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A MODEL IN BALANCE THEORY AND ITS APPLICATION TO COGNITIVE DISSONANCE.

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A MODEL IN BALANCE THEORY AND ITS APPLICATION TO COGNITIVE DISSONANCE

by
Jorge García-Bouza

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in the
University of Michigan
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Doctoral Committee

Professor John R. P. French, Jr., Chairman
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Professor Theodore M. Newcomb

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TABLE OF CONTENTS

CHAPTER		Page
I.	INTRODUCTION	1
II.	DEFINITIONS	3
	(1) Aspects of objects and events. Situations.	3
	(2) Cognitive relationships (unit-formations)	5
	(3) Affective relationships	8
III.	THE THREE PARTS OF THE PROPOSED MODEL . .	13
	(1) The cognized objective situation. Analysis in terms of (a) accuracy, and (b) balance	14
	(2) The cognized relationships between the subject and the objective situation. Analysis in terms of (a) accuracy and (b) balance	18
	(3) The affective orientations	22
IV.	RECAPITULATION	25
V.	THE MAPPING OF MAGNITUDES: LINES	27
	(1) Importance of relationships in the objective situation	28
	(2) Importance of relations linking E to the objective situation	29
	(3) Intensity of affective orientations	30
VI.	THE MAPPING OF MAGNITUDES: CYCLES AND GRAPHS	34

CHAPTER Page

A rule for assigning importances to balanced and unbalanced cycles 35

VII. A PROPOSITION ON PROCESSES OF CHANGE TOWARD BALANCE 38

VIII. COGNITIVE DISSONANCE AS A TEST OF THE PROPOSED MODEL 44

IX. "COGNITIVE DISSONANCE" IS NOT RESTRICTED TO COGNITIVE PHENOMENA 47

X. THE NOTION OF 'COGNITIVE CLUSTER.' DISSONANCE IN COGNITIVE CLUSTERS. ITS IMPLICATIONS FOR THE PROPOSED MODEL . 52

XI. REFORMULATION OF THE PROPOSITION ON PROCESSES OF CHANGE TOWARD BALANCE . . . 58

XII. THE THREE EXPERIMENTAL PARADIGMS IN "COGNITIVE DISSONANCE" 62

XIII. ANALYSIS OF COHEN AND LATANE'S EXPERIMENT ON "CHOICE IN COMMITMENT TO COUNTERATTITUDINAL BEHAVIOR" 64

(a) The situation before the manipulations 65

(b) The situation after the manipulations 74

XIV. THE CONCEPTUALIZATION OF 'CHOICE' IN FREHE AND COHEN. THE CONCEPT OF 'PREFERABILITY' OF ALTERNATIVES 92

XV. SUMMARY OF DISSONANCE, BALANCE AND CHOICE 105

CHAPTER Page

XVI. AN ORDERING OF EXPERIMENTAL EXAMPLES ON A DIMENSION OF PREFERABILITY OF THE CHOSEN ALTERNATIVE 107

XVII. GENERALIZATION TO OTHER MANIPULATIONS OF CHOICE 110

XVIII. THE CONCEPT OF 'VOLITION' 112

XIX. COMMENTS ON SOME EXPERIMENTS WHICH APPARENTLY CONTRADICT OUR THEORY 127

XX. EXPERIMENTS INCLUDING NEGATIVE SELF-EVALUATION (EnE). 137

XXI. DIFFERENCES BETWEEN SELF-ESTEEM AND SELF-INVOLVEMENT 158

XXII. THE ROLE OF COMMITMENT, DECISION AND BEHAVIOR IN THE AROUSAL OF DISSONANCE 160

XXIII. POSSIBLE ORIENTATIONS FOR FUTURE RESEARCH 168

XXIV. SUMMARY AND CONCLUSIONS 170

GLOSSARY 174

BIBLIOGRAPHY 177

LIST OF FIGURES

FIGURE		Page
I.	Theoretical curves relating magnitude of dissonance and exposure to information. (Festinger, p. 130)	101
II.	Experimental relation between magnitude of dissonance and exposure to information. (Festinger, p. 171) . . .	101
III.	Experimental relation between magnitude of dissonance and exposure to information. Yale replications, public condition (Cohen, Brehm and Latane, 1959, p. 69).	102
IV.	Experimental relation between magnitude of dissonance and exposure to information. Yale replications, private condition (Cohen, Brehm and Latane, 1959, p. 69)	102

CHAPTER I

INTRODUCTION

The present study is an attempt to use a formal model based on balance theory (Heider, 1946, 1958; Cartwright and Harary, 1956; Newcomb, 1953, 1959, 1961) to map the configuration of cognitive and affective orientations of a subject to himself and to his environment as he cognizes it at a given moment, and the reciprocal influences among those orientations. As an example of the applicability of the model to empirical data we have used it to represent the interrelations among the cognitive and affective orientations of subjects in experiments in cognitive dissonance. We have also explored the possibility of applying the model to a larger range of phenomena: the A-B-X paradigm, mechanisms of defense and coping mechanisms, interpersonal orientations, cognitive inconsistency as a motivating factor, and the relationships between direct and indirect cognition.

Although this is a theoretical study we have tried to keep as close a contact as possible with experimental results, to express our hypotheses in an empirically-oriented fashion, and to suggest in various places the type of factual evidence which could result in their confirmation or disconfirmation.

We have omitted on several occasions the definition of the more usual notions of balance theory and cognitive dissonance; we assume the reader has some familiarity with the works of Heider (1958), Newcomb (1953, 1959, 1961), Cartwright and Harary (1956), Festinger (1957) and Brehm and Cohen (1962). On the other hand, we devoted much space to a detailed definition of the elements of the model. If the reader feels that even these definitions do not cover all the possible formal and empirical implications we ask him to proceed with the factual examples dealing with cognitive dissonance. Their relation to known experimental results will be the best possible illustration of how we intend to apply the model to the mapping of psychological processes.

CHAPTER II

DEFINITIONS

(1) Aspects of objects and events. Situations.

Our theoretical model is formulated in terms of graph theory (Cartwright and Harary, 1956; Harary, Norman and Cartwright, forthcoming).

The aspects of the universe which are relavant to a subject in a given context are mapped as points in a space (a 'cognitive' space).

We use letters to label the points:

(a) Subjectively different aspects of the same object, alternative, course of action or event, are mapped into different points labeled with the same letter (with different subscripts). E. g., alternative A, complying with a request, may have a cognized aspect which generates a positive affective orientation in the subject; it will be mapped into a point, which may be labeled A_p. A cognized aspect of the same alternative which generates a negative affective orientation will be mapped into a different point, which may be labeled A_n.

(b) Aspects of different objects, alternatives, etc., are labeled with different letters. Each object, alterna-

tive, etc., is represented by a letter (labeling one or more points), and the cognition by the subject of each aspect of an object, alternative, etc., is represented by a point. E. g., two alternatives A and B, compliance and noncompliance, where each has a positive and a negative aspect cognized by the subject, will be mapped into four points, which may be labeled A_p, A_n, B_p and B_n.

These and subsequent symbols will be included in the glossary, p. 174.

The cognition of two or more successive aspects of the same alternative, object or event is represented by two or more points labeled with the same letter and different numerical superscripts (increasing in the order of the temporal sequence).

All the aspects which are cognized (which become cognitively relevant) within the same unit of time have the same numerical superscripts. In self-explanatory cases we omit these.

Two or more simultaneous aspects of the same object or event are represented by two or more points labeled with the same letter, the same numerical superscript, and different numerical or alphabetical subscripts (e. g., A^2_p, A^2_n, A^2_x, etc.).

Each configuration of cognitive and affective orientations and relationships will be called a situation and mapped into a graph. The relevance of a given orientation or relationship will determine its inclusion in or exclusion from a given graph.

Examples of the proposed notation (individual system of orientations of subject E):

"E cognizes an aspect of A" is noted	A
"E cognizes an aspect of B" is noted	B
"E cognizes an aspect of E" is noted	E

(2) Cognitive relationships (unit-formations).

The cognitive relationships among aspects of the universe are mapped as lines.

A solid line represents a positive unit-formation; (Heider, 1958, p.176); a dashed line represents a negative unit-formation; the absence of a line between two points (a zero line) represents the absence--or perhaps the 'neutralization,' later to be defined--of a cognitive relationship between these points.

Examples of positive unit-formations are: "coexists," "is close to," "approaches," " is approached," "follows," "is followed by," "implies," "is implied," "causes," "is caused," "decides," etc. Examples of negative unit-formations are: "cannot coexist," "is far from," "avoids," "is

avoided by," "does not follow," "implies the contrary of," "is implied by the contrary of," "does not cause," "is not caused by," "decides against," etc. In many cases (of the type "A approaches B, and B is approached by A") the relationship has different implications with respect to each of the two aspects mapped in the points. Nevertheless, from the point of view of the cognizing subject it is a unique relationship, and it is represented by one line.

The cognition by E that a second subject A has a positive affective relationship with some aspect of the environment is mapped in E's cognitive space as a positive unit-formation, a positive line. E's cognition of A's negative affective relationship with X is mapped in E's cognitive space as a negative line between A and X.

The same notation is used, respectively, for E's cognition of A's positive or negative affective relationship with E.

E's cognition of the fact that in the past E had a positive or negative affective relationship with X is mapped in the cognitive space of E (as a positive or negative unit-formation, a positive or negative line).

In the mapping of psychological configurations or situations we will use fairly "common-sense" definitions of empirical entities and relationships. Ideally we should include in each case an exhaustive definition of (a) the objects, events and aspects we map on the points, and (b)

the relationships (cognitive unit-formations) we map on the lines, since our conclusions about balance, probable outcomes, etc., are only valid for empirical systems to which such correspondence rules are applicable.

To a certain extent, this is one of the most important aspects of our future task. We do not want to allow too great a margin in our correspondence rules lest we introduce too many degress of freedom in our reasoning and make impossible any empirical check of the hypotheses to be eventually stated in terms of our formulation.

Examples, in the individual system of cognitive orientations of subject E:

"E cognizes a positive unit-formation between A and X" is noted — A ——— X.
This case includes the cognitions 'A has a positive affective relationship with X'.

"E cognizes a negative unit-formation between A and Y" is noted — A - - - - Y.

"E cognizes a positive unit-formation between E and A" is noted — E ——— A.
This last case includes the cognition 'A has a positive affective relationship with E'.

"E cognizes at time n that E had, at time n-x, a positive affective relationship with A" is noted $E^{n-x}\!\!\longrightarrow A$.

(3) Affective relationships

In addition to the cognitive points we have described, our graphs will include one or more points of origin of affective orientations.

In the present series of definitions and examples we will deal only with one such point: E, the point of origin of the conscious affective orientations in the ego of the cognizing subject. In future studies we plan to incorporate S, for the point of origin of the unconscious affective orientations in his superego, and probably other points of origin of affective orientations.

Any point in the cognitive space of E can be the object of an affective orientation, represented by a positive or negative line joining such point to the origin point E.

The origin point E is not in the cognitive space of E. Hence, any affective relationship between E and a cognized aspect of E will be represented by a positive or negative line joining the origin point E to a point in E's cognitive space.

Each line joining the origin point E to any other point in the graph and representing an affective orientation of

the subject will have an arrowhead pointing to the point in the cognitive space. Such an arrowhead is meant only as a notational device to distinghuish between the lines upon which we map the (cognitive) unit-formations and the lines upon which we map the affective relationships. They are not intended as indicating direction, in the graph-theoretical sense of the word. Formally, we will be dealing with graphs, and not with digraphs. All the cognitive lines may be considered bi-directed (or non directed). Even "E causes X" or or "E precludes X" mean "E cognizes a (positive or negative) relation between E and X". We will use no arrowhead instead of two of them.

We will use the convention of Harary and Norman (1953, p. 11) and say that our graphs are rooted, with the roots as the points of origin of affective orientations.

To distinguish between E's orientations toward the present situation after each episode and his "potential" (or "future," or "hypothetical") orientations, we will use the notation $\underline{E}$ to label E's cognitive space and the root E-point as related to E's appraisal of and orientations toward the present situation, and $\dot{E}$ to label E's cognitive space and the root E-point as related to E's appraisal of and orientations toward future, hypothetical or potential situations.

The empirical relevance of the "potential," "future," or "hypothetical" system of orientations is the covert trial and error of possible alternatives to the present situation:

all of the logical alternatives, or the relevant ones, or the ones E is aware of.

We will also be interested in unconscious orientations as well as in conscious ones; it will then be better to take into consideration as many as possible of all the logically possible alternatives, since we cannot exclude "a priori" the unconscious relevance of a given alternative, even if E is consciously unaware of it.

Whether we choose or not to put a chronological superscript to the root E-point it should always be understood that the root E-point indicates present affective orientations related to the present cognitions of E about past, present, future or hypothetical aspects of the universe (including himself).

Examples, in the individual system of cognitive and affective orientations of subject E:

"E likes, is attracted by, cathects positively (at the present moment) X" is noted — $E \longrightarrow X$.

"E dislikes, etc., (at the present moment) X" is noted — $E \dashrightarrow X$.

"E likes, etc., (at the present moment) himself" is noted — $E \longrightarrow E$.

"E dislikes, etc. ...himself" is noted — $E \dashrightarrow E$.

We will use only one line joining any two points; hence, our graphs will be of strength one (see Harary, 1957, p. 264, and his references to Harary and Norman, 1953).

This means that we will use different points for different aspects of the same object or event or for the same aspect at different moments. This is a stylistic preference that, in our opinion, allows for greater clarity about different aspects, qualities, etc., of the "same" objects.

In the following chapters we will see that our model will allow us to map and study:

(1) Empirical discrepancies: differences between the situation as defined (cognized) by

   (a) E, and

   (b) an "ideal observer."

(2) Cognitive consistency and inconsistency: balance or imbalance in the cognitive relations in E's space.

   Combined with (1) this gives us:

   (a) veridical cognitive consistencies and inconsistencies;

   (b) non-veridical cognitive consistencies and inconsistencies.

(3) Cognitive-affective balance, with different degrees of

(a) veridicality;

(b) cognitive consistency;

(c) cognitive-affective balance.

CHAPTER III

THE THREE PARTS OF THE PROPOSED MODEL

The best way to study the empirical implications of the several features of our model is to retrace the steps we have been following--some of them for rather intuitive and not always conscious reasons--each time we tried to use it to map the cognitive and affective orientations of a subject in a given situation.

Increasingly, we have come to think of conditions of balance or imbalance, accuracy or inaccuracy of cognitions (either of aspects or of relations among them),[1] degree of importance of the cognized relationships, and degree of intensity of affective orientations, as having different implications in different 'parts' or 'regions' of each graph (or different subgraphs). Moreover, we have found ourselves following again and again--indeed in each case--the same series of steps in mapping any situation in a graph, beginning with one 'region' and following with the rest, in a given order, and abiding intuitively by certain rules, the implications of which only lately have we been able to

---

[1] Unit-formations.

analyze, at least in part.

(1) The cognized objective situation. Analyses in terms of (a) accuracy, and (b) balance.

We regularly start the graph by mapping--generally in its right hand portion--the objective situation, as cognized by the subject. This includes all cognized aspects of the situation relevant to the subject (with the exclusion of E), and all cognized relationships among those cognized aspects (with the exclusion of relationships to E).

(a) This suggests the possibility of a first analysis (or comparison), in terms of accuracy of cognitions: Does the subject cognize the objective situation in a realistic way?

For such an analysis we must assume that we are in a position to

(i) ascertain the relevant aspects of the situation for the subject;

(ii) ascertain the cognitive relationships (unit-formations) relevant for him in the situation;

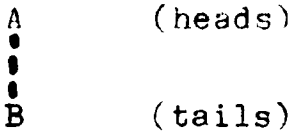
(iii) appraise the objective situation in a realistic way [2],

[2] As known by us, or by an 'ideal observer.' If we do not believe in our possibility of knowing the objective situation, this analytic step will be meaningless, and concepts as "objectivity," "distortion," etc., will lose their significance.

and

(iv) compare this appraisal with the subject's cognitions.

