He hypothesized that: 1) Subjects differentiated on the Berkeley Questionnaire for Intolerance of Ambiguity would show concomitant variation on a series of tasks believed to be related to Intolerance of Ambiguity; 2) Manipulation of the degree of ambiguity in instructions for the performance of a series of tasks would produce differences in the performance of those tasks. The experimental tasks included an art preference task, a generalization task, a figure-relationships task, and a problem-solving task. Significant differences were found between ambiguity-tolerant and ambiguity-intolerant subjects on all but the first task. Instructions affected figure-relationships and problem solving. Rushlau took these results as evidence for the existence of Intolerance of Ambiguity as a personality trait.

Martin (1954) measured Intolerance of Ambiguity in an interpersonal situation by counting the number of questions asked by subjects in attempting to clarify ambiguities in the situation. He correlated this measure with scores on three perceptual tasks. Only scores on the Aniseikonic Illusion correlated significantly. (This illusion refers to the apparent tilting of a horizontal surface around a vertical axis.)

Kenny and Ginsberg (1958) tested the construct validity of several measures of Intolerance of Ambiguity. Seventy-six female subjects were given 13 tests of Intolerance of Ambiguity and an authoritarianism-submission scale. Only 7 of 66 correlations were significant at the .05 level, with 2 being opposite to the predicted direction. No measure correlated with the authoritarianism scale.

Bogen (1962) studied the construct validity of Intolerance of Ambiguity as well as its relationship to adaptation to anxiety. Positive and negative adaptive responses to anxiety were measured by the Jewell Anxiety Adaptation Scale (AAS). Anxiety was measured by the Taylor Manifest Anxiety Scale (Taylor, 1953) which was given to 317 female subjects. The 50 highest scoring and the 50 lowest scoring subjects were asked to fill out the AAS. Subjects were then divided into 4 groups of 15 each. These were High TMAS-High AAS, High-Low, Low-High, and Low-Low. Intolerance of Ambiguity was defined using 4 different measures. Bogen hypothesized that High-Low subjects would be more intolerant of ambiguity than Low-High subjects, and that all 6 measures would have a significant degree of variance in common. No significant differences were found, arguing against the construct validity of Intolerance of Ambiguity, and against the existence of a relationship between Intolerance of Ambiguity and anxiety.

Wolff (1955) studied the relationship between certainty and anxiety. He defined subjective certainty as the degree of consciously experienced conviction, and behavioral certainty as the amount of information requested before making a choice. Certainty was hypothesized as showing an inverse relationship to anxiety. He gave 60 female subjects 3 learning tasks, and derived subjective and objective certainty scores from each. Anxiety was measured using the Anxiety Scale from the MMPI. Wolff found no evidence for the generality of certainty as a concept, and no relationship between certainty and anxiety.

Davids (1955) intercorrelated authoritarianism, Ego-Structure, anxiety, academic achievement, reactions to ambiguous visual stimuli, and reactions to ambiguous auditory stimuli. There were no significant correlations between reactions to ambiguous stimuli and any other variables.

Blood (1961) explored the relationship between anxiety and ambiguity tolerance in a situation involving variation in the level of ambiguity of a visual stimulus. Low, medium, and high anxious subjects were selected using the Taylor Manifest Anxiety Scale. Tolerance of ambiguity was measured using the Ambiguous Figures Test, a series of 16 projected figures presented at various levels of focus. The focus setting at which a subject made his first guess determined the ambiguity-tolerance score. An inverse relationship between anxiety and ambiguity-tolerance was predicted. The results were negative, and Blood concluded that anxiety and tolerance of ambiguity were not related in a non-stress situation.

On the positive side, Siegel (1954) considered several variables as correlates of authoritarianism, including manifest anxiety as measured by the Taylor Scale, and intolerance of cognitive ambiguity, as measured by a specially designed test, which required matching statements with pictures of people who could have made them. Both anxiety and Intolerance of Ambiguity were highly correlated with authoritarianism as measured by the Ethnocentrism-Fascism Scale developed by Adorno (Adorno _et al._, 1950). Siegel concluded that anxiety and Intolerance of Ambiguity were related, and that both were aspects of the broader concept of authoritarianism.

Hamilton (1957) administered a battery of tests designed to elicit differential responses to a variety of ambiguous situations. His subjects were a group of psychiatric patients diagnosed as neurotic, and a control group. The

Neurotic group was divided into Anxiety Syndromes, Conversion Hysterics, and Obsessionals. He found marked individual differences, and considerable evidence for individual consistency in avoidance/non-avoidance of ambiguous situations. A high percentage of significant correlations suggested that the tests measured a few, closely related variables. As a group, neurotics avoided ambiguity significantly more than the Controls. Hamilton concluded that avoidance of ambiguity serves to reduce anxiety and conflict.

Smock (1957) gave junior high school students a decision-location task, a measure of response perseveration (generalization), and a recognition test for mutiliated pictures (perceptual closure). Early and late responders on the decision-location test showed significantly more generalization and faster perceptual closure than a middle group. Smock took this as support for the hypothesis that anxiety is an important determinant of Intolerance of Ambiguity, since response perseveration and perceptual closure are functional properties of anxiety.

In a related study, Smock (1955) tested the following hypotheses:

1) People under psychologically stressful conditions tend to become intolerant of ambiguity, i.e., in an ambiguous situation, they would be likely to make some response before enough information is available for a more appropriate response;

2) Experience in the situation would result in a decline in intolerance of ambiguity and in anxiety, due to the learning of relevant cues, as measured by the trial of first response. Eighty subjects were divided into a "stress" group, and a "security" group. In the stress group, a feeling of failure was induced by E's rejecting behavior, while in the security group a warm atmosphere prevailed, emphasizing that the experimental task was being studied. The task involved 5 series of 15 pictures of increasing clarity. Subjects were required to organize the partially structured stimuli into a complete picture to get the right answer. The dependent measures were the trial of first response, and the trial of correct response. The results showed a strong but non-significant trend in the predicted direction for the first hypothesis. The second hypothesis was confirmed in the secure group but not in the stress group. Smock concluded that the results supported the existence of a weak relationship between Intolerance of Ambiguity and anxiety.

Dibner (1958), viewing anxiety as a momentary trait rather than as a personality variable, studied its relationship to the presenting situation as objectively measured, and as subjectively perceived by the person. Forty neuropsychiatric patients were given clinical evaluative interviews by 4 interviewers. In half the interviews, the interviewer gave few clues to guide the patient (Ambiguous Condition). In the others, he took an active part in guiding the discussion (Structured Condition). All interviews were recorded, and Skin Conductance was measured. Subjects were then asked about their reactions to the talks.

Two measures of structuredness were obtained; a measure of the structuring qualities of the interviewer's behavior, and a rating of the subject's perception of the interview as analyzed from his post-interview report. The anxiety measures used were changes in Skin Conductance, ratings of anxiety by a clinical judge, subjects' self-report of tension by means of an adjective checklist, and two indices of disturbed speech. Each anxiety measure showed a significant relationship to objectively measured structure, except Skin Conductance. Two of the five showed significant relationships to subjectively perceived structure (Skin Conductance being one). Dibner concluded that anxiety can be manipulated by varying the amount of structure in a situation.

In an interesting field study, Hudson (1965) subjected college students, in an otherwise normal classroom situation, to sounds which were ambiguous in their origins, meaning, and implications. Intermittent sounds of fire equipment and aircraft were presented over a 25 minute period. The data consisted of post-experiment interviews and questionnaires, motion pictures, and ongoing observer recordings. Common interpretations were war, fire, and threat of war. Anxiety was a very typical response, and was correlated with, among other things, suggestibility, and need for organization. These results support the existence of a relationship between Intolerance of Ambiguity and anxiety.

In a study with 1000 subjects, Soueif (1958) gave a Personal Friends Questionnaire to various groups of Egyptians. Extreme response scores were obtained by counting the number of most extreme responses assigned by each subject. Soueif hypothesized that those social groups with a higher assumed level of tension would earn a higher extreme response score than those with a lower tension level. (He gave a detailed explanation of the sociological basis for each of the assumptions of tension level.) Independent variables were age, sex, membership in a religious minority, and socioeconomic status. All the predictions were confirmed.

Dittes (1961) studied the effects of feelings of failure on impulsive closure. He hypothesized that failure should induce closure only among persons with low self-esteem, because those with high self-esteem would be less threatened, i.e., anxious. Subjects were graduate Divinity students. After having filled out a self-esteem questionnaire, subjects took the Space-Relations Test, with either ego-involving or non-involving instructions. They were then given either "success", or "failure" feedback. He then had them interpret or explain an incoherent story written in biblical style, and also write impressions of persons described by a list of adjectives, some of which were inconsistent. The story was scored according to previously determined criteria. The results showed that ego-involved low self-esteem subjects found positive meaning in the passage, and based their impressions of the people on prominent traits, ignoring inconsistencies. High self-esteem subjects weren't affected by the instructions. Dittes concluded that anxiety and impulsive closure were related.

Brown (1953) tested the hypothesis that a relationship between rigidity and authoritarianism would hold only under stressful, i.e., anxiety-arousing, conditions. As in Dittes' study, the independent variable was the ego-involving nature of the testing atmosphere. He gave subjects the California F-Scale (authoritarianism), the Einstellung arithmetic problems (rigidity), and McClelland's projective measure of need for achievement. There was a significantly greater correlation between authoritarianism and rigidity in the ego-involved group than in the relaxed group. Also, both dependent variables were associated with anxiety about achievement in the former group, while only authoritarianism was associated with anxiety in the latter group. Brown concluded that the "same" measure of rigidity will yield different results, depending on the tension in the experimental situation.

Berlyne (1960), after reviewing the literature, concluded that ambiguity is related to anxiety, and intolerance of ambiguity is related to difficulty in dealing with anxiety. Berlyne further states that anxiety and ambiguity both contribute to increased arousal.

Budner (1962), agreeing with Berlyne, defines Intolerance of Ambiguity as the "tendency to perceive (i.e., interpret) ambiguous situations as sources of threat", while tolerance is "the tendency to perceive ambiguous situations as desirable" (p. 28). Budner adds that those tolerant of ambiguity should in fact find highly structured situations threatening.

One factor which seems to differentiate those studies showing positive from those showing negative results is the amount of stress they attempt to induce in the subject. Those studies showing negative results (Blood, Bogen, Davids, Wolff) used either the Taylor Scale or the MMPI anxiety scale to measure dispositional anxiety, and did not attempt to induce anxiety during the experiment. Those with positive results attempted to induce varying amounts of stress. As Brown has shown, intolerance of ambiguity may be manifested only under stressful conditions. If intolerance of ambiguity is viewed as a protective mechanism in a person's behavioral repertoire which is utilized to avoid the anxiety produced by ambiguity, then both a stimulus and a response must be available for the behavior to occur. If the person cannot avoid the anxiety by structuring the situation, then some anxiety response should be manifested. If a situation is not a source of threat, Intolerance of Ambiguity is not a probable response.

Another source of difficulty in previous research relates to the measurement of anxiety. As stated above, virtually all measures of anxiety (with a few minor exceptions) were "paper and pencil", self-report measures. While these are valuable techniques, they tap only conscious responses, and only verbal ones. As Epstein (1967) has pointed out, emotions have verbal, gross motor, and physiological components. Of the studies cited above, only Dibner's employed a physiological measure, and then only one, out of five measures of anxiety.

The present study examined the relationship of several physiological indices of anxiety, specifically Heart Rate, Skin Conductance, and Galvanic Skin Response (GSR), and Intolerance of Ambiguity as a personality variable revealed in attitudes towards ambiguous situations.

Several investigators have used a paradigm consisting of a countup to a noxious stimulus, introduced by Deane and Zeamon (1958) to study anxiety. This paradigm allows one to vary the nature of the stimulus, its occurrence or non-occurrence, and its time of occurrence, in addition to many other variables. This study varied ambiguity in terms of the amount of information available to the subject about the occurrence or non-occurrence of a noxious stimulus.

The following hypotheses were derived from the above review:

1) Subjects high in intolerance of ambiguity show greater arousal in an ambiguous than in an unambiguous condition;

2) Subjects low in intolerance of ambiguity show greater arousal in an unambiguous than in an ambiguous condition;

3) In an ambiguous condition, subjects high in intolerance show greater arousal than those low in intolerance;

4) In an unambiguous condition, subjects low in intolerance show greater arousal than those high in intolerance;

5) Those moderate in intolerance of ambiguity fall between Highs and Lows in arousal, in both ambiguous and unambiguous conditions, and show greater arousal in the former condition.

In this experiment, increased arousal was indicated by an increasing Heart Rate, Skin Conductance, and size of GSR, except in one special case (Anticipatory Deceleration).

6) Those high in intolerance manifest greater anxiety on a measure of dispositional anxiety, than those low in intolerance, with a moderate group falling in between.

METHOD

Subjects

Two-hundred fifty potential subjects filled out the Budner Intolerance of Ambiguity Scale (Budner, 1962), a 16-item Lickert-type scale, which is intended to tap attitudes towards ambiguous situations (see Appendix IV).

In the present study, 16 subjects scoring 34 or below, 16 scoring 40-50 inclusive, and 16 scoring 56 or greater (representing the lowest, middle, and highest 7%), were considered to be relatively low (L), moderate (M), or high (H), respectively, in intolerance of ambiguity.

All were male undergraduates at the University of Massachusetts. Subjects were volunteers, and were paid $2.00 each. Their mean age was 20.0. Fifty-four subjects were run, 6 being eliminated due to equipment failure or procedural error.

Apparatus

A Beckman Type RN Dynograph was used. Heart rate was recorded directly with Beckman Bio-Potential Skin Electrodes, Telectrode paste, and a Beckman Type 9806 A A-C coupler, and was simultaneously converted to Beats Per Minute (PBM) using a Type 9857 Cardiotachometer coupler. The electrodes were placed approximately 2 inches below each pectoral muscle, and slightly to the side.

Galvanic Skin Response (GSR) was measured using 2 Beckman electrodes (are exposed to skin = 2.75 sq. mm./electrode), and Beckman Offner Paste. Phasic responses were measured in micromhos conductance (mmhos) with a Beckman Type 9842 GSR coupler. Basal conductance was recorded on a separate channel using a Type 9806A A-C coupler. The electrodes were placed on the palm of the right hand, ½ inch apart.

A 108 db. "white noise" sound, .5 second duration, produced by a Grason Stadler Model 901B Noise Generator, was the noxious stimulus.

The subject (S) was seated in a reclining chair in an AIC soundproof room. The room contained an electric counter which faced S, a two-way intercom, and a speaker through which the sound was delivered. The timing of experimental events was controlled by a series of relays and timers located in the adjacent control room.

Procedure

The experimental session took place within 2 weeks of each S's pre-screening. Within each experimental group, Ss were alternately assigned to either an ambiguous (A) or an unambiguous (U) condition. Eight Ss from each group were in Condition A, and eight were in Condition U. Event ambiguity was varied, holding time ambiguity constant.

The experiment proper consisted of five trials. Each trial consisted of a countup from 0-12, with a 15 second interval between each count (i.e., stimulus). The schedule for all _Ss_ was:

Trial	Event
Practice	No Sound
1	Sound @ 8
2	No Sound
3	No Sound
4	Sound @ 8
5	Sound @ 8

There were three significant aspects of the situation that _S_ could know; 1) the nature of the sound; 2) whether or not he would receive a sound on any given trial; 3) if so, when it would occur.

For Trials 1-5, subjects in condition A were not told whether or not they would hear the sound on any given trial, although they knew when it would occur, if it did occur. Subjects in condition U were told whether they would or would not receive the sound on any given trial, in addition to being told when it would occur. Thus on Trial 1, _Ss_ in A knew only the time of possible occurrence, while those in U knew both the time of occurrence and whether the noxious sound would occur at all. By Trial 5, _Ss_ in A knew the nature and time of the possible stimulus, while those in U knew all the relevant aspects of the situation.

The subject was seated in the soundproof room, and E pointed out the intercom, counter, and speaker, and questioned S as to the presence of any hearing difficulties. The electrodes were then attached. A writing board and a subjective loudness rating scale were placed across S's lap, and he was instructed to use his left hand only to check the rating scale. E cautioned S against excessive movement, and then entered the control room to calibrate the instruments. The following instructions were then read to S:

> Condition A - "This experiment consists of several trials. Each trial consists of a countup from 0 to 12. On each trial the indicator in front of you will count off the numbers at 15 second intervals, starting at 0. There will be a slight click on the indicator each time a number appears.
>
> On any given trial you may or may not hear a single blast or noise. If you do hear the blast, it will only occur on number 8; never on any other number. It will be the same loudness each time you hear it. The counter will reset to 0 at the end of each countup, and there will be a slight pause between trials.
>
> On those trials on which the sound occurs, please mark the appropriate place on the loudness rating scale in front of you, after the end of the countup. Please don't mark the scale during the countup. Wait until number 12 appears. Do you have any questions? We'll now run one practice to familiarize you with the situation. There will be no sound blast on this trial."
>
> Condition U - "This experiment consists of several trials. Each trial consists of a countup from 0 to 12. On each trial the indicator in front

> of you will count off the numbers at 15 second intervals, starting at 0. There will be a slight click on the indicator each time a number appears.
> On any given trial you may or may not hear a single blast of noise. If you do hear the blast, it will only occur on number 8; never on any other number. It will be the same loudness each time you hear it. I will tell you before each trial whether or not you will hear the sound on that trial. The counter will reset to 0 at the end of each countup, and there will be a slight pause between trials. On those trials on which the sound occurs, please mark the appropriate place on the loudness rating scale in front of you, after the end of the countup. Please don't mark the scale during the countup. Wait until number 12 appears. Do you have any questions? We'll now run one practice trial to familiarize you with the situation. There will be no sound blast on this trial."

After any questions were answered, the experiment was run through Trial 5, with E verbally signalling the start of each trial.

Preference Request

After Trial 5, S was told that he would receive one more sound, but that he could choose the manner in which he would receive it. The choices were: 1) in a countup on number 8; 2) by complete surprise; 3) by "Ready, Set, Go". The aim was to allow S to choose the level of time ambiguity he preferred, surprise being the most ambiguous, and the countup being least so. The order of presentation of choices was counterbalanced. No sound was given.

One last countup was then run, during which no sound was given. This control trial was run in order to relax the subject, and to indicate the apparent end of the experiment to the subject. After the control trial, S was told that the experiment was over, and that E would join him momentarily. Thirty to forty seconds later S received a surprise sound, the purpose of which was to study the effects of differential experience on Ss' reaction to a completely unexpected stimulus.

After the surprise, E apologized and removed the electrodes. The subject then filled out the E-F Manifest Anxiety Scale, which is a modification of the Taylor Manifest Anxiety Scale. (For a detailed description of the E-F scale see Appendix IV, Fenz & Epstein, 1965 and Fenz, 1967.)

Post-experiment Interview

After filling out the E-F Scale, S was then asked to describe his reactions to the sound, to the situation in general, and to the various countups. The subject was also asked whether he would have preferred to be in the Ambiguous or Unambiguous Condition after the difference between the two was described. The interview ended with a thorough explanation of the experiment.

RESULTS

Each trial consisted of a countup from 0-12. Each count in each countup was regarded as a stimulus with a 15 second inter-stimulus interval. Only the post-stimulus intervals for Stimuli 1, 4, 7, 8, 9, 10, and 11, on Trials 1 and 5, were considered. Stimuli 1, 4, and 7 constituted the Anticipatory Phase; Stimulus 8 was the Impact Stimulus, on which the sound occurred, and 9, 10, and 11 were the Recovery Phase.

Heart Rate

Heart Rate was measured by recording the fastest beat in the first 5 seconds after each of the above stimuli (and in the last 5 seconds before Stimulus 8). Heart Rate was recorded in Beats Per Minute (BPM).

In addition, Lykken's (1966) Range-Correction for individual differences was applied to the data. Lykken has shown (1966, 1971) that conflicting and confusing results caused by tremendous individual variability in psychophysiological reactivity can be made more orderly and understandable by the application of his Range-Correction, which removes the effects of individual variability.

Anticipatory Phase. A 3 X 2 X 2 X 3 Anova was done comparing Groups, Conditions, Trials, and Stimuli 1, 4, and 7. The data consisted of the fastest beat in the period described above. There was a significant Groups X Trials X Stimuli interaction ($F = 3.89$; $p < .01$, 4/84 df). Figure 1 shows that on Trial 1 all groups showed little change from

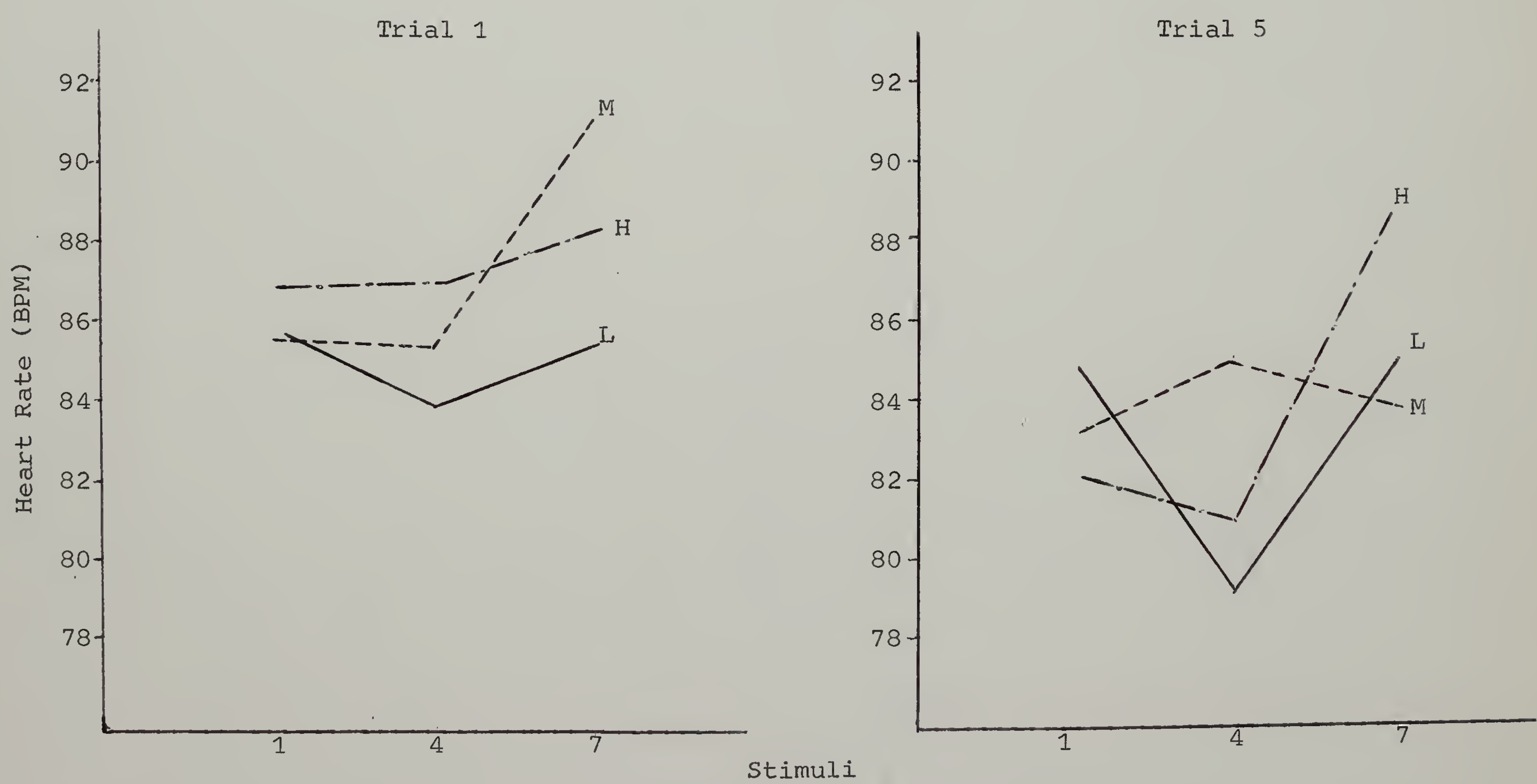


Figure 1. Heart Rate During the Anticipatory Phase As a Function of Groups, Trial, and Stimuli

Stimulus 1 to 4, and a rise in Heart Rate from 4 to 7, with the Moderate group showing the greatest increase. Figure 1 and Figure 2 show that by Trial 5 the Moderate group showed a shift in peak Heart Rate from just before Impact, backwards in time to the middle of the Anticipatory Phase, while the other groups did not show this shift.

Anticipatory Deceleration. Several recent studies of anxiety (Obrist, Wood, & Perez-Reyes, 1965; Zeamon & Smith, 1965; Epstein & Clarke, 1970) have found that an anticipatory Heart Rate deceleration develops just prior to Impact, with repeated trials. In order to analyse this deceleration, a 3 X 2 X 2 X 2 Anova was done comparing Groups, Conditions, and Trials, on the fastest beat in the 5 second post-Stimulus 7 and pre-Stimulus 8. For this phase, increased arousal was indicated by a decrease in Heart Rate. As can be seen in Figure 3, an overall anticipatory deceleration occurred ($F = 6.93$; $p < .02$, 1/42 df). However, no other significant effect was found.

Impact Phase. The Impact effect was analysed in two ways. A 3 X 2 X 2 X 2 Anova was done comparing Groups, Conditions, and Trials on the fastest beat within 5 seconds post-Stimulus 7, and the fastest beat within 5 seconds post-Stimulus 8. A similar Anova was done comparing pre-8 and post 8.

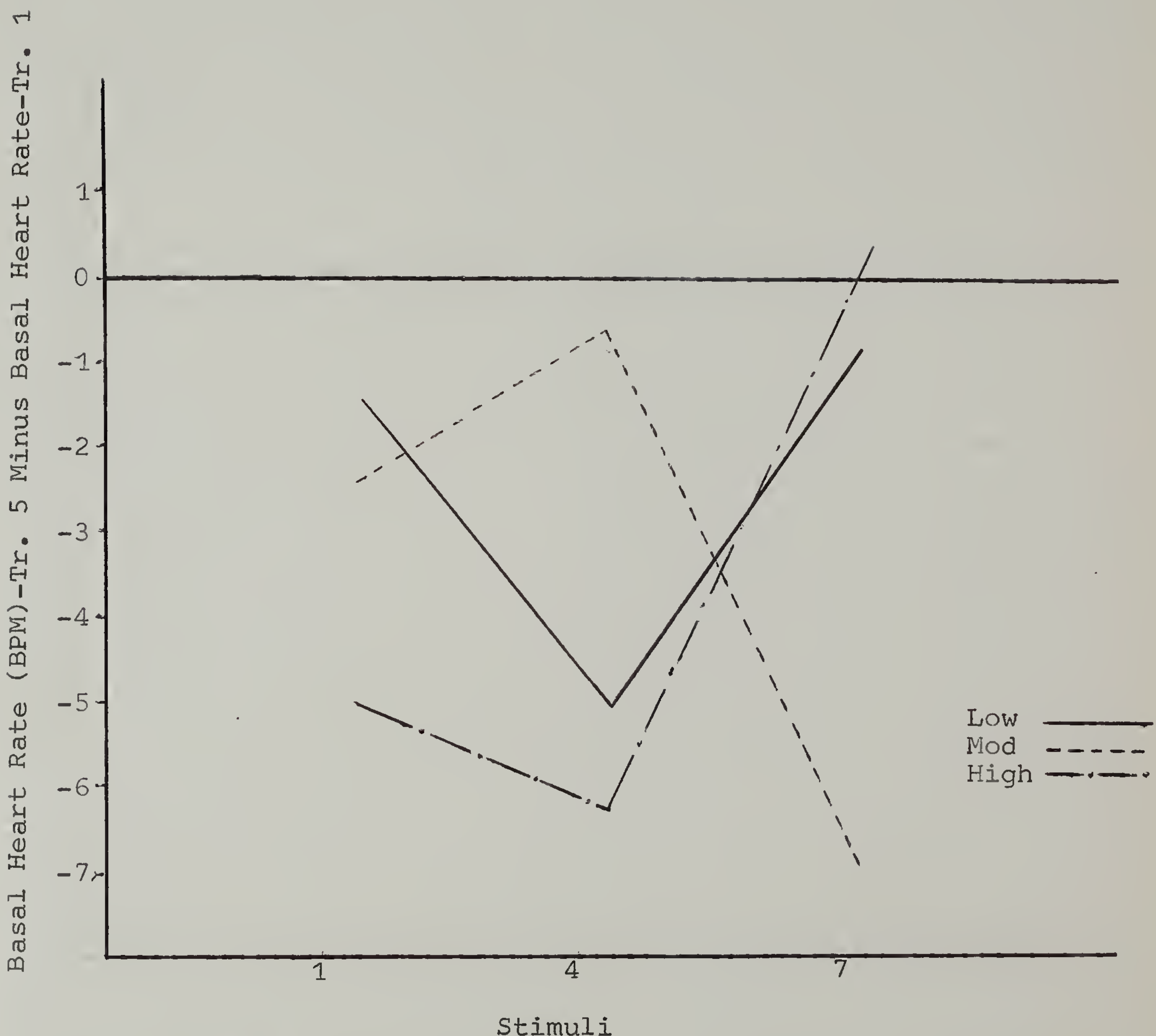


Figure 2. Heart Rate-Trial 5, Minus Heart Rate-Trial 1, as a Function of Groups and Stimuli, During the Anticipatory Phase

