This dissertation has been
microfilmed exactly as received 68-13,563

MACE, Kenneth Curtis, 1939-
EGO INVOLVEMENT IN A HEDONIC SITUATION WITH DISCONFIRMED EXPECTANCIES.

The University of Oklahoma, Ph.D., 1968
Psychology, general

University Microfilms, Inc., Ann Arbor, Michigan

Downloaded from SHAREOK. Persistent Handle URL: https://hdl.handle.net/11244/2371

THE UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

EGO INVOLVEMENT IN A HEDONIC SITUATION WITH DISCONFIRMED EXPECTANCIES

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

DOCTOR OF PHILOSOPHY

BY

KENNETH CURTIS MACE

Norman, Oklahoma

1968

EGO INVOLVEMENT IN A HEDONIC SITUATION

WITH DISCONFIRMED EXPECTANCIES

APPROVED BY

Carl R. Aldrovd

John L. Manning

Paul D. Jacobs

Vera M. Gatea

C. W. Berendt

DISSERTATION COMMITTEE

ACKNOWLEDGEMENTS

The author wishes to thank Dr. Carlton Berenda, Dr. Paul Jacobs, Dr. Vera Gatch and Dr. John Morris, who served as members of the dissertation committee, for their time and interest. Special recognition is given to Dr. Carl Oldroyd, who served as dissertation director, for his understanding, interest and awareness of the problems that a graduate student experiences in the process of obtaining the degree that he is seeking.

Special consideration goes to my wife, Marion, who kept me smiling. Without her support and encouragement this degree would not have been possible.

TABLE OF CONTENTS

		Page
LIST OF TABLES		v
LIST OF FIGURES		vi
Chapter		
I.	INTRODUCTION AND PROBLEM	1
II.	METHOD	12
III.	RESULTS	23
IV.	DISCUSSION	34
REFERENCES		41
APPENDIX A		43
APPENDIX B		47

LIST OF TABLES

Table		Page
1.	Statements used for Subject Selection.....	13
2.	Order of Presentation of Solutions.....	18
3.	Analysis of Variance of Changes in Stimulus Rating on Trial 3, Reversing the Signs of Groups 1E and 1N.....	26
4.	Significance of Changes in Non-involved Groups on Stimulus Ratings.....	27
5.	Analysis of Variance of Feeling Tone Changes in Rating on Trial 3, Reversing signs of Groups 1E and 1N.....	29
6.	Significance of Changes in Non-involved Groups on Feeling Tone scale.....	31
7.	Comparison of Inter-group Means on Feeling Tone Scale.....	31

LIST OF FIGURES

Figure		Page
1.	Expected Changes in Hedonic Rating due to Contrast and Dissonance.....	10
2.	Obtained Changes on Stimulus Ratings.....	27
3.	Obtained Rating Changes on Feeling Tone Scale...	32

EGO INVOLVEMENT IN A HEDONIC SITUATION WITH DISCONFIRMED EXPECTANCIES

CHAPTER I

INTRODUCTION AND PROBLEM

In recent years, psychologists have been concerned with experimentally examining the dynamics of change in attitudes and opinions. Within this framework, Festinger (1957) offered a theory of cognitive dissonance. He proposed that the existence of incompatible cognitions is a motivating force which impels the organism toward attaining cognitive balance. Cognition, for Festinger, refers to any idea, belief, or opinion that an individual may have.

The basic assumptions of this cognitive dissonance theory are:

> 1. The existence of dissonance, being psychologically uncomfortable, will motivate the individual to attempt to reduce the dissonance and achieve consonance.
> 2. When dissonance is present, in addition to trying to reduce it, the person will actively avoid situations and information which would likely increase the dissonance.
> 3. Manifestations of these pressures include behavior changes, changes in cognition, and circumspect exposure to new information and new opinions (Festinger, 1957, pp. 30-31).

Chapanis and Chapanis reviewed the extensive volume of research that was inspired by Festinger's theory and criticized the supportive evidence as being limited by the following:

> 1. The experimental manipulations are usually so confounded that no valid conclusions can be drawn from the data.
> 2. A number of fundamental methodological inadequacies in the analysis of the results, e.g., rejection of cases and faulty statistical analysis of the data, vitiate the findings (1964, p. 1).

The conclusion that Chapanis and Chapanis drew from their investigation is that the evidence that had so far been offered in support of dissonance theory was inconclusive.

Dissonance and disconfirmed expectancies. Aronson and Carlsmith (1962) suggested that cognitive dissonance occurs most often when a person's behavior is at variance with his self concept. In support of this position, they reported that students who expected to perform poorly on a certain task, but who actually did well, expressed more dissonance (discomfort) than subjects who expected to perform poorly and who did perform poorly. This study dealt with a specific and limited kind of expectancy, i.e., an expectancy which involved the individual's self conception regarding a particular task.

Carlsmith and Aronson (1963) attempted to generalize the above findings to any situation involving an expectancy. They suggested that dissonance is aroused whenever an event

occurs which disconfirms a strong expectancy. They examined the hedonic consequences of disconfirmed and confirmed expectancies, assuming that, if dissonance does arise from the disconfirmation of an expectancy, then the resulting perception should be hedonically negative or unpleasant. That is, if a person expects a certain event (X) to occur, and a different event (Y) occurs, he should experience dissonance. Therefore, he should perceive (Y) to be less pleasant than if he had no expectancy toward (X).

They had their subjects taste and rate a random order of sweet and bitter solutions. The experimenters used subtle signals to induce expectancies on the part of the subjects as to whether the next solution would be sweet or bitter. By giving an inappropriate signal, they attempted to disconfirm the subjects' expectancies. According to dissonance theory, this would produce unpleasant ratings.

Carlsmith and Aronson reported that when the subjects' expectancies were disconfirmed, both for sweet and bitter solutions, the subjects judged the solutions to be more unpleasant than when they had no expectancy of occurrence for the solution. They interpreted these results as being supportive of dissonance theory.

Taylor (1965) criticized Carlsmith and Aronson for neglecting physiological variables which may have influenced their results, discarding subjects, using unnecessary complications in the attempt to arouse expectancies, and for

using an inadequate method of statistical analysis. In correcting for these deficiencies, Taylor experimentally re-examined their work and found no significant differences between judgments where expectancies were disconfirmed and judgments where expectancies were confirmed.