One of the simplest possible examples of an objective situation is given by a subject confronted by two mutually exclusive, simple alternatives; e.g., winning or losing an amount of money depending on whether a coin comes up heads or tails. Such objective situation may be mapped



(1)

and if E cognized the situation as



(2)

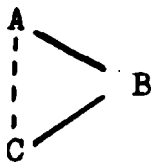
we would judge his representation of reality to be distorted and ineffectual.

(b) We try, and have found it possible in most cases, to map the objective situation in terms of a balanced subgraph. The rationale underlying this orientation is that:

(i) unit-formations can be an effective, if loose, representation of logical and empirical relationships, and

(ii) if used in that way, the representation of any objective situation will give a balanced subgraph.

There is one important exception to this proposition: the cognitive representation, in E's cognitive space, of unbalanced relationships among persons, as when E cognizes the fact that individuals A and B are mutually attracted, individuals B and C are mutually attracted, and individuals A and C reject each other (in terms of relationships which for them are mutually relevant and important). In this case, whatever the relationships between E and each of the three individuals, his cognitions in this region will be unbalanced, but realistic. Thus:



(3)

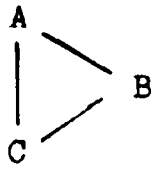
Such situations, involving what we have called a 'purely cognitive imbalance,' pose interesting problems which should be explored theoretically and empirically.

The relevance of the analysis of balance in this region of the graph is given by the fact that a balanced objective situation entails the possibility of a balanced relation of E to such situation [3], and also the possibility of a bal-

[3] Here, as in 4, below, we sometimes use the expression "whether the relations among X and the rest of the graph (or subgraph) are balanced or not" to mean "whether the addition of X and its relations, to the part of the graph previously studied, results in a balanced or unbalanced graph (or subgraph)."

anced set of affective orientations (originating at E), while an unbalanced objective situation excludes such possibilities. In the first case, if either E's or E's relationships to the objective situation (or both) are not balanced,[4] a change in these relationships may restore the balance. In the second case only a change in the objective situation will permit a balanced set of relationships to it, from either E or E.[4]

Let us compare, in this respect, two objective situations, one balanced and one unbalanced. The balanced one may be the case in which three individuals known to the subject feel mutually attracted (in a relevant and important way, in the sense given to these terms by Newcomb, 1961, pp. 12-13):

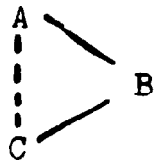


(4)

The unbalanced one may be the one previously represented in diagram (3), in which A and B feel attracted to each other, and A and C reject each other:

---

[4] See footnote 3, p. 16.



(5)

For our example to be clear-cut, let us imagine that mutual attraction is the relevant issue in both situations. It is apparent that in situation (4) there are two possibilities of balanced relationships between E, on the one hand, and A, B, and C, on the other: no matter what we map into the EA, EB, and EC lines, we will have a balanced graph (i) if the three of them are positive or (ii) if the three of them are negative. It is also apparent that as long as the objective situation is as the one represented in diagram (5), no combination of positive and negative EA, EB, and EC lines will give a balanced graph.

The same is applicable to affective orientations (the EA, EB and EC lines).

(2) The cognized relationships between the subject and the objective situation. Analysis in terms of (a) accuracy and (b) balance.

(a) The next step of analysis is: Does the subject cognize correctly either (i) the relevant implications of the objective situation for him, or (ii) his existing rela-

tions to the objective situation?

In the first case, the point of origin of affective orientations is E; in the second case it is E.

We have already seen, above, an analysis in terms of accuracy of cognitions. The difference is that E and its relations to other points of the graph (with the exclusion of E or E) are included here.

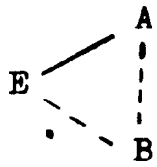
(b) We find next whether E's relations to the objective situation result in a balanced or unbalanced subgraph. The latter may result either from (i) an unbalanced objective situation or (ii) an incorrect appraisal on the part of the subject of the implications of the situation for him, or of his existing relations to the objective situation.

Perhaps a cognized situation may be mapped in which the relations of E to his objective situation will generate an unbalanced graph even though (i) the objective situation is not unbalanced, and (ii) the subject's cognitions of his--potential or actual--relationships to the objective situation are correct. But even if such mapping were possible we believe we would exclude it from our formulations. In fact, intuitively, in our hypothetical examples and in our analyses of empirical data, we have tried always to map situations in such a way that the proposition advanced in the text held. We do not know to what extent this should be taken to be only a stylistic idiosyncrasy, or upheld as

a permanent 'rule of correspondence' for the mapping of cognized situations in our formulation. We feel that here, as in many cases elsewhere, we have not had time to explore all the implications of such a 'rule' and of any alternative to it.

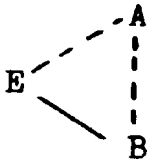
In any case, our analyses in the present paper have been limited to situations in which the two parts of the graph we have described (cognized objective situation, and cognized relationships between the subject and the objective situation), if cognized accurately, may be mapped in balanced subgraphs. What imbalance might exist is generated at the level of the next part of the graph: the affective orientations.

We already studied the case in which imbalance in E's relationships to the objective situation is the effect of an imbalance in the objective situation (see pp. 16-17, above). The case in which imbalance in E's cognized relationships to the objective situation is produced by an incorrect appraisal on the part of the subject of the implications of the situation for him, or of his existing relations to the objective situation may be exemplified by the subject who will either win or lose a certain amount of money depending on whether a coin comes up heads or tails. The subject may cognize his possibilities as



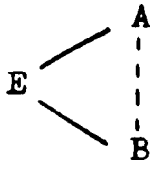
(6)

or



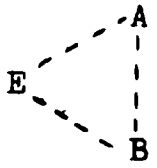
(7)

or



(8)

or



(9)

Unbalanced cognitions (8) and (9) express relations which are, in the context of our previous definitions of A and B (p. 15, above), physically impossible, and only a serious distortion of reality will account for the subject cognizing the implications of the situation in this fashion. Of course, while we may exclude (8) and (9) a priori, only

an analysis in terms of accuracy (p. 18, above) will permit us to choose among (6) and (7).

(3) The affective orientations

We determine next whether the inclusion of E (or E) and its relationships to the rest of the graph result or not in a balanced graph. A balanced graph will indicate the compatibility among E's affective orientations [5] and the structure of his environment and of his relation to it, as cognized by him. An unbalanced graph will indicate the incompatibility among E's affective orientations and the structure of his environment and of his relations to it.

We believe this notion of the incompatibility of orientations to be the basic difference between the conceptions of balance, symmetry or cognitive dissonance (of Heider, Newcomb and Festinger, respectively) and our theory. Where Heider, Newcomb [6], and Festinger assume unbalanced situations to be motivating in their own right, we see imbalance only as an indicator of the impossibility for the subject, given his cognitive orientations, to satisfy an affective orientation (or several simultaneous affective orientations). We will have an opportunity to elaborate on this distinction

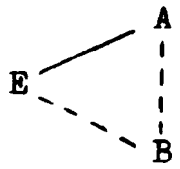
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[5] In an inclusive sense, comprising motives, attitudes, drives, etc.

[6] See for instance Newcomb, 1961, especially pp. 12 ff., and fn. 8 (p. 13).

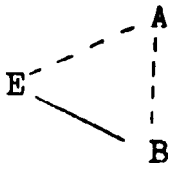
when we study Festinger's concept of ..."dissonance... (as) a motivating factor in its own right." (1957, p. 3).

The simple model of the heads-tails bet will permit us to exemplify what we mean. We have seen above (pp. 20-21) that the only two actual possibilities for the relationships of E to the objective situation are



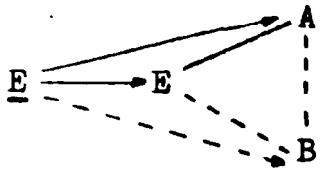
(6)

or



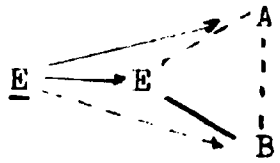
(7)

When we include E's orientations: EpA, a positive orientation toward 'heads' and winning; EpE, a positive orientation toward himself; and EnB, a negative orientation toward 'tails' and losing, we have two graphs, one, describing the system of cognitive and affective orientations of our subject if he wins:



(10)

And the other, mapping his system of cognitive and affective orientations if he loses:



(11)

In the first case the graph is balanced (this results from Cartwright and Harary's 'structure theorem,' see below, p. 56. In the second case, it is unbalanced. So this exceedingly trivial example fits our conceptualization: imbalance indicates lack of satisfaction of one or more affective orientations through a given configuration of cognitions, and balance indicates the satisfaction of the existing affective orientations in terms of the cognized structure of events.

There may be a certain 'redundancy' in our representation of the situation in terms of both A and B. The problem is: to what extent (and in which concrete cases) is B equivalent to not-A? Formally, as when we compute probabilities, etc., it always is. But as two different cognized possibilities of concrete events B may have for E a richer meaning than the mere negation of A. So in representing mutually exclusive alternatives (as in our study of 'cognitive dissonance') we will distinguish between the positive aspects of a given alternative and the negative aspects of the other.

CHAPTER IV

RECAPITULATION

Before going on, we may briefly recapitulate the parts of the graph we have described, and the analytical steps we have studied:

(1) The first two steps deal with the subject's objective situation, defined in terms of a subgraph including all the cognitive aspects and relationships of the situation, with the exclusion of $\underline{E}$ (or $\dot{\underline{E}}$), and E, and any lines connected with $\underline{E}$ (or $\dot{\underline{E}}$) and with E.

In step (a) we estimate the accuracy of the subject's cognitions of his objective situation. In step (b) we appraise the balance of the objective situation.

(2) The next two steps deal with the cognized relationships among E and the objective situation. The corresponding subgraph includes all the points and lines with the exclusion of $\underline{E}$ or $\dot{\underline{E}}$ and lines connected with any of the two.

In step (a) we assess the accuracy of the (potential or real) cognitions of the relationships between E and his objective situation, and in step (b) we estimate the

degree of balance of this second subgraph.

(3) The next analyses deal with the whole graph, including $\underline{E}$ (or $\dot{E}$) and the affective orientations of the subject toward the cognized aspects of the situation. As a first step, we have studied the possibility of appraising the balance or imbalance of the whole graph.

CHAPTER V

THE MAPPING OF MAGNITUDES: LINES

The next step concerns the possibility of representing different importances or intensities both of the unit-formations (cognized relations among different aspects) and of the affective orientations (relations between E and the aspects in the cognitive space).

In this connection, let us examine the example of the heads-tails bet. Nothing, in the graphs we have presented, tells us whether the wager was one dollar or one thousand. Yet it would seem necessary to be able to include such a variable in our mapping, since it is obviously related to important differences in psychological processes and outcomes.

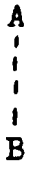
There is any number of possible methods to represent such differences in importance or intensity, and, admittedly, we have arrived at the one we will be using not through an abstract, theoretical rationale, but rather through trial and error in representing diverse situations from the experimental literature.

Here again, we will study the representation and assessment of the importance of relationships in three different regions of the graph: (1) the objective situation,

(2) the relationships of E with that situation, and (3) the affective orientations linking $\underline{E}$ or $\underline{\underline{E}}$ to the rest of the graph.

(1) Importance of relationships in the objective situation.

We will use the same example as before. The A (heads) and B (tails) aspects of the situation are related by a negative unit-formation of a value of minus one,



$$- 1. \qquad (12)$$

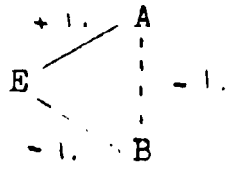
symbolizing the absolute impossibility of both aspects ever happening simultaneously. In other situations the unit-formation in this region may vary from - 1. through 0 to + 1.

An interesting theoretical and notational problem in this area is the possibility of 'translating' probability statements in terms of positive and negative unit-formations. In the example we have just examined it seems quite straightforward to indicate a probability of 0 by a unit-formation of - 1. If, on the other hand, the probability of two events (different from heads and tails) taking place together were equal to 1, we would not hesitate to map it with a positive unit-formation of + 1. But we are not clear about the most convenient way to map probabilities between those two limits.

E.g., should a probability of .5 be mapped by a zero line? Do we want thus to equate complete uncertainty about the relation between two cognized aspects [7] and lack of unit-formation, of cognitive link? We do not think so, but have not been able to find a sure way to handle this problem, although a possible one would be to map complete uncertainty about a relevant relation between two cognized aspects X and Y as two simultaneous graphs (of the E type), the first one showing the two aspects linked by a unit-formation of + .5 and the second one showing them linked by a unit-formation of - .5. The relation of this formulation to the Bayesian notion of prior (subjective) distribution of probabilities is apparent.

(2) Importance of relations linking E to the objective situation

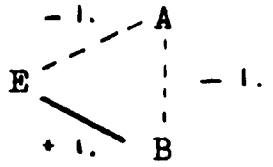
In the event of heads the situation will be



(13)

[7] And, of course, such relation may be any one, in addition to simultaneity or lack of it.

and in the event of tails it will be



(14)

The same considerations which prompted us to use the range - 1. to + 1. to map the relative importance of the relations among cognized aspects of E's environment, are relevant here, in the representation of the importance of E's relations to such aspects.

(3) Intensity of affective orientations

While in the previous cases it seemed convenient to use real numbers from - 1. to + 1. to symbolize the importance of cognitive relations, such limitation is impossible when mapping affective orientations because there do not seem to be meaningful upper limits to the intensity of (negative or positive) affective orientations. In our previous example of the bet, for instance, we will have usually a positive orientation, EpA, toward heads, winning, and a negative one, EnA, toward tails, losing. If we compare two situations with wagers of ten and one hundred dollars, we cannot give EpA a value of +.1 in the first case, and + 1. in the second case, because we may have later to compare both situations with a different one involving even higher

or lower wagers. Situations involving nonmonetary aspects are equally lacking in meaningful upper limits both for positive and for negative affective orientations.

These considerations suggest that intensities of affective orientations should be represented, in our model, by any convenient number x ($-\infty < x < +\infty$). As will be seen below, it has not been possible for us to enter any numbers in the graphs we use to analyze a series of experimental evidence. Before this is possible, very difficult problems of intrapersonal comparability of affective orientations will have to be tackled. This seems unavoidable for a theory of the configurational or systemic aspects of orientations (Newcomb, 1959, pp. 384-422; 1961, pp. 8 ff.), and, although we think that, at least to some extent, such endeavor is not hopeless,[8] most of the published experimental results are in the form of mean values of groups of subjects, and quite unfit for a detailed concrete analysis in terms of individual configurations of orientations.

A more basic question in this same field of notation is posed by the necessity of assigning numerical values also

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[8] E.g., most "free-choice" experiments deal with rankings of the relevant alternatives, and some meaningful results can be obtained by entering such rankings into the respective EA, EB, EC, etc., relationships.

to the EE orientation. We must recognize that here any solution seems to us much more remote than in the preceding points. On the one hand the EE orientation, and its possibility of increasing and decreasing, of changing its sign from positive to negative, and of being 'ambivalent,' i.e., simultaneously positive and negative toward different aspects of the cognized E, is a crucial feature of our model, and, as such, must have a representation equivalent to that of any other orientation; on the other hand the problems of meaningful measurement seem, intuitively, of a different (and larger) order of magnitude from the ones related to any other cognitive or affective orientations.

Here again, the unavoidable 'abstract' character of our analysis of experimental data tends to gloss over this difficulty but we are quite aware of the problem. On the other hand, we think that the possibility of integrating in the same configurational analysis (a) the systems of orientation toward the environment and (b) the orientations toward the self (cognitive: self-concept, and affective: self esteem) is a positive aspect of our model, and that, perhaps, the need to compare on the same terms the two sets of orientations, although full of obstacles at first, may prove to be a fruitful field of analysis and research.

In most cases one may assume safely that the EE orientation is (i) positive, and (ii) of greater importance than any other orientation the subject might have. But this

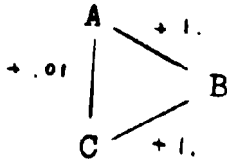
does not hold true for all cases and, in fact, some of the less obvious predictions which may be derived from our model are based on the assumption of EnE, a--probably partial--negative orientation of the subject toward his own self.