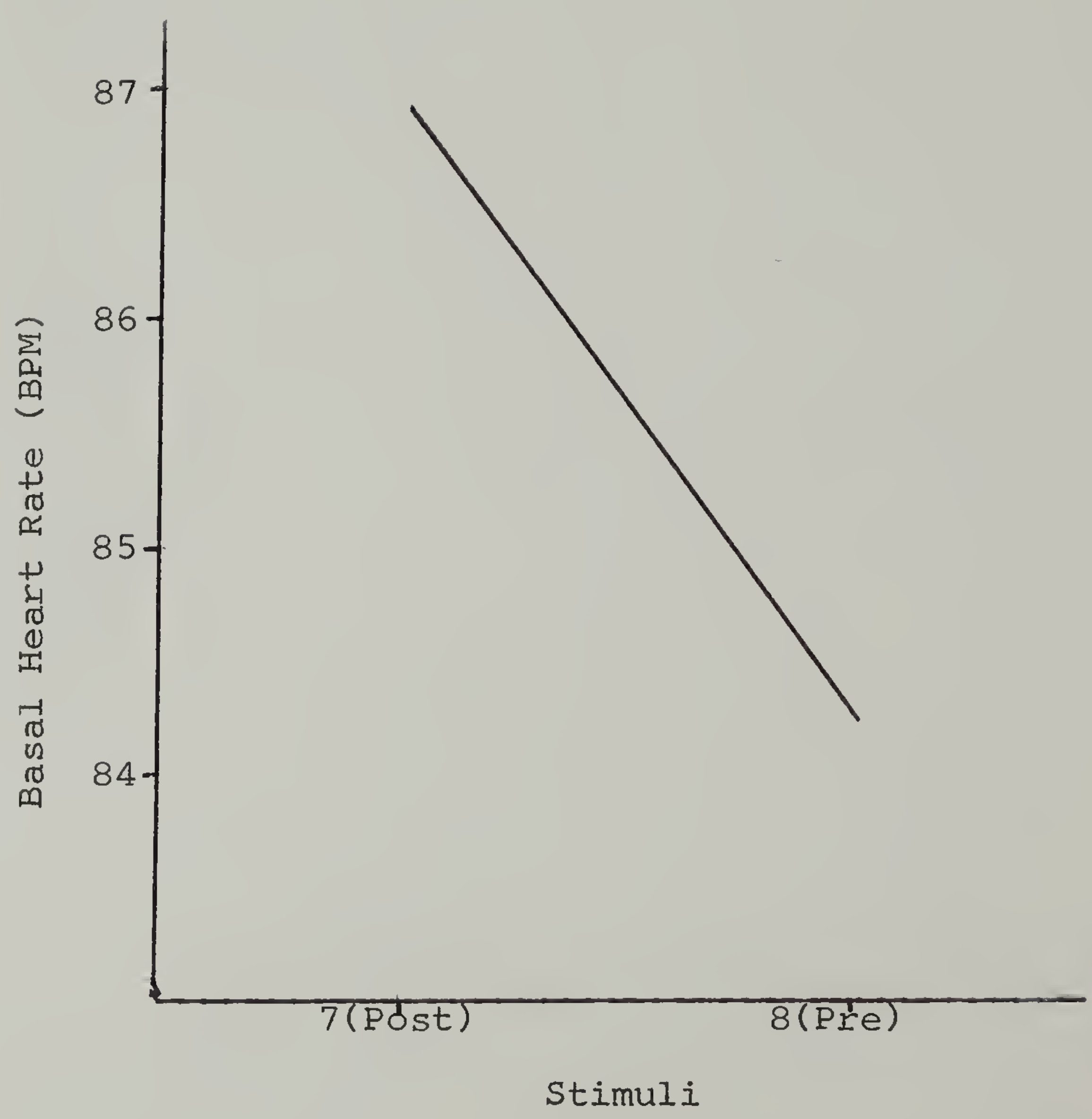
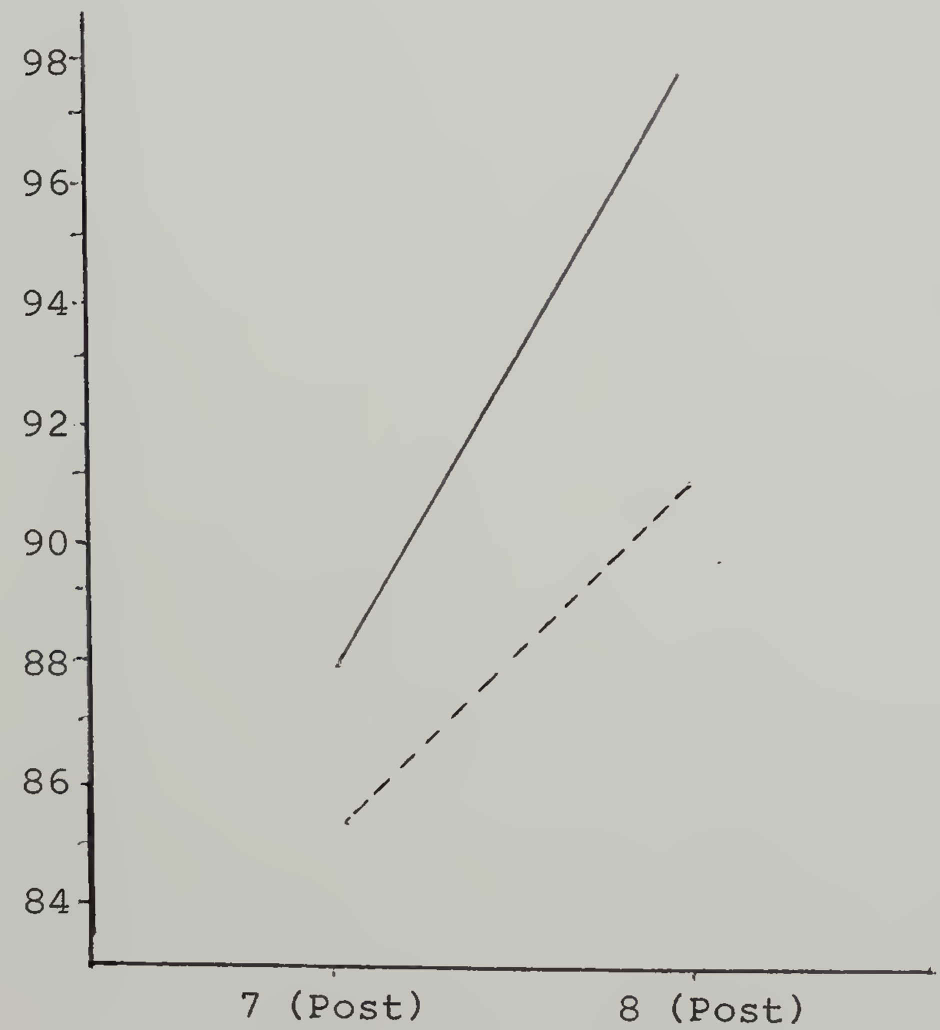


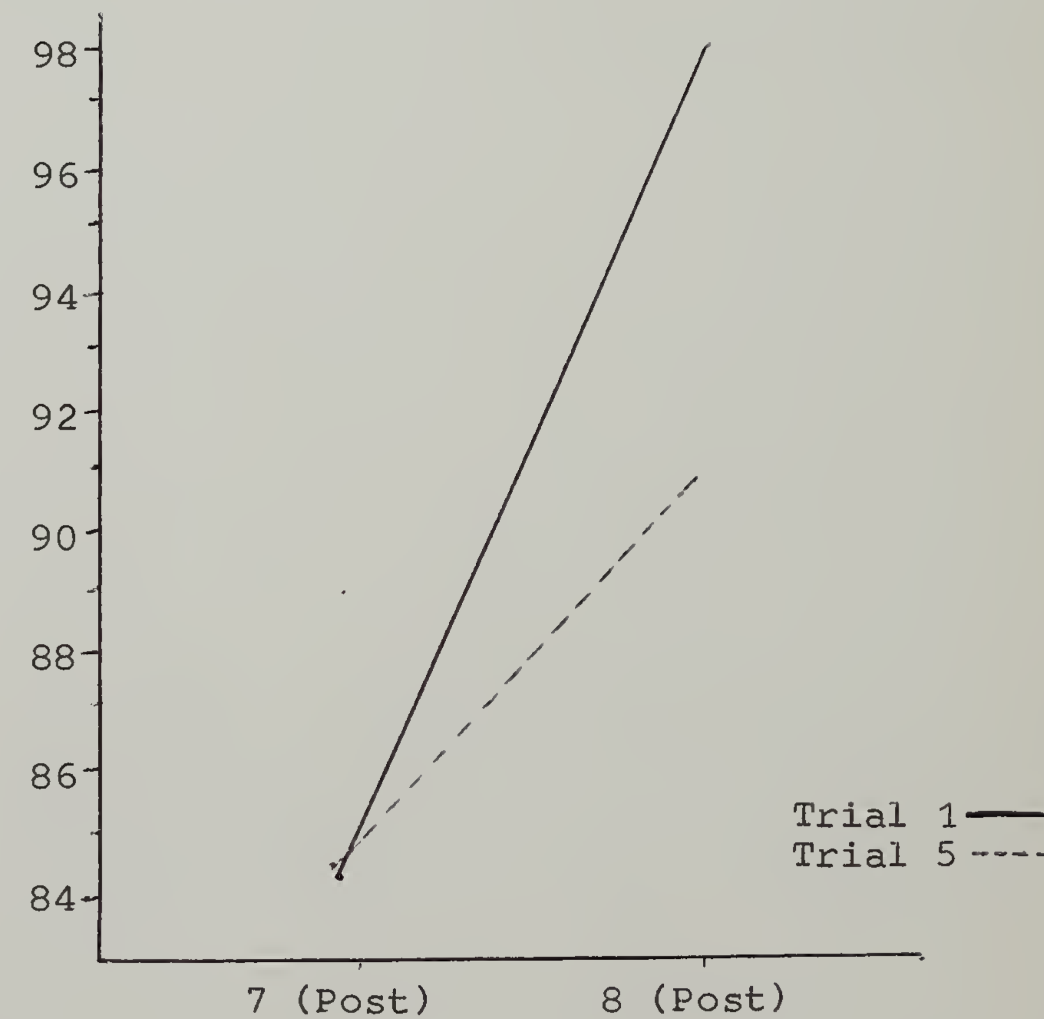
Figure 3. Heart Rate (Anticipatory Deceleration) Prior to Impact for All Subjects, Trial 1 and Trial 5 Combined

The only significant effect for the first Anova was a Trials X Stimuli interaction ($F = 5.42$; $p < .025$, 1/42 df). As can be seen in Figure 4 the Impact effect on Trial 1 was a 10.1 BPM increase in Heart Rate. On Trial 5, the Impact effect dropped to a 5.5 BPM increase.

The second Anova also showed a Trials X Stimuli interaction ($F = 14.20$; $p < .001$, 1/42 df). Figure 5 shows that on Trial 1 the Impact effect was a 13.9 BPM increase in Heart Rate, while on Trial 5, it was only a 6.6 BPM increase. Thus, both Figure 4 and Figure 5 indicate that regardless of experimental conditions, subjects developed a marked habituation in Heart Rate to the Impact Stimulus from Trial 1 to Trial 5. None of the hypotheses was confirmed in the Impact Phase.

Recovery Phase. A 3 X 2 X 2 X 2 Anova was done comparing Groups, Conditions, Trials, and Stimuli 9, 10, and 11 on the fastest beat within 5 seconds post-stimuli. The only significant effect was a Trials X Stimuli interaction ($F = 4.33$; $p < .05$, 2/84 df). As can be seen in Figure 6, there was an overall decrease in Heart Rate during the Recovery Phase, from Trial 1 to Trial 5, as well as a general decrease within each trial. The decrease over trials was similar to that for the Impact Phase, and indicates a general habituation effect. None of the hypotheses was confirmed in the Recovery Phase.





Stimuli

Figure 4. Heart Rate As a Function of Pre, Post Impact and Trials

Figure 5. Heart Rate As a Function of Pre, Post Impact and Trials

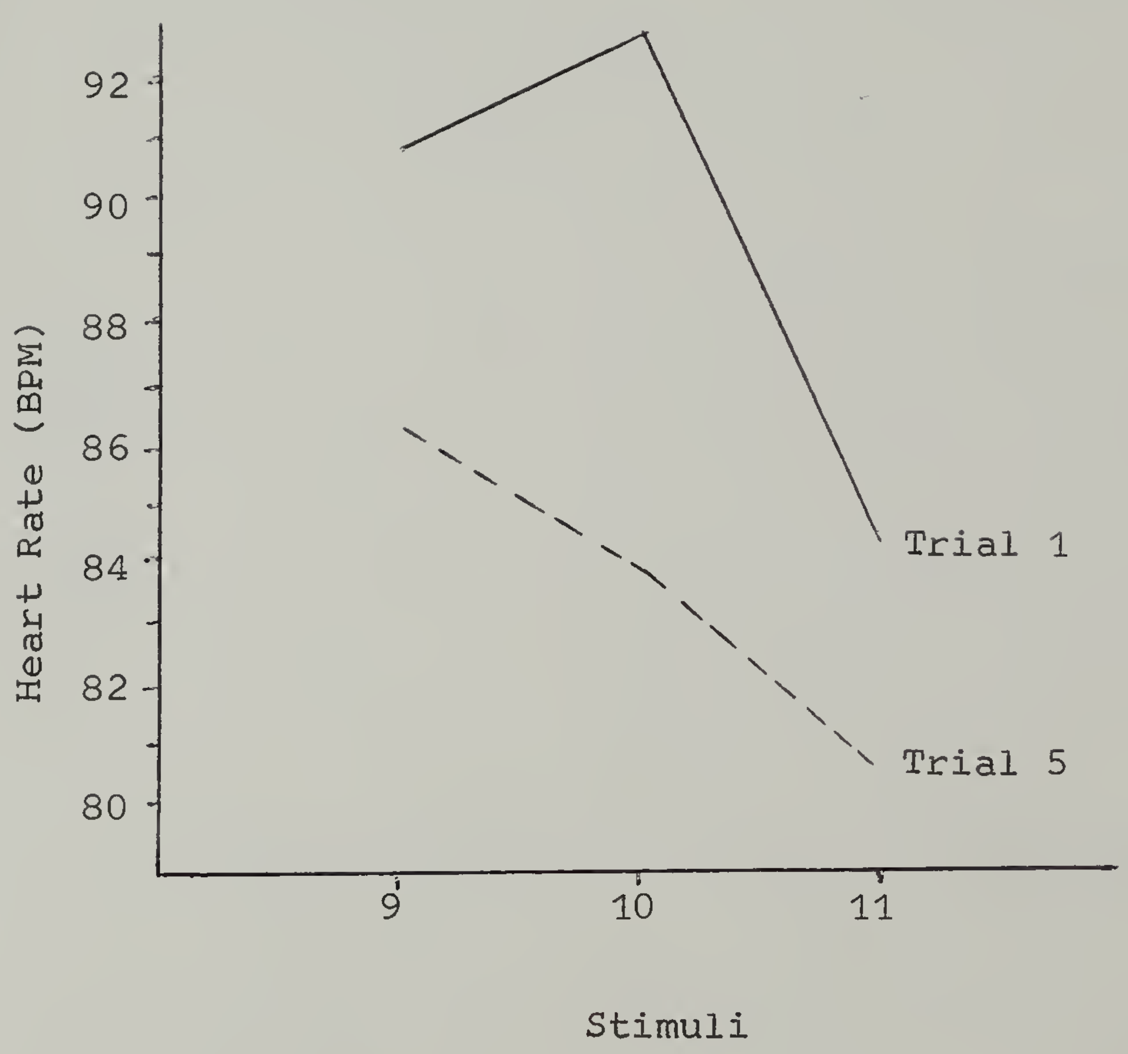


Figure 6. Heart Rate During the Recovery Phase As a Function of Trials and Stimuli

Surprise Stimulus. The Surprise Stimulus was analysed in the following ways: 1) A 3 X 2 X 2 X 2 Anova comparing Groups, Conditions, Trial 5, and the Surprise, on the fastest beat within 5 seconds pre and post-stimuli; 2) A 3 X 2 X 2 Anova comparing Groups and Conditions, on the fastest beat within 5 seconds pre and post-Surprise.

For the first Anova, other than a strong pre, post-Impact effect pooled over trials ($F = 45.21$; $p < .001$, 1/42 df), there were no significant findings. The same was true for the second Anova ($F = 22.98$; $p < .001$, 1/42 df). None of the hypotheses was confirmed. (See Appendix III for the complete Heart Rate Anovas.)

Heart Rate, Range-Corrected

The formula for the Lykken Range-Correction, for any given subject, is $p = \frac{p_{ix} - p_{(min)}}{p_{i(max)} - p_{i(min)}}$; p_{ix} = Raw Score.

The range-corrected scores were multiplied by 100 to remove the decimal points. All Anovas were identical to those for the uncorrected data.

Anticipatory Phase. The results were the same as those for the uncorrected data. The only significant effect was a Groups X Trials X Stimuli interaction ($F = 3.56$; $p < .01$, 4/84 df). The curve forms were the same as those for the uncorrected data (see Figure 1).

Anticipatory Deceleration. The only significant effect was a Groups X Conditions X Stimuli interaction ($F = 3.63$; $p < .05$, 2/42 df). This effect did not occur with the uncorrected data. As can be seen in Figure 7, both the Moderate and High groups showed an anticipatory deceleration in the Ambiguous condition, with the High group showing a marked decrease in Heart Rate. The Low group showed a slight increase in Heart Rate.

In the Unambiguous condition, the Low and Moderate groups showed mild decelerations, while the High group showed a slight increase. Thus, in Condition A, the High group was the most reactive just prior to Impact, with the Low group being least reactive. In Condition U, the High group showed a complete reversal to low reactivity, the Moderate group was slightly less reactive, and the Low group was more reactive, showing a mild deceleration. These results tend to confirm the first 5 hypotheses.

Impact Phase. For the first Anova, the results were identical to those for the uncorrected data. The only significant effect was a Trials X Stimuli interaction ($F = 4.88$; $p < .05$, 1/42 df). The curve forms were the same as those for the uncorrected data (see Figure 4).

For the second Anova, the results were again identical to those for the uncorrected data. There was a Trials X Stimuli interaction ($F = 12.56$; $p < .001$, 1/42 df). The curve

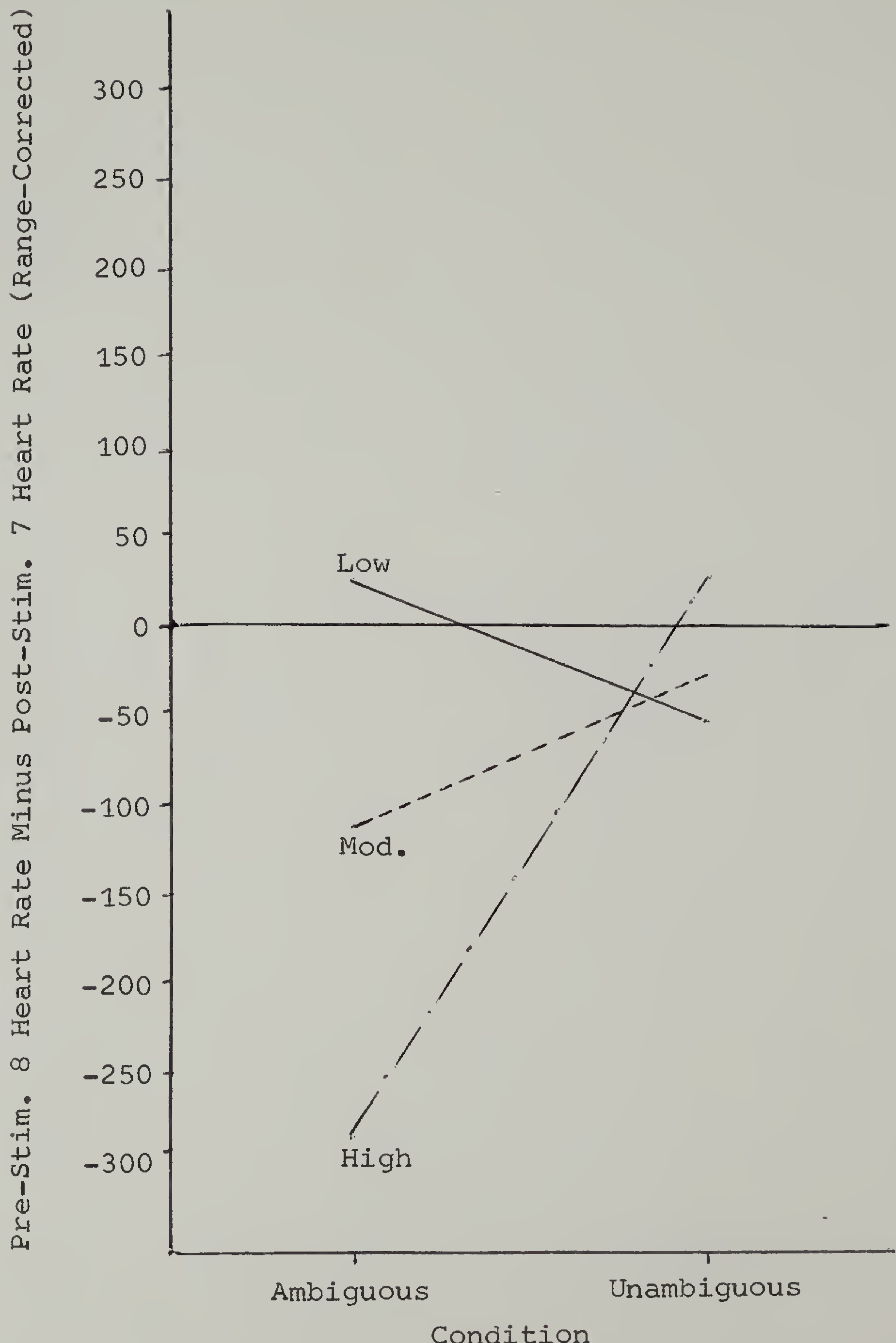


Figure 7. Heart Rate Pre-Stimulus 8 Minus Heart Rate Post-Stimulus 7 (Range-Corrected), As a Function of Groups and Conditions, During Anticipatory Deceleration

forms were the same as those for the uncorrected data (see Figure 5). No hypotheses were confirmed.

Recovery Phase. The results for the Recovery Phase were the same as those for the uncorrected data. There was a Trials X Stimuli interaction ($F = 5.89$; $p < .01$, 2/84 df). The curve forms were the same as those for the uncorrected data (see Figure 6). No hypotheses were confirmed.

Surprise Stimulus. The first Anova showed a strong Trials X Stimuli interaction ($F = 12.56$; $p < .001$, 1/42 df). This effect did not occur with the uncorrected data. Figure 8 shows that Range-Corrected Heart Rate increased from pre to post-Impact on both Trial 5 and the Surprise, but the increase to the Surprise was less than that to Trial 5 Stimulus 8, indicating that subjects were less reactive to the totally unexpected stimulus than they were to what was at least a partially expected stimulus.

The second Anova showed the same results as for the uncorrected data. There was a strong main effect for pre, post-Surprise ($F = 26.80$; $p < .001$, 1/42 df). No other significant findings were obtained, and none of the hypotheses were confirmed. (See Appendix III for the complete Anovas for Heart Rate, Range-Corrected.)

Basal Skin Conductance

Basal Skin Conductance was measured by taking the high-

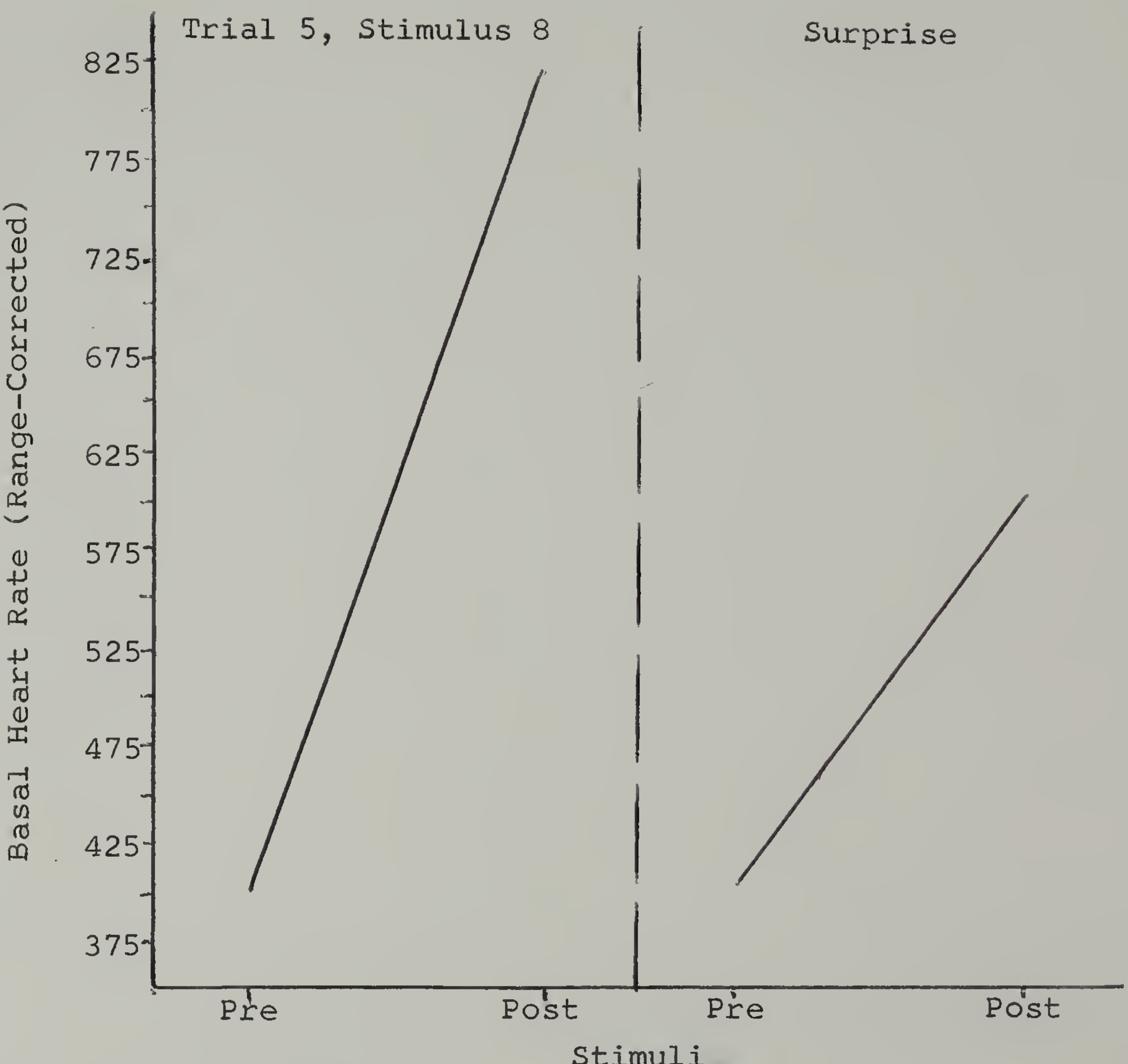


Figure 8. Heart Rate (Range-Corrected) During Impact As a Function of Trial 5, Stimulus 8 vs. Surprise

est point between 2 seconds and 7 seconds post-stimulus onset, and converting it directly into mmhos conductance. (The 2 second delay accounts for the latency of skin conductance.) Due to the use of an electrode paste which reduced skin resistance over time, an artifactual increase in Basal SC occurred over the course of the experiment. Those results which were due to this artifact are not reported here.

The Anovas for Basal SC were the same as those for Heart Rate.

Anticipatory Phase. A main effect for stimuli was the only significant result ($F = 13.25$; $p < .001$, 2/84 df). Skin Conductance was 8.9 mmhos on Stimulus 1, dropped slightly on 4, and increased to 9.4 on 7 (see Figure 9).

Impact Phase. When post-7 and post-8 were compared, there was a strong Stimuli effect ($F = 77.00$; $p < .001$, 1/42 df). As can be seen in Figure 9, there was a sharp rise in Skin Conductance from post-7 to post 8. When pre and post-8 were compared, the same Stimuli effect occurred ($F = 68.02$; $p < .001$, 1/42 df).

Recovery Phase. Again, there was only a main effect for Stimuli ($F = 40.50$; $p < .001$, 2/84 df). As can be seen in Figure 9, there was a monotonic decrease in conductance 9 to 11, indicating that subjects were progressively more relaxed as the countup neared its end.

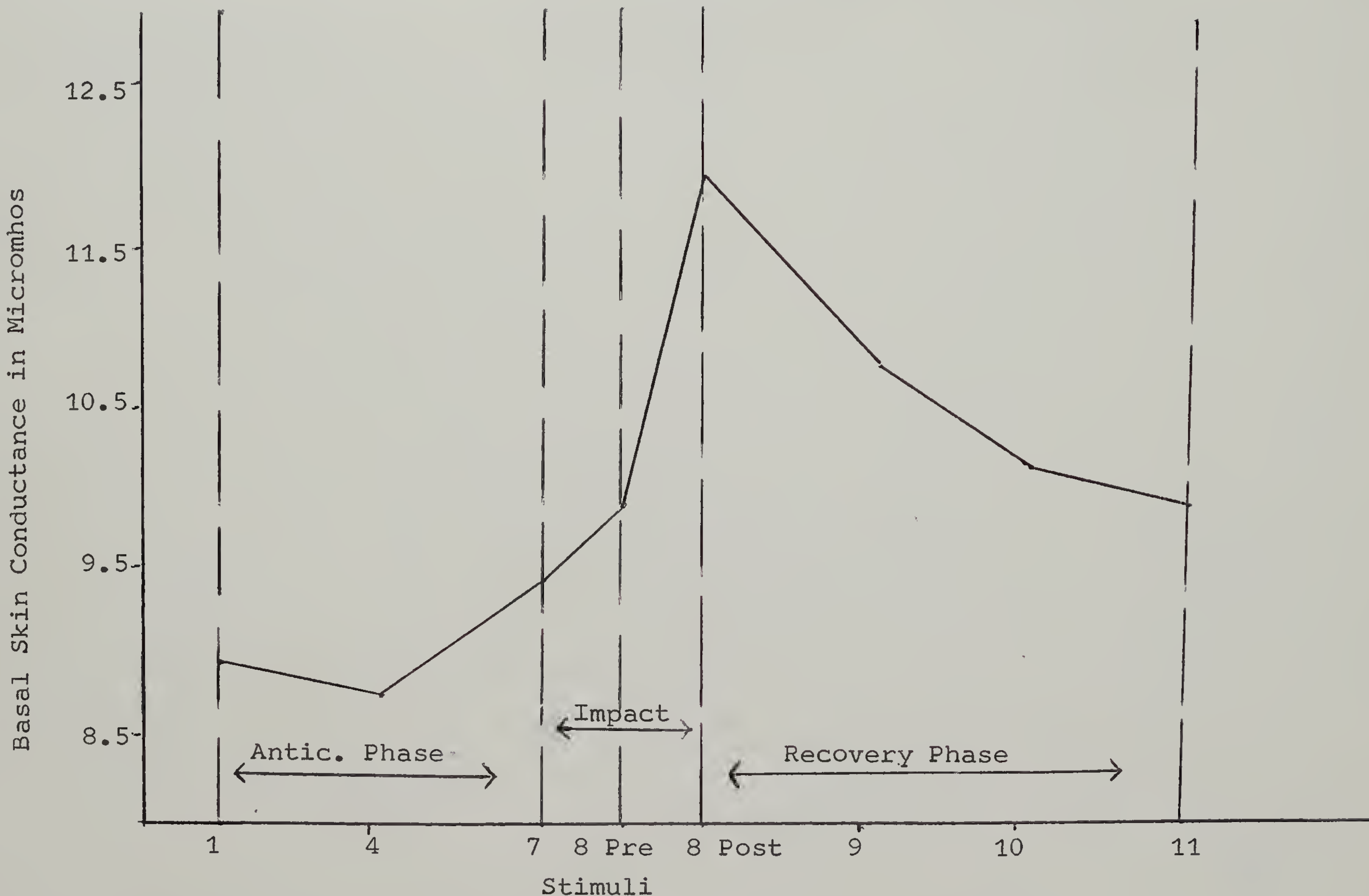


Figure 9. Basal Skin Conductance As a Function of Stimuli Pooled over Trials, Groups, and Conditions

In summary, Figure 9 shows Basal Skin Conductance over all recorded stimuli, pooled over trials, groups, and conditions. There was a drop in tension at the middle of the Anticipatory Phase, then a marked increase to a peak at Impact followed by a decrease.