Mace (1966) criticized both of the above studies for incorporating the use of two rating scales: one for bitter solutions and one for sweet solutions. He claimed that the use of one rating scale for both pleasant and unpleasant solutions would allow for a more valid hedonic judgment, since this procedure would allow the subjects to judge sweet solutions as being more pleasant than bitter solutions. Also, Mace criticized both of the above studies for having an unreliable agent (saccharine) as the basis for sweet solutions. He re-examined this affective judgment situation, using 7 Up and quinine water for the pleasant and unpleasant solutions respectively, and using the color of the solution as the basis for establishing expectancies. He reported that when expectancies were disconfirmed a contrast effect was demonstrated. That is, when the subject expected a solution to be pleasant and found it to be unpleasant, it was perceived as being more unpleasant than when there was no basis for an expectancy; when the subject expected the solution to be unpleasant and it was perceived as being pleasant, he judged it to be more pleasant than when there was no basis for an expectancy. In contrast to the report

of Carlsmith and Aronson (1963), these results do not support the idea that dissonance was aroused in this hedonic judgment situation. Mace interpreted these results within the framework offered by Sherif and Hovland (1961) in their discussion of assimilation and contrast effects in attitude change. According to Sherif and Hovland, if a stimulus is perceived as being quite discrepant with a reference, a contrast effect occurs. There is then a tendency to push the judgment farther away from the reference.

Ego involvement. Ego involvement has been defined as "the arousal, singly or in combination, of the individual's commitments or stands in the context of appropriate situations, be they interpersonal relations or a judgment task in actual life or an experiment" (Sherif, Sherif, & Nebergall, 1965, p. 65). Sherif, Sherif, and Nebergall go on to say that:

> The person is ego-involved when any one of these ties and commitments, singly or in combination, is situationally aroused. Such ego involvements are manifested unmistakably in the reactions of the individual, in the evaluative adjectives he used, and in the corrective measures he takes, for example, when confronted by statements insulting his family, his party, or his church (1965, p. 65).

A number of studies have demonstrated that the judgments of ego involved subjects differ from the judgments of subjects who are not ego involved (Harvey, 1953; Holt, 1945; Sherif & Hovland, 1961).

Ego involvement has been operationally defined as follows:

> The degree of involvement and personal commitment on the issue of communication can be operationally defined by comparing the sizes of (number of positions in) the latitudes of acceptance, rejection, and non-commitment. Specifically, the more involved and personally committed the individual is on the issue, the greater the latitude of rejection is in relation to the latitude of acceptance, the number on which he remains noncommittal approaching zero (Sherif et al., 1965, p. 14).

The latitude of acceptance refers to that position that is most acceptable plus other acceptable positions. The latitude of rejection refers to the most objectionable position plus other objectionable positions. Also, there are positions that the individual neither accepts nor rejects which compose the latitude of noncommitment.

The present study

In the study by Mace (1966) the subjects were told that they were participating in an experiment that would help to determine the extent to which different chemical formulations affect the taste of several soft drinks. There was no attempt to provide any kind of "pay-off" for the subjects having their expectancies confirmed. Carlsmith and Aronson (1963) paid their subjects $.50 for being correct in their guess as to the nature of the next solution and charged them $1.00 for being incorrect. Even though the subjects knew that they could not owe money at the end of the experiment, they could win more money by being consistently correct. Also, the subjects were told that the ability to notice such cues as the signals used in the experiment to induce

expectancies was related to personal sensitivity. Both of these factors may have served to increase the subjects' involvement in the situation, although there was no attempt to assess any degree of involvement by the experimenters. Such a difference in involvement might be responsible for the difference between the results of Carlsmith and Aronson and those reported by Mace. That is, perhaps with a relative lack of involvement there is a contrast effect and with some degree of personal involvement there is a dissonance effect. Therefore, both ego-involved and non-involved subjects were introduced into this affective judgment situation in the present study.

Another variable that was introduced into this study, in line with the idea of possible differences in focus, was the use of two rating scales. It occurred to this author that, from personal experience, there seems to be a difference between the hedonic nature of a <u>stimulus</u> and the hedonic reaction to the <u>total situation</u>. For example, with a disconfirmed expectancy, one might find that the general feeling toward the whole situation of making a judgment is more pleasant or unpleasant than the hedonic perception of the stimulus itself. The use of two rating scales would allow the subjects to express separately a reaction to the stimulus and a reaction to personal feelings about the situation. This possibility was not presented to either the subjects of Carlsmith and Aronson or to the subjects of Mace.

Specifically, it was thought that the difference between the two above reports might be that in one the subjects were expressing a contrast reaction to a stimulus situation and in the other a dissonance reaction based on their feeling tone in the total judgment situation of a disconfirmed expectancy.

Also, it seemed possible that such a difference in reaction might vary with degree of involvement. It could be that ego-involvement forces the individual into a judgment based more on his personal feelings than on the stimulus characteristics. If the effect of disconfirmation of an expectancy is only a contrast effect and if the individual judges his feelings separately from the stimulus characteristics, the only differences associated with the degree of involvement would be in the strength of the reaction. On the other hand, even though the individual can still separate his personal feelings from the stimulus characteristics, it might be that a significant degree of ego-involvement is necessary in order for cognitive dissonance to occur. In this case, a highly involved individual should show dissonance in his personal feelings while a non-involved individual would show contrast. Therefore, it was important in this study to examine the effect of ego-involvement on the two scales, or two hedonic measures, simultaneously.

With the use of two hedonic scales, one for the stimulus reactions and one for the feeling tone reactions, the following specific patterns of change in ratings were looked for in this study:

1. Contrast--if the subject expects an experience to be pleasant but it is unpleasant, the experience would be rated as more unpleasant than if he had no expectancy. If the experience is expected to be unpleasant but it is pleasant, it would be rated as more pleasant than if he had no expectancy.

2. Dissonance--because any disconfirmed expectancy would be uncomfortable, disconfirmed expectancies for both pleasant and unpleasant experiences would be rated as more unpleasant than if there was no expectancy.

Although this procedure and scaling technique would also show assimilation, there was no evidence of an assimilation effect in the previous studies. Assimilation would be indicated by changes in rating exactly opposite to those that would indicate contrast.

Figure 1 shows the direction of change that would indicate either a contrast or a dissonance effect. These same patterns of change apply to both the feeling tone ratings and the stimulus ratings. However, each scale had its own reference points (ratings for both the unpleasant and pleasant solutions when there was no basis for an expectancy).