CHAPTER VI

THE MAPPING OF MAGNITUDES: CYCLES AND GRAPHS

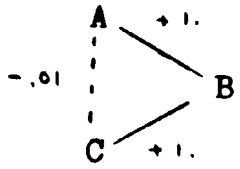
The inclusion of numerical values in the relations linking the points of our graph should permit a number of different analyses. We may, for instance, study the overall importance of either balance or imbalance in the different subgraphs to which we have referred in the previous sections, or assess the accuracy with which the importance of the different relationships are cognized by the subject, and the result of any distortion, in terms of resulting balance or imbalance.

E.g., if the actual relationships among three relevant aspects of E's environment are



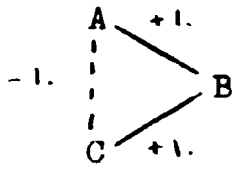
(15)

and the subject cognizes it as



(16)

his distortion of reality will be less important than if he cognizes it as



(17)

A rule for assigning importances to balanced and unbalanced cycles.

To assess the importance of a given b (balanced) or u (unbalanced) cycle we will use the simple rule of multiplying the numerical values of all the lines in the cycle. Hence, in the examples above, the cycle in figure (15) is + .01 (equivalent to b .01), the one in figure (16) is - .01 or u .01, and the one in figure (17) is - 1. or u 1.

In (1) the part of the graph in which we map the cognized objective situation, and (2) the part in which we map E's cognized relationships to the objective situation, a weighted degree of balance [9] (in terms of the importance of each relationship) is assessed by (i) estimating the importance of each cycle by applying the rule of multiplying the

[9] For the concept of 'degree of balance,' see Cartwright and Harary, 1956, p. 288.

numerical values of all the lines in the cycle; (ii) expressing the weighted degree of balance as a proportion of the sum of the importances of the balanced cycles to the importance of all the cycles in the respective part of the graph (or subgraph).

We have found that when we include the affective orientations (originating at E or E), the most meaningful results may be obtained by restricting the computations to those cycles of length 4 which include E (or E) and E. We will call them, generically, "EEX cycles." This solution, which is perhaps temporary, has been arrived at through trial and error, and not deductively, and we do not know whether the rationale for the application of different rules to different portions of our model should be found in the dissimilar nature of the orientations involved (affective ones, in the latter case, while the orientations and relations in the two previous regions or subgraphs were exclusively cognitive), or perhaps in the two types of numerical notation we are using, for unit-formations and for affective orientations. We have not explored the formal implications of this 'restricted' rule. Should some such implications prove to be inconvenient or inelegant we suppose the same practical solutions could be arrived at by computing the weighted balance over all cycles, even when we include the affective orientations, but, in this case, giving a differen-

tial weight, as great as necessary, to cycles of lenght 3 which include $\underline{E}$ (or $\dot{E}$) and E.

CHAPTER VII

A PROPOSITION ON PROCESSES OF CHANGE TOWARD BALANCE

It is now possible to formulate in precise form the basic proposition of this study:

I - If we map a psychological situation in the terms we have formerly proposed, we will find that changes in the situation will be generated as a direct function of the number and/or importance of the unbalanced EEX cycles, and as an inverse function of the number and/or importance of the balanced EEX cycles. The changes will be in the direction of decreasing the number and/or importance of the unbalanced EEX cycles, or increasing the number and/or importance of the balanced EEX cycles.[10]

Nothing is said in the above proposition about the conscious or unconscious nature of the changes which will take place, or of the processes which bring about such changes. In fact, we think that many of those changes will take place without conscious awareness, and that, in any case,

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[10] We call cycles of length 3 including E (or Ė) and E, which are unbalanced, u EEX, and cycles of length 3 including E (or Ė) and E, which are balanced, b EEX.

the processes which bring about such changes are partly or wholly unconscious.

In this sense our former description of the situation and its changes in terms of the conscious cognitions of the subject and his conscious affective orientations, although correct, is partial and 'superficial.' We have therefore used E (which stands for 'ego') as a symbol of both (i) the point of origin of affective orientations and (ii) the cognized aspects of the subject. We thus suggest the possibility of extending our model to other less conscious levels of the subject's psyche, in the hope of finding there further explanations for the 'balance-restoring processes' we will be describing.

We will have little to say, at this point, on the issue of which elements of the situation (cognized aspects, unit-formations, or affective orientations) will change first, and which will remain unchanged in the case of predominance of u EEX cycles.

In terms of graph theory (as a purely formal system of relationships among symbols) the changes succeptible of increasing the number and importance of b EEX cycles or decreasing the number or importance of u EEX cycles are, in each conceivable situation, quite numerous. Nevertheless, we find that in each concrete situation, or type of situation, some changes take place quite often, and others almost never. Some authors believe in the existence of 'economic'

reasons for the appearance of one type of change rather than another; Rosenberg and Abelson, for instance, designed several experiments to prove that subjects, when role-playing unbalanced situations (situations which, in our formulation, present imbalance either in the objective situation, the total cognitive situation or the EEX cycles), will select the changes that will permit a restoration of balance 'with the fewer possible moves.' [11]

Festinger, in dealing with the closely related problem of attitude change in situations of 'cognitive dissonance,' utilizes the rather circular concept of "resistance to change," as a descriptive notion (1957, pp. 24 ff.), and attributes such resistance (a) to affective orientations, or (b) to the difficulty of distorting reality and the impossibility of changing it through behavior, or (c) to the relationships between the given element and each of the other cognitive and affective orientations of the subject.

Excerpts of his views on each of these three sources of resistance to change follow:

(a) Resistance to change due to affective orientations. Festinger explains in p. 25 that 'behavioral cognitive elements' (which we usually map in EA, EB, ..., EN lines)

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[11] Rosenberg and Abelson, 1960, pp. 112-163.

may be resistant to change because "1. The change may be painful or involve loss." or "2. The present behavior may be otherwise satisfying."

(b) Resistance to change due to the difficulty of distorting reality and the impossibility of changing it through behavior. 'Behavioral cognitive elements' may also be resistant to change because "...the change may simply not be possible... Some behavior, especially emotional reactions, may not be under the voluntary control of the person...(or) the new behavior may not be in the behavior repertory of the person." Also, the behavior may be irrevocable. In these latter circumstances, adds Festinger, "...it is not correct to say that the resistance to change of the corresponding cognitive element is infinite. The resistance to change which the cognitive element possesses can, of course, not be greater than the pressure to respond to reality." (1957, p. 26). As for 'environmental cognitive elements' (equivalent to what we have defined above as 'objective situation') "...the major source of resistance to change lies in the responsiveness of these elements to reality." (Festinger, 1957, pp. 26-27).

(c) Resistance to change due to the relationships between a given element and each of the other cognitive and affective orientations of the subject. "There is another source of

resistance to change of both behavioral and environmental cognitive elements. We have postponed discussion of it until now, however, because it is a more important source of resistance to change for environmental elements than for others. This source of resistance to change lies in the fact that an element is in relationship with a number of other elements. To the extent that the element is consonant with a large number of other elements and to the extent that changing it would replace these consonances by dissonances, the element will be resistant to change." (Festinger, 1957, p. 27).

This last source of resistance to change is particularly important in the case of a crucial affective orientation, central to all the cognitive-affective configurations we study: the EpE orientation. Whenever the u EEX cycles exceed the b EEX ones, a change in EE from positive to negative would be a simple way of reducing the proportion of those u cycles. Nevertheless, we believe that this possibility is seldom actualized because in the overwhelming majority of any subject's cognitive-affective configurations the EE orientation is positive. Hence, to restore balance by the change from EpE to EnE would imply generating imbalance between the given configuration and each of the other configurations in the subject's total system of cognitive-affective orientations.

Later on we will have to qualify the apparent generality of these last propositions; they should not be interpreted as meaning that EnE is never possible, but rather that when such change takes place some process of isolation of the corresponding configuration(s) must also take place, or more dissonance than originally existed will be aroused.[12]

[12] We are assuming, for reasons related to our study of the mechanisms of defense in terms of our model, that EpE prevails in the system of orientations as a whole, although in isolated parts of it the situation may be EnE.

CHAPTER VIII

COGNITIVE DISSONANCE AS A TEST OF THE PROPOSED MODEL

Several reasons have decided us to select the theory and data of "cognitive dissonance" as the 'test-case' of the possibilities of the proposed model:

(1) Cognitive-dissonance theory is closely related to balance theory. Thus Festinger, referring to the then unpublished manuscript of Heider's The Psychology of Interpersonal Relations, quotes a paragraph and says (1957, pp. 7-8): "If one replaces the word 'balanced' with 'consonant' and 'imbalance' with 'dissonance,' this statement by Heider can be seen to indicate the same process with which our discussion up to now has dealt." At the same time, there are between the two formulations important differences which may be fruitfully explored.

(2) A series of experiments on 'cognitive dissonance' provides a convenient set of empirical data to test the relevance of the proposed formulation.

(3) We wanted to start with an area close enough to balance theory before generalizing our findings to other, less directly related fields (e.g., defense mechanisms, on which we have also been working more or less simultaneously).

The two outstanding theoretical studies on "cognitive dissonance" are Festinger's A Theory of Cognitive Dissonance (1957) and Brehm and Cohen's Explorations in Cognitive Dissonance (1962), to both of which we will refer quite frequently in the next sections.

Brehm and Cohen give special importance to the notions of commitment (1962, pp. 7, 105-106, specifically 113 and 115, 247, 248, etc.), choice (id., pp. 191-200), and volition (id., pp. 201-220).[13]

We expect to be able to suggest or prove that:

(1) The phenomena studied under the name of "cognitive dissonance" are not exclusively, nor even predominantly, cognitive.

(2) Dissonance is not a motivating factor in its own right.

(3) Brehm and Cohen's concept of 'choice' is not exact.

(4) Brehm and Cohen's notion of volition is not significantly different from their notion of 'choice' and not useful for a theory of 'dissonance.'

(5) Self-esteem is a relevant concept in the theory of 'dissonance,' and some nonobvious predictions may be made and confirmed, by using the notion of negative

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[13] We have referred to some passages where Brehm and Cohen are more systematic about the importance of these three concepts for their theory of dissonance, but the three run through all the book and are linked to their general interpretation in such a way that practically no part of their theoretical or experimental analyses is understandable without reference to them (especially to 'commitment' and 'choice').

self-esteem.

(6) Commitment is not indispensable for the arousal of 'dissonance.'

(7) The basic concept in 'dissonance' arousal and reduction is the relative "preferability" of the alternatives presented to the subject.

The first 5 propositions, and possibly also the sixth, differ explicitly from either Festinger's or Brehm and Cohen's notions about "cognitive dissonance." Proposition (7), if found correct, will give us the possibility of a unidimensional ordering of all cases of 'dissonance' in terms of a single fundamental concept, and of linking them to other similar phenomena.

CHAPTER IX

"COGNITIVE DISSONANCE" IS NOT RESTRICTED TO COGNITIVE PHENOMENA

Since our model is explicitly worded in terms of cognitive and affective orientations, and derives directly from the formulations of Heider, Newcomb, Cartwright and Harary, in no way restricted exclusively to relationships among cognitions, it is pertinent to state its relation to Festinger's theory, in which the emphasis is clearly put on cognitive processes.

We think (i) that what Festinger named 'cognitive dissonance' can not be formulated without reference to affective processes, and (ii) that in fact his theory is a detailed study of cognitive-affective configurations in conditions of imbalance.

The first assertion results from the very same theoretical statements in which Festinger and his students define the scope of the theory:

> The terms "dissonance" and "consonance" refer to relations which exist between pairs of "elements." It is consequently necessary, before proceeding to define these relations, to define the elements themselves as well as we can.
>
> These elements refer to what has been called cognition, that is, the things a person knows about himself, about his behavior, and about his surroundings. These elements, then, are "knowledges", if I may coin the plural form of the word. Some of these elements re-

> present knowledge about oneself: what one does, what one feels, what one wants or desires, what one is and the like. Other elements of knowledge concern the world in which one lives: what is where, what leads to what, what things are satisfying or painful or inconsequential or important, etc.
>
> It is clear that the term "knowledge" has been used to include things to which the word does not ordinarily refer--for example, opinions. (Festinger, 1957, pp. 9-10) (our emphasis).

> ...elements of cognition correspond for the most part with what the person actually does or feels or with what actually exists in the environment." (Id., p. 11, our emphasis).

> Motivations and desired consequences may also be factors in determining whether or not two elements are dissonant. (Id., p. 13).

If we combine Festinger, 1957, p. 3: "By the term cognition, here and in the remainder of the book, I mean any knowledge, opinion, or belief about the environment, about onself, or about one's behavior," with his already quoted notion (in p. 11) that "...elements of cognition correspond for the most part with what the person actually does or feels..." etc., we see that, for him, the word 'cognition' is practically synonymous with awareness or consciousness.

It includes, then, not only cognitive, but also affective and decisional aspects.

> ...under at least some conditions, motivation is an integral part of a dissonance creating situation. (Brehm and Cohen, 1962, p. 132).

We think it always is, and we believe the motivational orientations included in our mapping of the situation are enough to explain the balance-restoring processes, without a need for a new, autonomous drive, different from them (see above, p. 22).

> ...it seems quite plausible to assume that knowledge of being motivated may be dissonant with any condition other than availability of the goal object. (Id., p. 158).

> ...discrepancies or inconsistencies, especially as they appear in the experiments deriving from the dissonance formulation, produce a drive toward their resolution because of motive states, insofar a discrepancy has some instrumental relationship to their satisfaction or frustration. (Id., p. 231, their emphasis).

We will have occasion to study again most of these opinions of Festinger, and of Brehm and Cohen below, when we analyze their claims for 'dissonance' as "...a motivating factor in its own right." The relation is apparent: if dissonance (or imbalance) is purely cognitive, no motivations are included in the configuration being studied, and we must assume a new motivation, or drive, born from cognitive inconsistency. If, on the other hand, the configuration in which we find 'dissonance' or imbalance includes motivations as an essential part, these will perhaps be enough as dynamic factors, with a consequent gain in the parsimony of the model.

Abelson, in his paper on "Computer Simulation of 'Hot' Cognition" (in Tomkins and Messick, 1963, p. 279), says: "Festinger's theory has been very provocative and has given rise to many experiments, but the fact must be faced that although labeled 'cognitive dissonance theory,' it is in essence not a cognitive theory, but a theory of action. That is to say, Festinger and his students are not really concerned with processes inside the head, but with the behavioral consequences of the presentation of dissonant situations." Abelson tends to overlook the fact that in many of the experiments and studies by Festinger and his followers the dependent variables can not be said to be 'behavioral,' but 'affective' and 'attitudinal' (a change in cognitive and affective orientations, without behavioral correlate, except in the way of an answer to a questionnaire). But his basic point, the noncognitive nature of 'cognitive dissonance' is exact.

These examples and opinions could be multiplied, but we feel that the really convincing demonstration of the essential role of motivation and affective orientations in 'cognitive dissonance' will be given by our analyses of concrete experimental results. In some cases we will point to the fact that the independent or the dependent variable, or both, include affective orientations, motivations, behavioral changes in order to restore or create balance, briefly, that the whole system of orientations of the subject

is involved in the experimental manipulation and in its consequences; and even in the cases in which we will not spell out in detail such affective, motivational and behavioral aspects of 'cognitive dissonance,' this will be implicitly done by the application of our model, which stresses such affective, motivational and behavioral aspects.

For these reasons, we will refer to these phenomena as 'dissonance' rather than "cognitive dissonance."

CHAPTER X

THE NOTION OF 'COGNITIVE CLUSTER.' DISSONANCE IN COGNITIVE CLUSTERS. ITS IMPLICATIONS FOR THE PROPOSED MODEL

When studying "The Magnitude of Dissonance," Festinger (1957, p. 16), introduces the notion of 'cluster of cognitive elements,' equivalent to the object, event or course of action to which we have referred above (pp. 3 ff.). It should be apparent that what Festinger calls element is what we have named 'cognitive aspect of the situation.'

He goes on to say:

> It is probably safe to assume that it is rare for no dissonance at all to exist within any cluster of cognitive elements. For almost any action a person might take, for almost any feeling he might have,[14] there will most likely be at least one cognitive element dissonant with this "behavioral" element. Even perfectly trivial cognitions like knowing one is taking a walk on a Sunday afternoon would likely have some elements dissonant with it. The person who is out for a walk might also know that there are things around the house requiring his attention, or he might know that rain was likely, and so on. In short, there are generally so many other cognitive elements relevant to any given element that some dissonance is the usual state of affairs. (Festinger, 1957, pp. 16-17).