No differences were found between groups or conditions, and thus none of the hypotheses were confirmed.

Surprise Stimulus. The Anovas were the same as those for Heart Rate, and they showed similar results. Pooled over trials, there was a strong pre, post-stimulus effect (F = 67.88; p .001, 1/42 df). When the Surprise was analysed alone, the same effect occurred (F = 63.10; p .001, 1/42 df). No hypotheses were confirmed. (See Appendix III for the complete Anovas for Basal Skin Conductance.)

Basal Skin Conductance, Range-Corrected

Lykken's Range-Correction for individual differences was applied to the data. However, in order to remove the artifact mentioned above, high and low values were determined for each trial individually.

All Anovas were the same as those for the previous measures.

Anticipatory Phase. The only significant effect was a Conditions X Trials X Stimuli interaction (F = 3.42; p .05, 2/84 df). As can be seen in Figures 10 and 11, the Unambi-

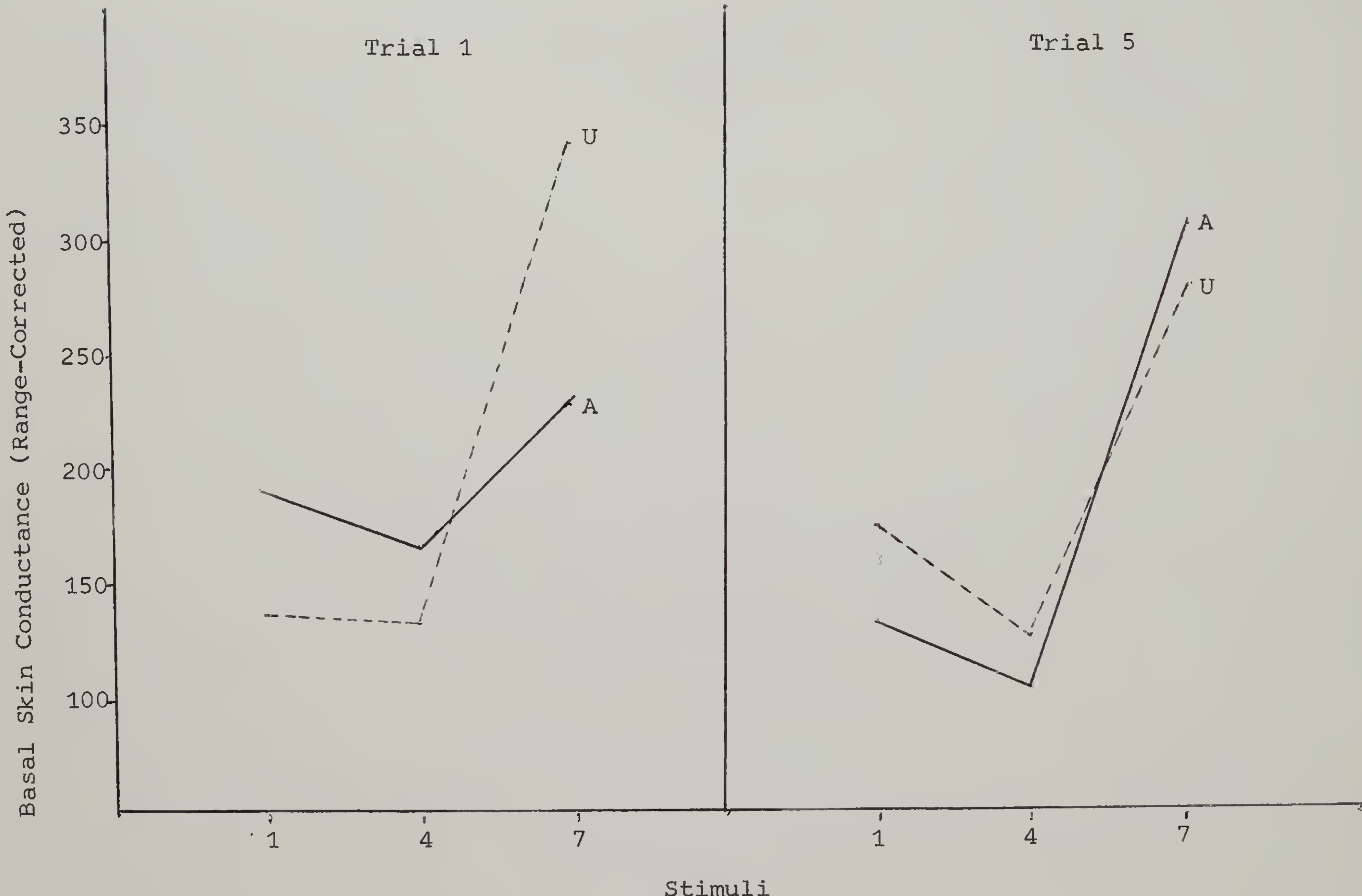


Figure 10. Basal Skin Conductance During the Anticipatory Phase As a Function of Conditions, Trials, and Stimuli

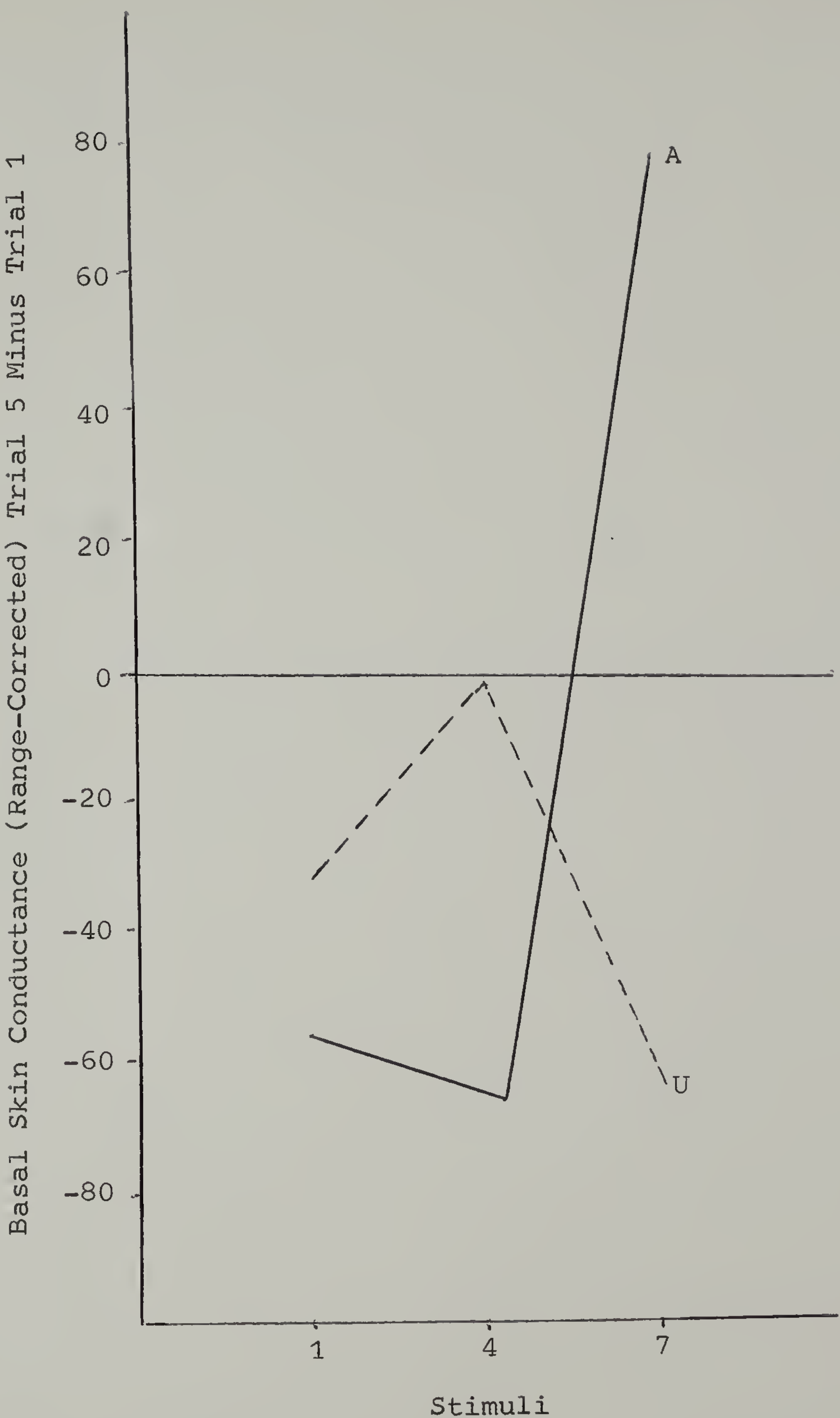


Figure 11. Basal Skin Conductance (Range-Corrected), Trial 5 Minus Trial 1, As a Function of Conditions and Stimuli, During the Anticipatory Phase

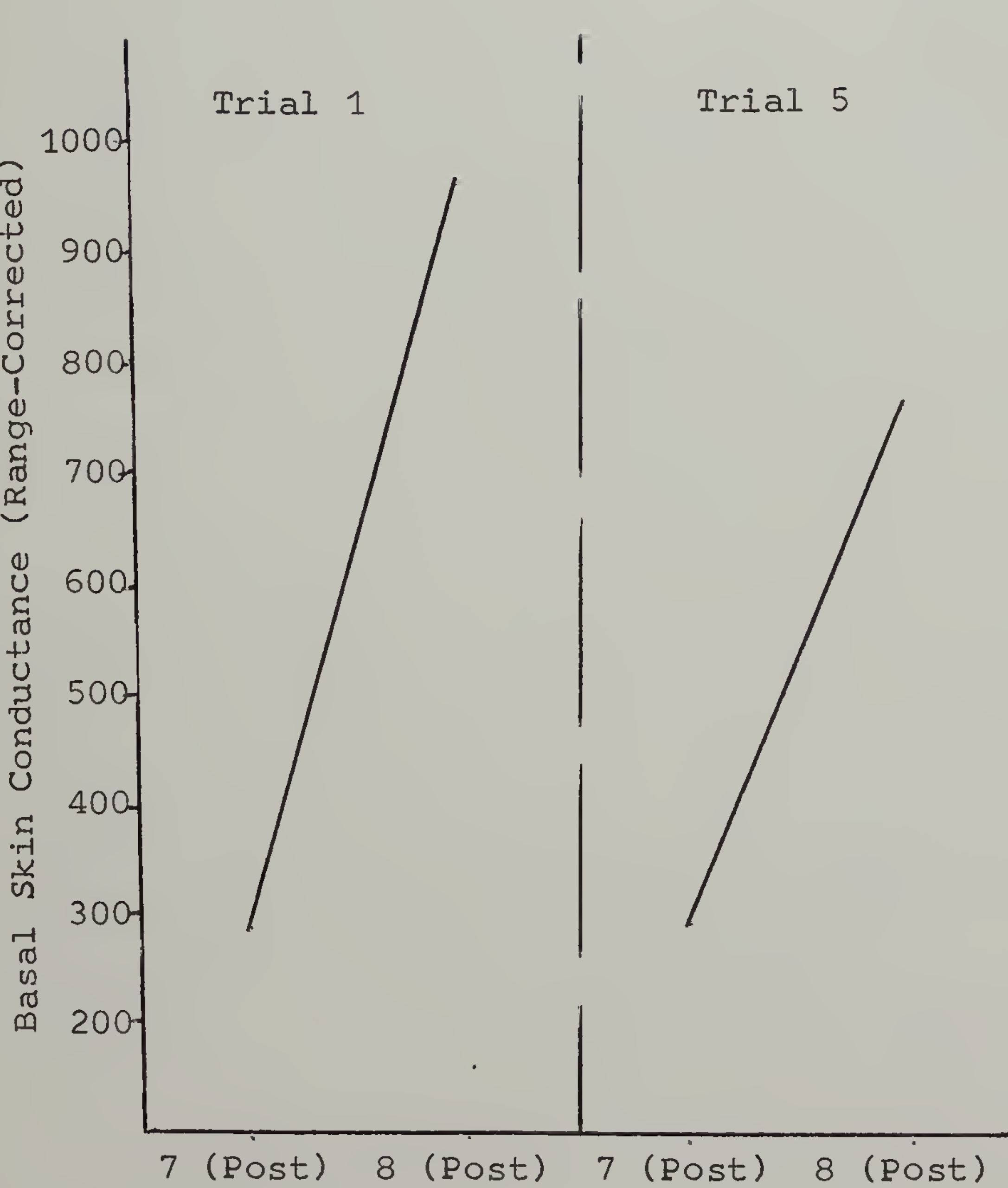
guous condition showed a much greater rise in conductance prior to Impact than the Ambiguous condition on Trial 1. By Trial 5, the Unambiguous condition's reaction prior to Impact had been reduced, while that of the Ambiguous condition had increased markedly.

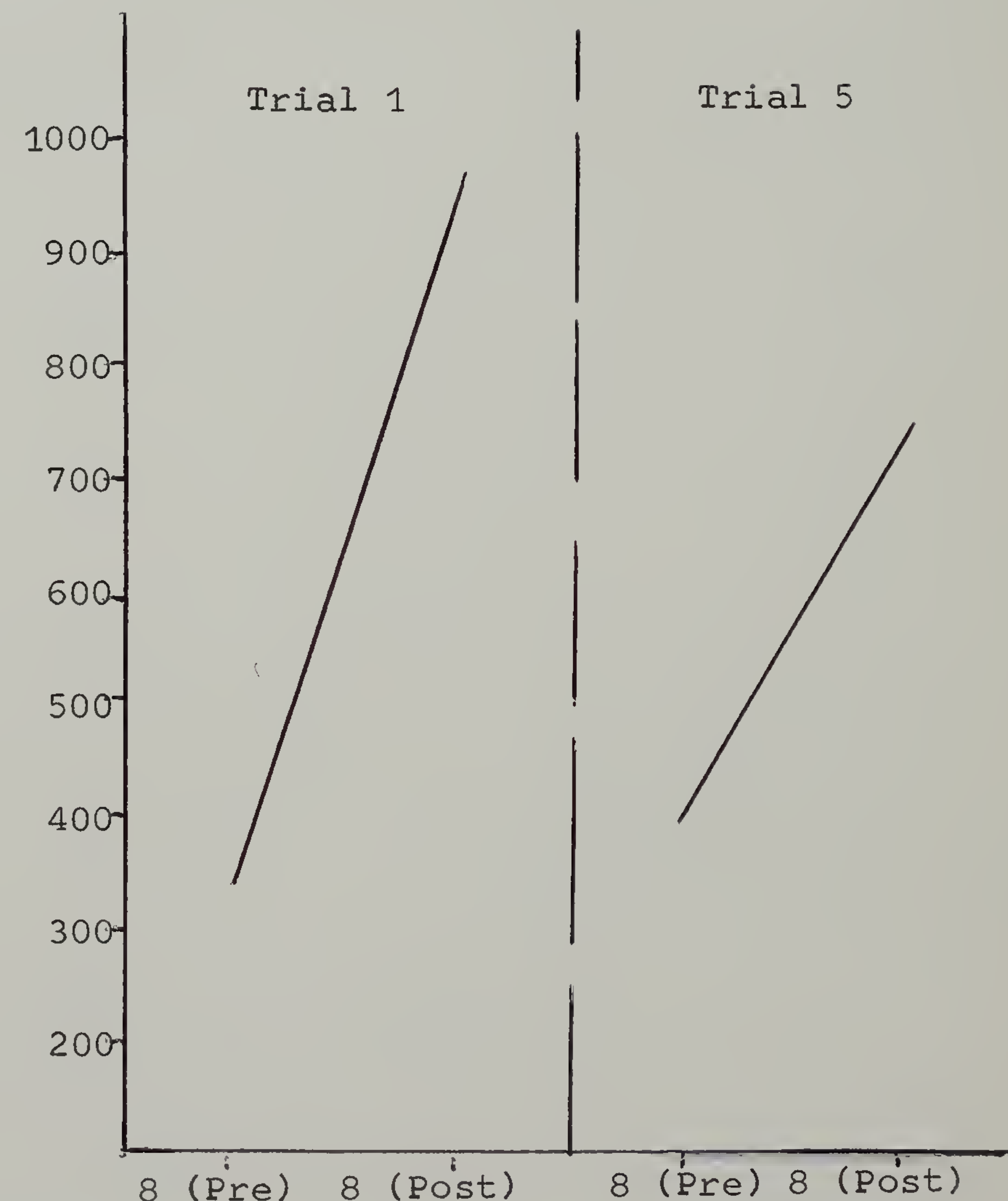
Impact Phase. The only significant effect for the first Anova was a Trials X Stimuli interaction ($F = 34.10$; $p < .001$, 1/42 df). As can be seen in Figure 12, there was a sharp rise in conductance on Trial 1, from post-7 to post-8 and a milder rise on Trial 5.

The same held true for the second Anova ($F = 58.10$; $p < .001$, 1/42 df). Figure 13 shows that conductance increased from pre to post- 8 on Trial 1, and increased less on Trial 5. These results indicate that overall, subjects' Basal Skin Conductance habituated to the Impact Stimulus over trials. This was very similar to the habituation of Heart Rate (See Figures 4 & 5). Due to the artifact mentioned above, these results did not occur with the uncorrected data.

Recovery Phase. There was a main effect for Stimuli ($F = 65.36$; $p < .001$, 2/84 df). Overall, subjects showed a decrease in Basal Skin Conductance during Recovery. This was similar to the results for the uncorrected data.

Also, a Conditions X Trials interaction occurred ($F = 5.96$; $p < .001$, 1/42 df). Pooled over Stimuli, subjects in Condition U were more reactive than those in Condition A,





Stimuli

Figure 12. Basal Skin Conductance (Range-Corrected) During Impact, As a Function of Trials and Stimuli

Figure 13. Basal Skin Conductance (Range-Corrected) During Impact, As a Function of Trials and Stimuli

on Trial 1, but by Trial 5 the conductance level of Condition U had decreased markedly, to a point below that of Condition A, which had also decreased.

Surprise Stimulus. The Anova for Trial 5 Stimulus 8 vs. Surprise showed a Conditions X Trials X Stimuli interaction ($F = 5.76$; $p<.025$, 1/42 df). Both conditions showed bigger reactions to the Surprise than to Impact on Trial 5. However, Figure 14 shows that on Trial 5, Condition A produced a bigger increase in conductance to Impact than Condition U, while the reverse was true for the Surprise. Thus, subjects having complete knowledge of the approaching stimulus were less reactive than those having only partial knowledge, but when the stimulus was totally unexpected, subjects whose experience had been ambiguous were less reactive.

The Anova for Surprise alone showed a main effect for Stimuli ($F = 264.29$; $p<.001$, 1/42 df). Conductance increased from pre-Surprise to post-Surprise. This result was similar to those for previous measures.

None of the hypotheses were confirmed by Basal Skin Conductance (Range-Corrected). (See Appendix III for the complete Anovas.)

Phasic GSR

Phasic GSR was measured by recording the distance in

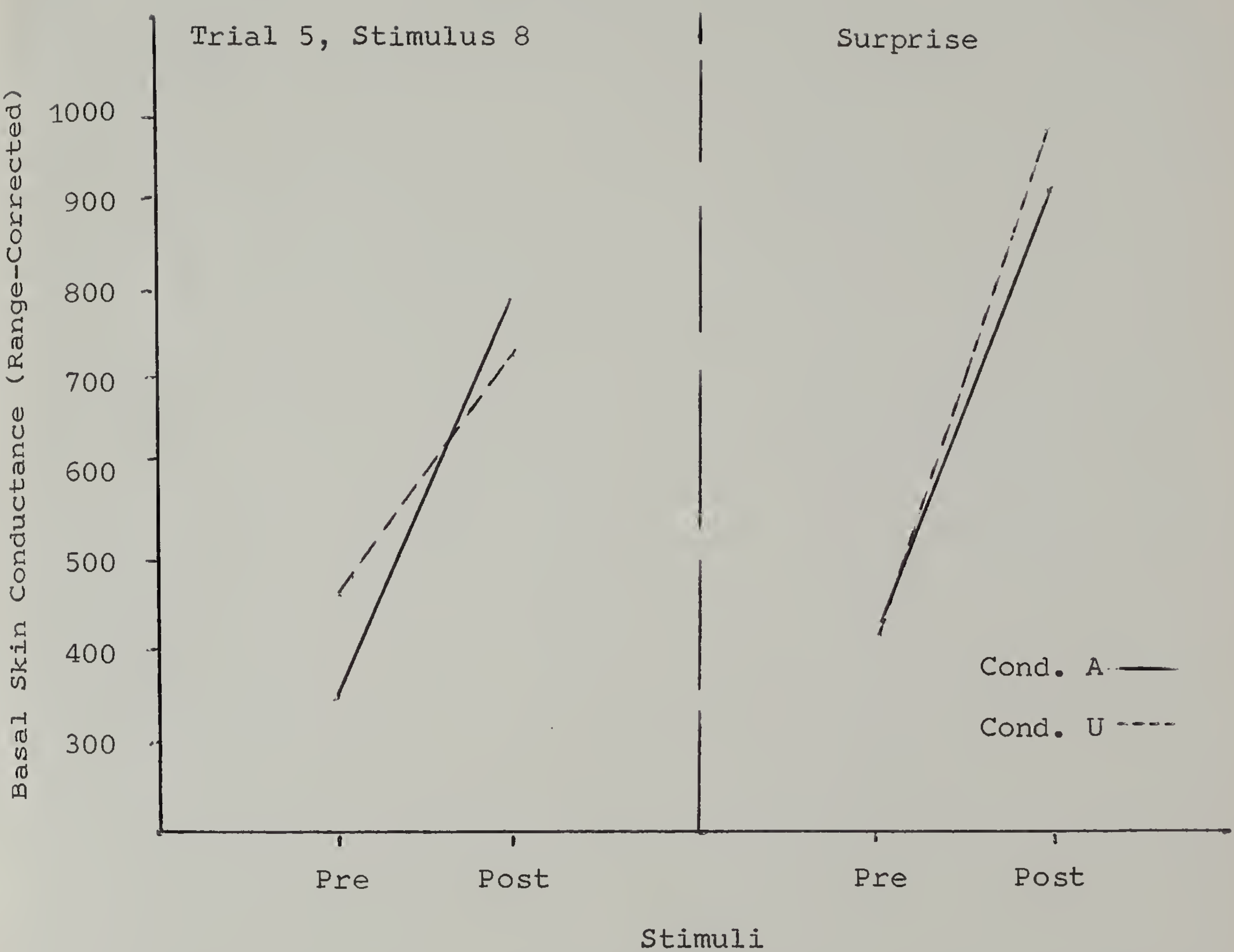


Figure 14. Basal Skin Conductance (Range-Corrected) During Impact As a Function of Trial 5 vs. Surprise, Conditions, and Stimuli

millimeters between the peak and through of any GSR from 3 seconds to 4.5 seconds post stimulus-onset for Ss 1-30, and 1.5 seconds to 3 seconds post-stimulus-onset for the remaining subjects. (The difference in time was due to a change to a recording pen of a different length.) Distance was converted directly into micromho's conductance. A GSR was any positive deviation of 0.5 millimeters or greater. The Anovas were the same as those for previous measures.

Anticipatory Phase. The only significant finding was a Trials X Stimuli interaction ($F = 3.42$; $p < .05$, 2/84 df). As can be seen in Figure 15, there was a monotonic increase in Phasic reactivity throughout the Anticipatory Phase on Trial 1. A mild increase occurred from Stimulus 1 to 4, and a sharp increase occurred from 4 to 7. On Trial 5, GSR remained the same from 1 to 4, and increased sharply to 7. This indicates that overall, rather than a general decrease in arousal during the Anticipatory Phase occurring over trials as subjects became more familiar with the situation, there was a gradual focusing and intensification of arousal at a point close to Impact.

Impact Phase. A 3 X 2 X 2 X 2 Anova was done comparing Groups, Conditions, Trials, and Stimuli, on GSR post-7 and post-8. The only significant effect was a main effect for Stimuli ($F = 40.38$; $p < .001$, 1/42 df). Phasic reactivity increased from post-7 to post-8. The result was similar to

Figure 15. GSR During the Anticipatory Phase As a Function of Groups and Stimuli

that for Basal Skin Conductance. However, it was different habituation to Impact over trials, while GSR did not differ over trials.

Recovery Phase. The Anova was the same as that for previous measures, using GSR post-9, 10, and 11. There was a main effect for Trials ($F = 4.24$; $p<.05$, 1/42 df). Overall, reactivity during the Recovery Phase on Trial 1 was 0.24 mmhos, and was 0.15 mmhos on Trial 5, indicating that over trials subjects learned to recover more completely from the Impact.

There was also a Groups X Stimuli interaction ($F = 2.83$; $p<.05$, 4/84 df). As can be seen in Figure 16, the High group was the most aroused group on Stimulus 9, dropped sharply at 10, and increased slightly to 11. The Moderate group was the least reactive at 9, dropped further at 10, and rose moderately at 11. The Low group was the only group to show a linear increase during Recovery.

Surprise Stimulus. Comparing Trials 5 post-Stimulus 8 to post-Surprise, there was a trend towards a Conditions X Trials interaction ($F = 3.96$; $p<.06$, 1/42 df). Figure 17 shows that, while subjects in both conditions were less reactive to Trial 5 Stimulus 8 than to the Surprise, the difference in reactivity to the two stimuli was much greater for Condition U than for Condition A. This was similar to the results for Basal Skin Conductance, Range-Corrected.