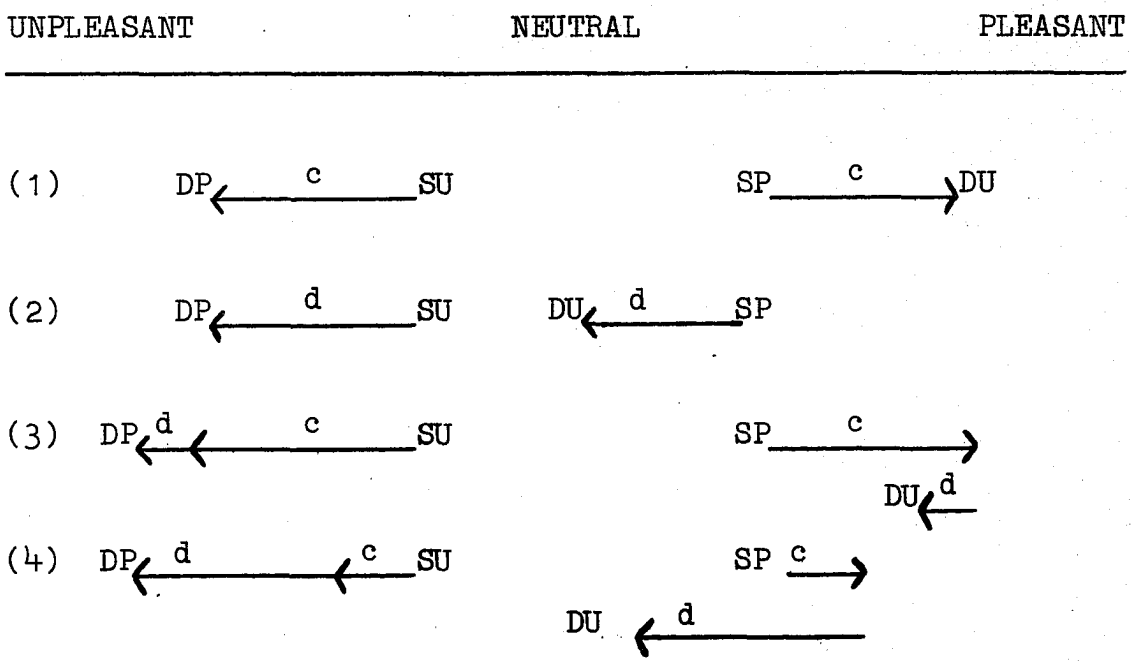

Fig. 1. Expected changes in hedonic rating due to contrast and dissonance. (1) pure contrast, (2) pure dissonance, (3) strong contrast, weak dissonance, (4) strong dissonance, weak contrast. The abbreviations used are:

SP--standard pleasant rating
SU--standard unpleasant rating
DP--disconfirmed pleasant expectancy
DU--disconfirmed unpleasant expectancy
c--contrast
d--dissonance effect

The separation of stimulus ratings and feeling tone ratings, the disconfirmation of both pleasant and unpleasant expectancies, and the use of both an ego-involved group and a non-involved group permits the examination of a large number of hypotheses regarding specific combinations of effects. However, for the purposes of this study, the following were the pertinent basic hypotheses:

1. The basic reaction is a contrast effect and ego-involvement simply increases the strength of the reaction. Both ego-involved and non-involved subjects will show a contrast effect on both the stimulus scale and the feeling tone scale, but the reaction will be greater for the ego-involved subjects.

2. Dissonance requires, or is more likely to occur under, conditions of ego-involvement. On both scales the ego-involved subjects will show a dissonance effect, while non-involved subjects will show a contrast effect.

3. Dissonance applies only to judgments involving personal feelings of commitment. Both the ego-involved and non-involved subjects will show a contrast effect in their stimulus ratings and a dissonance effect in their feeling tone ratings.

Combinations of these effects (including the combination of contrast and dissonance effects in a single rating) could also occur. Figure 1 shows examples of several combination effects.

CHAPTER II

METHOD

Subjects

Nine statements pertaining to the importance of grades in college (see Table 1) were chosen from a group of 27 such statements that were given to 15 graduate students, who were asked to sort these statements into separate piles. They were told that they could use as many piles as they felt necessary in order to position the various statements along a continuum ranging from feeling that grades were very important to a position of feeling that grades were unimportant in college. After each of the judges had finished this task, a yardstick was used to measure the distance between piles. The nine statements that were selected were those that most closely approximated an interval scale including the two extreme statements which were consistently judged to be positioned at the two ends of the continuum.

Students enrolled in introductory psychology courses at the University of Oklahoma were then given the task of evaluating these nine statements. Each of 128 students was

Table 1

Statements used for Subject Selection

a.	There is no doubt that obtaining good grades is the most important aspect of college.
b.	Obtaining good grades is one of the most important aspects of college.
c.	Obtaining good grades is often a very important aspect of college.
d.	Obtaining good grades is sometimes a very important aspect of college.
e.	It is difficult to say whether or not obtaining good grades is an important aspect of college.
f.	Obtaining good grades is sometimes not a very important aspect of college.
g.	Obtaining good grades is often not a very important aspect of college.
h.	Obtaining good grades is one of the least important aspects of college.
i.	There is no doubt that obtaining good grades is the least important aspect of college.

given a complete set of the nine statements copied on each of four sheets of paper assembled into a booklet. This procedure was patterned after that of Sherif (1965, p. 28). On the first sheet the subjects were given the following instructions:

> Below are some statements expressing various positions on the matter of grades in college.
>
> 1. Please read all the statements Carefully first before making any marks on this page.
>
> 2. Now that you have read carefully all of the statements UNDERLINE the ONE statement that comes closest to your position on this matter.

On the second page the subjects were instructed:

> The statements below are the same as those on the preceding page.
>
> 1. Please read all the statements carefully again before making any marks on this page.
>
> 2. On the first page, you underlined the one statement that was most acceptable to you. On this page, CIRCLE the letter of any other statement or statements that are acceptable to you.

On the third page they were instructed:

> The statements below are the same as those on the two preceding pages.
>
> 1. Please read through the statements again.
>
> 2. Now that you have read through the statements again, CROSS OUT the ONE statement that is most OBJECTIONABLE from your point of view.

On the fourth page the subjects were instructed:

> The statements below are the same as those on the first three pages.
>
> 1. Read through the statements again.