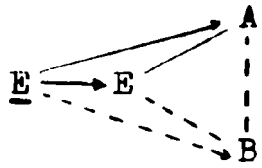
We agree with Festinger's remarks and we have included his assumptions into the theoretical bases of our model.

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[14] We have here another example of behavioral and affective aspects included in "cognitive" dissonance.

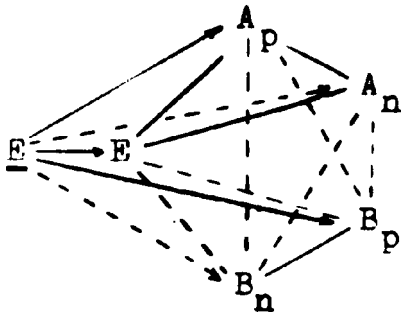
What we referred to, up to now, as 'objects,' 'events,' 'alternatives' or 'courses of action' will be equated to Festinger's "clusters of cognitive elements." We will often refer to them also as "cognitive clusters." Clusters of cognitive elements or cognitive clusters will be defined as any set of cognized aspects of the situation indisolubly related because of their empirical relationships. This concept, and Festinger's notions about what we may call the pervading ambivalence of such clusters, will help us to introduce in our model a very necessary refinement without which it would be grossly oversimplified. Up to now we have represented objects, events or alternatives as either 'good' or 'bad,' as generating either positive or negative affective orientataions in the subject. From now on we will map them as both attractive and rejecting, each object, event, course of action, alternative, etc., differing from the other not in "black or white" fashion, in terms of a dichotomy of attraction or rejection, but rather as occupying a position along a dimension, according to its simultaneous attractive and rejecting attributes or aspects (probably, we will have to place each object, event, alternative, etc., on a multidimentional space).

How will this show in our model? In the first place, our diagrams will no longer be of the type



(18)

but rather



(19)

where A_p and B_p mean the positive aspects (attractive, generating positive affective orientations) of alternatives A or B, and A_n and B_n mean the negative aspects (rejecting, generating negative affective orientations) of the respective alternatives.

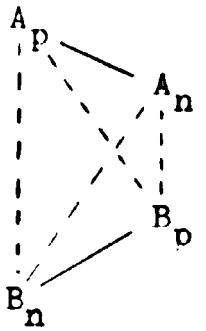
The graph may be the representation of a situation in which the subject has decided between two alternatives A and B, both presenting positive (A_p, B_p) aspects and negative ones (A_n, B_n). The positive lines linking A_p and A_n symbolize the 'inseparability' of the two kind of aspects in alternative A; the meaning of the positive line between B_p and B_n in alternative B is the same. The negative lines linking the A-points to the B-points symbolize the fact that both alternatives are mutually exclusive. The positive lines

linking E to the A points symbolize his decision in favor of alternative A; the negative lines between E and the B points symbolize the decision against alternative B. The lines between E and each of the other points of the diagram are self-explanatory, in terms of affective orientations.

The same graph may be the representation of a situation in which one of two events, A and B, has taken place, and its positive (A_p) and negative (A_n) consequences accrue to E without his prior decision, while he is deprived of the positive consequences of B (B_p) and relieved of its negative consequences (B_n).

If we accept Festinger's assumption of a pervading 'dissonance in cognitive clusters' as correct (and we assume it to be fundamentally so), then it will be impossible for a subject to be free of some degree of imbalance in any configuration of cognitive and affective orientations. We may see this if, as an example, we study diagram (19) decomposing it in (1) its 'objective situation,' (2) its 'total cognitive situation,' and (3) its EEX cycles.

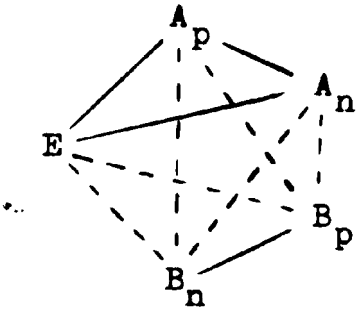
(1) Objective situation:



(20)

The subgraph may be subdivided in two sets of points: A_p and A_n on the one hand and B_p and B_n on the other; within each set the points are linked by positive lines (unit-formations) while each of the points of set A are linked to each of the points of set B by negative lines. This proves that the subgraph is balanced, by application of Cartwright and Harary's 'structure theorem': A graph "...is balanced if and only if its points can be separated into two mutually exclusive subsets such that each positive line joins points of the same subset and each negative line joins points from different subsets." (Cartwright and Harary, 1956, p. 286).

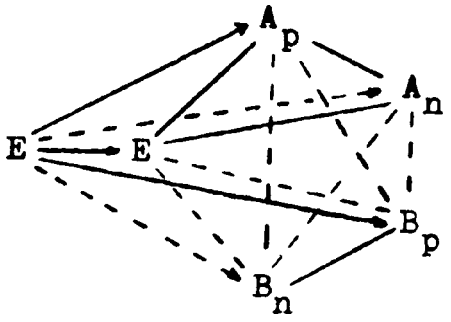
(2) Total cognitive situation:



(21)

The subgraph is balanced (by application of the same theorem; the two sets of points are: E, A_p, A_n, and B_p and B_n).

(3) EEX cycles:



(22)

Cycles $\underline{E}EA_p$ and $\underline{E}EB_n$ are balanced (ppp, and pnn, respectively). Cycles $\underline{E}EA_n$ (ppn) and $\underline{E}EB_p$ (pnp) are unbalanced.

CHAPTER XI

REFORMULATION OF THE PROPOSITION ON PROCESSES OF CHANGE TOWARD BALANCE

We are now in a position to restate the basic proposition of our study, in a more accurate form (see above, p. 38):

II - If we map a psychological situation in the terms we have formerly proposed, we will find that changes in the situation will be generated as a direct function of (a) the proportion of unbalanced EEX cycles to the total number of EEX cycles and/or (b) the absolute importance, of the unbalanced EEX cycles. The changes will be in the direction of decreasing the proportion and/or the importance of the unbalanced cycles up to a given lower limit or threshold.

We are not clear about how the proportion and the absolute importance of balanced and unbalanced EEX cycles combine in determining changes toward balance.

The distinctive aspects of this new formulation are: (i) the notion that 'balance restoring' changes--which now should be called 'changes toward increased balance'-- are in part a function of the proportion of u EEX cycles, rather

than of their absolute number; and (ii) the notion of a threshold or lower limit below which it seems plausible to assume that the changes toward balance decrease or cease altogether.

We conceive of the processes of increase of balance as acting, at any given moment, upon any configuration or group of configurations which then happen to be maximal in importance and proportion of unbalanced EEX cycles, and we believe that whenever the importance or proportion of unbalanced EEX cycles has decreased below the level of the next highest configuration or group of configurations, the process will tend to switch to this next configuration or group of configurations. Thus, for any configuration or group of configurations the importance and imbalance in other simultaneous configurations or groups of configurations will constitute a fluctuating level or threshold below which, at any given moment, processes of imbalance reduction will decrease or cease.

If we consider that new information and emerging situations (all of them initially ambivalent, according to Festinger) keep up what we may call the "general level of imbalance" in the whole system of cognitive and affective orientations of the subject, it will be clear that (as long as we accept Festinger's assumption) we must think in terms of processes toward balance, and not of a total restoration of balance at any point of the system, and, hence, in terms

of a varying threshold below which the changes toward balance will decrease or cease, in any given configuration of cognitive and affective orientations. [15]

The 'changes' to which we have been referring in pp. 38 and 58 ff., will take place either in the cognition of the objective situation, or in the affective orientation toward its cognized aspects, or, by way of behavioral modifications (symbolized by changes in the EX lines) in the relations between E and the objective situation.

They may also take place as changes in the relevance of all or parts of the configuration. We can not dwell here on a detailed enumeration of all the possible changes toward balance. Analytic lists have been presented by Newcomb [16] and examples related to the particular case of the 'dissonance' paradigm constitute the dependent variables in every study of that theory, and have been conceptualized by Festinger, Brehm and Cohen, as "attempts at dissonance reduc-

---

[15] If we may indulge in further speculation (rather destitute of empirical backing) we will think in terms of two other systemic processes: (a) a general drop in the relevance of any aspect, relation, orientation, etc., with the passage of time; (b) a process of isolation tending to suppress relationships among large sectors of the system of cognitive and affective orientations, and permitting the existence of different levels of imbalance in each of those different sectors.

[16] E. g., in Newcomb, 1959, pp. 403-404.

tion." In every case in which we analyze a concrete example we will spell out the changes toward balance in terms of our model.

CHAPTER XII

THE THREE EXPERIMENTAL PARADIGMS IN "COGNITIVE DISSONANCE"

Theory and experiments on "cognitive dissonance" have been usually categorized in terms of three paradigms: (a) forced-compliance, (b) free-choice, and (c) exposure:

(a) In 'forced-compliance' experiments the subject has to select among negative alternatives, defined by Brehm and Cohen as ..."one that the individual will avoid if he can, and only if he is forced will he take one." ..."the character of a negative choice is that one alternative is taken because any other alternative is something worse." (1962, p. 46). In a situation involving a negative choice negative aspects outweigh positive ones in each possible alternative.

(b) In 'free-choice' experiments the subject has to select among positive alternatives, i. e., alternatives in which positive aspects outweigh negative ones.

(c) In 'exposure' experiments the subject reacts to information which is dissonant. We will not study experiments in this category.

Many experiments present a combination of features corresponding to more than one paradigm. E. g., in Brehm's

experiment on "Post-decision Changes in the Desirability of Alternatives," (1956), subjects were presented with "research reports" on some of the objects among which they made their choices; although the experiment as a whole corresponds clearly to a free-choice paradigm, this part of it may be studied in terms of the exposure paradigm (the subjects not only did not avoid information about bad points of the chosen object, but even remembered this negative or "dissonant" information more than the neutral or positive one). In Brehm and Cohen (1962), a comparative study of several experiments in terms of salience, recall and avoidance of discrepant information (pp. 92-94) deals with the 'exposure' aspects of the 'forced-compliance' study by Davis and Jones (1960), and the 'free-choice' studies by Ehrlich et al. (1957), Mills, Aronson and Robinson (1959), and Rosen (1961). On the other hand, we will also study cases in which 'free-choice' experiments have 'forced-compliance' features, and vice versa. The important aspect is, of course, not the taxonomy of the studies, but the presence, at a given stage of an experiment, of a choice among positive or negative alternatives, of a situation involving either a positive or negative decision.

CHAPTER XIII

ANALYSIS OF COHEN AND LATANE'S EXPERIMENT ON "CHOICE IN COMMITMENT TO COUNTERATTITUDINAL BEHAVIOR"

The basic concepts used by Festinger, and by Brehm and Cohen, to explain the results of experiments on "cognitive dissonance," are (a) 'choice,' (b) 'volition,' and (c) 'commitment.'

To a large extent, the following chapters will be devoted to a comparison between their conceptualization of those variables and our own formulations. In the present one we will study an experiment on "Choice in Commitment to Counterattitudinal Behavior," by Cohen and Latane (1962, reported originally in Brehm and Cohen, 1962, pp. 78ff.), in terms of our concept of 'choice' (later to be defined). Chapter XIV (pp. 92 ff.) will compare this formulation with Brehm and Cohen's notion of 'choice.'

At the same time, the study of Cohen and Latane's experiment will give as an opportunity of showing how, in general terms, our model fits the data of a study on cognitive dissonance.

Subjects (Yale undergraduates) were induced--by manipulations to be presently described--to improvise speeches favoring the institution of a compulsory religion course at Yale. Initially, all of them were strongly opposed to such a course (this resulted from a previous questionnaire by a different experimenter, under the guise of a "research course"). They were made to identify themselves, when speaking into a tape recorder, by giving name, address and class at Yale, and they were told that the speeches, as part of a study for the "Chicago Yale Alumni Board," would be heard by an important group of Yale alumni in Chicago. As a measure of 'dissonance reduction,' and, indirectly, of 'dissonance,' the experimenters used the amount of change in the subjects' attitudes in the direction of favoring the institution of the compulsory religion course at Yale.

(a) The situation before the manipulations

The first step in our analysis of the present experiment will be the mapping in terms of our model of the situation, for the experimental subjects, before any manipulation took place. Only then will we be able to fit the experimental manipulations into our formulation and compare the obtained results with what our model would have predicted.

We repeat that, initially, all the subjects were strongly opposed to the institution of a compulsory religion

course at Yale. In all probability, then, if someone had gone to each of the subjects and asked him, without more persuasion, and outside the experimenter-subject relationship: "Do you want to speak into a tape recorder, after giving your name, address and class at Yale, and make a speech in favor of a compulsory religion course at Yale, to be heard by an important group of Yale alumni in Chicago?" the response would have been: "No, I don't," or perhaps some other less courteous wording of the same decision. If such were no the case, if from the start the Ss preferred to make the speech, this experiment would not fit (as it does) the "forced-compliance" paradigm (see above, pp. 62 ff., for the definition of the experimental paradigm in dissonance theory).

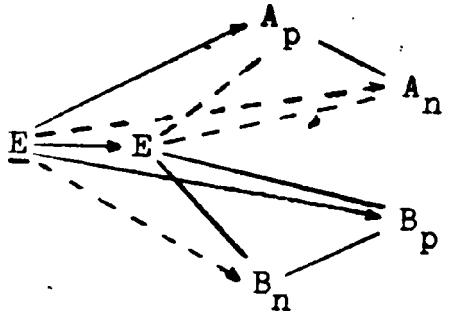
This is our baseline: barring other influences, the preferable alternative, for all the experimental subjects, is not to make the speech. We will map the alternative "making the speech" into points A_p and A_n, indicating respectively all the aspects of that alternative which generate a positive affective orientations in the subject (A_p) and all the aspects of that alternative which generate a negative affective orientation in the subject (A_n). Alternative "not making the speech" will be mapped into points B_p and B_n, with the same distinction between aspects which generate positive and negative affective orientations in the subject. It should be clear that we have condensed into each one of these four points a whole series of cognized aspects of one or the other

alternative, grouping them together on the basis of the affective orientations they generate. This will permit us (i) to simplify our graph, and (ii) to formulate relationships and outcomes in a general fashion, applicable to a large number of similar situations, which could not be possible if we specified the detailed aspects of each alternative.

This condensation of several points into one does not make any difference in the mathematical treatment of cycles: E. g., when we refer to cycle $\underline{E}EA_p$ we mean all cycles including $\underline{E}$, E and positive aspects of alternative A, all of which have been condensed into point A_p; in all such cycles the lines $\underline{E}E$ will have the same sign, and so will the lines EA_p (by our definition of A_p) and the lines EA_p (which will all be either positive, if the subject chooses alternative A, or negative, if he does not). If we treat these cycles as one, it will be weighted in accordance with the sum of its components; if we treat them separately, each one will be weighted less.

In graph (23) all the aspects of cluster A are related to all the aspects of cluster B by negative unit-formations, omitted here (and in the related graphs to follow) for the clarity of the diagram. The positive lines linking E to B_p and B_n, and negative lines linking E to A_p and A_n symbolize the decision at this stage (behavioral commitment, positive toward alternative B and negative toward alternative A).

We may represent the probable decision of all the Ss, before the manipulation, as follows:



(23)

This outcome illustrates a principle related to the basic proposition restated in p. 58, above; this principle can be expressed thus:

III - A decision among alternatives will be made so as to minimize (a) the proportion of unbalanced EEX [17] cycles to the total number of EEX cycles and (b) the sum of the absolute importances of the unbalanced cycles.