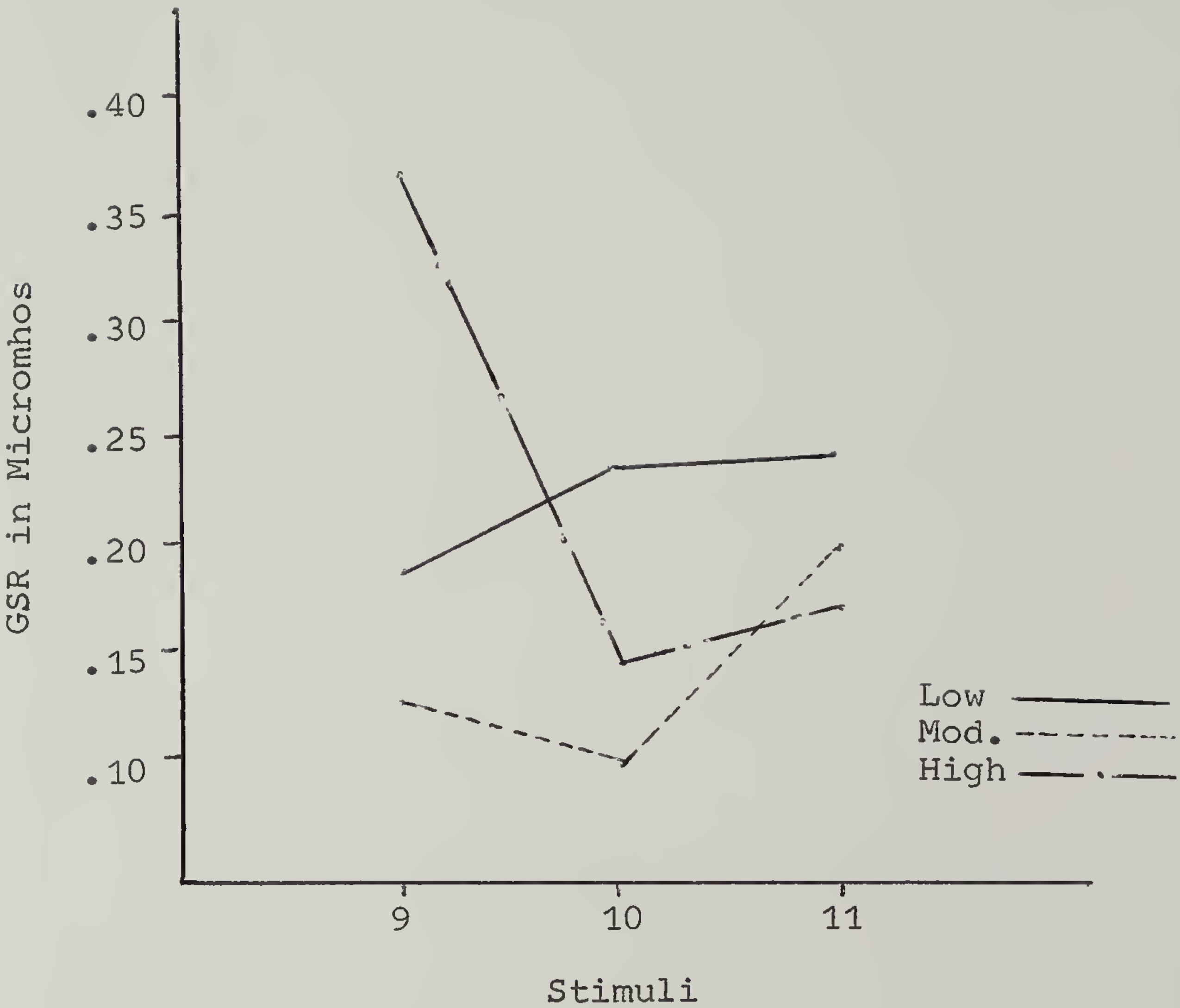


Figure 16. GSR During the Recovery Phase
As a Function of Groups and Stimuli

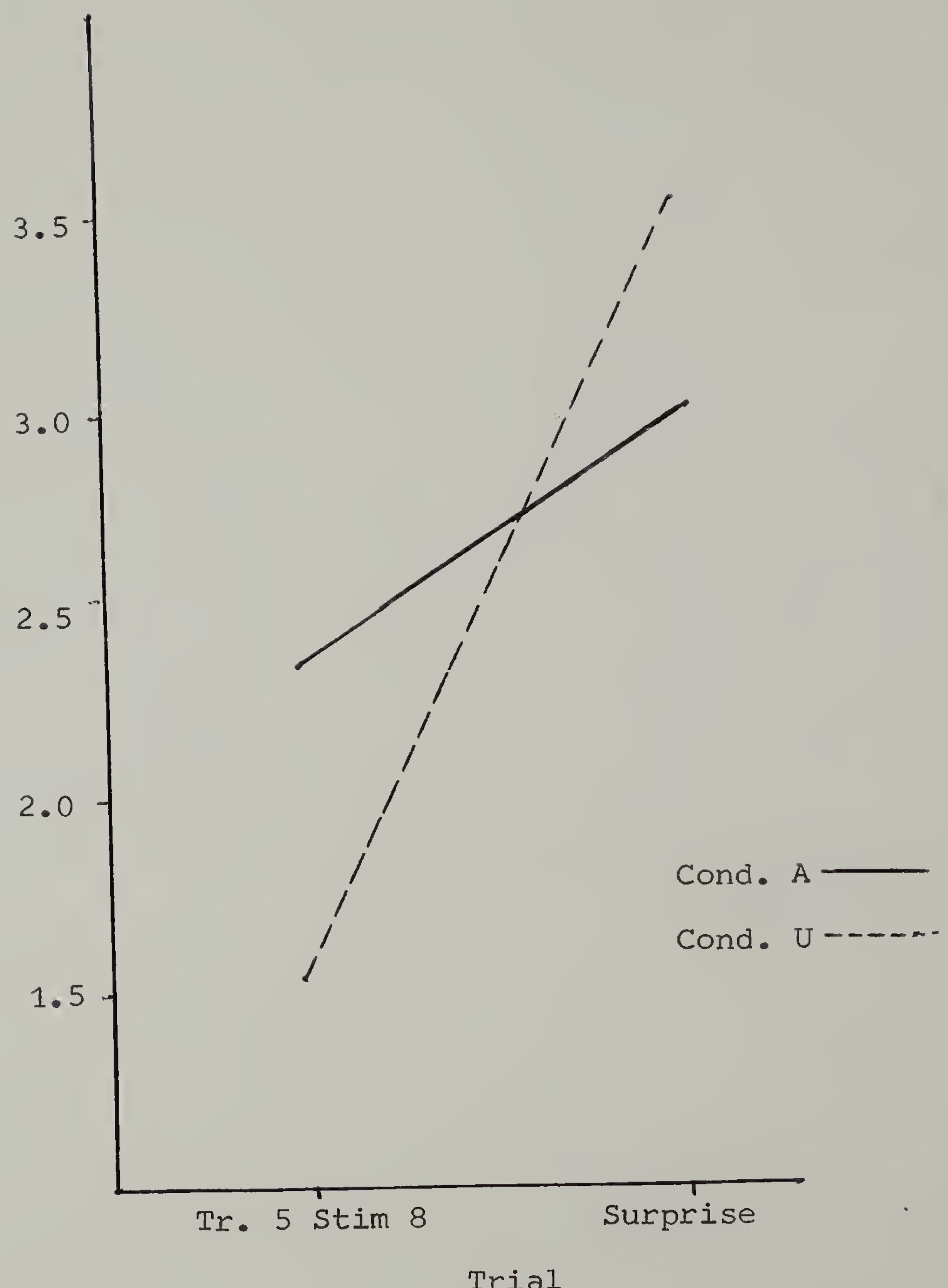


Figure 17. GSR During Impact as a Function of Trial 5 Stimulus 8 vs. Surprise, and Conditions

The Anova for post-Surprise alone showed no significant effects.

None of the hypotheses was confirmed by Phasic GSR. (See Appendix III for the complete Anovas.)

Phasic GSR, Range-Corrected

Lykken's (1971) Range-Correction for phasic measures was applied to the GSR data. The formula used was $\phi_p = p_{ix}/p_{max}$. In the case of GSR, where the minimum score was 0 for all subjects, this formula was identical to that for basal measures.

All Anovas were the same as those for the uncorrected data.

Anticipatory Phase. The only significant effect was a Trials X Stimuli interaction ($F = 6.17$; $p < .005$, 2/84 df). The curve forms were identical to those for the uncorrected data (See Figure 15).

Impact Phase. Comparing GSR post-7 to post-8, there was a weak trend towards a Conditions X Trials X Stimuli interaction ($F = 3.53$; $p < .07$, 1/42 df). As can be seen in Figure 18, subjects in both conditions showed a reduction in reaction to Impact from Trial 1 to Trial 5, with Condition U being more reactive than Condition A on Trial 1, and less reactive on Trial 5. These results are similar to those for Basal Skin Conductance (Range-Corrected), and

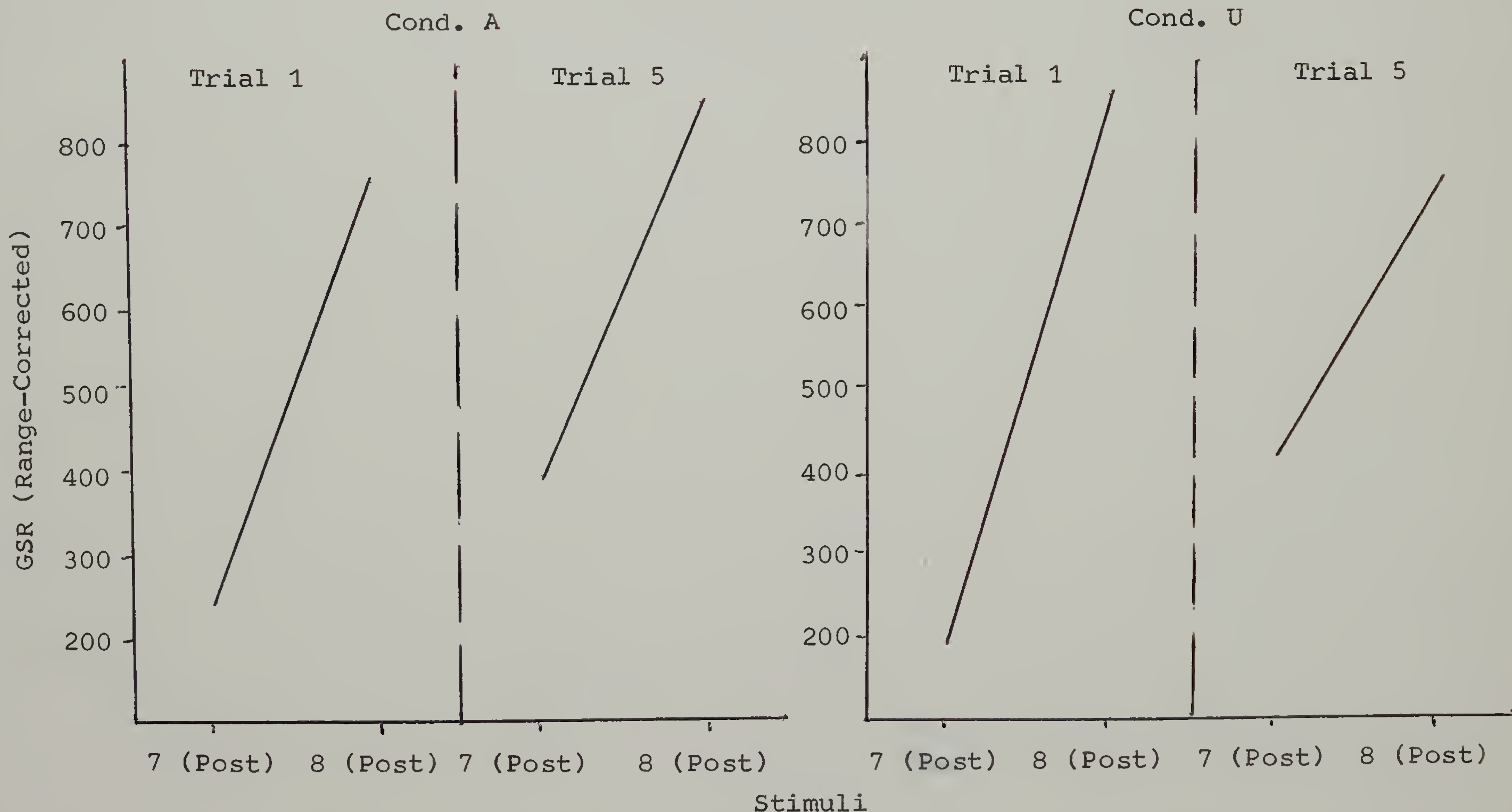


Figure 18. GSR (Range-Corrected) During Impact, as a Function of Conditions, Trials, and Stimuli

Heart Rate, in that there was an overall habituation to Impact over trials. However, in this case Condition U habituated to Impact to a greater extent than Condition A.

Recovery Phase. The only significant effect was a Groups X Stimuli interaction (F = 3.50; $p<.02$, 4/84 df). The curve forms were similar to those for the uncorrected data. (See Figure 16.)

Surprise Stimulus. For the first Anova, there was a main effect for trials (F = 5.50; $p<.025$, 1/42 df). Subjects were more reactive to the Surprise than to Trial 5 Stimulus 8. This result is opposite to that for Heart Rate (Range-Corrected), which was less reactive to the Surprise than to the expected stimulus.

The Anova for the Surprise alone showed no significant results.

None of the hypotheses was confirmed by GSR (Range-Corrected). (See Appendix III for the complete Anovas.)

Number of Non-Specific GSR/Min.

Number of Non-Specific GSR/Min. was measured by counting the number of deviations from 4.5 seconds to 18 seconds post stimulus-onset for Ss 1-30, and from 3 seconds to 16.5 seconds post stimulus-onset for the remaining Ss. (This change was due to the change in recording pens.) This score was then converted into number of Non-Specific GSR/Min. by the following formula: $\frac{\text{\# Deviations}}{\text{Time}} = \frac{X}{60}$, where Time = the time from the peak of any GSR specific to a stimulus to the end of that stimulus interval. When no specific GSR was present, Time = 13.5 seconds. All Anovas were the same as those for previous measures.

Anticipatory Phase. The only significant effect was a Conditions X Stimuli interaction ($F = 4.58$; $p < .02$, 2/84 df). As can be seen in Figure 19, Condition A showed a slight drop in number of GSR/Min. from Stimulus 1 to 4 and then a sharp increase from 4 to 7, while Condition U started lower, showed a slight rise from 1 to 4, and then a marked increase from 4 to 7, which was almost double that of Condition A.

Impact Phase. The Anova comparing post-7 to post-8 showed a Conditions X Trials X Stimuli interaction ($F = 7.24$; $p < .02$, 1/42 df). Figure 20 shows that both conditions reacted similarly to Impact on Trial 1. However, on Trial 5, while Condition A showed a larger decrease than on Trial 1, Condition U showed a massive decrease, starting from 14.6 at post-7 and dropping to 3.9 at post-8.

It is interesting to note that no measure other than number of Non-Specific GSR/Min. produced a decrease to Impact. This decrease was probably in part an artifact resulting from the effect of the large phasic response to Impact. However, though the decrease itself may have been artifactual, the differences between Trials and Conditions

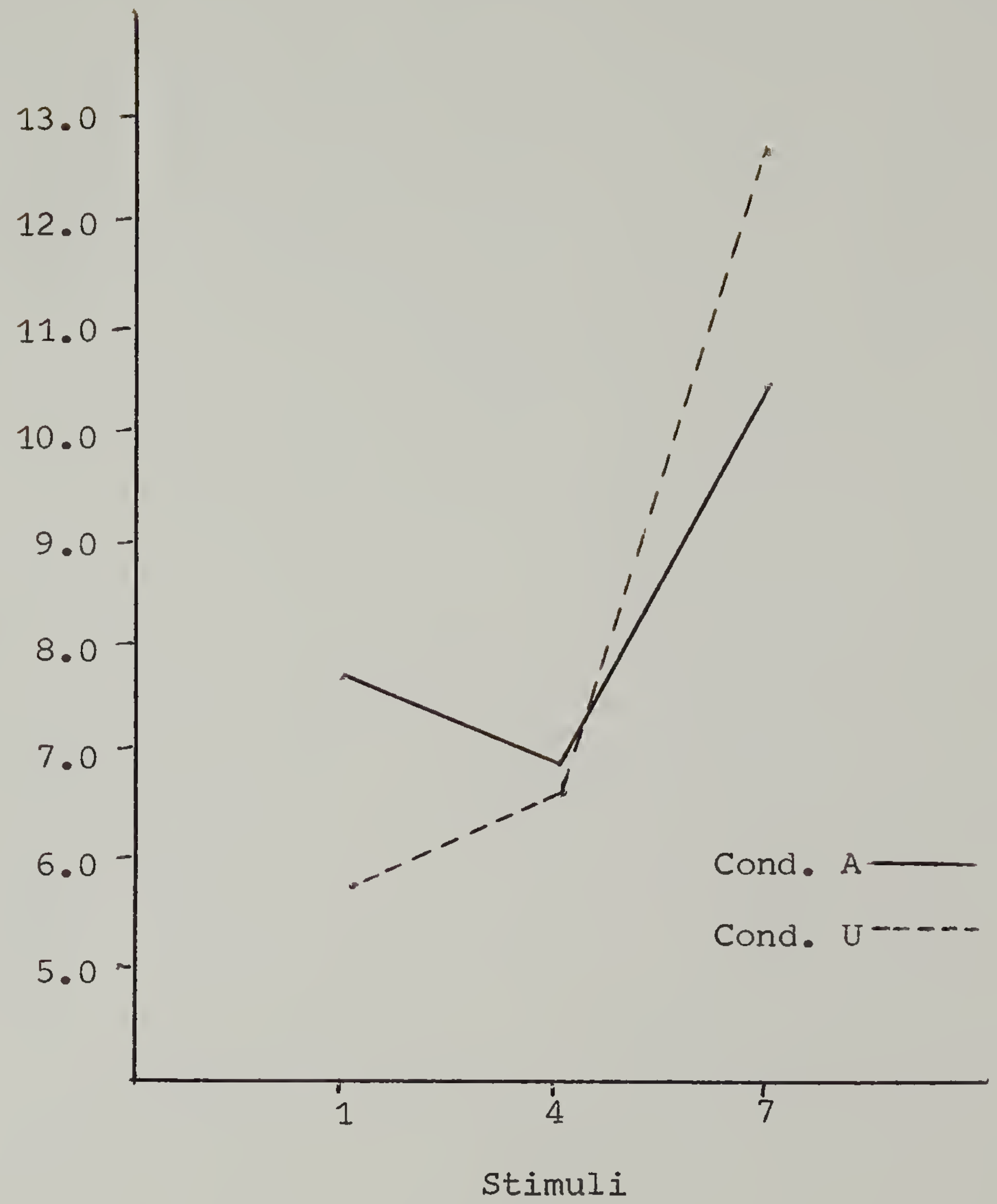


Figure 19. Number Non-Specific GSR/Min. During the Anticipatory Phase as a Function of Conditions and Stimuli

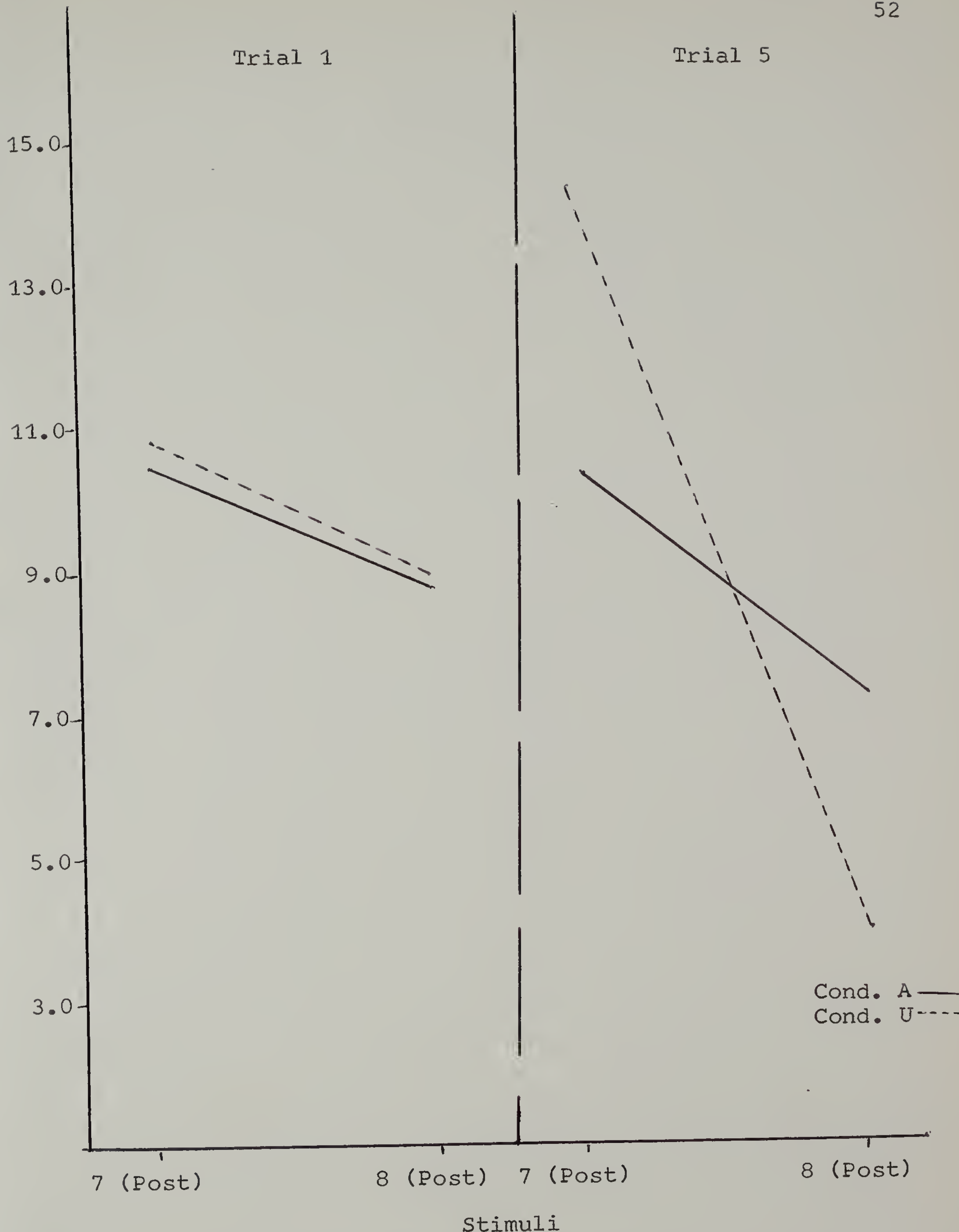


Figure 20. Number Non-Specific GSR/Min. During Impact as a Function of Trials and Stimuli

may not have been, because Phasic GSR showed no differences between Trials or Conditions.

Recovery Phase. The only significant effect was a Trials X Stimuli interaction ($F = 3.42$; $p < .05$, 2/84 df). Figure 21 shows that on Trial 1 subjects produced a sharp drop in number of Non-Specific GSR/Min. from Stimulus 9 to 10, and then levelled off from 10 to 11. On Trial 5 there was an overall drop in reactivity compared to Trial 1, and a stable reaction over the whole Recovery Phase. This result was similar to that for Heart Rate in that a general decrease in reactivity during the Recovery Phase occurred over trials.

Surprise Stimulus. The Anova comparing Trial 5 Stimulus 8 to post-Surprise showed a main effect for Trials ($F = 28.53$; $p < .001$, 1/42 df). Number of GSR/Min increased from Trial 5 Stimulus 8 to post-Surprise, indicating that subjects were much more reactive to the Surprise than to the expected stimulus. This result was similar to that for Phasic GSR.

The Anova for the Surprise alone showed no significant results.

None of the hypotheses were confirmed by this measure. (See Appendix III for the complete Anovas.)

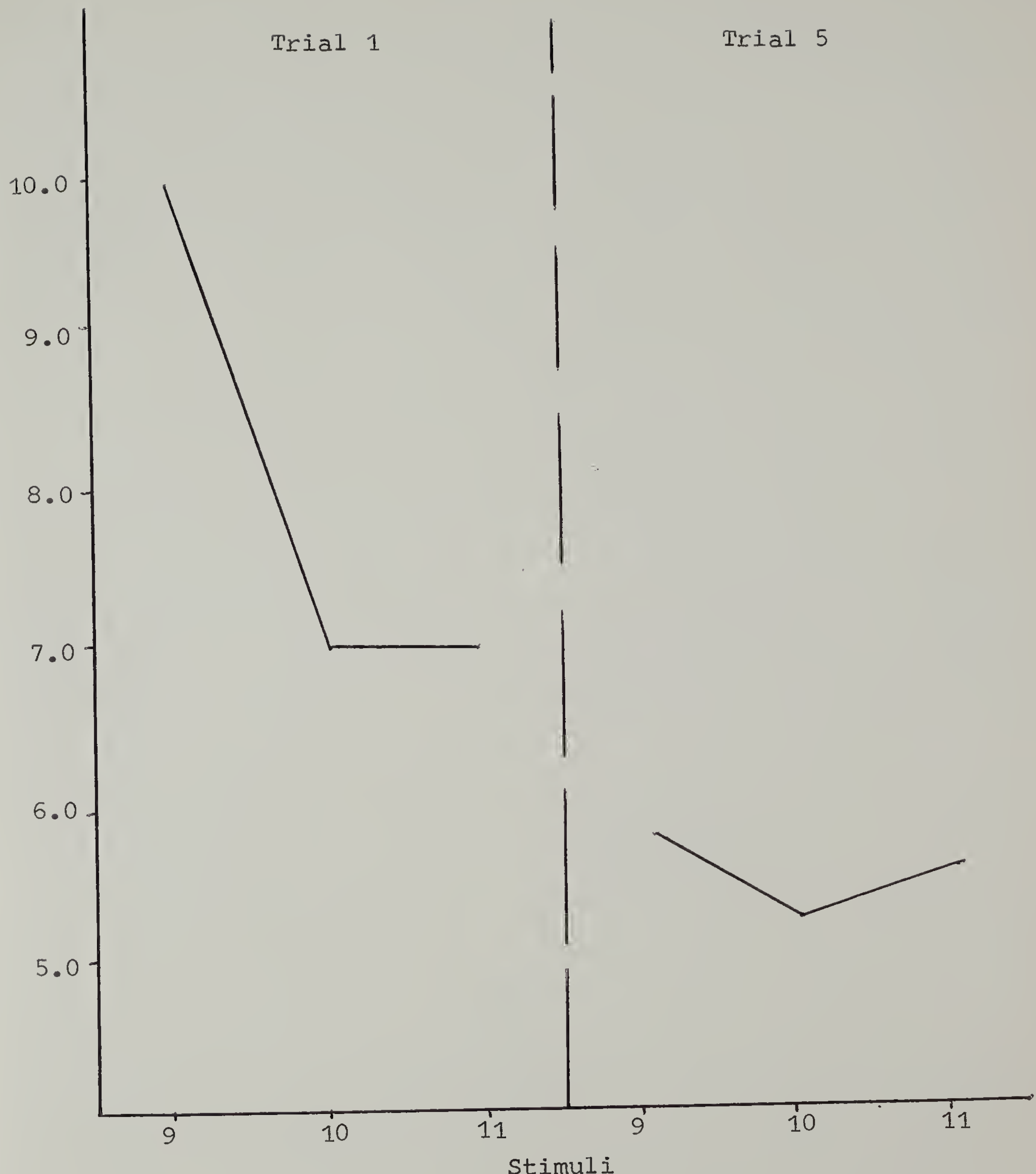


Figure 21. Number Non-Specific GSR/Min. During the Recovery Phase as a Function of Trials and Stimuli

Number of Non-Specific GSR/Min., Range-Corrected

Lykken's Range-Correction was applied to the uncorrected data.

Anticipatory Phase. The only significant was a Conditions X Stimuli interaction ($F = 3.89$; $p < .05$, 2/84 df). The curve forms were the same as those for the uncorrected data (see Figure 19).

Impact Phase. The results for the Impact Phase were the same as those for the uncorrected data ($F = 4.73$; $p < .05$, 1/42 df; see Figure 20).

Recovery Phase. There was a trend towards a Trials X Stimuli interaction ($F = 2.97$; $p < .06$, 2/84 df). The curve forms were the same as those for the uncorrected data (see Figure 21).

Surprise Stimulus. The only significant effect was a main effect for Trials ($F = 10.57$; $p < .001$, 2/84 df). The curve form was the same as that for the uncorrected data.

The Anova for the Surprise alone showed no significant results.

None of the hypotheses was confirmed. (See Appendix III for the complete Anovas.)

E-F Anxiety Scale

Separate Anovas were done for the Autonomic Anxiety, Striated Muscle Tension, and Feelings of Insecurity subscales, as well as for the Total Anxiety score, which was a combination of the subscales.

The Anova for Autonomic Anxiety showed a main effect for Conditions ($F = 5.79$; $p < .05$, 1/42 df). Mean score for the Ambiguous condition was 30.5, and for the Unambiguous Condition was 35.9 (see Table I in Appendix I). This was an unexpected result, since the E-F Scale was not designed to measure the effects of experimental conditions on subjects' responses, and can only be attributed to the particular sample chosen. Although it was not significant, there was a trend towards a direct relationship between Intolerance of Ambiguity and Autonomic Anxiety.

The Anova for Striated Muscle Tension showed a main effect for Groups ($F = 3.75$; $p < .05$, 2/42 df). Mean score for the Low group 26.2, for the Moderate group was 28.4, and for the High group was 32.9 (see Table II in Appendix I). Thus, Striated Muscle Tension increased with increasing Intolerance of Ambiguity.

The Anova for Feelings of Insecurity showed no significant results, although the High group had a higher mean score than the other groups (see Table III in Appendix I).

The Anova for the Total Anxiety score showed no significal results, although again the trend was towards a direct relationship between anxiety and Intolerance of Ambiguity (see Table IV in Appendix I).

Overall, the High group consistently showed higher anxiety scores than the other two groups, which were quite similar. (A t-test for Total Anxiety scores between the Low and High groups was significant at $p < .03$, one-tailed; $t = 1.97$, 30 df. A t-test between the Moderate and High groups was significant at $p < .05$, one-tailed, $t = 1.80$, 30 df. No difference was found between the Low and Moderate groups.)

Thus, the overall trend was that the High group showed more anxiety on the questionnaire than the other groups, which did not differ from each other.

Sound Preference

When asked to choose the means by which the final sound would be delivered subjects as a whole showed a preference for the relatively ambiguous choices. A X^2 test, pooling "Surprise" and "Ready" choices, was significant at $p < .01$ ($X^2 = 9.18$, 1 df).

No difference was found between the groups, although there was a slight trend towards a direct relationship between Intolerance of Ambiguity and choice of the Countup for the final sound. (See Table V in Appendix I for the exact frequencies.)

A X^2 test for Conditions pooled over Groups showed no difference between the Ambiguous and Unambiguous conditions. (See Table V in Appendix I).

Group Preference

During the post-experiment interview subjects' overall tendency, when asked what condition they would have preferred being in, was to choose the condition they were in fact in (X^2 = 4.47; p .05, 1 df). (See Table VI in Appendix I.)

The Groups comparison showed no significant differences. There was no difference between the Low and Moderate groups, with about half of each choosing each condition, while the High group showed a strong preference for the Unambiguous condition. (See Table 7 in Appendix I for the exact frequencies.)

DISCUSSION

In general, the results for the physiological data did not support the hypotheses. Although the interaction predicted in Hypotheses 1-5 did not as a rule occur, the physiological measures did provide some reliable indications of how subjects reacted to the situation.

During the Anticipatory Phase, all measures other than Heart Rate showed a general tendency to decrease during the middle of the waiting period, and then to increase prior to Impact. In the Groups X Trials X Stimuli interaction for

Heart Rate, both the Low and High groups showed the above pattern. However the Moderate group was markedly different in that it developed an inverted-V curve which was similar to that found by Epstein (1967) in his studies of the mastery of anxiety in sport parachuting. Like the parachutists, the Moderate group learned with experience to shift its peak arousal to an earlier point in time. The reason the other groups did not develop a peak shift, and were actually more reactive prior to Impact on Trial 5 than on Trial 1, might have been that they were more concerned with the ambiguity or lack of ambiguity in the situation than the Moderate group, and first had to deal with that before they could deal with the sound. A parachutist who is afraid of heights might react very differently than one who isn't afraid of heights. He would first have to master his anxiety about the heights before dealing with the jump.

The Conditions X Trials X Stimuli interaction for Basal Skin Conductance (Range-Corrected) indicated that Condition U's knowledge of the occurrence of the noxious stimulus caused greater arousal on Trial 1 than no knowledge, but this allowed subjects in Condition U to reduce their arousal in anticipation of a later impact.

This was not the case for the Ambiguous condition, whose anticipatory arousal increased over time. The reaction of the Ambiguous condition on Trial 5 was similar to that of the Unambiguous condition on Trial 1. Perhaps the development of a reaction pattern over time would be similar for both conditions, with the Ambiguous condition needing more exposure to the stimulus than the Unambiguous condition in order to build a reliable expectancy. (See Table 8 in Appendix II for a summary of significant F-tests during the Anticipatory Phase.)