2. On the preceding page you indicated the statement that you disagreed with the most. On this page CIRCLE the letter of any other statement or statements that you also find objectionable.

The positions checked on the first two pages indicated the subject's latitude of acceptance, while those positions checked on the last two pages indicated his latitude of rejection. Since the subject was not forced to respond to every statement, his latitude of noncommitment could also be assessed.

Subject selection. On the basis of the students' evaluations of these statements, 10 ego-involved males, 10 ego-involved females, 10 uninvolved males, and 10 uninvolved females were selected as subjects in the experiment. In order for a subject to be judged to be ego-involved in this issue, he had to indicate rejection of at least 50% of the statements. In order for a subject to have been judged to be uninvolved, he had to be non-committed on at least 50% of the statements. This 50% criterion is stated by Sherif as an often used method in judgment studies (1965, p. 30). Also, for the ego-involved subjects, only those who indicated being involved with obtaining good grades were selected. That is, the subjects who accepted as their own position either statement a, b, or c and rejected at least 50% of the other statements (see Table 1).

With the establishment of this criterion for the selection of subjects, groups of students were given the statements until 40 students who satisfied the requirements

for subjects were obtained. Of the 128 students given the statements, 10 ego-involved males, 12 ego-involved females, 14 non-involved males, and 11 non-involved females were found. The first 10 to satisfy the conditions for each group were used as subjects with the extra "subjects" being kept in reserve in case some of the selected subjects could not participate in the experiment. All of the originally selected subjects participated.

Solutions and the hedonic scales. Two standard soft drinks, 7 Up and quinine water, were used as the pleasant and unpleasant solutions respectively. Mace (1966) reported that 7 Up was consistently rated as pleasant and quinine water was consistently rated as unpleasant. The color of the stimulus solutions was used to induce expectancies on the part of the subjects. One drop (measured from an eyedropper) of either yellow or green food coloring per 12 oz. of soft drink gave a distinguishable color to either soft drink.

For rating the hedonic qualities of the solutions, each subject was given a form composed of 11 horizontal lines 150 mm. long. These lines were anchored at one end by the term PLEASANT, at the other end by the term UNPLEASANT, and in the middle by the phrase NEITHER PLEASANT NOR UNPLEASANT (see Appendix A). The first line, which was twice as thick as the others, was labeled STANDARD, while the remaining lines were consecutively numbered 1 through 10.

Procedure

The order of presentation of the solutions can be seen in Table 2. Mace (1966) reported that there were no differences in the ratings of the standard solutions due to order of tasting, nor were there any differences in rating of the standard solutions due to the sex of the subject. Although there was no attempt to counterbalance order of tasting in the present study, sex was retained as a variable in view of the possibility of sex differences in the effect of ego-involvement and in the feeling tone reactions as separate from the stimulus judgments.

Groups 1E and 1N both experienced a disconfirmed expectancy of pleasantness on the third trial, while Groups 2E and 2N both experienced a disconfirmed expectancy of unpleasantness on the third trial. Groups 1E and 2E were composed of subjects who were ego-involved with the importance of grades. Groups 1N and 2N were composed of subjects who were not ego-involved with the importance of grades.

The stimulus solutions, as well as the water to be drunk between solutions, were kept at constant room temperature. Fresh mixtures of solution and fresh water were used each day. Subjects received exactly two cubic centimeters of solution on each trial but were allowed to drink as much water between solutions as they desired. The containers for the solutions were white, opaque, half-ounce paper cups.

Table 2

Order of Presentation of Solutions

Group	Standards		Experimental solutions		
			Trial 1	2	3
1E	7y	Qg	7y	7y	<u>Qy</u>
1N	7y	Qg	7y	7y	<u>Qy</u>
2E	7y	Qg	Qg	Qg	<u>7g</u>
2N	7y	Qg	Qg	Qg	<u>7g</u>

Note.--inappropriately colored solutions (disconfirmed expectancies) are underlined. The abbreviations used are:
E--ego-involved group
N--non-involved group
7y--7 Up with a yellow color
7g--7 Up with a green color
Qg--quinine with a green color
Qy--quinine with a yellow color

Also, subjects were asked to refrain from smoking during the experiment. Subjects participated individually.

Each subject was seated at a desk facing the experimenter. Between them there was a row of 10 cups containing the solutions. Although only the first three were used in the experiment, 10 were displayed to balance for color. In front of the row of 10 cups were two cups containing the standard solutions.

The name, sex, and coded identification of the appropriate experimental group were recorded at the top of the rating forms. The following instructions were then given:

> As you may or may not know, one of the things that we are concerned with in the study of human behavior deals with the stable characteristics of individual people. That is, because of certain characteristics people who respond in one way in one situation will respond in a similar way in another situation.
>
> One of the things that research in this area has shown us is that there is a relationship between the ability to make sensory discriminations, such as being able to recognize the differences in tastes, and the ability to make intellectual discriminations. By intellectual discriminations, I'm refering to the ability to recognize the differences between alternatives such as the different answers on a multiple choice exam in college. Of course, the ability to make these discriminations directly affects our grades.
>
> The two solutions that are immediately in front of you are standard solutions which you will use as the basis for your judgments of the other solutions. I want you to taste and rate each of these two standards on how pleasant or unpleasant it tastes to you on this form. Starting with this one (7 Up), you may taste or sip these standards as often as you need before making your rating. However, rinse your mouth with this water between solutions so that the taste of one does not interfere with the taste of the next one. Make a

> slight perpendicular slash on the scale line labeled standard to indicate your rating of each of these solutions.

Each subject was supplied with another rating form, of the same design as the one described above. However, the second rating form was labeled FEELING TONE (see Appendix A). The subjects were then told:

> On this second rating form, I want you to indicate how pleasant or unpleasant you feel after each trial, i.e., after each tasting of a solution. This is because previous research has not made the distinction between pleasant and unpleasant taste and pleasant and unpleasant feelings. For each solution, make your rating on the taste form and then make your rating on the feeling tone form.