We will define an expression $|\Sigma\ \underline{E}EB_p|$ as being the summation of the number and absolute importance of all cycles including E, E, and aspects of type B_p (as defined above, p.66). Similarly, we will define expressions $|\Sigma\ \underline{E}EA_n|$, $|\Sigma\ \underline{E}EB_n|$, and $|\Sigma\ \underline{E}EA_p|$, in the same terms, but includ-

[17] EEX cycle: a length-3 cycle including the points E, E, and any other point in the graph.

ing aspects of type A_n, B_n, and A_p, repectively. We will say that in the previous example the decision favors alternative B because

$$|\Sigma \underline{E}\underline{E}B_p| + |\Sigma \underline{E}\underline{E}A_n| > |\Sigma \underline{E}EB_n| + |\Sigma \underline{E}EA_p| \quad . \qquad (1)$$

Whenever $\underline{E}pE$, EpB_p, EpB_n, EnA_p and EnA_n, then the left hand side of inequality (1) is formed by $\underline{b}$ $\underline{E}EX$ cycles, and the right hand side by $\underline{u}$ $\underline{E}EX$ cycles. If $\underline{E}nE$, or if EnB_p, EnB_n, EpA_p and EpA_n, then the left hand side of the inequality is formed by $\underline{u}$ $\underline{E}EX$ cycles and the right hand side by $\underline{b}$ $\underline{E}EX$ cycles.

More generally, we will say that:

IV - An alternative is preferable to any other alternative if EpX lines to all the--positive and negative--aspects of the first alternative result in a smaller proportion and importance of unbalanced $\underline{E}EX$ cycles than EpX lines to all the aspects of any other alternative.[18] It should be remembered that the event, alternative, object, etc., X may include compulsion from other persons so that a subject suffering from the coercion of another person will by definition 'prefer' to comply even if he does so unwillingly.

[18] As a practical rule, whenever $\underline{E}pE$, X will be the preferable alternative if $|\Sigma \underline{E}EX_p|$ is in the left hand side of inequality (1). If $\underline{E}nE$, the reverse is true.

In the previous example, the preferability of alternative B will be a function of the difference between b EEX and u EEX cycles; thus:

$$\text{Preferability of B} = f\left[\left(\left|\Sigma EEB_p\right| + \left|\Sigma EEA_n\right|\right) - \left(\left|\Sigma EEB_n\right| + \left|\Sigma EEA_p\right|\right)\right]$$

In many cases we will have to compare the preferabilities of two or more alternatives. For this purpose it will be convenient to refer to the difference in the right hand side of expression (2) as P.[19] By comparing a series of alternatives two by two, it will be possible to rank them in order of preferability.

If we keep in mind the meaning of inequality (1) (and similar expressions below) as referring to differences in both (a) the proportions and (b) the absolute amounts, disregarding signs, between potential b or u EEX cycles, we will

---

[19] We define the quantity P so that, in our example,

$$\left|\Sigma EEB_p\right| + \left|\Sigma EEA_n\right| - \left|\Sigma EEB_n\right| + \left|\Sigma EEA_p\right| + P \ , \qquad (3)$$

then

$$\text{Preferability of B} = f\ (P) \ , \qquad (4)$$

and

$$\text{Preferability of A} = f\ (-P) \ . \qquad (5)$$

We will say that alternative A has negative preferability.

see that, the first part of proposition II in p. 4 may be rephrased again in the following terms:

V - Changes toward the increase of the proportion and importance of the balanced EEX cycles will take place as an inverse function of the preferability of the alternative to which the subject is related by EpX lines, and as a direct function of the preferability of the alternative to which the subject is related by EnX lines.

We may then say that imbalance in EEX cycles will be an inverse function of the preferability of the alternative to which the subject is related by EpX lines, and a direct function of the preferability of the alternative to which the subject is related by EnX lines.

In the context of our example, and of similar ones within the 'dissonance' paradigm, this is equivalent to saying that

VI - 'Dissonance and attempts at 'dissonance reduction'[20] are a direct function of the preferability of the rejected alternative, and an inverse function of the preferability of the chosen one.

[20] See pp. 60-61 for the correspondence between 'changes toward balance' and 'attempts at dissonance reduction,' within the present context.

We will study later the possible extension of this principle to situations not involving 'choice' or decision. Such possibility is a major difference between our conception of the prerequisites and implications of dissonance, and Brehm and Cohen's.

It may appear out of place to have gone into this detailed formulation of the general propositions applicable to dissonance at this stage of our example, before the experimental manipulations. But we thought it indispensable to lay from the very beginning the bases for the analysis of the alternatives in terms of our model, since, as will presently be seen, the experimental manipulations result inmediately in further complications of the situation.

Our next step will be to explore effect of the values or importances of the three types of lines involved in the EEX cycles on inequality (1):

1 - The EF line. We have already said (above, p. 71 ff.) that the determination of the importance of EE is quite problematic, but in the present context it may be factored out and canceled without difficulty.

If we recall the meaning of each of the four terms in inequality (1) as the summation of the number and importance of cycles including E, E, and either E_p, A_n, E_n or A_p, it will be apparent that, in the case of EEB_p, for instance, the importance of the cycles we are adding up is the product of the importance of lines EE, times the impor-

tance of lines EB_p, times the importance of lines $\underline{E}B_p$. The same is true of the other three terms, so that inequality (1) is equivalent to:

$$|\measuredangle \underline{E}E x EB_p x \underline{E}P_p| + |\measuredangle \underline{E}E x EA_n x \underline{E}A_n| > |\measuredangle \underline{E}E x EB_n x \underline{E}B_n| + |\measuredangle \underline{E}E x EA_p x \underline{E}A_p| \quad (6)$$

Factoring out and cancelling $\underline{E}E$:

$$|\measuredangle EB_p x \underline{E}B_p| + |\measuredangle EA_n x \underline{E}A_n| > |\measuredangle EB_n x \underline{E}B_n| + |\measuredangle EA_p x \underline{E}A_p| . \quad (7)$$

2 - The EB_p, EA_n, EB_n, and EA_p lines. We now consider the effect of these lines on inequality (1). We may simplify even further inequality (1) if we assume

$$|EB_p| = |EA_n| = |EB_n| = |EA_p| = 1 . \quad (8)$$

Thus, factoring out and cancelling these magnitudes, for the simpler case in which the positive and negative relationships of E with both alternatives are quite unambiguous, inequality (1) reduces to

$$|\measuredangle \underline{E}B_p| + |\measuredangle \underline{E}A_n| > |\measuredangle \underline{E}B_n| + |\measuredangle \underline{E}A_p| . [21] \quad (9)$$

Conversely, if $|\measuredangle \underline{E}B_p| + |\measuredangle \underline{E}A_n| > |\measuredangle \underline{E}B_n| + |\measuredangle \underline{E}A_p|$, then $|\measuredangle b\ \underline{E}EX| > |\measuredangle u\ \underline{E}EX|$ if $\underline{E}pE$, EpB_p, EpB_n, EnA_p, and EnA_n. This

[21] It should be kept in mind that this holds only for the case where $\underline{E}pE$. If EnE then inequalities (1), (6), (7) and (9) are reversed.

is the rule for decision, in our model.

If we reinterpret these results in phenomenological terms they will sound trivial. In essence, what we are saying is that alternative B will be preferred to alternative A if and when the number and importance of the positive aspects of B, plus the negative ones of A, exceed that of the positive aspects of A, plus the negative ones of B. Hardly a very exciting conclusion, and we might be accused of belaboring the obvious. But this is so because the issue is not problematic, and the case is the simplest one. Let us remember that we are representing here what hypothetically would happen before the experimental manipulations. When we describe these, our detailed analysis will probably be more useful; and less obvious results will be obtained in cases, later to be studied, in which the EA and the EB lines represent other types of relationships than decisional commitment, and especially, in cases in which the ±E relation changes its importance or sign during the experiment.

(b) The situation after the manipulations.

At the initiation of the experiment proper the experimenter performed a series of manipulations in order (a) to obtain the collaboration of the Ss and (b) to create two different 'choice' conditions.

Since they are the relevant part of the experiment,

in the present context, we will reproduce in extenso Cohen and Latane's account of the manipulations (Brehm and Cohen, 1962, pp. 89-90):

> The experimenter introduced himself as a student working for the Yale News Bureau who had been given the subject's name by the bureau. Subjects were told that the "Chicago Yale Alumni Board" was very much interested in the question of a compulsory religion course at Yale, but before going ahead with any action, they wanted to get some ideas on the issue. Subjects were then asked if they would help by tape recording a statement giving their views. They were told that a program was to be put together which would represent a collection of ideas on the proposal rather than an opinion poll. The taped statements would be edited and a final program of ideas made up on both sides of the issue.
>
> The subjects were then told that, "We have many statements against the compulsory religion course, and now we need some ideas on the other side of the issue--a strong, convincing argument in favor of the compulsory religion course at Yale."
>
> However, before speaking into the microphone, which was ostensibly to record the speeches to be presented to the Chicago Alumni Board, subjects were given the choice manipulation. Half the subjects (those assigned to the Low Choice condition) were simply asked to make the discrepant speech. The microphone was practically pushed into their hands, and they were given no chance to decline or to have any say in the matter. The other half of the subjects, assigned to the High Choice condition, were told, "We need some people to speak in favor of the proposal, but, of course, the matter is entirely up to you." In effect, the experimenter attempted to create the illusion that the subject was entirely free to refuse, at the same time that the experimenter reopened the issue (of the subject's participating by giving a speech in favor of the proposal) every time the subject appeared to be vacillating and on the edge of refusal. In this manner the experimenter and subject sometimes "argued" back and forth as much as three times, but in all cases agreement was finally reached. Furthermore, after agreement was reached, the experimenter emphasized that he did not want to force the subject into anything he did not want to do, and he made certain the decision was again seen by the subject

as his own decision.

> Of the 51 subjects, 26 were placed in the Low Choice condition and 25 in the High Choice condition. In summary, an attempt was made to engender the maximum amount of dissonance involved in forced compliance: The subject was again told that it was necessary to take a strong stand for compulsory religion at Yale; he gave his name, address, and class at Yale; he spoke into a tape recorder which was apparently taking down everything he said; and he assumed that his speech, identified as his statement, would be played before an important group of Yale alumni. Thus subjects in this experiment who varied in the amount of choice given them took a strong public stand on an issue they opposed, producing a situation in which differential dissonance and attitude change could be expected.

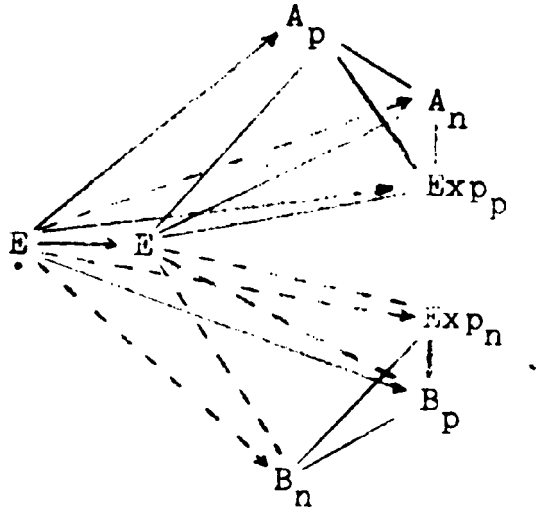
The manipulations were quite successful in their double objective: (a) all the Ss performed as required by the experimenter, and (b) the mean perceived choice for the Low Choice condition (as measured, by a questionnaire, on a 10-point scale ranging from 0, "No choice at all" to 9, "Complete choice") was 3.71, for the High Choice condition 7.42 ($p < .001$ by t test; Brehm and Cohen, 1962, p. 90).

After the manipulations, then, the situation has changed. For all the Ss, the preferred alternative is now A, making the speech (since the Ss gave the speech, we know, according to the definition in p.69, that they 'preferred' to do so).

It is apparent that the change has been brought about by the experimental manipulations. In trying to represent the new situation in terms of a graph we will use the assumption that the experimental manipulations have two different kinds

of effects: (i) positive aspects or 'elements' linked to alternative A (making the speech) and (ii) negative ones, linked to alternative B (not making the speech). In E's cognitive space the two sets of consequences or aspects are linked by a negative unit-formation, since they are mutually exclusive and, depending on his decision, E will either enjoy the relatively pleasant and attractive consequences of compliance, or suffer the unpleasant results of noncompliance. For the time being we are overlooking the differences between the High Choice and the Low Choice manipulations, and concentrating on the overall results of compliance by all the Ss in either condition. We are also overlooking, for simplicity's sake, the fact that the experimental manipulations, like any other cognitive cluster, are probably 'ambivalent,' so that, in all probability, a finer analysis would reveal both positive and negative elements linked to alternative A, and, also, both negative and positive elements linked to alternative B. It will be enough to assume that the positive ones associated to alternative A and/or the negative associated to alternative B are predominant.

The situation is now:



(24)

where Exp_p and Exp_n are, respectively, the experimenter-induced new positive and negative aspects of the situation, and

$$|\measuredangle EA_p| + |\measuredangle EB_p| + |\measuredangle EExp_p| + |\measuredangle EExp_n| > |\measuredangle EA_n| + |\measuredangle EB_p| . \quad (10)$$

We are now in a position to analyze the differences between High and Low Choice conditions:

> The change in subjects' attitudes toward the acceptance of the compulsory religion course at Yale from before to after taking the discrepant stand constitutes the main data of the present experiment...(When) a chi-square test is performed on the data after sppliting change at the exact median, the choice groups are...seen to be significantly different in the predicted direction ($X^2 = 7.07$, $p. < .01$). (Brehm and Cohen, 1962, p. 91).

The 'predicted direction' was: higher change of attitudes in favor of the religion course with High Choice than

with Low Choice. The results confirm the expectation:

	Low Change	High Change
Low Choice	18 subjects	8 subjects
High Choice	8 subjects	17 subjects

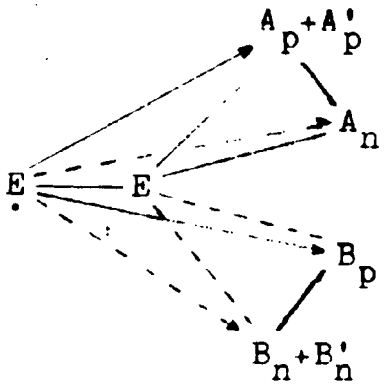
We believe this difference between conditions to be due to the different proportions and importances in each of (i) the aspects cognized by the subject as 'experimenter-induced' and (ii) those which are not cognized as such.

To the extent that E cognizes a given aspect of the situation as induced by the experimenter (or, for that matter, as induced by any external agent, physical or social) he will experience the situation as one of less choice--with the consequences we will see below. To the extent that he perceives a given aspect of the situation as not induced by the experimenter (or any other external agent) he will experience the situation as one of more choice. [22]

The representation of this distinction is straightforward. We will introduce the notation A'_p for the positive aspects of alternative A induced by the experimenter, but not cognized as such by E, and B'_n for the corresponding negative aspects of alternative B. This, again, is probably a simplification of the actual situation.

[22] This concept of choice departs fundamentally from the one used by Brehm and Cohen. See below p. 92 ff.

A situation in which the decision in favor of alternative A would be seen by E as pure choice would be the limiting case in which:



(25)

Where

$$|\Sigma \vec{E}A_p+A'_p| + |\Sigma \vec{E}B_n+B'_n| > |\Sigma \vec{E}A_n| + |\Sigma \vec{E}B_p|. \qquad (11)$$

It is easy to imagine a situation in which an effective experimental inducement would not be cognized as such by the subject, who would experience the situation as one of pure choice: it is the case of the post-hypnotic suggestion. As a matter of fact, this suggests the possibility of a whole series of "cognitive-dissonance" experiments in which the compliance would be obtained by post-hypnotic suggestion and the Ss will experience the situation as one of pure choice.[23]

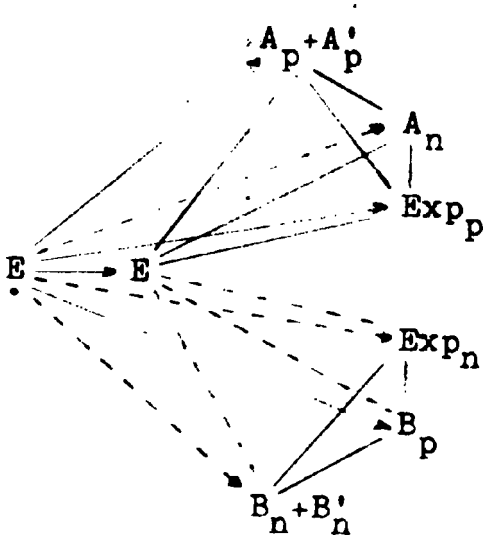
Maximal amounts of "dissonance" and of "dissonance-reduction" attempts should be obtained under such conditions.