Overall, subjects showed a reliable Heart Rate anticipatory deceleration. In addition, the anticipatory deceleration (Range-Corrected) showed the only Groups X Conditions interaction of any measure. The High group showed a marked deceleration in the Ambiguous condition, and a slight acceleration in the Unambiguous condition, while the reverse was true for the Low group.

This result supports Hypotheses 1-5. Given the interpretation of the anticipatory deceleration as facilitating attention to emotionally arousing stimuli (Zeaman & Smith, 1965; Epstein & Clarke, 1970), this result indicates that the Ambiguous condition elicited the most attention before Impact from the High group, and the least from the Low group, while the situation was almost completely reversed in the Unambiguous condition. Since this interaction did not occur during any other phase of the countup it is possible that Intolerance of Ambiguity affects the attention paid to stimuli rather than the reaction to them. This is consistent with Budner's (1961) suggestion that Intolerance of Ambiguity is a way of evaluating reality as opposed to a way of dealing with it.

Both Heart Rate and Basal Skin Conductance (Range-Corrected) showed an habituation effect over trials in response to Impact. However, GSR (Range-Corrected) and number of Non-Specific GSR/Min., both phasic Measures, showed that, although both conditions habituated to Impact, the Unambiguous condition habituated to a greater extent than the Ambiguous condition. This is consistent with previous findings (Epstein, 1967; Epstein, Breitner, and Hoobler, 1971) that an accurate time and event expectancy may not reduce initial reactivity, but allow for greater subsequent habituation than an inaccurate or incomplete expectancy. (See Tables 9 and 10 in Appendix II for a summary of significant F-tests for the Impact Phase.)

During the Recovery Phase the overall trend was towards a reduction in reactivity across trials. Since there was a general habituation to Impact over trials, this result is not surprising, and again indicates that increased familiarity leads to reduced reactivity.

The Conditions X Trials interaction for Basal Skin Conductance (Range-Corrected) was similar to that for Impact, discussed above, and the same interpretation applies. (See Table 11 in Appendix II for a summary of significant F-tests during the Recovery Phase.)

When Trial 5 Stimulus 8 was compared to the Surprise, the general finding was that subjects showed greater arousal to the Surprise than to the expected stimulus.

This general finding supports the conclusion that habituation is a form of learning and not due to fatigue, since fatigue would cause reduced reactivity to the Surprise.

The finding that the Unambiguous condition was less aroused than the Ambiguous condition when the stimulus was at least partially expected, and more aroused when it was totally unexpected, indicates that a precise expectancy facilitates habituation to a greater extent than an imprecise expectancy as long as conditions remain constant, but that a precise expectancy may leave one vulnerable to greater arousal if conditions change. (See Tables 12 and 13 in Appendix II for a summary of significant F-tests during the Surprise.)

The results for the E-F Scale showed a weak but quite consistent direct relationship between Intolerance of Ambiguity and anxiety. This provides some confirmation of Hypothesis #6. It is interesting that the Striated Muscle Tension subscale showed the strongest relationship to Intolerancy of Ambiguity, since Epstein & Fenz (1970) found that scores on this subscale were directly related to habituation of GSR to a loud sound over trials. As Epstein and Fenz have suggested, and as the above results indicate, previous negative results might have been due to the use of too global a measure of anxiety and a consequent failure to consider particular subsets of anxiety. Since the E-F Scale does differentiate between different forms of anxiety, it may be superior to the Taylor Scale in terms of studying the relationship between anxiety and personality variables.

The general failure of the physiological measure to indicate a relationship between Intolerance of Ambiguity and anxiety may be accounted for by considering the experimental sample and the Budner Scale.

Forty-eight male undergraduate volunteers at a large state university are likely to be a relatively homogeneous group on any given personality variable, when compared to the population at large. Budner's original sample of 813 consisted of various classes of undergraduate and graduate students in New York City, which is probably a similar sample to the present one. The range of scores for his sample was 25-79, and the mean was 47.2. The range for the present sample was 25-72, and the mean was 45.3. Since the maximum range is 16-112, and the expected population mean is 64, it seems clear that these samples are biased towards tolerance of ambiguity. The sample standard deviation in the present study was 9.6. Given the cutoff points between the groups, there would seem to be a fair degree of overlap between the groups. It would be useful to obtain scores on the Budner

Scale for a more representative range of subjects, e.g., a group of career military officers (assumed to be relatively intolerant of ambiguity) vs. a group of free-lance artists or writers (assumed to be relatively tolerant of ambiguity). This would provide data on the validity of the Budner Scale, and assuming group differences, they could then be compared as to their reactions to stressful or ambiguous situations.

Finally, on a conceptual level, the terms "Intolerance" and "Tolerance", although intended to be merely descriptive, imply a value judgment which seems inappropriate. The concept originated in the context of research on anti-Semitism just after World War II, and was related to the presence of authoritarianism and anti-Semitism, which are regarded as negative qualities. Thus, "Intolerance of Ambiguity" is regarded implicitly as a negative quality. However, in terms of adaptation to a given situation, an "intolerant" person would be expected to function more effectively than a "tolerant" person in a highly structured environment, and thus "intolerance" might be a positive quality. It is suggested that "preference for Structure" be used in place of "Intolerance of Ambiguity", since no value judgment is implied.

SUMMARY

The purpose of this experiment was to compare the physiological responses of subjects showing differences in Intolerance of Ambiguity in a situation involving varying levels of ambiguity. It was hypothesized that subjects high in Intolerance of Ambiguity would show greater arousal in an ambiguous than in an unambiguous condition, and that the reverse would be true for those low in Intolerance of Ambiguity. It was hypothesized that in the Ambiguous condition subjects high in Intolerance of Ambiguity would show greater arousal than those low in Intolerance, and that the reverse would be true for the Unambiguous condition. A moderate group was expected to fall between the other groups in arousal in both conditions, and to be more aroused in the Ambiguous condition than in the Unambiguous condition.

A direct relationship between Intolerance of Ambiguity and a measure of dispositional anxiety was predicted.

Forty-eight male subjects were assigned to groups of Low, Moderate, or High Intolerance of Ambiguity, on the basis of scores on the Budner Intolerance of Ambiguity Scale.

Heart Rate, skin conductance, and Galvanic Skin Response were monitered while subjects say through five trials of a countup and waited for the possible occurrence of a noxious, 108 decibel, white noise of 0.5 seconds duration. In the

Ambiguous condition subjects knew on what count the sound would occur if it occurred. However, they did not know if it would occur. The subjects in the Unambiguous condition knew both when and if the noxious sound would occur. At the end of the experiment subjects were given the E-F Manifest Anxiety Scale.

During the Anticipatory Phase the Moderate Intolerance group developed an inverted-V curve over time on the Heart Rate measure, while the other groups did not. The hypotheses were partially confirmed by evidence of heart rate anticipatory deceleration which suggested that the High Intolerance group was most attentive (i.e., it showed the greatest deceleration) in the Ambiguous condition, and the Low Intolerance group was most attentive in the Unambiguous condition, with the Moderate Intolerance group showing moderate reactivity in both conditions.

Habituation to Impact occurred over trials, as shown by decreases on all measures. Range-Corrected GSR and (Uncorrected and Range-Corrected) Number of Non-Specific GSR/Min. indicated that although subjects in the Unambiguous condition were initially more reactive than those in the Ambiguous condition, they became less reactive over trials. That is, subjects in the Unambiguous condition habituated to a greater extent than those in the Ambiguous condition. Arousal during the Recovery Phase was reduced over trials on both

Range-Corrected and Uncorrected measures of Heart Rate, GSR, and Number of Non-Specific GSR/Min. Basal skin conductance was higher on Trial 1 for Ss in the Unambiguous condition than for Ss in the Ambiguous condition, and the reverse was true for Trial 5, although both groups exhibited some degree of habituation.

When reactions to an anticipated stimulus were compared to reactions to a surprise stimulus, subjects in the Unambiguous condition were found to be less aroused by the anticipated stimulus, and more aroused by the surprise stimulus, than subjects in the Ambiguous condition. This was interpreted as indicating that a precise expectancy facilitates habituation when conditions remain constant, but causes greater arousal if conditions change.

There was a weak but consistent direct relationship between questionnaire measures of Intolerance of Ambiguity and dispositional anxiety, confirming the final hypothesis. Results for subscales of Autonomic Anxiety, Striated Muscle Tension, and Feelings of Insecurity indicated that it is necessary to separate anxiety into its different forms in order to establish relationships with personality variables. The Striated Muscle Tension subscale showed the strongest relationship to Intolerance of Ambiguity, while the other subscales showed weaker trends.

Results for Ss' subjective preference indicates that Ss High in Intolerance of Ambiguity tended to prefer being in the Unambiguous condition to a greater extent than Ss in the other groups. There was also a weak but consistent trend towards a direct relationship between Intolerance of Ambiguity and preference for the countup vs. the Surprise stimulus. These results tend to validate the Budner Scale.

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APPENDIX I

		Condition: A	Condition: U	
Group	L	31.1	32.8	31.9
	M	29.5	35.9	32.7
	H	31.1	39.1	35.1
		30.5	35.9	

Table 1. Mean Score on the Autonomic Anxiety Subscale of the E-F Manifest Anxiety Scale As a Function of Group and Condition

		Condition: A	Condition: U	
Group	L	25.4	27.0	26.2
	M	27.5	29.4	28.4
	H	32.2	33.6	32.9
		28.4	30.0	

Table 2. Mean Scores on the Striated Muscle Tension Subscale of the E-F Manifest Anxiety Scale As a Function of Group and Condition

Group	Condition: A	Condition: U	
L	38.6	39.0	38.8
M	37.1	39.8	38.4
H	41.3	48.0	44.6
	39.0	42.3	

Table 3. Mean Scores on the Feelings of Insecurity Subscale of the E-F Manifest Anxiety Scale As a Function of Group and Condition

Group	Condition: A	Condition: U	
L	95.1	98.8	96.9
M	94.1	105.1	99.6
H	104.6	120.7	112.3
	97.9	108.2	

Table 4. Mean Scores on the Combined Subscales of the E-F Manifest Anxiety Scale As a Function of Group and Condition

Group			Sound Preference "Surprise"	"Ready"	"Countup"	
	Low	A	4	4	0	8
		U	4	2	2	8
Group	Mod	A	4	2	2	8
		U	4	2	2	8
	High	A	3	2	3	8
		U	3	1	4	8
			22	13	13	48

Table 5. Frequency of Sound Preference As a Function of Group, Condition, and Ambiguity Level of Choices

		Choice "A"	Choice "U"	
Condition	A	13	10	23
	U	5	18	23
		18	28	46

Table 6. Frequency of Choice of Condition
As a Function of Actual Condition

		Choice "A"	Choice "U"	
Group	L	7	9	16
	M	8	7	15
	H	3	12	15
		18	28	46

Table 7. Frequency of Choice of Condition
As a Function of Group

APPENDIX II

Table 8

Summary of F-Values for the Anticipatory Phase

Measure	Source of Variance	df	F
Heart Rate	G X T X P	4/84	3.89**
Heart Rate (RC)	G X T X P	4/84	3.56**
Basal SC	P	2/84	13.25***
Basal SC (RC)	C X T X P	2/84	3.42*
GSR	T X P	2/84	3.42*
GSR (RC)	T X P	2/84	6.17[t]
# Non-Spec GSR/m.	C X P	2/84	4.58[o]
# Non-Spec GSR/m. (RC)	C X P	2/84	3.89*

*p<.05

[o]p<.02

**p<.01

[t]p<.005

***p<.001

Table 9

Summary of F-Values for the Impact Phase

(post-7 to post-8)

Measure	Source of Variance	df	F
Heart Rate	T X P	1/42	5.42°
Heart Rate (RC)	T X P	1/42	4.88*
Basal SC	P	1/42	77.00***
Basal SC (RC)	T X P	1/42	34.10***
GSR	P	1/42	40.38***
GSR (RC)	C X T X P	1/42	3.54⁻
# Non-Spec GSR/m.	C X T X P	1/42	7.24°
# Non-Spec GSR/m. (RC)	C X T X P	1.42	4.73*

⁻trend

*$p < .05$

°$p < .025$

**$p < .01$

t $p < .005$

***$p < .001$

Table 10

Summary of F-Values for the Impact Phase

(pre-8 to post-8)

Measure	Source of Variance	df	F
Heart Rate	T X P	1/42	14.20***
Heart Rate (RC)	T X P	1/42	12.56***
Basal SC	P	1/42	68.02***
Basal SC (RC)	T X P	1/42	58.10***

***$p < .001$

Table 11

Summary of F-Values for the Recovery Phase

Measure	Source of Variance	df	F
Heart Rate	T X P	2/84	4.33*
Heart Rate (RC)	T X P	2/84	5.89**
Basal SC	P	2/84	40.50***
Basal SC (RC)	P	2/84	65.36***
	C X T	1/42	5.96°
GSR	T	1/42	4.24*
	G X P	4/84	2.83*
GSR (RC)	G X P	4/84	3.50°
# Non-Spec GSR/m	T X P	2/84	3.42*
# Non-Spec GSR/m (RC)	T X P	2/84	2.97¯

¯trend

*$p < .05$

°$p < .025$

**$p < .01$

***$p < .001$

Table 12

Summary of F-Values

for the Trial 5 Stimulus 8 vs. Surprise

Measure	Source of Variance	df	F
Heart Rate	Q	1/42	45.21***
Heart Rate (RC)	T X Q	1/42	12.56***
Basal SC	Q	1/42	67.88***
Basal SC (RC)	C X T X Q	1/42	5.76°
GSR	C X T	1/42	3.96¯
GSR (RC)	T	1/42	5.50°
# Non-Spec GSR/m	T	1/42	28.53***
# Non-Spec GSR/m (RC)	T	1/42	10.57***

¯trend

°$p < .025$

***$p < .001$

Table 13

Summary of F-Values for the Surprise Alone

Measure	Source of Variance	df	F
Heart Rate	P	1/42	22.98***
Heart Rate (RC)	P	1/42	26.80***
Basal SC	P	1/42	63.10***
Basal SC (RC)	P	1/42	264.29***
GSR	No significant results		
GSR (RC)	No significant results		
# Non-Spec GSR/m	No significant results		
# Non-Spec GSR/m (RC)	No significant results		

***$p < .001$

APPENDIX III

Heart Rate

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 Anticipatory Period

	SOURCE	SUM OF SQUARES	F	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED ME
1	MEAN	2077061,6805		1	2077061,6805	288,000 (1)
2	G	187,9653		2	93,9826	96,000 (2)
3	C	1208,6806		1	1208,6806	144,000 (3)
4	T ** (.01) check	722,0000	9.19	1	722,0000	144,000 (4)
5	P ** (.01) check	591,2986	7.85	2	295,6493	96,000 (5)
6	GC	795,6736		2	397,8368	48,000 (6)
7	GT	18,5208		2	9,2604	48,000 (7)
8	CT	20,0556		1	20,0556	72,000 (8)
9	GP	257,0556	ns 1.71	4	64,2639	32,000 (9)
10	CP	3,5486		2	1,7743	48,000(10)
11	TP	29,0208		2	14,5104	48,000(11)
12	S(GC)	56293,3333		42	1340,3175	6,000(12)
13	GCT	42,1736		2	21,0868	24,000(13)
14	GCP	53,2222		4	13,3056	16,000(14)
15	GTP ** (.01) ~~check~~	426,7083	3.89	4	106,6771	16,000(15)
16	CTP	77,5486		2	38,7743	24,000(16)
17	ST(GC)	3298,5833		42	78,5377	3,000(17)
18	SP(GC)	3163,5417		84	37,6612	2,000(18)
19	GCTP	50,5972		4	12,6493	8,000(19)
20	STP(GC)	2302,7917		84	27,4142	1,000(20)

MEAN 84,92361

CELL MEANS

G =	1	2	3
	83,78125	85,47917	85,51042

C =	1	2
	86,97222	82,87500

T =	1	2
	86,50694	83,34028

P =	1	2	3
	84,61458	83,34375	86,81250

	C =	1	2
G =	1	84,75833	82,60417
	2	89,85417	81,10417
	3	86,10417	84,91667

	T =	1	2
G =	1	85,02083	82,54167
	2	87,14583	83,81250
	3	87,35417	83,66667

	T =	1	2
C =	1	88,81944	85,12500
	2	84,19444	81,55556

	P =	1	2	3
G =	1	85,21875	81,31250	84,81250
	2	84,25000	84,90625	87,28125
	3	84,37500	83,81250	88,34375

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Anticipatory Deceleration*

	SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MS
1	MEAN	1406647,6875	*F* 1	1406647,6875	192,000 (1)
2	G	196,5313	2	98,2656	64,000 (2)
3	C	285,1875	1	285,1875	96,000 (3)
4	T	65,3333	1	65,3333	96,000 (4)
5	P *(.02)* *7.27 for .01*	285,1875	*6.93* 1	285,1875	96,000 (5)
6	GC	1105,3438	2	552,6719	32,000 (6)
7	GT	151,0104	2	75,5052	32,000 (7)
8	CT	126,7500	1	126,7500	48,000 (8)
9	GP	43,9688	2	21,9844	32,000 (9)
10	CP	88,0208	*2+* 1	88,0208	48,000(10)
11	TP	85,3333	*ns 2.84* 1	85,3333	48,000(11)
12	S(GC)	40585,7500	42	966,3274	4,000(12)
13	GCT	9,4062	2	4,7031	16,000(13)
14	GCP	228,5729	*ns 2.78* 2	114,2865	16,000(14)
15	GTP	114,6979	2	57,3490	16,000(15)
16	CTP	4,0833	1	4,0833	24,000(16)
17	ST(GC)	4377,0000	42	104,2143	2,000(17)
18	SP(GC)	1728,7500	42	41,1607	2,000(18)
19	GCTP	18,1354	2	9,0677	8,000(19)
20	STP(GC)	1263,2500	42	30,0774	1,000(20)

MEAN 85,59375

CELL MEANS

G =	1	2	3
	84,26563	85,79688	86,71875

C =	1	2
	86,81250	84,37500

T =	1	2
	86,17708	85,01042

P =	1	2
	86,81250	84,37500

	C =	1	2
G =	1	86,65625	81,87500
	2	89,18750	82,40625
	3	84,59375	88,84375

	T =	1	2
G =	1	84,09375	84,43750
	2	87,62500	83,96875
	3	86,81250	86,62500

	T =	1	2
C =	1	88,20833	85,41667
	2	84,14583	84,60417

	P =	1	2
G =	1	84,81250	83,71875
	2	87,28125	84,31250
	3	88,34375	85,09375

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Impact Period Post Alone*

	SOURCE	SUM OF SQUARES	F	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED ME
1	MEAN	1581228,0000		1	1581228,0000	192,000 (1)
2	G	494,7188		2	247,3594	64,000 (2)
3	C	154,0833		1	154,0833	96,000 (3)
4	T **(.01) check .001	1102,0833	15.16	1	1102,0833	96,000 (4)
5	P ***(.001)	2976,7500	46.44	1	2976,7500	96,000 (5)
6	GC	846,9479		2	423,4740	32,000 (6)
7	GT	395,3854	ns 2.72	2	197,6927	32,000 (7)
8	CT	14,0833		1	14,0833	48,000 (8)
9	GP	65,0938		2	32,5469	32,000 (9)
10	CP	192,0000	ns 3.00	1	192,0000	48,000(10)
11	TP *(.025)	252,0833	5.42	1	252,0833	48,000(11)
12	S(GC)	41647,7500		42	991,6131	4,000(12)
13	GCT	126,3229		2	63,1615	16,000(13)
14	GCP	60,4062		2	30,2031	16,000(14)
15	GTP	23,8854		2	11,9427	16,000(15)
16	CTP	30,0833		1	30,0833	24,000(16)
17	ST(GC)	3053,6250		42	72,7054	2,000(17)
18	SP(GC)	2692,2500		42	64,1012	2,000(18)
19	GCTP	31,0729		2	15,5365	8,000(19)
20	STP(GC)	1953,3750		42	46,5089	1,000(20)

MEAN 90,75000

CELL MEANS

G =	1	2	3
	88,96875	90,42188	92,85938

C =	1	2
	91,64583	89,85417

T =	1	2
	93,14583	88,35417

P =	1	2
	86,81250	94,68750

	C =	1	2
G =	1	90,28125	87,65625
	2	93,65625	87,18750
	3	91,00000	94,71875

	T =	1	2
G =	1	90,25000	87,68750
	2	94,84375	86,00000
	3	94,34375	91,37500

	T =	1	2
C =	1	94,31250	88,97917
	2	91,97917	87,72917

	P =	1	2
G =	1	84,81250	93,12500
	2	87,28125	93,56250
	3	88,34375	97,37500

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 Impact Period Pre - Post-8

	SOURCE	SUM OF SQUARES	F	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED ME
1	MEAN	1539042.1875	F	1	1539042.1875	192.000 (1)
2	G	286.9688	—	2	143.4844	64.000 (2)
3	C	9.1875		1	9.1875	96.000 (3)
4	T *(.05)	574.0833	6.03	1	574.0833	96.000 (4)
5	Q ***(.001)	5104.6875	98.66	1	5104.6875	96.000 (5)
6	GC	1634.2813		2	817.1406	32.000 (6)
7	GT	142.3854		2	71.1927	32.000 (7)
8	CT	33.3333		1	33.3333	48.000 (8)
9	GQ	93.2188		2	46.6094	32.000 (9)
10	CQ	20.0208		1	20.0208	48.000(10)
11	TQ ** (.001) ~~check~~	630.7500	14.20	1	630.7500	48.000(11)
12	S(GC)	41628.8750		42	991.1637	4.000(12)
13	GCT	49.8229		2	24.9115	16.000(13)
14	GCQ	60.4479		2	30.2240	16.000(14)
15	GTQ	58.7187		2	29.3594	16.000(15)
16	CTQ	56.3333		1	56.3333	24.000(16)
17	ST(GC)	3999.8750		42	95.2351	2.000(17)
18	SQ(GC)	2173.1250		42	51.7411	2.000(18)
19	GCTQ	86.3229		2	43.1615	8.000(19)
20	STQ(GC)	1865.3750		42	44.4137	1.000(20)

MEAN 89.53125

CELL MEANS

G =	1	2	3
	88.42188	88.93750	91.23438

C =	1	2
	89.75000	89.31250

T =	1	2
	91.26042	87.80208

Q =	1	2
	84.37500	94.68750

	C = 1	2
G = 1	90.37500	86.46875
2	91.53125	86.34375
3	87.34375	95.12500

	T = 1	2
G = 1	89.09375	87.75000
2	91.71875	86.15625
3	92.96875	89.50000

	T = 1	2
C = 1	91.89583	87.60417
2	90.62500	88.00000

	Q = 1	2
G = 1	83.71875	93.12500
2	84.31250	93.56250
3	85.09375	97.37500

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Recovery Period*

	SOURCE	SUM OF SQUARES	F	DEGREES OF FREEDOM		MEAN SQUARE	EXPECTED ME…
1	MEAN	2151775,1250		1		2151775,1250	288,000 (1)
2	G	647,6458		2		323,8229	96,000 (2)
3	C	120,1250		1		120,1250	144,000 (3)
4	T *** (.001)	2278,1250	23.13	1		2278,1250	144,000 (4)
5	P ** (.001) *check*	2282,1458	13.28	2		1141,0729	96,000 (5)
6	GC	1620,5625		2		810,2813	48,000 (6)
7	GT	55,5625		2		27,7813	48,000 (7)
8	CT	190,1250		1	ns	190,1250	72,000 (8)
9	GP	328,3333		4		82,0833	32,000 (9)
10	CP	90,3958		2		45,1979	48,000(10)
11	TP * (.05)	419,8125	4.33	2		209,9062	48,000(11)
12	S(GC)	71107,5417		42		1693,0367	6,000(12)
13	GCT	574,3958 ns	2.92	2		287,1979	24,000(13)
14	GCP	87,1667		4		21,7917	16,000(14)
15	GTP	16,7500		4		4,1875	16,000(15)
16	CTP	9,8958		2		4,9479	24,000(16)
17	ST(GC)	4136,7917		42		98,4950	3,000(17)
18	SP(GC)	7219,9583		84		85,9519	2,000(18)
19	GCTP	251,3333		4		62,8333	8,000(19)
20	STP(GC)	4074,2083		84		48,5025	1,000(20)

MEAN 86,43750

CELL MEANS

G =	1	2	3
	85,61458	85,15625	88,54167

C =	1	2
	87,08333	85,79167

T =	1	2
	89,25000	83,62500

P =	1	2	3
	88,53125	88,32292	82,45833

	C =	1	2
G =	1	85,66667	85,56250
	2	88,95833	81,35417
	3	86,62500	90,45833

	T =	1	2
G =	1	88,60417	82,62500
	2	88,39583	81,91667
	3	90,75000	86,33333

	T =	1	2
C =	1	89,08333	85,08333
	2	89,41667	82,16667

	P =	1	2	3
G =	1	87,25000	87,90625	81,68750
	2	86,93750	85,62500	82,90625
	3	91,40625	91,43750	82,78125

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 Surprise vs Tr. 5 Items 8 Pre-Post

	SOURCE	SUM OF SQUARES		DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED ME
1	MEAN	1485440,3333	F	1	1485440,3333	192,000 (1)
2	G	72,0104		2	36,0052	64,000 (2)
3	C	30,0833		1	30,0833	96,000 (3)
4	T	4,6875		1	4,6875	96,000 (4)
5	Q ~~Rdr~~ (.001)	2961,0208	45.21	1	2961,0208	96,000 (5)
6	GC	1204,8854		2	602,4427	32,000 (6)
7	GT	195,0312		2	97,5156	32,000 (7)
8	CT	67,6875		1	67,6875	48,000 (8)
9	GQ	224,1979	ns 1.71	2	112,0990	32,000 (9)
10	CQ	2,5208		1	2,5208	48,000(10)
11	TQ	65,3333		1	65,3333	48,000(11)
12	S(GC)	43468,6875		42	1034,9688	4,000(12)
13	GCT	188,1563		2	94,0781	16,000(13)
14	GCQ	79,8229		2	39,9115	16,000(14)
15	GTQ	60,5104		2	30,2552	16,000(15)
16	CTQ	21,3333		1	21,3333	24,000(16)
17	ST(GC)	3035,4375		42	72,2723	2,000(17)
18	SQ(GC)	2750,4375		42	65,4866	2,000(18)
19	GCTQ	57,3854		2	28,6927	8,000(19)
20	STQ(GC)	1910,4375		42	45,4866	1,000(20)

MEAN 87,75833

CELL MEANS

G =	1	2	3
	88,53125	87,10938	88,23438

C =	1	2
	88,35417	87,56250

T =	1	2
	87,40208	88,11458

Q =	1	2
	84,03125	91,88542

	C = 1	2
G = 1	90,06250	87,00000
2	89,84375	84,37500
3	85,15625	91,31250

	T = 1	2
G = 1	87,75000	89,31250
2	86,15625	88,06250
3	89,50000	86,96875

	T = 1	2
C = 1	87,60417	89,10417
2	88,00000	87,12500

	Q = 1	2
G = 1	85,43750	91,62500
2	83,87500	90,34375
3	82,78125	93,68750

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Surprise Alone Pre-Post*

	SOURCE	SUM OF SQUARES		DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MEA
			F			
1	MEAN	745361,2604		1	745361,2604	96,000 (1)
2	G	88,0208		2	44,0104	32,000 (2)
3	C	94,0104		1	94,0104	48,000 (3)
4	Q ***(.001)	1953,0104	22.98	1	1953,0104	48,000 (4)
5	GC	396,5208		2	198,2604	16,000 (5)
6	GQ	166,0208		2	83,0104	16,000 (6)
7	CQ	19,2604		1	19,2604	24,000 (7)
8	S(GC)	20467,6875		42	487,3259	2,000 (8)
9	GCQ	136,0208		2	68,0104	8,000 (9)
10	SQ(GC)	3569,1875		42	84,9807	1,000(10)

MEAN 88,11458

CELL MEANS

G =	1	2	3
	89,31250	88,06250	86,96875

C =	1	2
	89,10417	87,12500

Q =	1	2
	83,60417	92,62500

C =	1	2
G = 1	90,12500	88,50000
2	91,62500	84,50000
3	85,56250	88,37500

Q =	1	2
G = 1	86,37500	92,25000
2	83,62500	92,50000
3	80,81250	93,12500

Q =	1	2
C = 1	85,04167	93,16667
2	82,16667	92,08333

G = 1

Q =	1	2
C = 1	86,25000	94,00000
2	86,50000	90,50000

G = 2

Q =	1	2
C = 1	87,50000	95,75000
2	79,75000	89,25000

G = 3

Q =	1	2
C = 1	81,37500	89,75000
2	80,25000	96,50000

CELL DEVIATIONS

Heart Rate Range Corrected

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 Anticipatory Period

	SOURCE	SUM OF SQUARES	F	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MEA
1	MEAN	51623807.2529		1	51623807.2529	288.000 (1)
2	G	88133.5903		2	44066.7951	96.000 (2)
3	C	94721.2813		1	94721.2813	144.000 (3)
4	T **(.01)	636098.0035	8.33	1	636098.0035	144.000 (4)
5	P **(.01)	367798.5278	5.48	2	183899.2639	96.000 (5)
6	GC	1769.1458		2	884.5729	48.000 (6)
7	GT	38319.7153		2	19159.8576	48.000 (7)
8	CT	5556.3368		1	5556.3368	72.000 (8)
9	GP	193159.0347		4	48289.7587	32.000 (9)
10	CP	6394.0833		2	3197.0417	48.000(10)
11	TP	18013.4445		2	9006.7222	48.000(11)
12	S(GC)	4792097.8959		42	114097.5689	6.000(12)
13	GCT	26352.3819		2	13176.1910	24.000(13)
14	GCP	52070.6458		4	13017.6615	16.000(14)
15	GTP **(.01)	351612.6181	3.56	4	87903.1545	16.000(15)
16	CTP	69923.8611		2	34961.9305	24.000(16)
17	ST(GC)	3206875.3953		42	76354.1761	3.000(17)
18	SP(GC)	2819121.0416		84	33560.9648	2.000(18)
19	GCTP	45621.4514		4	11405.3629	8.000(19)
20	STP(GC)	2072191.2919		84	24668.9440	1.000(20)