When both of the standard solutions were rated, as well as the subject's feeling tone after judging each standard, the experimenter (using a ruler) extended the standard solution ratings and the standard feeling tone ratings down through the remaining scale lines. The subjects were then told:

> I am extending your ratings of these two standard solutions and feeling tone ratings down through the other lines so that you will have an accurate reference to these when rating the sample solutions. For the same reason I am extending your ratings of how pleasant you feel at this moment in the experiment. You are, of course, free to go inside or outside of these lines in your subsequent ratings.
>
> These 10 sample solutions are slightly different formulations of the standards that you have just rated. For each of these, take the entire amount in your mouth, hold it there briefly and then rate it on the appropriate line below the standard. Line 1 refers to sample 1, line 2 to sample 1, etc; after you have rated each sample on the taste form, then rate your general feeling on the other form.

The experiment was terminated for all subjects after the third trial rating. They were asked to fill out a demand characteristic questionnaire (see Appendix A), were told the nature of the experiment, and were asked to refrain from telling any other students about the experiment because other students were to be used as subjects.

The use of the demand characteristic questionnaire is based on the work of Orne (1962). He reported that the subject's performance in an experimental situation may be conceptualized as problem solving behavior. The subject is seeking to become aware of the exact nature of the experiment, and the totality of cues in the experimental situation which convey an experimental hypothesis to the subject will affect his behavior. Orne termed these cues "the demand characteristics of the experimental situation." Therefore, an extended questionnaire was used to determine if the subjects formulated a hypothesis which would be the same as or similar to the experimental hypothesis.

Any subject who formulated a hypothesis equivalent to the experimental one was to have been disqualified. However, it was not necessary to discard any subjects on the basis of the questionnaire.

This questionnaire also served as an index of credibility. One of the questions that the subjects were asked was "Did the thought ever occur to you during the experiment that we were not interested in correlating taste with

intellectual ability?" All of the subjects responded "no" to this question, which indicated that they accepted the relationship.

CHAPTER III

RESULTS

The basic problem examined in this study was: Do ego-involved subjects respond differently than non-involved subjects when an expectancy has been disconfirmed in an affective judgment situation and, if they do, is the difference dependent on whether the feeling tone or the stimulus characteristics are being evaluated? Therefore, the critical comparisons were the third trial ratings of the ego-involved subjects with the third trial ratings of the non-involved subjects. As can be seen in Table 2, the third trial was designed to disconfirm an expectancy of pleasantness (yellow quinine, Groups 1E and 1N) or to disconfirm an expectancy of unpleasantness (green 7 Up, Groups 2E and 2N).

The rating scale lines were 150 mm. long and the standard ratings (ratings without an expectancy) were indicated on each scale line. The differences between the third trial ratings and the standard ratings for the same solution were determined for each subject, measured in millimeters. In recording the rating, change toward the pleasant end of the scale was given a plus sign and change

toward the unpleasant end of the scale was given a minus sign. As has been previously stated, Mace (1966) reported that there were no differences in rating of the standard solutions due to order of presentation or sex of subject.

Stimulus Ratings

The mean ratings of trial 3 were: Group 1E (-21.7), Group 2E (+22.9), Group 1N (-11.3) and Group 2N (+11.5). The variances of these groups were: 1E (47.5), 2E (30.5), 1N (108.6) and 2N (121.1). Hartley's test for homogeneity of variance was applied (Winer, 1962, p. 93) and indicated that the degree of hetrogeneity of variance is not large enough to invalidate the use of analysis of variance (F max = 3.96, $p > .05$). With the scaling technique used in this study, a contrast effect would be indicated by changes away from the neutral point of the scale; dissonance would be indicated by changes in rating toward the unpleasant end of the scale, i.e., with negative changes. The mean changes in rating on trial 3 are in the direction of a contrast effect. With the method of scoring used in this experiment, if a pure contrast effect existed and was not dependent on the type of expectancy disconfirmed, the positive and negative changes in each involvement group would cancel so that the mean change for each group would approximate zero and no differences between the two groups would show. Therefore, an analysis of variance was performed on these change scores, reversing the signs of groups 1E and 1N, and

separating the data by Involvement, Expectancy, and Sex. As can be seen in Table 3, the difference between involvement groups yielded a significant F ratio ($F = 12.9$, $p < .01$). None of the other differences were significant.

Thus there is a clear indication of a contrast effect in the reactions to the stimulus characteristics; the degree of the effect depends on the degree of ego-involvement. There is no evidence that the type of expectancy disconfirmed affects the magnitude of the contrast reaction. The very small portion of variance associated with the Involvement x Expectancy interaction indicates that the difference between the involvement groups is in no way dependent on the type of expectancy disconfirmed.

If dissonance had been present in any detectable degree, there would have been significant variation associated with either or both the Expectancy (E) factor and the Involvement x Expectancy (I x E) interaction. Therefore, as can be seen by comparing Figure 2 with Figure 1, there seems to be a relatively pure contrast effect in the hedonic ratings of the stimulus characteristics.

Although the significance of the Involvement (I) factor indicates that the ego-involved group changed more than the non-involved group, it does not indicate whether or not the changes in the non-involved groups were significant. Therefore, t tests were performed on the means for Groups 1N and 2N. As can be seen in Table 4, both of these rating changes

Table 3

Analysis of Variance of Changes in Stimulus Rating on Trial 3, Reversing the Signs of Groups 1E and 1N

Source	SS	df	MS	F	p
Involvement (I)	1188.1	1	1188.1	12.9	<.01
Expectancy (E)	5.0	1	5.0		
Sex (S)	14.4	1	14.4		
(I)x(E)	2.5	1	2.5		
(I)x(S)	1.9	1	1.9		
(E)x(S)	.9	1	.9		
(I)x(E)x(S)	3.8	1	3.8		
Error	2944.0	32	92.0		