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[23] For the possibility of the use of post-hypnotic suggestions in related studies, see Rosenberg, 1960, pp. 15-64.

Under less extreme experimental conditions (like the one reported in the study under analysis) the situation will be less clear-cut; part of the new--positive and negative--cognized aspects will be cognized by the subject as induced by the experimenter, as "external": the rest will not.

The situation may be represented thus:



(26)

With the situation in the Low Choice condition being probably:

$$|\measuredangle EA_p| + |\measuredangle EB_n| + |\measuredangle Exp_p + Exp_n| \gtrless |\measuredangle EA_n + B_p|, \tag{12}$$

and

$$|\measuredangle EA_p+A'_p| + |\measuredangle EB_n+B'_n| \gtrless |\measuredangle EB_p| + |\measuredangle EA_n| \ ; \tag{13}$$

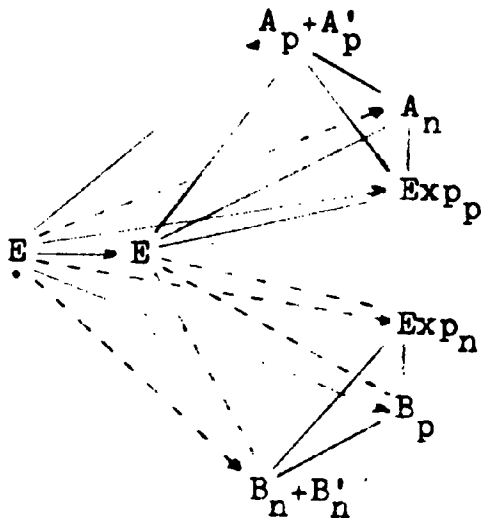
and the situation in the High Choice condition being probably:

$$|\measuredangle EA_p+A'_p| + |\measuredangle EB_n+B'_n| + |\measuredangle Exp_p + Exp_n| \gtrless |\measuredangle EB_p| + |\measuredangle EA_n| \ , \tag{14}$$

but

Under less extreme experimental conditions (like the one reported in the study under analysis) the situation will be less clear-cut; part of the new--positive and negative--cognized aspects will be cognized by the subject as induced by the experimenter, as "external": the rest will not.

The situation may be represented thus:



(26)

With the situation in the Low Choice condition being probably:

$$|\Sigma \vec{EA}_p| + |\Sigma \vec{EB}_n| \gtrless |\Sigma \vec{Exp}_p + \vec{Exp}_n| - |\Sigma \vec{EA}_n + \vec{B}_p|, \qquad (12)$$

and

$$|\Sigma \vec{EA}_p + \vec{A}'_p| + |\Sigma \vec{EB}_n + \vec{B}'_n| \gtrless |\Sigma \vec{EB}_p| + |\Sigma \vec{EA}_n| \ ; \qquad (13)$$

and the situation in the High Choice condition being probably:

$$|\Sigma \vec{EA}_p + \vec{A}'_p| + |\Sigma \vec{EB}_n + \vec{B}'_n| + |\Sigma \vec{Exp}_p + \vec{Exp}_n| \gtrless |\Sigma \vec{EB}_p| + |\Sigma \vec{EA}_n| \ , \qquad (14)$$

but

$$|\Sigma EA_p| + |\Sigma EB_n| + |\Sigma EExp_p| + |\Sigma EExp_n| < |\Sigma EB_p| + |\Sigma EA_n| . \quad (15)$$

The experimental manipulations in the High Choice condition ("...the experimenter attempted to create the illusion that the subject was entirely free to refuse..." etc., **Brehm and Cohen, 1962,** p. 89), are directed toward a maximization of A'_p and B'_n without undue increase of Exp_p or Exp_n. The experience of choice by the subject is a direct function of the increase in A'_p and B'_n and an inverse function of the increase in Exp_p and Exp_n. We are not in a position to ascertain at present whether "dissonance" and attempts at "dissonance reduction" are contingent upon (i) the absolute magnitude of $Exp_p + Exp_n$ not exceeding a given maximum, or upon (ii) the proportion of this sum to the sum of all relevant aspects, or upon (iii) the proportion of experimenter-induced aspects within each alternative: this question should probably be settled by experimental research, although the formulation itself, as we have presented it, might have relevant implications which we have not explored.

If the only relevant distinction between aspects of the type we have mapped as A'_p and B'_n, on the one hand, and aspects of the type Exp_p and Exp_n, on the other, were the degree to which they are cognized as being induced by the experimenter, they would not account for the difference in outcomes between choice conditions (see above, p. 79).

We conjecture that this disparity in outcomes is produced by an added difference between the two sets of aspects: a differential resistance to change and to decreases in relevance: higher resistance in aspects of the type Exp, and lower resistance in aspects of type A' and B'. According to this interpretation, in a decision based on extrinsic--although relevant--aspects, induced in the very special fashion which prevents the subject from cognizing them as experimenter-induced, those aspects will be more liable to change and to decrease in relevance than if they were cognized as such. To the extent that this is so, the relation between negative and positive aspects in each alternative and among them will tend to revert, after the decision is made, to the one prevailing in the original, pre-manipulation situation. Whenever this process takes place, E will find himself in the situation (or tending toward the situation) of having decided in favor of the--now--less preferable alternative.

We repeat that this last step of our interpretation is based on the assumption that positive or negative cognized aspects of a situation which are (i) extrinsic,* (ii) experimenter-induced, and (iii) not cognized as such, will also be (a) less resistant to change, and/or (b) more susceptible to decreases in relevance, than positive or negative aspects which have any of the opposite attributes --i. e., of being (i) intrinsic,* (ii) not induced by the experimenter or, if

* See p. 85.

so induced, (iii) cognized as such. Admittedly, this is a conjecture; but it seems plausible if we examine the dissimilar relation to the S's whole system of orientations, and to 'external reality' of both sets of cognized aspects:

(1) If a positive or negative aspect has been induced by the experimenter, its relations with the whole context of cognitions and orientations of the subject will in all probability be fewer and less important than if it has been spontaneously arrived-at, by the subject himself, as a result of the relations among other relevant parts of his system of orientations.

We may formulate this by saying that, most of the time, such induced aspects will be relatively "external" to the system of orientations of the subject.[29]

(2) Even such an "external" aspect--or set of aspects--may be resistant to change or to decreases in relevance if it is cognized as external and, lacking intimate and numerous links with an 'inner' reality, it is at least solidly anchored in 'outer' reality. Where a potential reward or punishment is cognitively linked to such 'outer' reality, its change is made difficult by all the processes

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[24] As different from "extrinsic," which denoted a similarly superficial connection, with relatively fewer, more indirect, and less important relations, with the cognitive cluster in question, or object of orientation.

that normally prevent the distortion of reality itself and, although far from perfect, these processes are, most of the time, important sources of resistance to change and have been utilized as such in a great many studies on attitude change, cognitive dissonance, etc.

(3) The last distinction we must take into account is the one between "intrinsic" and "extrinsic" aspects of an alternative. It may be said to be the distinction between (i) inseparable aspects, directly linked to the rest of the aspects of the alternative, and (ii) separable aspects, linked to the alternative indirectly, through another cluster.

If a child tries to play with a bright flame, and gets burned, this "intrinsic" negative aspect of the alternative "playing with the flame" is permanent, inseparable, and directly linked to the rest of the cluster; but if he is forbidden to play with a toy through threats or promises, these "extrinsic" negative or positive aspects are separable and indirectly linked with the cluster via the threatening or cajoling parent.[25]

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[25] And the degree of permanence of the link will be related to the degree of 'internalization' of the threats or the promises, i.e., to the degree to which the indirect link is transformed into a direct one, through an internal representative of the external authority figure. Here the 'intrinsic' character of the aspect develops as a result of its becoming increasingly 'internal' (that is, richly related to the whole of the system of orientations of the individual).

It seems plausible that "extrinsic" aspects of an alternative would depend, for their permanence and resistance to change, on their anchoring in external reality, on the cognition of their link with a potentially rewarding or punishing source. Here again, the lack of such cognition under conditions of High Choice increases the probability of change or decrease in relevance for the "extrinsic" aspects of both the selected and the rejected alternatives.

It is probably apparent that in all "forced-compliance" experiments the experimenter's influence is carefully directed toward eliciting changes in extrinsic aspects of the alternatives, with as little directly induced change as possible in their intrinsic aspects (the changes in the latter are assumed to be the result of 'dissonance' and of efforts at 'dissonance reduction,' and are measured as the dependent variable).

For instance, in Cohen and Latane's experiment (Brehm and Cohen, 1962, pp. 88 ff.), the experimenter's arguments were not directed toward the convenience of the institution of a compulsory religion course at Yale (as would have been the case in the usual 'attitude-change' experimental design) but rather toward the convenience of making the speech, for reasons not directly related to the central issue; that is, for extrinsic reasons (or aspects.)

We expect it to be apparent that for simplicity's sake we have presented dichotomously the distinctions between (a)

external versus internal aspects of the alternatives, (b) extrinsic versus intrinsic aspect, and (c) external aspects which are cognized as such versus those which are not. The three differentiations may be understood in terms of positions over three different continua (extrinsicality, externality, and degree of cognition of the latter).

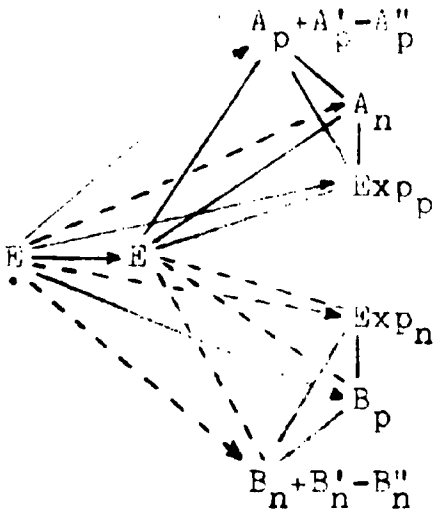
The above distinctions may be synthesized by saying that in the High Choice condition, in the experiment under study, the new positive and negative aspects which we have symbolized A'_p and B'_n are unstable cognitive and affective reorganizations (based on an illusion, Brehm and Cohen, 1962, p. 89,) lacking strong support both in terms of the rest of the orientations of the subject, and in terms of an effective 'anchorage' in external reality.

This assumption may be explored empirically and experimentally. Subjects may be induced to commit themselves to a (normally) unattractive behavior under conditions of either (a) High Choice or (b) Low Choice. Other things being equal, those under conditions of High Choice should, if our assumption is sound, "uncommit" themselves--if given the opportunity--significantly more than subjects in the Low Choice condition.

The conjectured lower resistance (to change and decreases in relevance) of aspects A'_p and B'_n may be represented by subtracting a subset A''_p from the sum of A_p plus A'_p, and a subset B''_n from the sum of B_n plus B'_n, in some moment between the decision and the measurement of the dependent variable (attitude change).

Such subsets A''_p and B''_n may be heterogeneous in their susceptibility to decreases in importance; some of the aspects in any of them may become irrelevant or even change their sign. As the simplest example to map, we will represent the case in which all the aspects in both subsets become irrelevant to the decision.

The situation is then:



(27)

As A''_p and B''_n increase (if we compare them for instance, from moment to moment in the same subject) and approach, respectively, A'_p and B'_n,[26] the situation, for subjects in the Low Choice condition, approaches inequality (12) in p. 81, so that alternative A is still the most preferable one, while for subjects in the High Choice condition the situation approaches inequality (15) in p. 82, above, in which alternative A is less preferable than alternative B. The relevance of this result comes, of course, from the fact that all subjects have decided in favor of alternative A.

Thus, if our assumptions about type A'_p and type B'_n aspects are granted, High Choice conditions imply the probability of the subject having decided in favor of the less preferable alternative and having rejected the more preferable one. And since changes toward balance (or 'attempts at dissonance reduction') are a direct function of the preferability of the rejected alternative and an inverse function of the preferability of the chosen one, our model is applicable not only to the 'forced-compliance' paradigm of 'dissonance' theory, in general, but also to the specific manipulations of 'choice' in this and equivalent experimental examples.

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[26] So that A'-A" becomes zero, and $A_p + A'_p - A''_p = A_p$, and $B'_n - B''_n$ also becomes zero, and $B_n + B'_n - B''_n = B_n$.

Does this applicability of the proposed model extend to the dependent variable in Cohen and Latane's experiment (Brehm and Cohen, 1962, pp. 88 ff.), and to the many other studies in which 'attempts toward dissonance reduction' were measured in terms of attitude change? A change of attitude in favor of the institution of a compulsory religion course at Yale is represented, in our diagrams, by an increase in positive orientations toward alternative A, i.e., by an increase either in the number of cognized aspects of type A_p, or in the intensity of the affective orientations directed toward preexistent aspects of that type. Probably such new aspects are 'internal' and 'intrinsic' (see our analysis of the lack of direct manipulation of this type of aspects, above). In subjects in whom EpE_n, EpA_n, ..., EnP_p, EnB_n, any increase in the number or importance of A_p aspects (and hence in the number and importance of $\underline{E}pEpA_p p\underline{E}$ cycles, b) is a change in the direction predicted by our former propositions, and an increase in the preferability of the chosen alternative. It is apparent that the same analysis applies to the increase in number or importance of B_n aspects, and the decrease of A_n and B_p aspects. In fact, any increase of A_p aspects must be accompanied by decreases in the number or importance of the u $\underline{E}EB_p$ cycles, since some aspects which

favor alternative A are in all probability simply contradictory to some B_p aspects; the corresponding decrease in the $\underline{u}\ \underline{EEB}_p$ cycles is also consistent with our predictions.

CHAPTER XIV

THE CONCEPTUALIZATION OF 'CHOICE' IN BREHM AND COHEN. THE CONCEPT OF 'PREFERABILITY' OF ALTERNATIVES

Up to now, we have studied Cohen and Latane's experiment in terms of our concept of 'choice'. It will be convenient to compare this concept to Brehm and Cohen's notions on the same subject:

> ...we will assume here that low choice is equivalent to the bulk of relevant attributes being consistent with choosing a given alternative and that high choice is equivalent to approximately equal distribution of relevant cognitions consistent with choosing one alternative course of action rather than any other. (Brehm and Cohen, 1962, p. 43.)

And, interpreting the evidence from Cohen and Latane (1962) and that of other experiments in which a direct manipulation of choice has been performed:

> They all support the derivation from dissonance theory that the more equal the distribution of

> relevant attributes consistent with choosing each alternative (the higher the choice), the greater the dissonance and consequent attitude change in line with one's discrepant commitment. (Id., p. 91.)

The two paragraphs of Brehm and Cohen we have quoted refer to 'choice'; we will refer now to passages dealing with 'volition.' We think they are also relevant to our present question; although Brehm and Cohen believe the concepts to be different, all of the following considerations are relevant:

(1) Their definition of each one in terms of the distribution of positive and negative aspects of each alternative renders them equivalent, as will result clearly from the passages we have quoted.

(2) A distinction in operational terms is impossible: see below, Chapter XVIII, in which we study the issue in detail and conclude that in each case in which they attribute an experimental result to the presence or absence of 'volition' they define it in terms of answers to questionnaires about perceived choice.

(3) Even at a phenomenological and introspective level, 'volition,' as defined by Brehm and Cohen does not seem to be separable from choice:

> The degree of volition...is the extent to which a person feels that he controls his own behavior...

> (It)...implies not only initiation and selection of behavior, but also responsibility for its consequences. (Brehm and Cohen, 1962, p. 201).
>
> ...The degree of volition will frequently be positively correlated with the magnitude of dissonance as defined in terms of dissonant and consonant cognitions. Consider, for example, a two-alternative choice situation. As the two alternatives become more nearly equal in attractiveness, the proportion of cognitions dissonant with choice of the more attractive alternative increases, and, hence, the magnitude of dissonance should increase. But the same would be true of the degree of volition, since, as the choice alternatives become more nearly equal in attractiveness, the individual must become more concerned with which alternative he will choose. When one alternative is clearly more attractive than the other, the degree of volition would ordinarily be low, since the individual would select the attractive alternative without much consideration. The fact that he could choose the less attractive alternative would be of little consequence. In general, then, the degree of volition will frequently be positively correlated with the ratio of dissonant to consonant cognitions.
>
> A similar analysis would apply to the "forced-compliance" paradigm. We may say, for example, that the greater the force that produces compliance, the less is the ratio of dissonant to consonant cognitions, and, also, the less is the degree of volition. (Brehm and Cohen, 1962, pp. 203-204).