MEAN 423.37847

CELL MEANS

G =	1	2	3
	421.60417	402.89583	445.63542

C =	1	2
	441.51389	405.24306

T =	1	2
	470.37500	376.38194

P =	1	2	3
	418.48958	382.26042	469.38542

	C = 1	2
G = 1	440.64583	402.56250
2	417.64583	388.14583
3	466.25000	425.02083

	T = 1	2
G = 1	453.81250	389.39583
2	463.25000	342.54167
3	494.06250	397.20833

	T = 1	2
C = 1	492.90278	390.12500
2	447.84722	362.63889

	P = 1	2	3
G = 1	465.93750	361.28125	437.59375
2	366.15625	384.21875	458.31250
3	423.37500	401.28125	512.25000

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Anticipatory Decelleration*

	SOURCE	SUM OF SQUARES	F	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MEA
1	MEAN	35912205.0469		1	35912205.0469	192.000 (1)
2	G	30882.1250		2	15441.0625	64.000 (2)
3	C	360.2552		1	360.2552	96.000 (3)
4	T	75406.3802		1	75406.3802	96.000 (4)
5	P *(.05)	261443.8802	6.23	1	261443.8802	96.000 (5)
6	GC	397436.7917	ns 2.32	2	198718.3958	32.000 (6)
7	GT	163481.2917		2	81740.6458	32.000 (7)
8	CT	69959.5052		1	69959.5052	48.000 (8)
9	GP	92797.5417		2	46398.7708	32.000 (9)
10	CP	129844.0052	ns 3.09	1	129844.0052	48.000(10)
11	TP	71340.6302	ns 2.15	1	71340.6302	48.000(11)
12	S(GC)	3594387.0312		42	85580.6436	4.000(12)
13	GCT	27391.5417		2	13695.7708	16.000(13)
14	GCP *(.05)	305179.1666	3.63	2	152589.5833	16.000(14)
15	GTP	128742.5417		2	64371.2708	16.000(15)
16	CTP	11147.7552		1	11147.7552	24.000(16)
17	ST(GC)	3625732.5313		42	86326.9650	2.000(17)
18	SP(GC)	1763319.6566		42	41983.8013	2.000(18)
19	GCTP	15218.6666		2	7609.3333	8.000(19)
20	STP(GC)	1390930.6564		42	33117.3966	1.000(20)

MEAN 432.48438

CELL MEANS

G =	1	2	3
	428.64063	419.23438	449.57813

C =	1	2
	431.11458	433.85417

T =	1	2
	452.90208	412.06667

P =	1	2
	469.38542	395.58333

	C =	1	2
G =	1	469.68750	367.59375
	2	400.18750	438.28125
	3	403.46875	495.68750

	T =	1	2
G =	1	422.65625	434.62500
	2	479.84375	358.62500
	3	454.40625	444.75000

	T =	1	2
C =	1	470.02083	392.20833
	2	434.58333	433.12500

	P =	1	2
G =	1	437.59375	419.68750
	2	458.31250	380.15625
	3	512.25000	386.90625

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Impact Period Post alone*

	SOURCE	SUM OF SQUARES	F	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MEAN
1	MEAN	66237104,0830		1	66237104,0830	192,000 (1)
2	G	153872,3229		2	76936,1615	64,000 (2)
3	C	1887,5208		1	1887,5208	96,000 (3)
4	T ***(.001)	980980,0833	16.15	1	980980,0833	96,000 (4)
5	P ***(.001)	2671992,1875	46.81	1	2671992,1875	96,000 (5)
6	GC	143280,8229		2	71640,4115	32,000 (6)
7	GT *(.05)	586602,0729	4.83	2	293301,0364	32,000 (7)
8	CT	8347,6875		1	8347,6875	48,000 (8)
9	GP	8294,4688		2	4147,2344	32,000 (9)
10	CP	148074,0834	ns 2.59	1	148074,0834	48,000(10)
11	TP *(.05)	201372,5209	4.88	1	201372,5209	48,000(11)
12	S(GC)	4140371,7504		42	98580,2798	4,000(12)
13	GCT	105305,2813		2	52652,6406	16,000(13)
14	GCP	51101,8853		2	25550,9427	16,000(14)
15	GTP	25977,5105		2	12988,7552	16,000(15)
16	CTP	4562,9999		1	4562,9999	24,000(16)
17	ST(GC)	2550574,3751		42	60727,9613	2,000(17)
18	SP(GC)	2397597,8746		42	57085,6637	2,000(18)
19	GCTP	42764,7187		2	21382,3593	8,000(19)
20	STP(GC)	1732865,7494		42	41258,7083	1,000(20)

MEAN 587,35417

CELL MEANS

G =	1	2	3
	564,67188	570,12500	627,26563

C =	1	2
	584,21875	590,48958

T =	1	2
	658,83333	515,87500

P =	1	2
	469,38542	705,32292

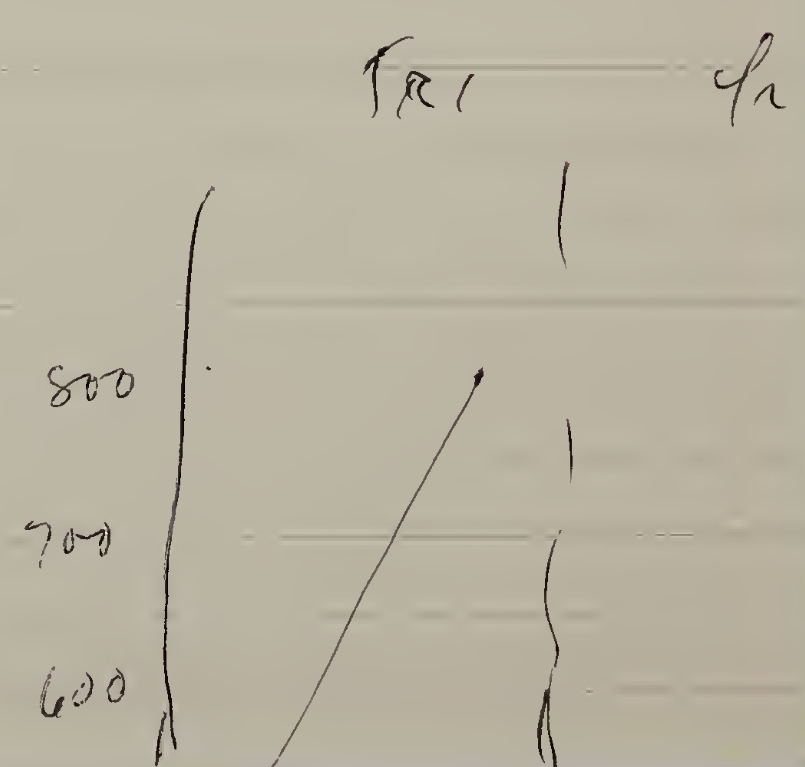
	C =	1	2
G =	1	599,31250	530,03125
	2	541,09375	599,15625
	3	612,25000	642,28125

	T =	1	2
G =	1	587,28125	542,06250
	2	718,87500	421,37500
	3	670,34375	584,18750

crossing

	T =	1	2
C =	1	662,29167	506,14583
	2	655,37500	525,60417

	P =	1	2
G =	1	437,59375	691,75000
	2	458,31250	681,93750
	3	512,25000	742,28125



ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Impact Period PrePost 8*

	SOURCE	SUM OF SQUARES	F	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MEAN SQUARE
1	MEAN	58175739.4219		1	58175739.4219	192.000 (1)
2	G	38674.3438		2	19337.1719	64.000 (2)
3	C	163041.7969	ns 1.74	1	163041.7969	96.000 (3)
4	T **(.01)	523231.9219	7.42	1	523231.9219	96.000 (4)
5	Q ***(.001)	4665053.2551	114.64	1	4665053.2551	96.000 (5)
6	GC *(.05)	729872.2813	3.90	2	364936.1406	32.000 (6)
7	GT	220760.7188	ns 1.56	2	110380.3594	32.000 (7)
8	CT	38788.7552		1	38788.7552	48.000 (8)
9	GQ	57047.8230		2	28523.9115	32.000 (9)
10	CQ	598.5469		1	598.5469	48.000(10)
11	TQ ***(.001)	512430.0052	12.56	1	512430.0052	48.000(11)
12	S(GC)	3932201.4063		42	93623.8430	4.000(12)
13	GCT	42942.4479		2	21471.2240	16.000(13)
14	GCQ	112284.5938		2	56142.2969	16.000(14)
15	GTQ	130733.8229		2	65366.9114	16.000(15)
16	CTQ	29975.0053		1	29975.0053	24.000(16)
17	ST(GC)	2962093.4064		42	70526.0335	2.000(17)
18	SQ(GC)	1687156.0315		42	40170.2388	2.000(18)
19	GCTQ	104464.8853		2	52232.4427	8.000(19)
20	STQ(GC)	1714142.5315		42	40812.9174	1.000(20)

MEAN 550.45313

CELL MEANS

G =	1	2	3
	555.71875	531.04688	564.59375

C =	1	2
	521.31250	579.59375

T =	1	2
	602.65625	498.25000

Q =	1	2
	395.58333	705.32292

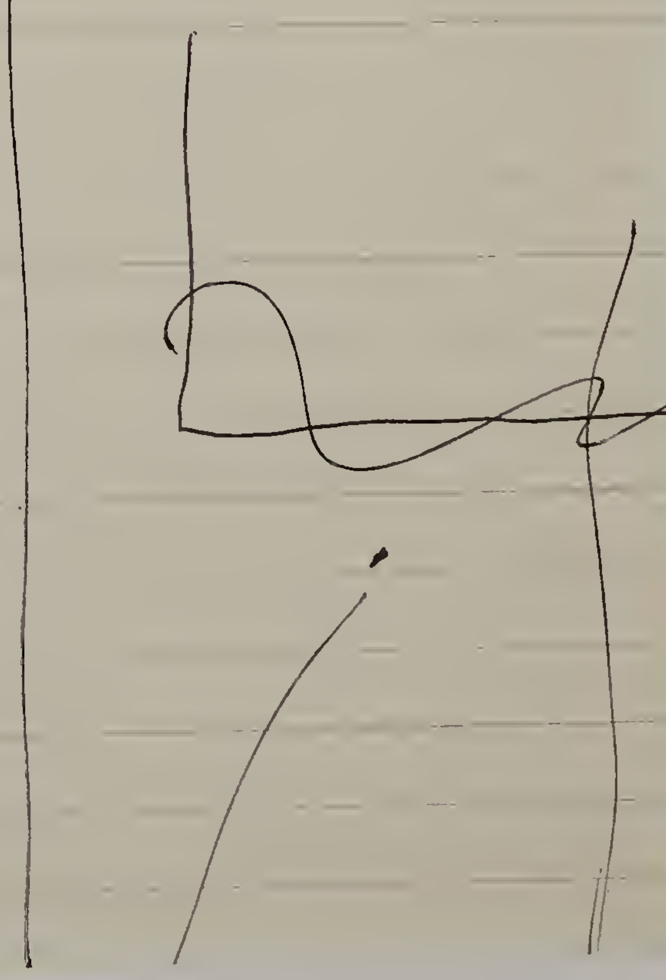
	C =	1	2
G =	1	610.18750	501.25000
	2	481.53125	580.56250
	3	472.21875	656.96875

*→ I don't think this means anything

	T =	1	2
G =	1	567.18750	544.25000
	2	625.53125	436.56250
	3	615.25000	513.93750

	T =	1	2
C =	1	587.72917	454.39583
	2	617.58333	541.60417

	Q =	1	2
G =	1	419.68750	691.75000
	2	380.15625	681.93750
	3	386.90625	742.28125



ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 Recovery Period

	SOURCE	SUM OF SQUARES	F	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MEAN
1	MEAN	59614100.3467		1	59614100.3467	288.000 (1)
2	G trend	541789.2569	3.09	2	270894.6285	96.000 (2)
3	C	35600.0139		1	35600.0139	144.000 (3)
4	T *** (.001)	2356258.6805	29.17	1	2356258.6805	144.000 (4)
5	P *** (.001)	1821172.7986	12.05	2	910586.3993	96.000 (5)
6	GC	147607.7153		2	73803.8576	48.000 (6)
7	GT	86583.5069		2	43291.7534	48.000 (7)
8	CT	266328.3472	ns 3.30	1	266328.3472	72.000 (8)
9	GP	203977.0346		4	50994.2587	32.000 (9)
10	CP	231538.8819	ns 1.53	2	115769.4410	48.000(10)
11	TP ** (.01)	431007.5069	5.89	2	215503.7534	48.000(11)
12	S(GC)	3680424.6666		42	87629.1587	6.000(12)
13	GCT	372946.3820	ns 2.31	2	186473.1910	24.000(13)
14	GCP	162532.5764		4	40633.1441	16.000(14)
15	GTP	10644.6183		4	2661.1546	16.000(15)
16	CTP	38572.8404		2	19286.4202	24.000(16)
17	ST(GC)	3392610.4168		42	80776.5814	3.000(17)
18	SP(GC)	6348267.7080		84	75574.6156	2.000(18)
19	GCTP	231856.7430	ns 1.58	4	57964.1857	8.000(19)
20	STP(GC)	3074759.9589		84	36604.2852	1.000(20)

MEAN 454.96528

CELL MEANS

G =	1	2	3
	470.83333	395.71875	498.34375

C =	1	2
	443.84722	466.08333

T =	1	2
	545.41667	364.51389

P =	1	2	3
	510.35417	512.03125	342.51042

	C = 1	2
G = 1	469.47917	472.18750
2	406.12500	385.31250
3	455.93750	540.75000

	T = 1	2
G = 1	553.75000	387.91667
2	510.14583	281.29167
3	572.35417	424.33333

	T = 1	2
C = 1	503.88889	383.80556
2	586.94444	345.22222

	P = 1	2	3
G = 1	511.37500	532.37500	368.25000
2	450.75000	416.50000	319.90625
3	568.43750	587.21875	339.37500

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 Surprise vs 15 items Pre Post

	SOURCE	SUM OF SQUARES	F	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED ME
1	MEAN	58175739.4219		1	58175739.4219	192.000 (1)
2	G	38674.3438		2	19337.1719	64.000 (2)
3	C	163041.7969	ns 1.74	1	163041.7969	96.000 (3)
4	T ** (.01)	523231.9219	7.41	1	523231.9219	96.000 (4)
5	Q *** (.001)	4605053.2551	114.64	1	4605053.2551	96.000 (5)
6	GC * (.05)	729872.2813	3.90	2	364936.1406	32.000 (6)
7	GT	220760.7188	ns 1.57	2	110380.3594	32.000 (7)
8	CT	38788.7552		1	38788.7552	48.000 (8)
9	GQ	57047.8230		2	28523.9115	32.000 (9)
10	CQ	598.5469		1	598.5469	48.000(10)
11	TQ *** (.001)	512430.0052	12.56	1	512430.0052	48.000(11)
12	S(GC)	3932201.4063		42	93623.8430	4.000(12)
13	GCT	42942.4479		2	21471.2240	16.000(13)
14	GCQ	112284.5938		2	56142.2969	16.000(14)
15	GTQ	130733.8229		2	65366.9114	16.000(15)
16	CTQ	29975.0053		1	29975.0053	24.000(16)
17	ST(GC)	2962093.4064		42	70526.0335	2.000(17)
18	SQ(GC)	1687150.0315		42	40170.2388	2.000(18)
19	GCTQ	104464.8853		2	52232.4427	8.000(19)
20	STQ(GC)	1714142.5315		42	40812.9174	1.000(20)

MEAN 550.45313

CELL MEANS

G =	1	2	3
	555.71875	531.04688	564.59375

C =	1	2
	521.31250	579.59375

T =	1	2
	602.65625	498.25000

Q =	1	2
	395.58333	705.32292

	C =	1 Ambig	2 Unambig
G =	1	610.18750	501.25000
	2	481.53125	580.56250
	3	472.21875	656.96875

*nother

	T =	1	2
G =	1	567.18750	544.25000
	2	625.53125	436.56250
	3	615.25000	513.93750

	T =	1	2
C =	1	587.72917	454.89583
	2	617.58333	541.60417

	Q =	1	2
G =	1	419.68750	691.75000
	2	380.15625	681.93750
	3	386.90625	742.28125

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 Surprise Alone Pre Post

	SOURCE	SUM OF SQUARES	F	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED ME
1	MEAN	25695946.7603		1	25695946.7603	96.000 (1)
2	G	169268.5208		2	84634.2604	32.000 (2)
3	C	15075.0938		1	15075.0938	48.000 (3)
4	Q ***(.001)	1701071.2604	26.80	1	1701071.2604	48.000 (4)
5	GC	66272.0625		2	33136.0313	16.000 (5)
6	GQ	174691.3958		2	87345.6979	16.000 (6)
7	CQ	9902.3438		1	9902.3438	24.000 (7)
8	S(GC)	2701202.0625		42	64314.3348	2.000 (8)
9	GCQ	80308.1875		2	40154.0937	8.000 (9)
10	SQ(GC)	2666241.3121		42	63481.9360	1.000 (10)

MEAN 517.36458

CELL MEANS

G =	1	2	3
	574.31250	503.46875	474.31250

C =	1	2
	504.83333	529.89583

Q =	1	2
	384.25000	650.47917

Same as uncorrected data

	C =	1	2
G =	1	598.62500	550.00000
	2	476.68750	530.25000
	3	439.18750	509.43750

	Q =	1	2
G =	1	494.37500	654.25000
	2	368.43750	638.50000
	3	289.93750	658.68750

	Q =	1	2
C =	1	381.87500	627.79167
	2	386.62500	673.16667

G = 1

	Q =	1	2
C =	1	490.12500	707.12500
	2	498.62500	601.37500

G = 2

	Q =	1	2
C =	1	359.75000	593.62500
	2	377.12500	683.37500

G = 3

	Q =	1	2
C =	1	295.75000	582.62500
	2	284.12500	734.75000

CELL DEVIATIONS

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Basal Skin Conductance Anticipatory Period* *100*

	SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	*F*	MEAN SQUARE	EXPECTED MS
1	MEAN	23247.0703	1		23247.0703	288.000 (1)
2	G	220.5194	2	*1.32*	110.2597	96.000 (2)
3	C	0.2059	1		0.2059	144.000 (3)
4	T **** (.001)*	587.3878	1	*118.19*	587.3878	144.000 (4)
5	P **** (.001)*	22.2527	2	*13.25*	11.1264	96.000 (5)
6	GC	212.2463	2	*1.27*	106.1232	48.000 (6)
7	GT	19.1444	2	*1.93*	9.5722	48.000 (7)
8	CT	0.3134	1		0.3134	72.000 (8)
9	GP	0.5523	4		0.1381	32.000 (9)
10	CP	0.8030	2		0.4015	48.000(10)
11	TP	2.0027	2	*1.46*	1.0014	48.000(11)
12	S(GC)	3507.6531	42		83.5156	6.000(12)
13	GCT	8.5988	2		4.2994	24.000(13)
14	GCP	0.2183	4		0.0546	16.000(14)
15	GTP	1.3985	4		0.3496	16.000(15)
16	CTP	0.5147	2		0.2573	24.000(16)
17	ST(GC)	208.8706	42		4.9731	3.000(17)
18	SP(GC)	70.5136	84		0.8394	2.000(18)
19	GCTP	0.4928	4		0.1232	8.000(19)
20	STP(GC)	57.3712	84		0.6830	1.000(20)

MEAN 8.98438

CELL MEANS

G =	1	2	3
	8.68854	10.17292	8.09167

C =	1	2
	9.01111	8.95764

T =	1	2
	7.55625	10.41250

Artifact

P =	1	2	3
	8.86354	8.72083	9.36875

	C =	1	2
G =	1	9.26250	8.11458
	2	10.86458	9.48125
	3	6.90625	9.27708

	T =	1	2
G =	1	6.78125	10.59583
	2	9.28125	11.06458
	3	7.00625	9.17708

	T =	1	2
C =	1	7.55000	10.47222
	2	7.56250	10.35278

	P =	1	2	3
G =	1	8.57812	8.41562	9.07187
	2	9.97187	9.95625	10.59062
	3	8.04063	7.79063	8.44375

	P =	1	2	3
C =	1	8.92917	8.78333	9.32083

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE - Impact Period PrePost 8

SOURCE		SUM OF SQUARES	DEGREES OF FREEDOM		MEAN SQUARE	EXPECTED MEAN
				E		
1	MEAN	22583.1942	1		22583.1942	192.000 (1)
2	G	116.0666	2	21	58.0333	64.000 (2)
3	C	1.3167	1		1.3167	96.000 (3)
4	T ***(.001)	573.0463	1	120.6	573.0463	96.000 (4)
5	Q ***(.001)	229.9063	1	68.02	229.9063	96.000 (5)
6	GC	174.3622	2		87.1811	32.000 (6)
7	GT	2.6695	2		1.3347	32.000 (7)
8	CT	1.4180	1		1.4180	48.000 (8)
9	GQ	3.7545	2		1.8772	32.000 (9)
10	CQ	3.0755	1		3.0755	48.000(10)
11	TQ	0.7626	1		0.7626	48.000(11)
12	S(GC)	3269.2928	42		77.8403	4.000(12)
13	GCT	9.0309	2		4.5155	16.000(13)
14	GCQ	2.4497	2		1.2248	16.000(14)
15	GTQ	1.9257	2	1.70	0.9629	16.000(15)
16	CTQ	0.2201	1		0.2201	24.000(16)
17	ST(GC)	199.4878	42		4.7497	2.000(17)
18	SQ(GC)	142.1666	42		3.3849	2.000(18)
19	GCTQ	0.1476	2		0.0738	8.000(19)
20	STQ(GC)	23.8566	42		0.5680	1.000(20)

MEAN 10.84531

CELL MEANS

G =	1	2	3
	10.25313	11.94375	10.33906

C =	1	2
	10.76250	10.92813

T =	1	2
	9.11771	12.57292

Q =	1	2
	9.75104	11.93958

artifact

	C =	1	2
G =	1	10.88437	9.62187
	2	12.49375	11.39375
	3	8.90937	11.76875

	T =	1	2
G =	1	7.43750	12.96875
	2	10.13750	13.75000
	3	9.77812	11.90000

	T =	1	2
C =	1	9.12083	12.40417
	2	9.11458	12.74167

	Q =	1	2
G =	1	9.33437	11.17187
	2	10.84063	13.04688
	3	9.07812	11.60000

	Q =	1	2
C =	1	9.54167	11.98333

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Impact Period Post alone*

	SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	*F*	MEAN SQUARE	EXPECTED MEAN
1	MEAN	21794,1633	1		21794,1633	192,000 (1)
2	G	130,5204	2		65,2602	64,000 (2)
3	C	0,0008	1		0,0008	96,000 (3)
4	T ****(.001)*	484,5052	1	*106.26*	484,5052	96,000 (4)
5	P ****(.001)*	317,2408	1	*77.0*	317,2408	96,000 (5)
6	GC	143,6504	2		71,8252	32,000 (6)
7	GT	6,5554	2		3,2777	32,000 (7)
8	CT	0,0752	1		0,0752	48,000 (8)
9	GP	9,2404	2		4,6202	32,000 (9)
10	CP	0,4033	1		0,4033	48,000(10)
11	TP	1,1102	1	*.15 2.22*	1,1102	48,000(11)
12	S(GC)	3161,6750	42		75,2780	4,000(12)
13	GCT	6,0504	2		3,0252	16,000(13)
14	GCP	0,8717	2		0,4358	16,000(14)
15	GTP	1,0867	2		0,5433	16,000(15)
16	CTP	0,9919	1		0,9919	24,000(16)
17	ST(GC)	191,5438	42		4,5606	2,000(17)
18	SP(GC)	173,2037	42		4,1239	2,000(18)
19	GCTP	0,1837	2		0,0919	8,000(19)
20	STP(GC)	21,0075	42		0,5002	1,000(20)

MEAN 10,65417

CELL MEANS

G =	1	2	3
	10,12188	11,81875	10,02187

C =	1	2
	10,65208	10,65625

T =	1	2
	9,06562	12,24271

P =	1	2
	9,36875	11,93958

artifact

	C = 1	2
G = 1	10,75625	9,48750
2	12,40313	11,23437
3	8,79688	11,24687

	T = 1	2
G = 1	8,42187	11,82187
2	10,08125	13,55625
3	8,69375	11,35000

	T = 1	2
C = 1	9,04375	12,26042
2	9,08750	12,22500

	P = 1	2
G = 1	9,07187	11,17187
2	10,29062	13,34688
3	8,74375	11,30000

	P = 1	2
C = 1	9,32083	11,98333

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE *Recovery Period*

	SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MEA[N SQUARE]
				E	
1	MEAN	30496.2672	1	30496.2672	288.000 (1)
2	G	218.0844	2	109.0422	96.000 (2)
3	C	10.7339	1	10.7339	144.000 (3)
4	T ****(.001)*	325.1250	1	*62.77* 325.1250	144.000 (4)
5	P ****(.001)*	48.6013	2	*40.50* 24.3007	96.000 (5)
6	GC	218.9644	2	109.4822	48.000 (6)
7	GT	7.4858	2	3.7429	48.000 (7)
8	CT	1.8689	1	1.8689	72.000 (8)
9	GP	3.6508	4	*1.51* 0.9127	32.000 (9)
10	CP	0.0134	2	0.0067	48.000(10)
11	TP	0.6540	2	0.3270	48.000(11)
12	S(GC)	5301.8933	42	126.2356	6.000(12)
13	GCT	28.4936	2	*NS 2.75* 14.2468	24.000(13)
14	GCP	0.6908	4	0.1727	16.000(14)
15	GTP	0.6215	4	0.1554	16.000(15)
16	CTP	0.6347	2	0.3173	24.000(16)
17	ST(GC)	217.5100	42	5.1788	3.000(17)
18	SP(GC)	50.7104	84	0.6037	2.000(18)
19	GCTP	1.0253	4	0.2563	8.000(19)
20	STP(GC)	23.1712	84	0.2758	1.000(20)

MEAN 10.29028

CELL MEANS

G =	1	2	3
	9.[illegible]8750	11.[illegible]2083	9.6[illegible]5[illegible]

C =	1	2
	10.[illegible]8333	10.[illegible]9722

T =	1	2
	9.[illegible]2778	11.[illegible]5278

antefort

P =	1	2	3
	10.[illegible]1771	10.23750	9.81563

	C =	1	2
G =	1	10.35000	[illegible].[illegible]2500
	2	12.46667	11.[illegible]7500
	3	[illegible].[illegible]3333	10.[illegible]9167

	T =	1	2
G =	1	[illegible].49375	10.38125
	2	10.[illegible]6250	12.[illegible]7917
	3	[illegible].[illegible]2708	10.49792

	T =	1	2
C =	1	9.[illegible]4028	11.[illegible]2639
	2	9.11528	11.[illegible]7917

	P =	1	2	3
G =	1	10.[illegible]5625	[illegible].[illegible]9062	[illegible].31563
	2	11.[illegible]9687	11.47187	11.09375
	3	10.[illegible]0000	[illegible].[illegible]5000	[illegible].03750

	P =	1	2	3
C =	1	11.[illegible]1875	[illegible].[illegible]3125	10.00000

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 Surprise vs Trials Stems Pre Post 104

	SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	F	MEAN SQUARE	EXPECTED MEAN SQUARE
1	MEAN	32092.7776	1		32092.7776	192.000 (1)
2	G	178.6145	2		89.3072	64.000 (2)
3	C	9.0567	1		9.0567	96.000 (3)
4	T **(.025)	24.2963	1	6.50	24.2963	96.000 (4)
5	Q ***(.001)	332.5901	1	67.88	332.5901	96.000 (5)
6	GC	186.1847	2		93.0923	32.000 (6)
7	GT *(.05)	26.3295	2	3.52	13.1647	32.000 (7)
8	CT	0.4505	1		0.4505	48.000 (8)
9	GQ	8.4364	2		4.2182	32.000 (9)
10	CQ	0.3588	1		0.3588	48.000(10)
11	TQ ***(.001)	15.5838	1	15.58	15.5838	48.000(11)
12	S(GC)	5077.6241	42		120.8958	4.000(12)
13	GCT	0.2347	2		0.1173	16.000(13)
14	GCQ	3.8632	2		1.9316	16.000(14)
15	GTQ	0.1726	2		0.0863	16.000(15)
16	CTQ	2.6367	1	NS 2.65	2.6367	24.000(16)
17	ST(GC)	156.9266	42		3.7363	2.000(17)
18	SQ(GC)	205.6391	42		4.8962	2.000(18)
19	GCTQ	0.5553	2		0.2777	8.000(19)
20	STQ(GC)	41.8991	42		0.9976	1.000(20)

MEAN 12.92865

CELL MEANS

G =	1	2	3
	12.65781	14.14375	11.78437

C =	1	2
	12.71146	13.14583

T =	1	2
	12.57292	13.28438

artifact

Q =	1	2
	11.61250	14.24479

✓

	C =	1	2
G =	1	13.02500	12.29063
	2	14.28750	14.00000
	3	10.22187	13.34687

	T =	1	2
G =	1	12.26875	13.04688
	2	13.75000	14.53750
	3	11.90000	11.66875

nothing

	T =	1	2
C =	1	12.40417	13.01875
	2	12.74167	13.55000

	Q =	1	2
G =	1	11.63438	13.68125
	2	12.94063	15.04687
	3	10.56250	13.20625

	Q =	1	2
C =	1	11.35208	14.07083

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Surprise Alone Pre Post*

	SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE	F	EXPECTED MEAN
1	MEAN	16941.5634	1	16941.5634		96.000 (1)
2	G	137.9831	2	68.9916		32.000 (2)
3	C	6.7734	1	6.7734		48.000 (3)
4	Q ***(.001)	246.0801	1	246.0801	63.10	48.000 (4)
5	GC	87.2969	2	43.6484		16.000 (5)
6	GQ	5.4265	2	2.7132		16.000 (6)
7	CQ	0.5251	1	0.5251		24.000 (7)
8	S(GC)	3106.4131	42	73.9623		2.000 (8)
9	GCQ	2.7327	2	1.3664		8.000 (9)
10	SQ(GC)	163.9706	42	3.9041		1.000(10)

MEAN 13.28438

CELL MEANS

G =	1	2	3
	13.84688	14.33750	11.66875

C =	1	2
	13.01875	13.55000

Q =	1	2
	11.68333	14.88542

✓

	C = 1	C = 2
G = 1	14.75000	12.94375
2	14.20000	14.47500
3	10.10625	13.23125

	Q = 1	Q = 2
G = 1	12.97500	14.71875
2	12.71250	15.96250
3	9.96250	13.37500

	Q = 1	Q = 2
C = 1	11.49167	14.54583
2	11.87500	15.22500

G = 1

	Q = 1	Q = 2
C = 1	13.83750	15.66250
2	11.71250	14.17500

G = 2

	Q = 1	Q = 2
C = 1	13.08750	15.31250
2	12.33750	16.61250

G = 3

	Q = 1	Q = 2
C = 1	8.65000	11.56250
2	11.27500	14.88750

CELL DEVIATIONS

X(G,.,.) - X(.,.,.)