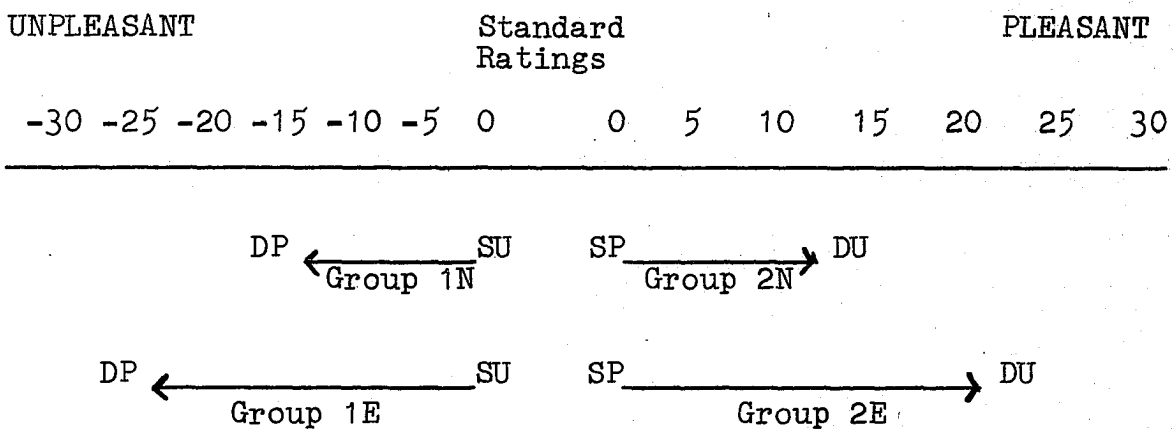

Fig. 2. Obtained changes on the stimulus ratings. Abbreviations used are:
SP--standard pleasant rating
SU--standard unpleasant rating
DP--disconfirmed pleasant expectancy
DU--disconfirmed unpleasant expectancy

were significantly different from the standard ratings, indicating that disconfirmation of an expectancy produces a contrast effect even in non-involved subjects.

Table 4

Significance of Changes in Non-involved Groups on the Stimulus Ratings

Group	Comparison Means	t	p
1N	(-11.3) vs (0)	2.8	<.05
2N	(+11.5) vs (0)	2.4	<.05

Feeling Tone Ratings

The changes in feeling tone ratings were obtained in the same manner as described above for the changes in ratings for the solutions. The mean ratings on this scale after a disconfirmed expectancy were: Group 1E (-37.1), Group 2E (+29.0), Group 1N (-8.3), and Group 2N (+6.4). The variances of these groups were: 1E (72.3), 2E (89.8), 1N (21.6), and 2N (59.4). Again, Hartley's test for homogeneity of variance was applied and indicated that the degree of hetrogeneity of variance is not large enough to invalidate the use of analysis of variance ($F_{max} = 4.15$, $p > .05$). An analysis of variance was performed on these change scores, reversing the signs of Groups 1E and 1N, and separating the data by Involvement, Expectancy, and Sex. As can be seen in Table 5, the Involvement factor yielded a significant F ratio ($F = 60.1$, $p < .01$). As with the analysis of the stimulus ratings, the Involvement factor (I) was the only significant one. However, the F ratio for the Expectancy factor (E) showed some variation. To the extent that this non-significant variation is meaningful, it would indicate some tendency for the type of expectancy disconfirmed to influence the amount of change in ratings. Inspection of the four group means shows that changes toward the unpleasant end of the scale were somewhat larger than those toward the pleasant end. This would be consistent with a small dissonance effect (see Figure 1). There is, therefore,

Table 5

Analysis of Variance of Feeling Tone Changes in Rating on Trail 3, Reversing signs of Groups 1E and 1N

Source	SS	df	MS	F	p
Involvement (I)	6604.1	1	6604.1	60.1	<.01
Expectancy (E)	273.0	1	273.0	2.3	NS
Sex (S)	22.7	1	22.7		
(I)x(E)	95.4	1	95.4		
(I)x(S)	14.8	1	14.8		
(E)x(S)	5.2	1	5.2		
(I)x(E)x(S)	7.1	1	7.1		
Error	3493.2	32	110.0		

some reason to suspect that, although the major effect in the feeling tone ratings is a contrast effect, there may be a small, but not statistically significant dissonance effect. The Involvement x Expectancy (I X E) interaction again produces slightly less than chance variation, so there seems to be no evidence that the two involvement groups are reacting differently as far as the contrast-dissonance combination is concerned.

Again, the appropriate t tests were performed to determine whether or not the mean changes in rating of the non-involved groups were significant. As can be seen in Table 6, neither comparison showed a significant difference. Thus lack of involvement reduces feeling tone changes to non-significance while the presence of ego-involvement boosts feeling tone changes to a highly significant level.

Inspection of the feeling tone means indicated a possible stronger reaction with a disconfirmed pleasant experience than with a disconfirmed unpleasant experience. As can be seen in Table 7, the mean of Group 1E was significantly different from the mean of Group 2E ($p < .05$), while the difference between the means for Groups 1N and 2N was not significant. Although this is actually an (I)x(E) interaction test, it is somewhat more informative than the (I)x(E) interaction in the analysis of variance. The latter, which would ordinarily indicate whether or not an interaction was present, is in fact a purified term from which the

Table 6

Significance of Changes in Non-involved Groups on Feeling tone Scale

Group	Comparison Means	t	p
1N	(-8.3) vs (0)	1.4	$>.10$
2N	(+6.4) vs (0)	1.07	$>.10$

Table 7

Comparison of Inter-group Means on Feeling tone Scale

Groups	Comparison Means	t	p
1E vs 2E	(37.1) vs (29.0)	1.92	$<.05$
1N vs 2N	(8.3) vs (6.4)	.9	-

effects of the overall expectancy factor and the involvement factor have been removed. The expectancy factor was approaching significance. The t test, which leaves the expectancy factor confounded with the interaction effect, allows them to combine to show a small significant effect.

Thus the analysis of the feeling tone ratings shows a strong contrast effect, with probably a small amount of dissonance, for the ego-involved groups. For the non-involved groups, the changes were in the same direction as for the ego-involved groups, but were not significant. Figure 3 shows a graphic representation of these effects.