We will find these same ideas of 'dissonance' as being correlated with situations in which the positive and negative aspects of the competing alternatives are almost equally distributed, in Brehm and Cohen's "Conceptual Summary," in their final chapter (1962, pp. 299 ff.). In the course of an analysis of a formal statement by Festinger on the relationship between magnitude of dissonance and proportion of dissonant elements, they comment:

> Another significant aspect of Festinger's formulation is that the magnitude of dissonance associated with a given cognition "...will depend on the proportion of relevant elements that are dissonant with the one in question" (1957, p. 17). This statement is the basis of much of what is "nonobvious" in the theory. For example, it is the major assumption involved in the derivation that the less the reward for saying something discrepant with one's private attitude, the greater the amount of attitude change. This assumption, then, says that the magnitude of dissonance (and consequent attempts to reduce dissonance) is greater where the weighted dissonant and consonant cognitions are equal in magnitude. (Brehm and Cohen, 1962, p. 301).

The last proposition (which, in essence, is the one that constitues their definitions of 'choice' and 'volition' above), does not follow from the preceeding ones, and we will see that it is an undue extrapolation from what usually takes place in the 'free-choice' paradigm to all post-decision situations.

In the usual 'free-choice' situations, that is, whenever the subject has to decide among two or more positive alternatives[27], his pre-decision conflict (and later his post-decision 'dissonance') will increase as the preferability of the less attractive alternative increases, until the limiting case in which the two are exactly equally attractive. If, before the decision, the preferability of the less attractive one increases beyond that level (without change in the other alternative) the decision will be

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27 See above pp. 62, ff.

reversed. So that, for this special case, (a) the preferability and attractiveness of the chosen alternative will always be greater than the preferability and attractiveness of the rejected one, and (b) the higher possible amount of 'dissonance', both in our formulation and in Brehm and Cohen's, will be produced when the attractiveness or preferability of both alternatives is almost--so that a decision is still possible--equally balanced.

We repeat that this is what usually happens in "free-choice" situations. But to take this to be a general description of all decision situations, and to extrapolate from this paradigm to general conditions of 'choice' and 'dissonance' is unwarranted, and only possible by overlooking two important features of the situation as described.

The two (implicit) requirements for the application of the principle that "the more equal the distribution of relevant attributes consistent with choosing each alternative (the higher choice), the greater the dissonance..."[28] (Brehm and Cohen, 1962 p. 91), are (1) that all the relevant aspects of the alternative will be correctly cognized by the subject before the decision, and (2) that all those relevant aspects will remain unchanged from before until after the

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28 In our formulation, "the higher the proportion and importance of u EEX cycles..."

decision (and, in experimental cases, until after the measurement of the attitude change, satsifaction, or any other dependent variable).

It is easy to see that these requirements are met in the usual "free-choice" paradigm. The subject inspects the alternatives beforehand. He chooses the preferable one. And, since no external influence is needed for him to choose among 'positive' alternatives, all the relevant aspects are intrinsic and internal, and hence probably permanent (see our previous study of the concepts of intrinsic and internal aspects of an alternative).

This need not be so: It is quite possible to design a series of experiments in which the subjects will be permitted to choose freely among alternatives, but with some relevant information being available to them only after their decision is made. This would be a crucial test betwen Brehm and Cohen's propositions about the relationship of the distribution of positive and negative aspects, and dissonance, and ours. If the subjects were to choose among wrapped objects, after reading a generic description of each, and to find out only after their choice the exact qualities and values of their chosen and rejected alternatives, it would be quite possible for subject S_1 to choose object A, and for subject S_2 to choose object X, and for the distributions of positive and negative aspects of the alternatives (and the correspond-

ing import of the preferabilities) to be

$$|\Sigma \underline{E}A_p| + |\Sigma \underline{E}B_n| = |\Sigma \underline{E}A_n| + |\Sigma \underline{E}B_p| + P_A, \quad (16)$$

$$|\Sigma \underline{E}Y_p| + |\Sigma \underline{E}X_n| = |\Sigma \underline{E}Y_n| + |\Sigma \underline{E}X_p| + P_Y, \quad (17)$$

and

$$P_Y > P_A \quad ;^{29} \quad (18)$$

so that, according to expressions (4) and (5) above:

$$\text{Preferability of } A = f(P_A), \quad (19)$$

and

$$\text{Preferability of } X = f(-P_Y). \quad (20)$$

According to Brehm and Cohen, subject S_1 should experience more dissonance, since "the distribution of relevant attributes consistent with choosing each alternative" is, in his case, more nearly equal, as results from expres-

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[29] For the simplicity of the example we have assumed $\underline{E}_p E$,

$$EA_p = EA_n = EX_p = EX_n = +1.,$$

and

$$EB_p = EB_n = EY_p = EY_n = -1.$$

sion (18), or, what is equivalent "... the weighted dissonant and consonant cognitions are equal in magnitude." (Brehm and Cohen, 1962, p. 301).

Our prediction, based on the proposition VI, p. 71, above, would be the opposite one: we would expect subject S_2 to experience more dissonance, since the preferability of the rejected alternative and the negative preferability of the chosen alternative are greater in his case than in the case of S_1.

In an effort to find empirical evidence of the preceeding predictions, we have reviewed the experimental literature of"cognitive dissonance." Since experiments like the one loosely designed above have not been performed, we centered on the free-choice features of experiments whose general design corresponds to some other paradigm.[30] And we found clear corroborating evidence in Festinger's experiment on exposure to information, reported in Festinger, 1957, pp.162-176, and replicated by Cohen, Brehm and Latane (1959). The experimenters, in both studies, gave each subject a sum of money to play a two-sided card game. The subjects were given the free choice of two different strategies (and this

[30] See above, p. 62 ff.

is the 'free-choice' aspect of this 'exposure' experiment). As the game progressed, some of the subjects found that their choice had been an advantageous one (they had a net gain), some found that both alternatives were almost or completely equivalent (their gains and losses turned out to be similar, and to cancel out) and some found that the chosen alternative was less advantageous--or preferable--than the rejected one (they lost different amounts).

Festinger had an elaborate prediction about the relation between magnitude of dissonance and active seeking of new information (1957, pp. 126-131, and Fig. 4, p. 130), and, in general terms, his predictions were confirmed both in his experiment and in the replication by Cohen, Brehm and Latane. We have reproduced in Figure I his theoretical curve, as presented in Festinger, 1957, Fig. 4, p. 130, and in Figures II, III and IV the findings of his experiment and of the replications by Brehm, Cohen and Latane (headed "Yale replications" and including a condition in which the subjects believed their gains or losses would have a wide publicity--"Public Condition," Fig. III--, and one in which the subjects believed their gains or losses to be confidential--"Private Condition," Fig. IV). The relevant aspect of both experiments, for our present purposes, is the variable "Magnitude of Dissonance" or "Measure of Dissonance," plotted on the abscissa in all four graphs. The units on that axis are

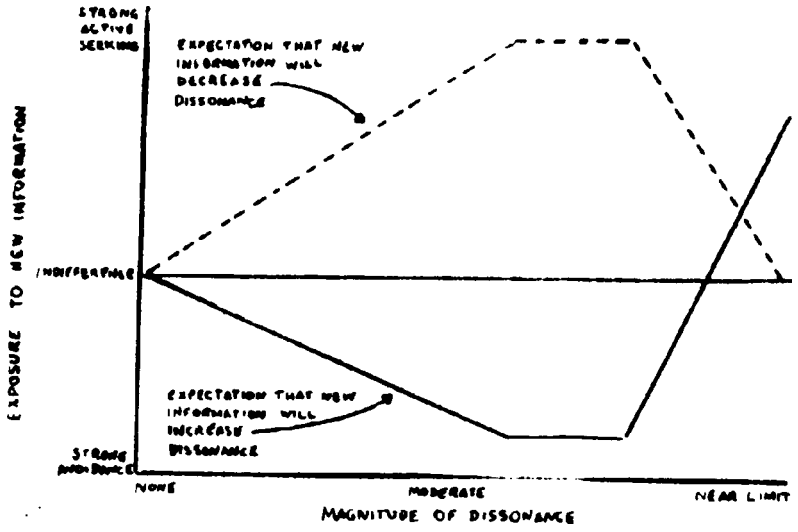


Fig. I. Theoretical curves relating magnitude of dissonance and exposure to information. (Festinger, 1957, p. 130).

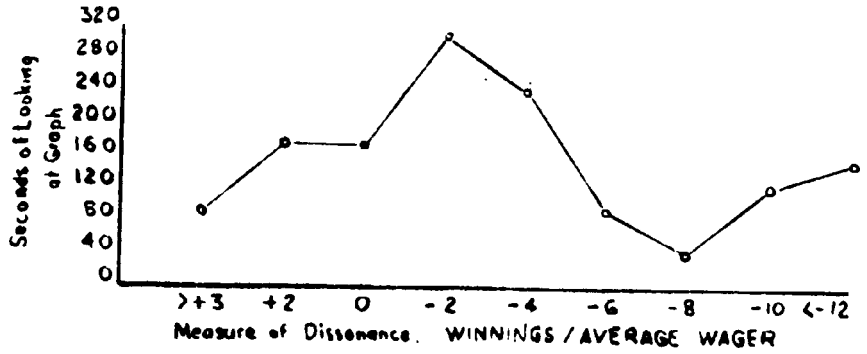


Fig. II. Experimental relation between magnitude of dissonance and exposure to information. (Festinger, 1957, p. 171).

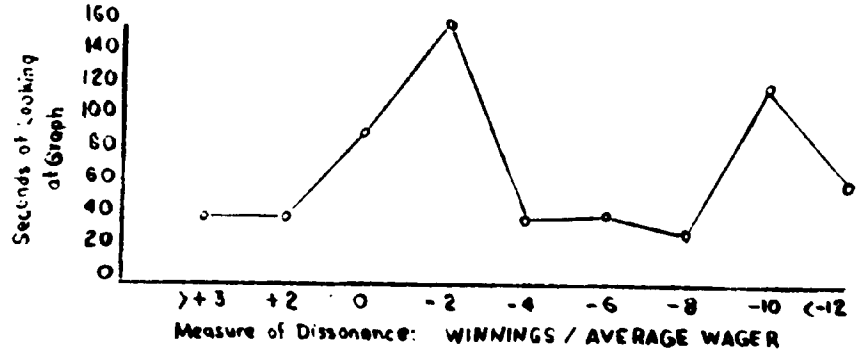


Fig. III. Experimental relation between magnitude of dissonance and exposure to information. Yale replications, public condition (Cohen, Brehm and Latane, 1959, p. 69).

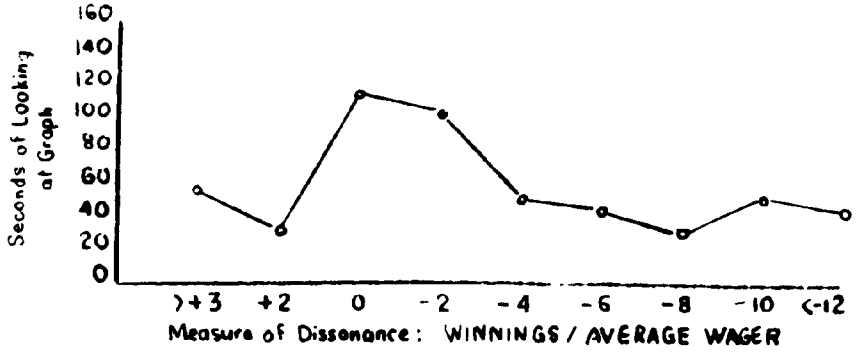


Fig. IV. Experimental relation between magnitude of dissonance and exposure to information. Yale replications, private condition (Cohen, Brehm and Latane, 1959, p. 69).

winnings/average wager; and Festinger, and Cohen, Brehm and Latane assume dissonance to be lowest with highest winnings (of three or more times the average wager after twelve trials) and to be highest with highest losses (of up to twelve times the average wager). We will not go here into the hypothesized effects of expectation and dissonance on exposure, which explain the obtained curves;[31] what is crucial for us, in the present connection, is that not only Festinger, but also Brehm and Cohen, as co-authors of the replication of his experiment, had, in this instance, the right intuition and made dissonance dependent, not on the equality between alternatives before the decision,[32] nor on the equality between alternatives after the decision, but on the advantageousness or preferability of the rejected alternative, and the disadvantageousness or negative preferability of the chosen alternative. This is in complete agreement with our propositions, and contradicts the general state-

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[31] See Festinger, 1957, pp. 126, and Cohen, Brehm and Latane, pp. 68 ff.

[32] In that respect all the Ss went through exactly the same manipulations and there were no differential conditions linked to dissonance; see the descriptions by Festinger (1957, pp. 165-169) and by Cohen, Brehm and Latane (1959, pp. 65-66).

ments of Brehm and Cohen upon which we are commenting.[33]

The most important consequence to be drawn from our general proposition on the arousal of 'dissonance' and from the preceding analysis is (1) that 'dissonance' fluctuates independently of the degree of choice, and (2) that the equal distribution of relevant attributes is not positively correlated with the arousal and amount of dissonance.

Another possible design could be used as a crucial test of both hypotheses by tricking subjects into freely choosing a low-preferability or disadvantageous alternative. We predict that in that case, the lower the preferability of the alternative, the higher would be the arousal of dissonance. This was not the case in Festinger's experiment. In spite of what Brehm and Cohen (1962) say on p. 25, it seems that he--for once--did not stack the cards...

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[33] Their statements, as we said before, remain as a correct description of the conditions of dissonance in free-choice experiments in which all the relevant aspects of both alternatives are known before the decision, and permanent after it.

CHAPTER XV

SUMMARY OF BALANCE, DISSONANCE AND CHOICE

We may summarize what we have been saying up to now, about 'dissonance' arousal, as follows:

1 - Dissonance and attempts at its reduction represent a particular case of imbalance; in terms of our model, a case of above-threshold proportion and importance of u ERX cycles in situations in which the X points map the cognized positive and negative aspects of chosen and rejected alternatives (later on, we will extend the present propositions to include cases in which there is no choice or decision).

2 - Dissonance and attempts at its reduction will be positively related to the preferability of the rejected alternative, and to the negative preferability of the chosen alternative.

3 - For cases of High Choice manipulations as the one we studied in Chapter XIII, the post-decisional preferability of the chosen alternative decreases due to the lability to change of 'external' and 'extrinsic' aspects of the alternatives when, although induced by the experimental situation and the experimenter, they are

not cognized by the subject as being so induced. According to what we have seen in the preceeding paragraph, this decrease in the post-decisional preferability of the chosen alternative is positively related to dissonance and to attempts at its reduction.

4 - There is no relation between 'choice' and the equal distribution of positive and negative aspects between alternatives.

5 - There is no relation between such equal distribution of positive and negative aspects between alternatives and the amount of dissonance aroused.

We have also hinted that 'volition,' as conceptualized by Brehm and Cohen, is not an independent notion, but rather a reformulation of their concept of 'choice,' and subject to the same criticism.

CHAPTER XVI

AN ORDERING OF EXPERIMENTAL EXAMPLES ON A DIMENSION OF PREFERABILITY OF THE CHOSEN ALTERNATIVE

If we confine ourselves for the moment to cases in which the EX lines map decisions (and to two alternative situations) we may order the experimental examples we have seen up to now, on a dimension of preferability of the chosen alternative, from High Positive Preferability (Low Dissonance) through No Preferability, to High Negative Preferability (High Dissonance). If we denote the chosen alternative by A and assume EpE, and all EX lines equal to 1., the ordering will be as shown in the next page.

HIGH DISSONANCE (High Negative Preferability)

$|\Sigma \underline{E}A_p| + |\Sigma \underline{E}B_n| < |\Sigma \underline{E}A_n| + |\Sigma \underline{E}B_p|$; $P_A < P_B$.