Basal SC-RC with trials

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 Anticipatory Phase

	SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	F	MEAN SQUARE	EXPECTED MEAN
1	MEAN	10726168.0554	1		10726168.0554	288.000 (1)
2	G	28264.0069	2		14132.0035	96.000 (2)
3	C	6365.6806	1		6365.6806	144.000 (3)
4	T	10488.3472	1		10488.3472	144.000 (4)
5	P ***(.001)	1343961.0278	2	17.96	671980.5139	96.000 (5)
6	GC	202045.5486	2		101022.7743	48.000 (6)
7	GT	3145.2569	2		1572.6285	48.000 (7)
8	CT	786.7222	1		786.7222	72.000 (8)
9	GP	57129.0972	4		14282.2743	32.000 (9)
10	CP	35492.5278	2		17746.2639	48.000(10)
11	TP	22550.1111	2		11275.0556	48.000(11)
12	S(GC)	2786643.0417	42		66348.6439	6.000(12)
13	GCT	33235.7153	2		16617.8576	24.000(13)
14	GCP	41413.4306	4		10353.3576	16.000(14)
15	GTP	62304.4722	4		15576.1180	16.000(15)
16	CTP (.05)*	183159.3611	2	3.42	91579.6805	24.000(16)
17	ST(GC)	1231850.2917	42		29329.7689	3.000(17)
18	SP(GC)	3143414.5831	84		37421.6022	2.000(18)
19	GCTP	54349.8889	4		13587.4722	8.000(19)
20	STP(GC)	2250688.8329	84		26793.9147	1.000(20)

MEAN 192.98611

CELL MEANS

	1	2	3
G =	205.88542	181.80208	191.27083

	1	2
C =	188.28472	197.68750

	1	2
T =	199.02083	186.95139

	1	2	3
P =	158.16667	132.35417	288.43750

	C = 1	2
G = 1	164.85417	246.91667
2	203.16667	160.43750
3	196.83333	185.70833

	T = 1	2
G = 1	208.16667	203.60417
2	192.12500	171.47917
3	196.77083	185.77083

	T = 1	2
C = 1	195.97222	180.59722
2	202.06944	193.30556

	P = 1	2	3
G = 1	148.75000	149.03125	319.87500
2	151.34375	113.15625	280.90625
3	[illegible]	[illegible]	[illegible]

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Impact Effect*

	SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MEAN
1	MEAN	62719839,4219	1	62719839,4219	192,000 (1)
2	G	20615,6563	2	10307,8281	64,000 (2)
3	C	5863,1302	1	5863,1302	96,000 (3)
4	T [** (.001)]	500106,2552	1	[17.50] 500106,2552	96,000 (4)
5	P [** (.001)]	15388976,2969	[422.59] 1	15388976,2969	96,000 (5)
6	GC	44900,6979	2	22450,3490	32,000 (6)
7	GT	116515,5104	2	58257,7552	32,000 (7)
8	CT [* (.05)]	124797,0052	1	[4.37] 124797,0052	48,000 (8)
9	GP	128677,5938	2	64338,7969	32,000 (9)
10	CP	42334,3804	1	42334,3804	48,000(10)
11	TP [** (.001)]	589079,2969	1	[34.16] 589079,2969	48,000(11)
12	S(GC)	2796583,3436	42	66585,3177	4,000(12)
13	GCT	10000,1354	2	5000,0677	16,000(13)
14	GCP	78503,7603	2	39251,8802	16,000(14)
15	GTP	23000,9063	2	11500,4532	16,000(15)
16	CTP	13350,0053	1	13350,0053	24,000(16)
17	ST(GC)	1200302,3438	42	28578,6272	2,000(17)
18	SP(GC)	1529466,2191	42	36415,8624	2,000(18)
19	GCTP	3847,3223	2	1923,6612	8,000(19)
20	STP(GC)	725481,7175	42	17273,3742	1,000(20)

MEAN 571,54688

CELL MEANS

G =	1	2	3
	575,06250	557,46875	582,10938

C =	1	2
	566,02083	577,07292

T =	1	2
	622,58333	520,51042

P =	1	2
	288,43750	854,65625

	C = 1	2
G = 1	548,18750	601,93750
2	559,62500	555,31250
3	590,25000	573,96875

	T = 1	2
G = 1	651,31250	498,81250
2	616,71875	498,21875
3	599,71875	564,50000

	T = 1	2
C = 1	591,56250	540,47917
2	653,60417	500,54167

I don't think this means anything!!

	P = 1	2
G = 1	319,87500	830,25000
2	280,90625	834,03125
3	264,53125	899,68750

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Impact Effect*

	SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	*F*	MEAN SQUARE	EXPECTED MEAN
1	MEAN	71311500.7500	1		71311500.7500	192.000 (1)
2	G	51623.4688	2		25811.7344	64.000 (2)
3	C	49987.5208	1		49987.5208	96.000 (3)
4	T	284284.0833	1	*7.26*	284284.0833	96.000 (4)
5	P ****(.001)*	11545389.1875	1	*360.07*	11545389.1875	96.000 (5)
6	GC	32446.8854	2		16223.4427	32.000 (6)
7	GT	186209.8229	2	*.15 2.38*	93104.9115	32.000 (7)
8	CT	1740.0208	1		1740.0208	48.000 (8)
9	GP	48793.0313	2		24396.5156	32.000 (9)
10	CP	124440.3335	1	*trend 13.85*	124440.3335	48.000(10)
11	TP ****(.001)*	886448.5210	1	*156.10*	886448.5210	48.000(11)
12	S(GC)	3176311.3749	42		75626.4613	4.000(12)
13	GCT	727.5729	2		363.7865	16.000(13)
14	GCP	98925.8228	2		49462.9114	16.000(14)
15	GTP	57602.6353	2		28801.3177	16.000(15)
16	CTP	38420.0832	1		38420.0832	24.000(16)
17	ST(GC)	1644891.5002	42		39164.0833	2.000(17)
18	SP(GC)	1346675.6243	42		32063.7053	2.000(18)
19	GCTP	30140.0106	2		15070.0053	8.000(19)
20	STP(GC)	640837.7515	42		15258.0417	1.000(20)

MEAN 609.43750

CELL MEANS

G =	1	2	3
	593.82813	602.39063	632.09375

C =	1	2
	593.30208	625.57292

T =	1	2
	647.91667	570.95833

P =	1	2
	364.21875	854.65625

	C =	1	2
G =	1	570.28125	617.37500
	2	604.53125	600.25000
	3	605.09375	659.09375

	T =	1	2
G =	1	645.46875	542.18750
	2	670.68750	534.09375
	3	627.59375	636.59375

	T =	1	2
C =	1	626.77083	557.83333
	2	667.06250	584.08333

	P =	1	2
G =	1	357.40625	830.25000
	2	370.75000	834.03125
	3	364.50000	899.68750

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 Recovery Period

	SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	F	MEAN SQUARE	EXPECTED MEAN
1	MEAN	60381807.7813	1		60381807.7813	288.000 (1)
2	G	96391.7500	2		48195.8750	96.000 (2)
3	C	9835.0313	1		9835.0313	144.000 (3)
4	T (.001)	6611157.0313	1	97.04	6611157.0313	144.000 (4)
5	P (.001)	2106406.1875	2	65.36	1053203.0938	96.000 (5)
6	GC	39272.2500	2		19636.1250	48.000 (6)
7	GT	305358.0834	2		152679.0417	48.000 (7)
8	CT (.025)	406276.0034	1	5.96	406276.0034	72.000 (8)
9	GP	90936.8749	4		22734.2187	32.000 (9)
10	CP	3902.7708	2		1951.3854	48.000 (10)
11	TP	47627.7708	2		23813.8854	48.000 (11)
12	S(GC)	6711988.3540	42		159809.2465	6.000 (12)
13	GCT	116028.1111	2		58014.0555	24.000 (13)
14	GCP	37812.1667	4		9453.0417	16.000 (14)
15	GTP	38359.2082	4		9589.8020	16.000 (15)
16	CTP	23868.2153	2		11934.1076	24.000 (16)
17	ST(GC)	2861255.2717	42		68125.1255	3.000 (17)
18	SP(GC)	1353559.3331	84		16113.8016	2.000 (18)
19	GCTP	29746.6392	4		7436.6598	8.000 (19)
20	STP(GC)	1200616.1688	84		14293.0496	1.000 (20)

MEAN 457.88542

CELL MEANS

G =	1	2	3
	437.65625	454.03125	481.96875

C =	1	2
	463.72917	452.04167

T =	1	2
	609.39583	306.37500

P =	1	2	3
	566.25000	450.21875	357.18750

	C = 1	2
G = 1	446.87500	428.43750
2	472.18750	435.87500
3	472.12500	491.81250

	T = 1	2
G = 1	630.89583	244.41667
2	601.54167	306.52083
3	595.75000	368.18750

	T = 1	2
C = 1	577.68056	349.77778
2	641.11111	262.97222

228 378 maybe

	P = 1	2	3
G = 1	523.81250	443.06250	346.09375
2	549.81250	448.62500	363.65625
3	625.12500	458.96875	361.81250

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 Th.5 Hems. vs Surprise Pre-Post

	SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	F	MEAN SQUARE	EXPECTED ME
1	MEAN	74520768.0000	1		74520768.0000	192.000 (1)
2	G	25436.3438	2		12718.1719	64.000 (2)
3	C	36410.0833	1		36410.0833	96.000 (3)
4	T ** (.01)	520000.3333	1	7.32	520000.3333	96.000 (4)
5	Q *** (.001)	9435020.0208	1	373.65	9435020.0208	96.000 (5)
6	GC	62637.9479	2		31318.9740	32.000 (6)
7	GT * (.05)	468346.9479	2	3.30	234173.4740	32.000 (7)
8	CT	80.0833	1		80.0833	48.000 (8)
9	GQ	104196.4480	2		52098.2240	32.000 (9)
10	CQ	29156.0210	1		29156.0210	48.000(10)
11	TQ *** (.001)	378607.6875	1	15.27	378607.6875	48.000(11)
12	S(GC)	1923074.1249	42		45787.4792	4.000(12)
13	GCT	18638.8854	2		9319.4427	16.000(13)
14	GCQ	46426.3853	2		23213.1927	16.000(14)
15	GTQ	13565.8438	2		6782.9219	16.000(15)
16	CTQ ** (.025)	142899.1874	1	5.76	142899.1874	24.000(16)
17	ST(GC)	2982077.2504	42		71001.8393	2.000(17)
18	SQ(GC)	1060553.6253	42		25251.2768	2.000(18)
19	GCTQ	4455.0314	2		2227.5157	8.000(19)
20	STQ(GC)	1041577.7501	42		24799.4702	1.000(20)

MEAN 623.00000

CELL MEANS

G =	1	2	3
	638.45313	610.84375	619.70313

C =	1	2
	609.22917	636.77083

T =	1	2
	570.95833	675.04167

Q =	1	2
	401.32292	844.67708

	C =	1	2
G =	1	629.09375	647.81250
	2	616.65625	605.03125
	3	581.93750	657.46875

	T =	1	2
G =	1	542.18750	734.71875
	2	534.09375	687.59375
	3	636.59375	602.81250

	T =	1	2
C =	1	557.83333	660.62500
	2	584.08333	689.45833

	Q =	1	2
G =	1	449.68750	827.21875
	2	374.00000	847.68750
	3	380.28125	859.12500

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 Phasic GSR Anticipatory Period 111

	SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	F	MEAN SQUARE	EXPECTED MEAN
1	MEAN	29.1975	1		29.1975	288.000 (1)
2	G	0.3033	2		0.1519	96.000 (2)
3	C	0.3403	1		0.3403	144.000 (3)
4	T	0.3828	1	ns 1.69	0.3828	144.000 (4)
5	P (.001)	12.2009	2	22.59	6.1005	96.000 (5)
6	GC	0.2044	2		0.1022	48.000 (6)
7	GT	0.0440	2		0.0220	48.000 (7)
8	CT	0.0475	1		0.0475	72.000 (8)
9	GP	0.3331	4		0.0833	32.000 (9)
10	CP	0.2331	2		0.1166	48.000 (10)
11	TP * (.05)	1.3840	2	3.42	0.6920	48.000 (11)
12	S(GC)	26.7856	42		0.6378	6.000 (12)
13	GCT	0.2617	2		0.1309	24.000 (13)
14	GCP	0.2000	4		0.0500	16.000 (14)
15	GTP	1.3158	4		0.3290	16.000 (15)
16	CTP	0.0092	2		0.0046	24.000 (16)
17	ST(GC)	9.5290	42		0.2269	3.000 (17)
18	SP(GC)	22.7863	84		0.2713	2.000 (18)
19	GCTP	0.9856	4		0.2464	8.000 (19)
20	STP(GC)	17.0054	84		0.2024	1.000 (20)

MEAN 0.31840

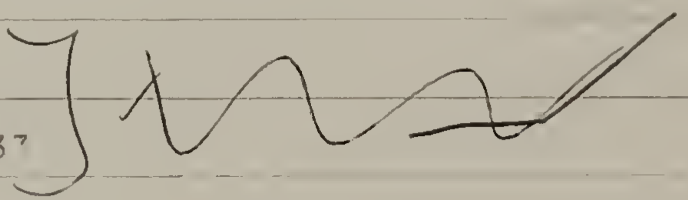
CELL MEANS

G =	1	2	3
	0.35313	0.32708	0.27500

C =	1	2
	0.35278	0.28403

T =	1	2
	0.28194	0.35486

P =	1	2	3
	0.15104	0.19583	0.60637



	C =	1	2
G =	1	0.42500	0.28125
	2	0.33958	0.31458
	3	0.29375	0.25625

	T =	1	2
G =	1	0.33125	0.37500
	2	0.27500	0.37917
	3	0.23958	0.31042

	T =	1	2
C =	1	0.32917	0.37639
	2	0.23472	0.33333

	P =	1	2	3
G =	1	0.16250	0.22187	0.67500
	2	0.12813	0.20625	0.64687
	3	0.16250	0.15937	0.50719

	P =	1	2	3
C =	1	0.22500	0.20417	0.62917

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Impact Period* 112

	SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	F	MEAN SQUARE	EXPECTED MEAN
1	MEAN	318,0126	1		318,0126	192,000 (1)
2	G	1,9929	2		0,9965	64,000 (2)
3	C	3,2813	1	ns 1.09	3,2813	96,000 (3)
4	T	0,5105	1		0,5105	96,000 (4)
5	P ***(.001)	88,4276	1	40.38	88,4276	96,000 (5)
6	GC	1,3329	2		0,6665	32,000 (6)
7	GT	2,3037	2	ns 1.74	1,1519	32,000 (7)
8	CT	0,8401	1		0,8401	48,000 (8)
9	GP	2,4029	2		1,2015	32,000 (9)
10	CP	2,3188	1		2,3188	48,000 (10)
11	TP	1,2838	1		1,2838	48,000 (11)
12	S(GC)	126,1478	42		3,0035	4,000 (12)
13	GCT	0,0717	2		0,0358	16,000 (13)
14	GCP	2,5054	2		1,2527	16,000 (14)
15	GTP	0,0267	2		0,0133	16,000 (15)
16	CTP	1,0651	1		1,0651	24,000 (16)
17	ST(GC)	27,8816	42		0,6638	2,000 (17)
18	SP(GC)	91,9628	42		2,1896	2,000 (18)
19	GCTP	1,5529	2		0,7765	8,000 (19)
20	STP(GC)	36,8691	42		0,8778	1,000 (20)

MEAN 1,28698

CELL MEANS

G =	1	2	3
	1,19844	1,42969	1,23281

C =	1	2
	1,41771	1,15625

T =	1	2
	1,23542	1,33854

P =	1	2
	0,60833	1,96563

	C =	1	2
G =	1	1,26563	1,13125
	2	1,50625	1,35313
	3	1,48125	0,98437

	T =	1	2
G =	1	1,29062	1,10625
	2	1,25625	1,60312
	3	1,15938	1,30625

	T =	1	2
C =	1	1,30000	1,53542
	2	1,17083	1,14167

	P =	1	2
G =	1	0,67500	1,72187
	2	0,64687	2,21250
	3	0,50312	1,96250

	P =	1	2
C =	1	0,62917	2,20625
	2	[illegible]	[illegible]

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 Hs. Items vs Surprise 113

	SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MEA
1	MEAN	646.8817	1	F 646.8817	96.000 (1)
2	G	13.3540	2	6.6770	32.000 (2)
3	C	0.1837	1	0.1837	48.000 (3)
4	T ***(.001)	41.8704	1	15.17 41.8704	48.000 (4)
5	GC	17.2519	2	8.6259	16.000 (5)
6	GT	0.7015	2	0.3507	16.000 (6)
7	CT trend .06	10.9350	1	3.96 10.9350	24.000 (7)
8	S(GC)	259.3588	42	6.1752	2.000 (8)
9	GCT	9.5644	2	4.7822	8.000 (9)
10	ST(GC)	116.1187	42	2.7647	1.000(10)

MEAN 2.59583

CELL MEANS

G =	1	2	3
	2.06750	2.97167	2.72817

C =	1	2
	2.63958	2.55208

T =	1	2
	1.93542	3.25625 ✓

	C =	1	2
G =	1	2.63750	1.03750
	2	2.42500	3.21875
	3	3.15625	2.30000

	T =	1	2
G =	1	1.93125	2.84375
	2	2.31250	3.63125
	3	1.96250	3.49375

	T =	1	2
C =	1	2.31667 (.65)	2.96250 ✓
	2	1.55417 (1.55)	3.55000

G = 1

	T =	1	2
C =	1	1.61250	2.26250
	2	1.25000	2.42500

G = 2

	T =	1	2
C =	1	2.53750	2.31250
	2	2.08750	4.95000

G = 3

	T =	1	2
C =	1	2.00000	3.71250
	2	1.92500	3.27500

CELL DEVIATIONS

X(G,.,.) - X(.,.,.)

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Surprise Alone*

	SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MEAN
			F		
1	MEAN	508.9519	1	508.9519	48.000 (1)
2	G	9.1550	2	4.5775	16.000 (2)
3	C	4.1419	1	4.1419	24.000 (3)
4	GC	25.2150	≈2 2	12.6075	8.000 (4)
5	S(GC)	262.2063	42	6.2430	1.000 (5)

MEAN 3.25625

CELL MEANS

G =	1	2	3
	2.64375	3.63125	3.49375

C =	1	2
	2.96250	3.55000

	C =	1	2
G =	1	2.86250	2.42500
	2	2.31250	4.95000
	3	3.71250	3.27500

CELL DEVIATIONS

X(G..) - X(...)

G =	1	2	3
	-0.61250	0.37500	0.23750

X(.C.) - X(...)

C =	1	2
	-0.29375	0.29375

X(GC.) - X(.C.) - X(G..) + X(...)

	C =	1	2
G =	1	0.51250	-0.51250
	2	-1.02500	1.02500
	3	0.51250	-0.51250

3.

.10 2.84

.05 4.08

28.8

.12
1.24

57.6
28.8
86.4

12
12.4

.08
.10

8

Phasic GSR R-C
Anticipatory Period

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1

	SOURCE	SUM OF SQUARES	F	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MEA
1	MEAN	7676341.5313		1	7676341.5313	288.000 (1)
2	G	39127.5208		2	19563.7604	96.000 (2)
3	C	58453.5035		1	58453.5035	144.000 (3)
4	T **(.01) check	273122.0868	7.77	1	273122.0868	144.000 (4)
5	P ***(.001)	2818006.3333	27.44	2	1409003.1667	96.000 (5)
6	GC	81168.1736		2	40584.0868	48.000 (6)
7	GT	44677.2153		2	22338.6076	48.000 (7)
8	CT	12311.4201		1	12311.4201	72.000 (8)
9	GP	14956.8958		4	3739.2240	32.000 (9)
10	CP	24146.7778		2	12073.3889	48.000(10)
11	TP **(.005) check	536486.0278	6.17	2	268243.0139	48.000(11)
12	S(GC)	4352844.1046		42	103639.1453	6.000(12)
13	GCT	1203.8403		2	601.9201	24.000(13)
14	GCP	183690.0764		4	45922.5191	16.000(14)
15	GTP	296736.0763		4	74184.0191	16.000(15)
16	CTP	12582.6944		2	6291.3472	24.000(16)
17	ST(GC)	1476590.9377		42	35156.9271	3.000(17)
18	SP(GC)	4313610.5835		84	51352.5069	2.000(18)
19	GCTP	245273.9515		4	61318.4879	8.000(19)
20	STP(GC)	3650007.2470		84	43452.4672	1.000(20)

MEAN 163.26042

CELL MEANS

G =	1	2	3
	175.92708	166.06250	147.79167

C =	1	2
	177.50694	149.01389

T =	1	2
	132.46528	194.05556

P =	1	2	3
	83.17708	103.96875	302.63542

	C =	1	2
G =	1	208.87500	142.97917
	2	183.62500	148.50000
	3	140.02083	155.56250

	T =	1	2
G =	1	151.81250	200.04167
	2	117.81250	214.31250
	3	127.77083	167.81250

	T =	1	2
C =	1	153.25000	201.76389
	2	111.68056	186.34722

	P =	1	2	3
G =	1	91.06250	117.78125	318.93750
	2	78.71875	105.28125	314.18750
	3	79.75000	88.84375	274.78125

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Impact Period*

	SOURCE	SUM OF SQUARES	F	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MEA
1	MEAN	58441360.3330		1	58441360.3330	192.000 (1)
2	G	15237.5104		2	7618.7552	64.000 (2)
3	C	10770.0208		1	10770.0208	96.000 (3)
4	T *(.05)	355008.0000	4.53	1	355008.0000	96.000 (4)
5	P ***(.001)	11911165.0208	127.24	1	11911165.0208	96.000 (5)
6	GC	52943.2604		2	26471.6302	32.000 (6)
7	GT	43635.2188		2	21817.6094	32.000 (7)
8	CT	69692.5208		1	69692.5208	48.000 (8)
9	GP	24938.1980		2	12469.0990	32.000 (9)
10	CP	18.7502		1	18.7502	48.000(10)
11	TP (.02)**	457275.5210	7.24	1	457275.5210	48.000(11)
12	S(GC)	3187952.3751		42	75903.6399	4.000(12)
13	GCT	51825.2604		2	25912.6302	16.000(13)
14	GCP	76239.0308		2	38119.5154	16.000(14)
15	GTP	109456.6978		2	54728.3489	16.000(15)
16	CTP almost sig. .07	223586.9997	ns 3.54	1	223586.9997	24.000(16)
17	ST(GC)	3289603.0004		42	78323.8810	2.000(17)
18	SP(GC)	3931660.0002		42	93610.9524	2.000(18)
19	GCTP	99528.4071		2	49764.2035	8.000(19)
20	STP(GC)	2652349.3725		42	63151.1755	1.000(20)

MEAN 551.70833

CELL MEANS

G =	1	2	3
	556.21875	559.64063	539.26563

C =	1	2
	559.19792	541.21875

T =	1	2
	508.70833	594.70833

P =	1	2
	302.63542	800.78125

G = \ C =	1	2
1	558.40625	554.03125
2	589.59375	529.68750
3	529.59375	548.93750

G = \ T =	1	2
1	528.25000	584.18750
2	496.03125	623.25000
3	501.84375	576.68750

C = \ T =	1	2
1	497.14583	621.25000
2	520.27083	568.16667

G = \ P =	1	2
1	318.93750	793.50000
2	314.18750	805.09375
3	274.78125	803.75000

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Recovery Period*

	SOURCE	SUM OF SQUARES	F	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MEA
1	MEAN	2085562.7222		1	2085562.7222	288.000 (1)
2	G	86254.1944		2	43127.0972	96.000 (2)
3	C	308.3472		1	308.3472	144.000 (3)
4	T	62128.1250	ns 3.0	1	62128.1250	144.000 (4)
5	P	17925.2986		2	8962.6493	96.000 (5)
6	GC	11165.4444		2	5582.7222	48.000 (6)
7	GT	7914.2500		2	3957.1250	48.000 (7)
8	CT	10853.5556		1	10853.5556	72.000 (8)
9	GP * (.02/.05) almost	219278.5972	3.50	4	54819.6493	32.000 (9)
10	CP	4540.9236		2	2270.4618	48.000 (10)
11	TP	87636.0208	ns 2.0	2	43818.0104	48.000 (11)
12	S(GC)	2406807.2916		42	57304.9355	6.000 (12)
13	GCT	42091.3611		2	21045.6806	24.000 (13)
14	GCP	55333.8472		4	13833.4618	16.000 (14)
15	GTP	149097.6667		4	37274.4167	16.000 (15)
16	CTP	5.9236		2	2.9618	24.000 (16)
17	ST(GC)	869827.3753		42	20710.1756	3.000 (17)
18	SP(GC)	1315539.3336		84	15661.1825	2.000 (18)
19	GCTP	44970.9722		4	11242.7431	8.000 (19)
20	STP(GC)	1837018.7501		84	21869.2708	1.000 (20)

MEAN 85.09722

CELL MEANS

G =	1	2	3
	101.35417	61.12500	92.81250

C =	1	2
	86.13194	84.06250

T =	1	2
	99.78472	70.40972

P =	1	2	3
	95.73958	82.67708	76.87500

	C =	1	2
G =	1	93.58333	109.12500
	2	66.56250	55.68750
	3	98.25000	67.37500

	T =	1	2
G =	1	121.14583	81.56250
	2	77.91667	44.33333
	3	100.29167	85.33333

	T =	1	2
C =	1	94.68056	77.58333
	2	104.88889	63.23611

	P =	1	2	3
G =	1	87.90625	132.75000	83.40625
	2	47.40625	53.90625	82.06250
	3	151.90625	61.37500	65.15625

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 hs Hum & vs Surprise

	SOURCE	SUM OF SQUARES	F	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MEA
1	MEAN	69200292.0410		1	69200292.0410	96.000 (1)
2	G	1913.2708		2	956.6354	32.000 (2)
3	C	104808.1667	1.89	1	104808.1667	48.000 (3)
4	T F(.05).025	280368.1667	5.50	1	280368.1667	48.000 (4)
5	GC	125236.8958		2	62618.4479	16.000 (5)
6	GT	1547.6458		2	773.8229	16.000 (6)
7	CT	74928.3750		1	74928.3750	24.000 (7)
8	S(GC)	2325046.6252		42	55358.2530	2.000 (8)
9	GCT	87219.4375		2	43609.7187	8.000 (9)
10	ST(GC)	2142435.3745		42	51010.3661	1.000 (10)

MEAN 849.02083

CELL MEANS

G =	1	2	3
	852.50000	842.71875	851.84375

C =	1	2
	882.06250	815.97917

T =	1	2
	794.97917	903.06250

	C =	1	2
G =	1	910.37500	794.62500
	2	824.68750	860.75000
	3	911.12500	792.56250

	T =	1	2
G =	1	802.00000	903.00000
	2	790.75000	894.68750
	3	792.18750	911.50000

	T =	1	2
C =	1	855.95833	908.16667
	2	734.00000	897.95833

G = 1

	T =	1	2
C =	1	856.25000	964.50000
	2	747.75000	841.50000

G = 2

	T =	1	2
C =	1	841.25000	808.12500
	2	740.25000	981.25000

G = 3

	T =	1	2
C =	1	870.37500	951.87500
	2	714.00000	871.12500

CELL DEVIATIONS

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Surprise alone*

	SOURCE	SUM OF SQUARES		DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MEA
1	MEAN	39145050.1875	F	1	39145050.1875	48.000 (1)
2	G	2261.3750		2	1130.6875	16.000 (2)
3	C	1250.5208		1	1250.5208	24.000 (3)
4	GC	205236.7917	ns 2.20	2	102618.3958	8.000 (4)
5	S(GC)	1959276.1250		42	46649.4315	1.000 (5)

MEAN 903.06250

CELL MEANS

G =	1	2	3
	903.00000	894.68750	911.50000

C =	1	2
	908.16667	897.95833

	C =	1	2
G =	1	964.50000	841.50000
	2	808.12500	981.25000
	3	951.87500	871.12500

CELL DEVIATIONS

X(G..) - X(...)

G =	1	2	3
	-0.06250	-8.37500	8.43750

X(.C.) - X(...)

C =	1	2
	5.10417	-5.10417

X(GC.) - X(.C.) - X(G..) + X(...)