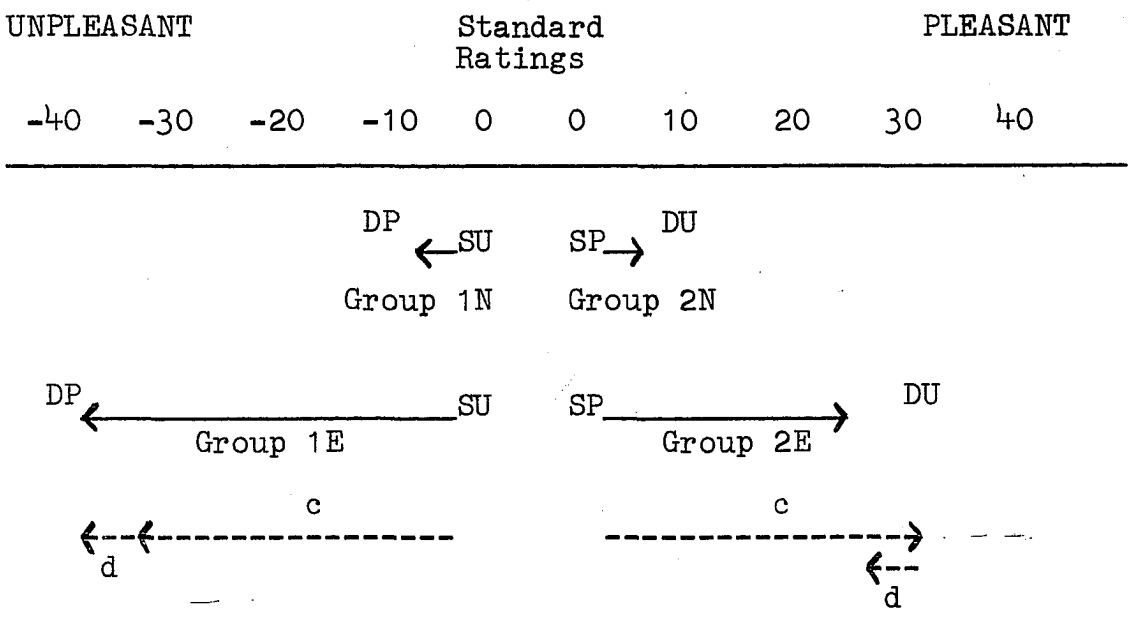

Fig. 3. Obtained rating changes on feeling tone scale. Abbreviations used are:
SU--standard unpleasant rating
SP--standard pleasant rating
DP--disconfirmed pleasant experience
DU--disconfirmed unpleasant experience
c--presumed pure contrast effect
d--presumed small dissonance effect

Summary

Of the hypotheses stated earlier in this report, the first, that the effect is a contrast effect and that ego-involvement simply increases the strength of the effect, is clearly supported for the stimulus ratings and is clearly the major factor on the feeling tone ratings. No support for hypothesis two was found. Some small partial support was found for hypothesis three, that dissonance applies only to judgments involving personal feelings of commitment.

CHAPTER IV

DISCUSSION

The third trial rating changes in this experiment demonstrate that the subjects experienced a contrast effect when their expectancies were disconfirmed. If a person expects an experience to be pleasant and it is unpleasant, he perceives it as being more unpleasant than if he had no basis for an expectancy. If he expects an experience to be unpleasant and it is pleasant, he perceives it as being more pleasant than if he had no basis for an expectancy. These results are in line with those reported by this author in an earlier study (Mace, 1966). The results obtained in the present study gave no evidence of a dissonance effect on the stimulus ratings, although there is some indication of a small dissonance effect on the feeling tone scale.

The present study also showed that if a subject is ego-involved, he will experience a significantly stronger contrast effect than a subject who is not involved in the situation. Also, the pattern of judgment is quite symmetrical on the stimulus ratings. That is, the contrast effect to the stimulus characteristics did not depend on

the expectancy which was disconfirmed. The contrast effect with a disconfirmed pleasant experience was of the same intensity as the contrast effect with a disconfirmed unpleasant experience. There were no differences in male and female subjects in terms of the intensity or direction of the reaction.

Sherif and Hovland offer a framework for assimilation and contrast effects in attitude change. In referring to the anchors that individuals use in making judgments, they state, "The use of anchors within the stimulus series is functionally equivalent to the use of a standard stimulus in classical psychophysical methods (1961, p. 51). The standard solutions used in the present experiment can be viewed as the anchors from which judgments of succeeding solutions were made.

According to Sherif and Hovland, an anchor acts as a reference from which the determination of either an assimilation or contrast effect is made when viewing succeeding judgments. If the stimulus is perceived as being similar to the anchor, there is a tendency to draw the judgment closer to the anchor, i.e. to assimilate toward the anchor. On the other hand, if the stimulus is perceived as being dissimilar to the anchor, a contrast effect occurs and the judgment is pushed farther away from the anchor.

Sherif and Hovland postulate two forces as potentially affecting each judgment: a contrast effect to push the

rating away from its respective anchor and an assimilation effect to pull the rating toward its respective anchor.

In the present study, when an expectancy was disconfirmed, such a contrast effect was indicated by the ratings being significantly beyond their respective anchors and toward the extremes of the scale.

Sherif, Sherif, and Nebergal (1965, p. 40) state that a number of recent studies (Unshaw, 1962; Webb & Chueh, 1962; Zavalloni & Cook, 1963), as well as their own research, indicate that an individual who is ego-involved will tend to have a stronger contrast effect than non-involved individuals. The above research is primarily dealing with discrepant communication in the pattern of attitudes and attitude change. An individual who is highly ego-involved in an attitude will tend to view any communication that is not similar to his own position in an exaggerated contrast reaction when compared with judgments of people who are relatively non-involved (Sherif, Sherif, & Nebergall, 1965, p. 236-237).

The same type of phenomenon seems to be occurring in the present experiment. That is, the ego-involved subject showed a stronger or exaggerated contrast effect when their expectancies were disconfirmed, compared to the non-involved subjects. The perception of the disconfirmed expectancy can be conceived of as a form of communication. That is, the individual is receiving some information about the

situation. Apparently, those who are ego-involved perceive this information as being more discrepant from their anchor or reference than those who are not involved.

Feeling Tone Analysis

The analysis of the feeling tone ratings indicate that there is also a strong contrast effect in feeling tone for ego-involved subjects, but no significant change in feeling tone for non-involved subjects when an expectancy is disconfirmed. However, this analysis indicated a difference in intensity of the reaction, depending on which expectancy was disconfirmed. That is, if an individual expects an experience to be pleasant and it is unpleasant, the magnitude of his unpleasant feeling is greater than the magnitude of his pleasant feeling when he expects an experience to be unpleasant and it is pleasant. This could indicate a combination of dissonance and contrast. The contrast effect tends to pull the ratings toward the extremes, while a dissonance effect tends to pull the ratings toward the unpleasant end of the scale. As can be seen in line 3 of Figure 1, a combination effect would follow a pattern such as that of the ego-involved subjects' ratings on the feeling tone scale. That is, the disconfirmed pleasant reaction would be quite large, since both contrast and dissonance would be pulling the rating toward the unpleasant end of the scale. The disconfirmed unpleasant reaction would be significantly smaller than the disconfirmed pleasant reaction because the

contrast effect would be pulling the rating toward the pleasant end of the scale while the dissonance effect would be pulling the rating toward the unpleasant end of the scale.

Some support is given to the idea of a possible combination effect by the results of Mace (1966). The contrast reaction reported there in a disconfirmed expectancy situation also shows that the disconfirmed pleasant reaction appeared to yield a larger mean change in rating than the disconfirmed unpleasant reaction. The means reported are: disconfirmed pleasant (-22.4) and disconfirmed unpleasant (+8.6). A *t* test comparing these two means indicates a significant difference between the two ratings ($t = 1.92$, p .05). In that study, the subjects were not asked to differentiate between their reaction to the stimulus and their feeling tone. It seems quite possible that a significant proportion of subjects were rating their feeling tone rather than their reaction to the stimulus.

Failure to Find Dissonance on the Stimulus Ratings

In the study of Carlsmith and Aronson (1963) there was a possible confounding variable operating. In having each subject guess whether the solution would be sweet or bitter, they attempted to increase his motivation for guessing correctly by paying him $.50 for each correct guess and charging him $1.00 for each incorrect guess. It seems possible that this factor of gain or loss of money may have influenced the perception of their subjects.

When a subject guessed wrong, he lost $1.00 and had previously been told that he could keep the amount of money that he ended up winning. If he guessed wrong, he realized it as soon as he started to taste the solution. His perception would seem to be that he had both guessed wrong on the nature of the solution and also had lost $1.00.

In viewing this possible influence, Carlsmith and Aronson state:

> The difference between being correct and being incorrect with no expectancy gives an estimate of the effects of being wrong and losing money. But the crucial comparison is between being incorrect with an expectancy (disconfirmation) and being incorrect without an expectancy (incorrect) (1963, p. 154).

However, this analysis does not consider a possible confounding effect. Even though their results showed significant differences between being incorrect with an expectancy and being incorrect without an expectancy, this does not eliminate the possible influence of money. The fact that they expected to win $.50 and then lost $1.00 when an expectancy was disconfirmed may have left the subjects in a psychologically negative state which affected their ratings. When the subject was incorrect without an expectancy, he did not expect to win any money. When he was incorrect, he was not disappointed over the loss of money. It seems quite possible that the "dissonance" reaction of these subjects was not so much with the

disconfirmation of an expectancy as with the realization that they had just lost money.

Conclusions

The conclusions that can be drawn from this study are:

1. If in a hedonic judgment situation individuals' expectancies are disconfirmed, they will experience a contrast effect based on the stimulus characteristics.

2. The magnitude of this contrast effect will be significantly stronger if they are ego-involved in the situation.

3. If they are ego-involved in the situation, they will also experience a strong contrast effect based on their personal feeling tone. However, if they are relatively non-involved, there will be no significant change in their feeling tone with a disconfirmed expectancy.

4. Cognitive dissonance is not a major factor in their reactions in this situation. There is some evidence for a small dissonance effect in the feeling tone reactions of individuals who are ego-involved in the situation.

REFERENCES

Brehm, J. W., & Cohen, A. R. Explorations in cognitive dissonance. New York: John Wiley & Sons, 1962.

Carlsmith, J. M., & Aronson, E. Some hedonic consequences of confirmation and disconfirmation of expectancies. J. abnorm. soc. Psychol., 1963, 66, 151-156.

Chapanis, Natalia P., & Chapanis, A. Cognitive dissonance: five years later. Psychol. Bull., 1964, 61, 1-22.

Festinger, L. A theory of cognitive dissonance. White Plains, N.Y.: Row, Peterson, 1957.

Harvey, O. J. An experimental approach to the study of status relations in informal groups. Amer. sociol. Rev., 1953, 18, 357-367.

Holt, R. R. Effects of ego-involvement upon levels of aspiration. Psychiatry: J. biol. and interpersonal Relations, 1945, 3, 299-317.

Mace, K. C. Hedonic consequences of disconfirmed expectancies. Unpublished masters thesis, Univer. of Oklahoma, 1966.

Orne, M. T. On the social psychology of the psychological experiment: with particular reference to demand characteristics and their implications. Amer. Psychologist, 1962, 17, 776-783.

Sherif, M., & Hovland, C. Social judgment. New Haven, Conn.: Yale Univer. Press, 1961.

Sherif, Carolyn W., Sherif, M., & Nebergall, R. E. Attitude and attitude change. Philadelphia, Pa.: W. B. Saunders Company, 1965.

Taylor, G. L. A re-examination of the effects of cognitive dissonance on the disconfirmation of expectancies. Unpublished masters thesis, Univer. of Oklahoma, 1965.

Winer, B. J. Statistical principles in experimental design. New York, N. Y.: McGraw-Hill, 1962.

APPENDIX A

RATING SCALES

QUESTIONNAIRE

UNPLEASANT NEITHER PLEASANT NOR UNPLEASANT PLEASANT

STANDARD

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

FEELING TONE

UNPLEASANT	NEITHER PLEASANT NOR UNPLEASANT	PLEASANT

STANDARD

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

Please answer the following questions.

What did you think that we were after in this experiment?

Did you suspect anything about the experiment?

Did you suspect anything about the solutions?

Why do you think that you were given solutions that did not have the same colors as the standards?

Did the thought ever occur to you during the experiment that we were not interested in correlating taste with intellectual discriminatory ability?

Did anything or any idea that you had influence where you placed your marks on the rating scales?

If so, what was the idea?

APPENDIX B

RAW DATA

Raw Data

Group	Sex	Third Trial Stimulus Ratings	Third Trial Feeling Tone Ratings
1E	M	-16	-41
	M	-23	-36
	M	-24	-32
	M	-31	-26
	M	-13	-54
	F	-25	-29
	F	-15	-38
	F	-23	-42
	F	-19	-27
	F	-28	-46
2E	M	23	28
	M	28	16
	M	24	33
	M	15	24
	M	18	48
	F	33	56
	F	26	37
	F	19	12
	F	27	19
	F	16	17
1N	M	-16	- 5
	M	-11	- 3
	M	7	- 6
	M	-15	-11
	M	-24	-14
	F	-15	- 6
	F	-21	-18
	F	9	- 3
	F	-10	-10
	F	-17	- 7

Group	Sex	Third Trial Stimulus Ratings	Third Trial Feeling Tone Ratings
2N	M	14	7
	M	- 9	14
	M	21	2
	M	6	4
	M	20	9
	F	- 9	22
	F	17	5
	F	23	3
	F	14	-11
	F	18	9