	C =	1	2
G =	1	56.39583	-56.39583
	2	-91.66667	91.66667
	3	35.27083	-35.27083

#NoneSpec GSR/Min 1.20

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 Antecyatory Period

	SOURCE	SUM OF SQUARES	F	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MEA
1	MEAN	19956.6901		1	19956.6901	288.000 (1)
2	G	34.1776		2	17.0888	96.000 (2)
3	C	0.0006		1	0.0006	144.000 (3)
4	T	0.0035		1	0.0035	144.000 (4)
5	P ***(.001)	1466.6672	29.77	2	733.3336	96.000 (5)
6	GC	81.0942		2	40.5471	48.000 (6)
7	GT	70.9026	1.83	2	35.4513	48.000 (7)
8	CT	74.4200	ns 3.85	1	74.4200	72.000 (8)
9	GP	88.4658		4	22.1164	32.000 (9)
10	CP*(.02)	225.8409	4.58	2	112.9205	48.000(10)
11	TP	135.9709	ns 2.86	2	67.9855	48.000(11)
12	S(GC)	3196.3975		42	76.1047	6.000(12)
13	GCT	98.2290	ns 2.54	2	49.1145	24.000(13)
14	GCP	1.9024		4	0.4756	16.000(14)
15	GTP	129.5387		4	32.3847	16.000(15)
16	CTP	77.7344		2	38.8672	24.000(16)
17	ST(GC)	812.8717		42	19.3541	3.000(17)
18	SP(GC)	2068.7738		84	24.6283	2.000(18)
19	GCTP	99.8448		4	24.9612	8.000(19)
20	STP(GC)	1998.0746		84	23.7866	1.000(20)

MEAN 8.32431

CELL MEANS

G =	1	2	3
	8.80833	8.13021	8.03437

C =	1	2
	8.32569	8.32292

T =	1	2
	8.32083	8.32778

P =	1	2	3
	6.70625	6.75104	11.51563

	C = 1	2
G = 1	8.46458	9.15208
2	7.72708	8.53333
3	8.78542	7.28333

	T = 1	2
G = 1	9.10833	8.50833
2	7.42708	8.83333
3	8.42708	7.64167

	T = 1	2
C = 1	8.83056	7.82083
2	7.81111	8.83472

	P = 1	2	3
G = 1	7.95000	7.28750	11.18750
2	5.81875	6.29688	12.27500
3	6.35000	6.66875	11.08437

C P

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 Impact Period

	SOURCE	SUM OF SQUARES	F	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MEA
1	MEAN	16764.5563		1	16764.5563	192.000 (1)
2	G	5.7351		2	2.8676	64.000 (2)
3	C	8.5430		1	8.5430	96.000 (3)
4	T	26.1813		1	26.1813	96.000 (4)
5	P ***(.001)	905.2376	18.22	1	905.2376	96.000 (5)
6	GC	9.1897		2	4.5948	32.000 (6)
7	GT	10.5707		2	5.2854	32.000 (7)
8	CT	0.6888		1	0.6888	48.000 (8)
9	GP	97.1507		2	48.5754	32.000 (9)
10	CP	169.6888	ns 3.42	1	169.6888	48.000(10)
11	TP ***(.001)	331.5380	15.74	1	331.5380	48.000(11)
12	S(GC)	2830.3584		42	67.3895	4.000(12)
13	GCT	5.6232		2	2.8116	16.000(13)
14	GCP	28.5657		2	14.2829	16.000(14)
15	GTP	123.7597	ns 2.93	2	61.8798	16.000(15)
16	CTP *(~~.05) almost .01~~)(.02)	152.4751	7.24	1	152.4751	24.000(16)
17	ST(GC)	1266.7784		42	30.1614	2.000(17)
18	SP(GC)	2085.7197		42	49.6600	2.000(18)
19	GCTP	91.5626	ns 2.17	2	45.7813	8.000(19)
20	STP(GC)	884.3272		42	21.0554	1.000(20)

MEAN 9.34427

CELL MEANS

G =	1	2	3
	9.44063	9.10156	9.49062

C =	1	2
	9.13333	9.55521

T =	1	2
	9.71354	8.97500

P =	1	2
	11.51563	7.17292

	C =	1	2
G =	1	9.38125	9.50000
	2	8.58125	9.62187
	3	9.43750	9.54375

	T =	1	2
G =	1	9.47812	9.40312
	2	9.63125	8.57187
	3	10.03125	8.95000

	T =	1	2
C =	1	9.56250	8.70417
	2	9.86458	9.24583

	P =	1	2
G =	1	11.18750	7.69375
	2	12.27500	5.92812
	3	11.08437	7.89688

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 Recovery Period

	SOURCE	SUM OF SQUARES		DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MEA
			F			
1	MEAN	13004.8128		1	13004.8128	288.000 (1)
2	G	147,4127		2	73,7064	96.000 (2)
3	C	0,2750		1	0.2750	144.000 (3)
4	T *** (.001)	438,3267	19.92	1	438.3267	144.000 (4)
5	P ** (.01)	177,6527	5.002	2	88.8264	96.000 (5)
6	GC	55,3988		2	27,6994	48,000 (6)
7	GT	57,3005		2	28,6502	48.000 (7)
8	CT	52,4459		1	52.4459	72,000 (8)
9	GP	58,0002		4	14.5001	32.000 (9)
10	CP	52,5255		2	26,2627	48,000(10)
11	TP * (.05)	99,3334	3.42	2	49,6667	48.000(11)
12	S(GC)	3609,5823		42	85,9424	6,000(12)
13	GCT	99,1180	ns 2.25	2	49,5590	24,000(13)
14	GCP	75,5128		4	18,8782	16,000(14)
15	GTP	9,3328		4	2,3332	16,000(15)
16	CTP	5,5984		2	2,7992	24,000(16)
17	ST(GC)	924,4240		42	22,0101	3,000(17)
18	SP(GC)	1491,0821		84	17,7510	2,000(18)
19	GCTP	85,0149		4	21,2537	8,000(19)
20	STP(GC)	1219,8604		84	14.5221	1,000(20)

MEAN 6,71979

CELL MEANS

G =	1	2	3
	7,57500	6,76042	5,82396

C =	1	2
	6,68889	6,75069

T =	1	2
	7,95347	5,48611

P =	1	2	3
	7,82708	6,09062	6,24167

	C =	1	2
G =	1	6,95625	8,19375
	2	6,85208	6,66875
	3	6,25833	5,38958

	T =	1	2
G =	1	9,43542	5,71458
	2	7,61875	5,90208
	3	6,80625	4,84167

	T =	1	2
C =	1	7,49583	5,88194
	2	8,41111	5,09028

	P =	1	2	3
G =	1	8,32500	6,44375	7,95625
	2	7,83437	6,49687	5,95000
	3	7,32187	5,33125	4,81875

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 Ludls Hemsros Surprise

	SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	F	MEAN SQUARE	EXPECTED MEA
1	MEAN	6837.7504	1		6837.7504	96.000 (1)
2	G	74.3908	2		37.1954	32.000 (2)
3	C	36.0150	1		36.0150	48.000 (3)
4	T *** (.001)	835.4400	1	28.53	835.4400	48.000 (4)
5	GC	33.7675	2		16.8838	16.000 (5)
6	GT	122.2275	2	ns 2.01	61.1138	16.000 (6)
7	CT	86.2604	1	ns 2.95	86.2604	24.000 (7)
8	S(GC)	3296.4062	42		78.4859	2.000 (8)
9	GCT	55.8958	2		27.9479	8.000 (9)
10	ST(GC)	1229.6863	42		29.2782	1.000(10)

MEAN 8.43958

CELL MEANS

G =	1	2	3
	9.51875	7.36250	8.43750

C =	1	2
	9.05208	7.82708

T =	1	2
	5.48958	11.38958

	C =	1	2
G =	1	10.96250	8.07500
	2	7.46250	7.26250
	3	8.73125	8.14375

	T =	1	2
G =	1	6.68750	12.35000
	2	2.97500	11.75000
	3	6.80625	10.06875

	T =	1	2
C =	1	7.05000	11.05417
	2	3.92917	11.72500

G = 1

	T =	1	2
C =	1	9.91250	12.01250
	2	3.46250	12.68750

G = 2

	T =	1	2
C =	1	4.20000	10.72500
	2	1.75000	12.77500

G = 3

	T =	1	2
C =	1	7.03750	10.42500
	2	6.57500	9.71250

CELL DEVIATIONS

NonSpec GSR/mean R-C 124

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 Anticipatory Period

	SOURCE	SUM OF SQUARES	F	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED M
1	MEAN	53406112.5000		1	53406112.5000	288.000 (1)
2	G	21534.2500		2	10767.1250	96.000 (2)
3	C	13257.3472		1	13257.3472	144.000 (3)
4	T	15196.0556		1	15196.0556	144.000 (4)
5	P ***(.001)	4250238.5833	32.41	2	2125119.2916	96.000 (5)
6	GC	28891.4444		2	14445.7222	48.000 (6)
7	GT	144329.6944		2	72164.8472	48.000 (7)
8	CT	173362.3472	ns 2.64	1	173362.3472	72.000 (8)
9	GP	158199.0417		4	39549.7604	32.000 (9)
10	CP *(.05)	507412.1112	3.89	2	253706.0556	48.000(10)
11	TP	250725.5277		2	125362.7639	48.000(11)
12	S(GC)	7470114.4585		42	177859.8681	6.000(12)
13	GCT	294923.8611	ns 2.25	2	147461.9306	24.000(13)
14	GCP	40098.8472		4	10024.7118	16.000(14)
15	GTP	382784.7223		4	95696.1806	16.000(15)
16	CTP	174137.1944		2	87068.5972	24.000(16)
17	ST(GC)	2753751.3760		42	65565.5090	3.000(17)
18	SP(GC)	5481285.4158		84	65253.3978	2.000(18)
19	GCTP	287569.2222		4	71892.3056	8.000(19)
20	STP(GC)	5420305.9991		84	64527.4524	1.000(20)

MEAN 430.62500

CELL MEANS

G =	1	2	3
	432.89583	419.08333	439.89583

C =	1	2
	437.40972	423.84028

T =	1	2
	437.88889	423.36111

P =	1	2	3
	343.18750	346.27083	602.41667

	C =	1	2
G =	1	425.95833	439.83333
	2	435.77083	402.39583
	3	450.50000	429.29167

	T =	1	2
G =	1	450.06250	415.72917
	2	395.35417	442.81250
	3	468.25000	411.54167

	T =	1	2
C =	1	469.20833	405.61111
	2	406.56944	441.11111

	P =	1	2	3
G =	1	383.81250	351.43750	563.43750
	2	308.28125	329.90625	619.06250
	3	337.46875	357.46875	624.75000

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Impact Period*

	SOURCE	SUM OF SQUARES		DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MS
1	MEAN	44342463.0205		1	44342463.0205	192.000 (1)
2	G	129665.1104		2	64832.5552	64.000 (2)
3	C	172.5208		1	172.5208	96.000 (3)
4	T	161356.0208		1	161356.0208	96.000 (4)
5	P **** (.001)*	2850412.6375	*20.65*	1	2850412.6375	96.000 (5)
6	GC	64543.3229		2	32271.6615	32.000 (6)
7	GT	73643.3229		2	36821.6615	32.000 (7)
8	CT	1862.5208		1	1862.5208	48.000 (8)
9	GP	124805.8437		2	62402.9218	32.000 (9)
10	CP	447953.5209	*ns 3.25*	1	447953.5209	48.000(10)
11	TP **** (.001) check*	725454.1875	*13.57*	1	725454.1875	48.000(11)
12	S(GC)	4691941.6250		42	111712.8958	4.000(12)
13	GCT	5728.3024		2	2864.1512	16.000(13)
14	GCP	67104.9480		2	33552.4740	16.000(14)
15	GTP	250374.2313	*ns 2.34*	2	125187.1157	16.000(15)
16	CTP ** (.05)*	253025.5207	*4.73*	1	253025.5207	24.000(16)
17	ST(GC)	3832804.3753		42	91257.2470	2.000(17)
18	SP(GC)	5797583.5005		42	138037.7024	2.000(18)
19	GCTP *~~trend~~ (.06)*	325862.7605	*3.05*	2	162931.3803	8.000(19)
20	STP(GC)	2245291.0097		42	53459.3095	1.000(20)

MEAN 480.57292

CELL MEANS

G =	1	2	3
	463.01563	461.39063	517.31250

C =	1	2
	481.52083	479.62500

T =	1	2
	509.56250	451.58333

[

P =	1	2
	602.41667	358.72917

]

	C =	1	2
G =	1	471.93750	454.09375
	2	479.71875	443.06250
	3	492.90625	541.71875

	T =	1	2
G =	1	466.50000	459.53125
	2	493.73125	429.00000
	3	568.40625	466.21875

	T =	1	2
C =	1	513.62500	449.41667
	2	505.50000	453.75000

	P =	1	2
G =	1	563.43750	362.59375
	2	619.06250	303.71875
	3	624.75000	409.87500

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Recovery Period*

	SOURCE	SUM OF SQUARES	*F*	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MS
1	MEAN	31804300.1250		1	31804300.1250	288.000 (1)
2	G	242657.3125		2	121328.6563	96.000 (2)
3	C	9522.0000		1	9522.0000	144.000 (3)
4	T ****(.001)*	1128002.0000	*20.82*	1	1128002.0000	144.000 (4)
5	P **(.05)*	377707.8958	*4.34*	2	188853.9479	96.000 (5)
6	GC	68050.0208		2	34025.0104	48.000 (6)
7	GT	224173.2708		2	112086.6354	48.000 (7)
8	CT	125751.1250		1	125751.1250	72.000 (8)
9	GP	119877.1667		4	29969.2917	32.000 (9)
10	CP	143457.0208		2	71728.5104	48.000 (10)
11	TP *~~trend~~ (.06)*	243731.6875	*2.97*	2	121865.8438	48.000 (11)
12	S(GC)	6363721.5420		42	151517.1796	6.000 (12)
13	GCT	240662.1458		2	120331.0729	24.000 (13)
14	GCP	175480.3333		4	43870.0833	16.000 (14)
15	GTP	15587.0416		4	3896.7604	16.000 (15)
16	CTP	8973.1458		2	4486.5729	24.000 (16)
17	ST(GC)	2275467.7912		42	54177.8046	3.000 (17)
18	SP(GC)	3654324.5836		84	43503.8641	2.000 (18)
19	GCTP	274272.7083		4	68568.1771	8.000 (19)
20	STP(GC)	3442379.0828		84	40980.7034	1.000 (20)

MEAN 332.31250

CELL MEANS

G =	1	2	3
	357.11458	348.23958	291.58333

C =	1	2
	338.06250	326.56250

T =	1	2
	394.89583	269.72917

P =	1	2	3
	383.01042	300.67708	313.25000

	C =	1	2
G =	1	345.16667	369.06250
	2	373.77083	322.70833
	3	295.25000	287.91667

	T =	1	2
G =	1	459.14583	255.08333
	2	390.41667	306.06250
	3	335.12500	248.04167

	T =	1	2
C =	1	379.75000	296.37500
	2	410.04167	243.08333

	P =	1	2	3
G =	1	393.87500	301.15625	376.31250
	2	395.18750	336.71875	312.81250
	3	359.96875	264.15625	250.62500

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE *Th.5 Items vs Surprise*

	SOURCE	SUM OF SQUARES	*F*	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED MS
1	MEAN	12146016.7605		1	12146016.7605	96.000 (1)
2	G	23572.3958		2	11786.1979	32.000 (2)
3	C	128115.0938		1	128115.0938	48.000 (3)
4	T *check* *.005*	733775.5104	*10.57*	1	733775.5104	48.000 (4)
5	GC	354703.5625		2	177351.7812	16.000 (5)
6	GT	368078.6458		2	184039.3229	16.000 (6)
7	CT	202308.8437	*n 52.91*	1	202308.8437	24.000 (7)
8	S(GC)	5913024.6876		42	140786.3021	2.000 (8)
9	GCT	85344.8125		2	42672.4063	8.000 (9)
10	ST(GC)	2915304.6879		42	69412.0164	1.000 (10)

MEAN 355.69792

CELL MEANS

G =	1	2	3
	357.31250	335.75000	374.03125

C =	1	2
	392.22917	319.16667

T =	1	2
	268.27083	443.12500

	C = 1	C = 2
G = 1	479.68750	234.93750
2	325.43750	346.06250
3	371.56250	376.50000

	T = 1	T = 2
G = 1	309.62500	405.00000
2	150.87500	510.62500
3	334.31250	413.75000

	T = 1	T = 2
C = 1	350.70833	433.75000
2	185.83333	452.50000

G = 1

	T = 1	T = 2
C = 1	489.37500	470.00000
2	129.87500	340.00000

G = 2

	T = 1	T = 2
C = 1	225.87500	425.00000
2	95.87500	596.25000

G = 3

	T = 1	T = 2
C = 1	336.87500	406.25000
2	331.75000	421.25000

CELL DEVIATIONS

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 Surprise Alone

	SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE	EXPECTED M
1	MEAN	9425268.7500	1	9425268.7500	48.000 (1)
2	G	109962.5000	2	54981.2500	16.000 (2)
3	C	4218.7500	1	4218.7500	24.000 (3)
4	GC	181587.5000	2	90793.7500	8.000 (4)
5	S(GC)	5532862.4999	42	131734.8214	1.000 (5)

MEAN 443.12500

CELL MEANS

G =	1	2	3
	405.00000	510.62500	413.75000

C =	1	2
	433.75000	452.50000

	C = 1	2
G = 1	470.00000	340.00000
2	425.00000	596.25000
3	406.25000	421.25000

CELL DEVIATIONS

X(G..) - X(...)

G =	1	2	3
	-38.12500	67.50000	-29.37500

X(.C.) - X(...)

C =	1	2
	-9.37500	9.37500

X(GC.) - X(.C.) - X(G..) + X(...)

	C = 1	2
G = 1	74.37500	-74.37500
2	-76.25000	76.25000
3	1.87500	-1.87500

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Autonomic anxiety*

	SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	*F*	MEAN SQUARE	EXPECTED MEAN
1	MEAN	53067.0000	1		53067.0000	48.000 (1)
2	G	88.8750	2		44.4375	16.000 (2)
3	C *+(.05) maybe .03*	341.3333	1	*5.79*	341.3333	24.000 (3)
4	GC	87.7917	2		43.8958	8.000 (4)
5	S(GC)	2475.0000	42		58.9286	1.000 (5)
		2992.99				

MEAN 33.25000

CELL MEANS

G =	1	2	3
	31.93750	32.68750	35.12500

C =	1	2
	30.58333	35.91667

	C =	1	2
G =	1	31.12500	32.75000
	2	29.50000	35.87500
	3	31.12500	39.12500

CELL DEVIATIONS

X(G,.,) - X(.,.,)

G =	1	2	3
	-1.31250	-0.56250	1.87500

X(,C,) - X(.,.,)

C =	1	2
	-2.66667	2.66667

X(GC,) - X(,C,) - X(G,.,) + X(.,.,)

	C =	1	2
G =	1	1.85417	-1.85417
	2	-0.52083	0.52083
	3	-1.33333	1.33333

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Striated Muscle Tension*

	SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	*F*	MEAN SQUARE	EXPECTED MEAN
1	MEAN	40833.3333	1		40833.3333	48.000 (1)
2	G *(.05)*	370.5417	2	*3.75*	185.2708	16.000 (2)
3	C	33.3333	1		33.3333	24.000 (3)
4	GC	0.2917	2		0.1458	8.000 (4)
5	S(GC)	2072.5000	42		49.3452	1.000 (5)

MEAN 29.16667

CELL MEANS

G =	1	2	3
	26.18750	28.43750	32.87500

C =	1	2
	28.33333	30.00000

	C =	1	2
G =	1	25.37500	27.00000
	2	27.50000	29.37500
	3	32.12500	33.62500

CELL DEVIATIONS

X(G,.,) - X(.,.,)

G =	1	2	3
	-2.97917	-0.72917	3.70833

X(.,C,) - X(.,.,)

C =	1	2
	-0.83333	0.83333

X(GC,) - X(.,C,) - X(G,.,) + X(.,.,)

	C =	1	2
G =	1	0.02083	-0.02083
	2	-0.10417	0.10417
	3	0.08333	-0.08333

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 Feelings of Insecurity

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	F	MEAN SQUARE	EXPECTED MEAN
1 MEAN	79218.7500	1		79218.7500	48.000 (1)
2 G	385.1250	ns 2	2.55	192.5625	16.000 (2)
3 C	126.7500	1	ns	126.7500	24.000 (3)
4 GC	83.6250	2		41.8125	8.000 (4)
5 S(GC)	3169.7500	42		75.4702	1.000 (5)

MEAN 40.6250

CELL MEANS

G =	1	2	3
	38.9125	38.43750	44.62500

C =	1	2
	39.00000	42.25000

	C = 1	2
G = 1	38.62500	39.00000
2	37.12500	39.75000
3	41.25000	43.00000

CELL DEVIATIONS

X(G,.) - X(.,.)

G =	1	2	3
	-1.91250	-2.18750	4.00000

X(.C.) - X(.,.)

C =	1	2
	-1.62500	1.62500

X(GC.) - X(.C.) - X(G..) + X(...)

	C = 1	2
G = 1	1.43750	-1.43750
2	0.31250	-0.31250
3	-1.75000	1.75000

ANALYSIS OF VARIANCE FOR DEPENDENT VARIABLE 1 *Total Anxiety Score*

	SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	*F*	MEAN SQUARE	EXPECTED MEAN
1	MEAN	503480.3333	1		503480.3333	48.000 (1)
2	G	1721.7917	2	*2.19*	860.8958	16.000 (2)
3	C	972.0000	1	*2.47*	972.0000	24.000 (3)
4	GC	178.6250	2		89.3125	8.000 (4)
5	S(GC)	16541.2500	42		393.8393	1.000 (5)

MEAN 102.41667

CELL MEANS

G =	1	2	3
	96.43750	99.56250	110.75000

C =	1	2
	97.91667	106.91667

	C =	1	2
G =	1	95.12500	97.75000
	2	94.12500	105.00000
	3	104.50000	117.00000

CELL DEVIATIONS

X(G..) - X(...)

G =	1	2	3
	-5.97917	-2.85417	8.33333

X(.C.) - X(...)

C =	1	2
	-4.50000	4.50000

X(GC.) - X(.C.) - X(G..) + X(...)

	C =	1	2
G =	1	2.68750	-2.68750
	2	-0.93750	0.93750
	3	-1.75000	1.75000

t =

t =

APPENDIX IV

BUDNER INTOLERANCE OF AMBIGUITY SCALE

Name ______________________________ Telephone ______________________

Read each statement carefully and place the number of the appropriate response at the end of the statement. If you have no opinion, or feel neutral about the statement, do not respond to that statement. Although you may feel that a statement is too vague, or that your answer requires qualification, try to take the statement at face value, and respond according to your general feeling. Please answer as honestly and truthfully as you can. Thank you for your cooperation.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1	2	3	5	6	7

1. A good teacher is one who makes you wonder about your way of looking at things. ______
2. An expert who doesn't come up with a definite answer probably doesn't know too much. ______
3. Many of our most important decisions are based upon insufficient information. ______
4. A good job is one where what is to be done and how it is to be done are always clear. ______
5. A person who leads an even, regular life in which few surprises or unexpected happenings arise, really has a lot to be grateful for. ______
6. I would like to live in a foreign country for a while. ______
7. The sooner we all acquire similar values and ideals the better. ______
8. Often the most interesting and stimulating people are those who don't mind being different and original. ______
9. What we are used to is always preferable to what is unfamiliar. ______
10. It is more fun to tackle a complicated problem than to solve a simple one. ______
11. In the long run it is possible to get more done by tackling small, simple problems rather than large and complicated ones. ______

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1	2	3	5	6	7

12. People who insist upon a yes or no answer just don't know how complicated things really are. ______

13. There is really no such thing as a problem that can't be solved. ______

14. People who fit their lives to a schedule probably miss most of the joy of living. ______

15. Teachers or supervisors who hand out vague assignments give a chance for one to show initiative and originality. ______

16. I like parties where I know most of the people more than ones where all or most of the people are complete strangers. ______

Name____

Age_________________ Sex_____________ Date_______________

INSTRUCTIONS: The following are some statements on feelings, daydreams, attitudes, and behavior. Read each statement and decide how often it applies to _you_. Circle "1" if the statement _never_ applies to you; "5" if you experience it almost all the time; use "2", "3", and "4" for in between ratings.

Never = 1, Rarely = 2, Sometimes = 3, Fairly often = 4, Nearly always = 5

A few items may be difficult to answer by checking frequencies. For these, you may indicate how true or false the item is for you by using "1" for "Definitely false," "3" for "Questionable," "5" for "Definitely true," and "2" and "4" for in between ratings.

Be honest, but do not spend too much time over any one statement. As a rule, first impressions are as accurate as any.

Are there any questions?

Never = 1 Rarely = 2 Sometimes = 3 Fairly often = 4 Nearly always = 5

1.	I am an easy-going person.	1	2	3	4	5
2.	I believe that aggressive feelings should be expressed.	1	2	3	4	5
3.	I have sensations of burning, tingling, or crawling in certain parts of my body.	1	2	3	4	5
4.	I believe a great many people exaggerate their misfortune in order to gain the sympathy and help of others.	1	2	3	4	5
5.	I feel chilly at temperatures that are comfortable for others.	1	2	3	4	5
6.	I am quick to anger.	1	2	3	4	5
7.	I believe it is foolish to be nice to those who are inconsiderate.	1	2	3	4	5
8.	I have daydreams about hurting someone I don't like.	1	2	3	4	5
9.	My feelings are easily hurt.	1	2	3	4	5
10.	I am either too hot or too cold and cannot get comfortable at a constant temperature setting.	1	2	3	4	5
11.	I have trouble getting my breath, for no special reason.	1	2	3	4	5
12.	At elections I vote for men about whom I know very little.	1	2	3	4	5
13.	My mouth feels dry.	1	2	3	4	5
14.	I like to know some important people because it makes me feel important.	1	2	3	4	5
15.	I have feelings of panic for no special reason.	1	2	3	4	5
16.	I have pounding headaches in which I can feel a definite beat.	1	2	3	4	5
17.	My table manners are not quite as good at home as when I am out in company.	1	2	3	4	5

(cont'd)

Never = 1   Rarely = 2   Sometimes = 3   Fairly often = 4   Nearly always = 5

18.	I am a relaxed person.	1 2 3 4 5
19.	I clench my teeth when anxious.	1 2 3 4 5
20.	I am troubled by discomfort in the pit of my stomach.	1 2 3 4 5
21.	I worry about little things.	1 2 3 4 5
22.	I have a hard time swallowing.	1 2 3 4 5
23.	I laugh at dirty jokes.	1 2 3 4 5
24.	I become upset when I have to wait.	1 2 3 4 5
25.	My skin becomes painfully sensitive.	1 2 3 4 5
26.	I notice my heart pounding.	1 2 3 4 5
27.	I feel like beating or smashing things.	1 2 3 4 5
28.	I take things hard.	1 2 3 4 5
29.	I grind my teeth in my sleep.	1 2 3 4 5
30.	I am bothered with blushing.	1 2 3 4 5
31.	I gossip.	1 2 3 4 5
32.	I have daydreams in which I make a fool of someone who knows more than I do.	1 2 3 4 5
33.	I am troubled by tension interfering with my speech.	1 2 3 4 5
34.	My finger tips or other extremities become cold.	1 2 3 4 5
35.	I become irritable about little things.	1 2 3 4 5
36.	I believe we are never really justified in being hostile towards others.	1 2 3 4 5
37.	I have pressure headaches in which my head feels as if it were caught in a vise or as if there were a tight band around it.	1 2 3 4 5
38.	I read every editorial in the newspaper.	1 2 3 4 5

(cont'd)

Never = 1   Rarely = 2   Sometimes = 3   Fairly often = 4   Nearly always = 5

39.	When embarrassed, I break out in a sweat which annoys me greatly.	1	2	3	4	5
40.	I take things in stride.	1	2	3	4	5
41.	I have trouble with my hand shaking while I write.	1	2	3	4	5
42.	I would rather win than lose in a game.	1	2	3	4	5
43.	I break out in a sweat which is not the result of heat or physical exertion.	1	2	3	4	5
44.	I feel there are situations where one is justified in hurting another person's feelings.	1	2	3	4	5
45.	I am troubled with diarrhea.	1	2	3	4	5
46.	I have pains in the back of my neck.	1	2	3	4	5
47.	I suddenly feel hot all over, without apparent cause.	1	2	3	4	5
48.	I think it is wrong to seek revenge since two wrongs don't make a right.	1	2	3	4	5
49.	I am troubled with backaches.	1	2	3	4	5
50.	I am a nervous person.	1	2	3	4	5
51.	In the absence of physical action my heart beats wildly.	1	2	3	4	5
52.	I say things that are not completely true.	1	2	3	4	5
53.	What others think of me does not bother me.	1	2	3	4	5
54.	My hand shakes when I try to do something.	1	2	3	4	5
55.	I have stomach trouble.	1	2	3	4	5
56.	I go to sleep without thoughts or ideas bothering me.	1	2	3	4	5
57.	I feel that might makes right.	1	2	3	4	5
58.	My head feels tender to the point that it hurts when I comb my hair or put on a hat.	1	2	3	4	5

(cont'd)

Never = 1 Rarely = 2 Sometimes = 3 Fairly often = 4 Nearly always = 5

59. My sleep is fitful and disturbed. 1 2 3 4 5

60. When someone annoys me, my first impulse is to tell him (her) off. 1 2 3 4 5

61. The muscles in my neck ache as if they were tied in knots. 1 2 3 4 5

62. I feel that people are too much concerned with satisfying their own desires at the expense of others. 1 2 3 4 5

63. I feel that I am about to go to pieces. 1 2 3 4 5

64. I become very angry. 1 2 3 4 5

65. I believe there are times when physical violence can be justified. 1 2 3 4 5

66. I am easily frightened. 1 2 3 4 5

67. I imagine taking revenge on someone I dislike. 1 2 3 4 5

68. I believe that it takes a lot of argument to convince most people of the truth. 1 2 3 4 5

69. I put off until tomorrow what I ought to do today. 1 2 3 4 5

70. I have frightening dreams. 1 2 3 4 5

71. I think of ways to get even with certain people. 1 2 3 4 5

72. I believe nearly anyone would tell a lie to keep out of trouble. 1 2 3 4 5

73. I have trouble with muscles twitching and jumping. 1 2 3 4 5

74. I am bothered by dizziness. 1 2 3 4 5

75. I have met people who were supposed to be experts who were no better than I. 1 2 3 4 5

76. I am bothered with constipation. 1 2 3 4 5

77. I have trouble concentrating. 1 2 3 4 5

Date ______________________ Class ______________________

Name ______________________ Major ______________________

Age ______________________

What was the sound like?

Were you anxious?

Did you try to control your reaction in any way? What were you thinking during the trials?

Which condition did you prefer? Why?

Comments or Questions?

Did you look at the counter?

STRUCTURE PREFERENCE