Ss with high losses. Festinger, 1957, 162-176.

High-Choice Ss. Cohen and Latane.

$|\Sigma \underline{E}A_p| + |\Sigma \underline{E}B_n| = |\Sigma \underline{E}A_n| + |\Sigma \underline{E}B_p|$; $P_A = P_B = 0$. (No preferability)

Ss with no losses nor gains. Festinger, id.id.

Usual free-choice experiments (two almost equivalent alternatives).

Low-Choice Ss. Cohen and Latane.

Usual free-choice experiments (two widely different alternatives).

Ss with moderate gains. Festinger, id.id.

LOW DISSONANCE (High Positive Preferability)

$|\Sigma \underline{E}A_p| + |\Sigma \underline{E}B_n| > |\Sigma \underline{E}A_n| + |\Sigma \underline{E}B_p|$; $P_A > P_B$.

We believe this dimension of preferability of chosen alternative to be fundamental for the understanding of phenomena of 'dissonance' and imbalance, and we will refer to it repeatedly, in the following chapters.

CHAPTER XVII

GENERALIZATION TO OTHER MANIPULATIONS OF CHOICE

We may now generalize from the particular choice manipulations in Cohen and Latane's experiment to all cases of direct and indirect manipulation of choice. There are two types of manipulation which result in differences in perceived choice: (1) In some experiments the perception of choice is manipulated by varying the amount of inducement (e.g., less reward, more choice, as in Cohen, 1962, pp. 73 and 204, Table 14; less justification, more choice, as in Cohen, Brehm and Fleming, 1958; more threat, less choice, as in Cohen and Brehm, 1962, p. 208, Table 15; etc. (2) In other experiments, like the one by Cohen and Latane which we have analysed in Chapter XIII, the difference between High Choice and Low Choice conditions is not the amount of inducement, but its kind (saying to the subject in the first, High Choice condition, "It is up to you to do it or not," "It is your choice," etc.).

(1) The differences between choice conditions produced by varying the amount of inducement apparently result from the fact that the reward, the justification, the threat, etc., or an important part of it, although 'extrinsic,' is cognized as external. In terms of our diagram (24) and expressions

(10), (12) and (13), this implies for subjects in the Low Choice condition both (i) a greater absolute importance of ΣEX cycles including aspects cognized as induced by the experimenter (Exp aspects) and (ii) a greater proportion of them to the sum of all the ΣEX cycles relevant to the alternatives. For subjects in the High Choice condition the reverse is true, with both (i) a greater absolute importance of ΣEX cycles including aspects induced by the experimenter but not cognized as such (A' and B' aspects) and (ii) a greater proportion of them to the sum of all the relevant ΣEX cycles.

(2) When the difference between conditions is the kind of inducement ("It is your choice," etc.), we have seen in Chapter XIII that the situation, if the more subtle manipulation is successful, is equivalent to (1), above. In the High Choice condition some of the relevant aspects which the experimenter has induced in the subject are not cognized as such and both (i) the absolute importance of ΣEX cycles including Exp aspects and (ii) their proportion to the sum total of all the relevant ΣEX cycles are less than in the Low Choice condition.

CHAPTER XVIII

THE CONCEPT OF VOLITION

Before going on to the study of self-esteem and compliance in dissonance, we will complete the analysis of the concept of 'volition' in Brehm and Cohen (1962).[34]

We said before (p. 93) that, in their study, there is no real distinction, in operational terms, between the notions of 'choice' and 'volition.' A review of the experiments in which Brehm and Cohen have used the second of these concepts will make that evident.

1 - The first systematization of the idea of 'volition' appears in their appraisal[35] of the results of one of their prior experiments.[36] In this experiment Low Choice was manipulated by not mentioning any way for the Ss to be excused from a dreary task; High Choice, by telling them that "though it was desirable that everyone participate.

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[34] See above, 45, (4), and 93 ff.

[35] Brehm and Cohen, 1962, pp. 200-201.

[36] Brehm and Cohen, 1959.

a person could be excused if necessary. E told them that to be excused, they must indicate on a separate form attached to their schedule sheets their desire for an appointment with the Psychology Department's Director of Undergraduate Studies concerning the excuse." (Brehm and Cohen, 1959, p. 384). Apparently this was the case which suggested to them the necessity of the concept of volition, but pp. 200-201, in which they use it for the first time, are only an attempt to explain the results of the experiment in which the direct manipulation of choice failed (in their original experiment they commented: "...it was found that more variance in choice existed within experimental conditions than between them. In effect, then, the manipulation of choice failed to determine the amount of choice felt by Ss." (Brehm and Cohen, 1959, pp. 384-385).

It is apparent that, in this example, there is no previous nor independent operationalization of 'volition,' and this concept is included as an ex-post-facto intervening variable. The success of the choice manipulation was checked by asking the subjects, on a nine-point scale, "How difficult do you think it would be for you to get out of this experiment?" In operational terms, then, what was manipulated here, and what was measured by the questionnaire, was not degree of volition,[37] but choice.

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[37] Which Brehm and Cohen define as "the extent to which a person feels that he controls his own behavior (including responses, emotions, motivations, etc.)" (1962, p. 201).

If a subject answered that he thought it would be very difficult for him to get out of the experiment this means that noncompliance, by refusing to participate in the experiment, had for such a subject too high a price which made it less preferable. In terms of our diagram (23) above, (i) the negative aspects of the rejected alternative, B_n and, hence, (ii) ΣEEB_n were for him high in number or importance. In all probability, for him, $|\Sigma EEA_p| + |\Sigma EEB_n|$ would exceed $|\Sigma EEA_n| + |\Sigma EEB_p|$. Therefore we would not expect him to show the particular changes--in the direction of increased balance--which we have identified with 'dissonance reduction.' Thus, the results of the experiment may be simply analyzed, as we have done up to now, in terms of the preferability of alternatives.

2 - The same type of analysis is applicable to Brehm and Cohen's interpretation of the 'small rewards' experiment by Cohen (originally reported in Brehm and Cohen, 1962, pp. 73 ff., and reanalyzed in p. 204). They summarize it as follows:

> College students were requested to write essays counter to their private opinions on an issue of current concern. They understood they would be paid for writing the essay. The inducing force was varied by offering different amounts of pay. The amounts were $.50, $1.00, $5.00, and $10.00. It was expected and found that attitude change toward the assumed position decreases as amount paid increases.
>
> Our interest at this point, however, is in the perception of volition as a function of the amount to be paid. Immediately after the subjects had

> finished writing their discrepant essays, they were given a post-experimental questionnaire, which included the following question: "Considering that you agreed to take part in the general survey, how much choice do you feel you really had in whether or not you could turn down the request to write the essay?" Answers were indicated along an a priori seven-point labeled scale having five unlabeled points between the seven. The labels ranged from "No choice at all" to "Complete choice." According to the above suggestion that volition is an intervening variable in the arousal of dissonance, it would be expected that perceived volition would decrease as payment increased. (Brehm and Cohen, 1962, p. 204).

And their Table 14 reads:

MEAN RATING OF VOLITION BY AMOUNT OF PAY

	$0.50	$1.00	$5.00	$10.00
Perceived Volition	5.78	6.37	4.04	3.83

Again, we see a complete operational identification between choice and volition; again, the results may be analyzed straightforwardly in terms of the preferability of alternatives: high reward for compliance is equivalent to high A_p, and less 'dissonance.'[38] In fact, we may interpret Table 14 as a direct confirmation of our definition of choice: the negative relation between external aspects of the alternatives (in this case, 'reward,' Exp_p) and perceived choice,

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[38] This, of course, is what they report in their original findings; in Table 1, p. 77, they present mean positive attitudes to the controversial issue--their measure of 'dissonance'--ranging from 2.32 with $10.00 rewards to 4.54 with $0.50 rewards.

is quite obvious.[39]

3 - The next example of the use of the concept of volition is "An Experiment on Illegitimate Coercion, Volition, and Attitude Change," by Cohen and Brehm (Brehm and Cohen, 1962, pp. 206-210). They attempted to create in the subjects the impression of illegitimate coercion, under the rationale that this would cause them to resent the coercion. In a similar case (1962, p. 201) they commented:

> To the extent that a person did feel resentful, he would entertain the idea of getting out of participation and would therefore tend to see the difficulty of getting out as relatively low. He would, in short, feel that he could get out if he really wanted to. What may be involved here is the individual's feeling of control over his own behavior.

We do not think so: it is quite possible for a person to be resentful because compliance has been obtained through illegitimate coercion, and nevertheless feel rather helpless (especially if the coercion is strong, and effective).

This experiment is important not only because of Brehm and Cohen's operationalization of volition but because it presents some apparently paradoxical results from the point of view of the usual findings in dissonance theory, but it will be possible to show that they fit what could be predicted by the use of our model.

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[39] See diagrams (25) and (27), and their explanations, above.

The procedure was as follows:

> The subjects consisted of 30 Yale undergraduates--ten in each experimental condition--who were fraternity pledges recruited from four different campus fraternities. Arrangements had been made with the pledgemasters of the various fraternities to send pledges to the experimental room "to help out in some research for a short period of time."
>
> The general condition of illegitimacy was established in the following way. First, the pledges were told by their pledgemasters that they were to report for a short project of 15 to 20 minutes duration, whereas the experimenter then demanded that they sign up for a boring and profitless task that would take 3 to 4 hours. Above all, however, the experimenter was a professor who had no connection whatsoever with any of the fraternities involved. To make the coercion completely illegitimate, then, the experimenter threatened to have the pledge's fraternity penalize him if he failed to participate in the unexpectedly long task. Since such an influence by a professor on a fraternity's business would be very unusual, it was expected that the attempted coercion would be seen by the pledge as illegitimate. The exact procedure follows.
>
> When the subject arrived, he was told that he was expected to participate in 3 to 4 continuous hours of copying random numbers. It was emphasized that participation would be extremely dull and that there was nothing the subject would learn from it, but that his help was needed in order to "establish norms for other research." After being shown an example of the task, the subject was given one of the following coercion manipulations:
>
> High Coercion. "Now we need your cooperation, and if you don't cooperate, I'm afraid we'll have to report you as uncooperative to your pledgemaster and the other fellows and really push for some severe penalties. This can have very bad effects; we'll try to see that it has very strong consequences for extending your pledge period considerably and even for keeping you out of the house permanently."

> Low Coercion. "Now we need your cooperation, and if you don't cooperate, I'm afraid we'll have to report you as uncooperative to your pledgemaster and the other fellows and see that you get some hours of extra duty as a pledge."
>
> In the Control condition, the subjects were told: "Now we need your cooperation." Nothing was said to them about any possible penalties for noncooperation (Brehm and Cohen, 1962, pp. 206-207).

Here again, the most relevant aspect of the experiment, for the purposes of this conceptual and operational analysis, is the measurement of 'volition':

> Perception of the coercive force, perceived choice about whether or not to participate (voltion),[40] and evaluation of the...task were measured on a questionnaire given immediately after commitment to participation (Brehm and Cohen, 1962, p. 207, our emphasis).
>
> "The major indicator of dissonance reduction...was a single question, which asked: Considering what you will get out of this research project (interest, enjoyment, learning, etc.), how satisfied are you with having to take part in it? Answers were indicated by marking a single dot along an 81-point response scale, labeled at every twentieth point by 'Extremely satisfied,' 'Moderately satisfied,' 'Neither,' 'Moderately dissatisfied,' and 'Extremely dissatisfied,' and were scored +4.0 to -4.0, respectively." (Id., p. 87).

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[40] In this particular passage, Brehm and Cohen seem to be equating, even conceptually, 'choice' and 'volition.' However, we have seen before that they generally treat these as separate and independent concepts.

Thus, also in this experiment, the operational measure of 'volition' is a questionnaire item about perceived choice, and no new concept is operationally defined.

The overall results of this experiment are apparently paradoxical. They are summarized in the following table, adapted from Table 15 in Brehm and Cohen (1962):

MEAN RATINGS OF POSTQUESTIONNAIRE ITEMS BY EXPERIMENTAL GROUPS

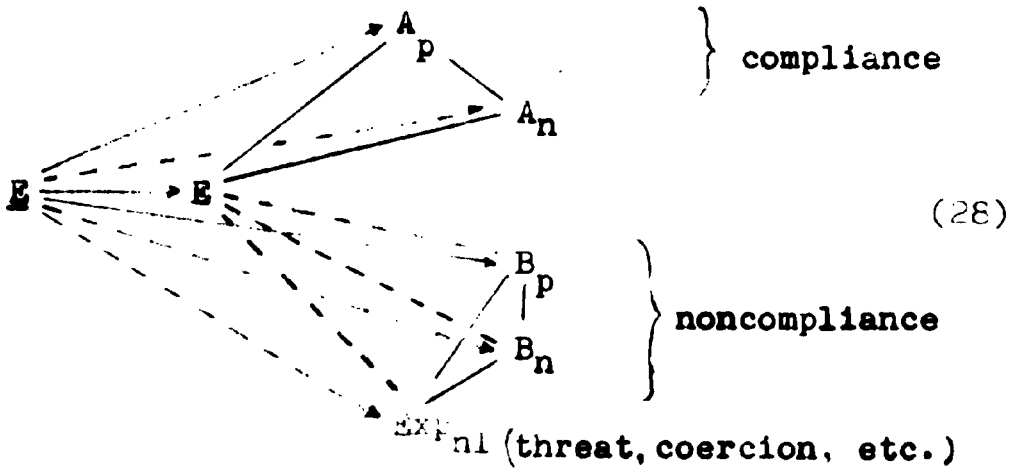
	Severity of Threat	Choice	Satisfaction**
High Coercion (N = 10):	4.00*	3.14	+1.09
Low Coercion (N = 10):	2.18	2.04	- .70
Control (N = 10):	1.46	.95	-1.58

*In all cases, the higher the mean figure, the greater the response in question.

**Satisfaction was used as a measure of dissonance and attempts at dissonance reduction.

This is the only example we know of high coercion (severity of threat) producing high dissonance. Normally, there is a negative relationship between these two variables, as we would expect from our propositions: threat or coercion are negative aspects, i.e., aspects toward which the affective

orientations of the subject are negative. If we represent compliance by A (with A_p and A_n as the aspects which generate positive and negative affective orientations in the subject, respectively) and noncompliance by B (with aspect B_p and B_n), and define Exp_{nl} as the negative aspects of noncompliance induced by the experimenter (threat, coercion, etc.) and cognized as dependent on the experimenter, the usual situation for a compliant subject, one who has chosen alternative A, will be:

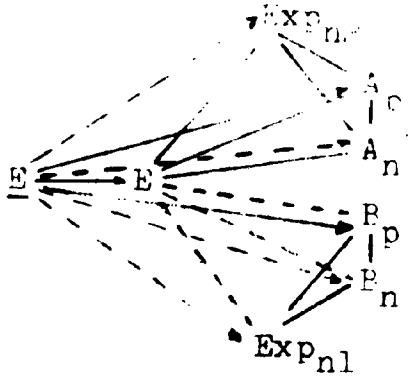


(28)

For that compliant subject the number and importance of the u EEX cycles will be inversely related to the amount (importance, relevance, etc.), of threat and coercion. In other words, an increase in coercion will decrease the preferability of noncompliance, and increase the preferability of compliance. And since 'dissonance' is a direct function of the preferability of the chosen alternative and an inverse

function of the preferability of the chosen one (see proposition VI, p.71) subjects in the High Coercion condition should present less 'dissonance' (measured in this case by satisfaction) than subjects in the Low Coercion condition. Why is it, then, that in the present case Cohen and Brehm found a positive relationship between coercion and dissonance?[41]

The probable explanation of these apparently paradoxical results is related to the <u>type</u> of coercion used by the experimenters: <u>illegitimate</u> threats. At least in our culture, illegitimacy of coercion implies not only negative aspects linked to noncompliance,[42] <u>but also negative aspect linked to compliance</u>. Members of our culture are supposed "not to let people push them around," "to stand up for their rights," etc., and to comply under illegitimate force is humiliating. We must then include in our graph this negative aspect of the situation, related by a positive unit-formation to alternative A, compliance.



(29)

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[41] See Table in page 119.

[42] E.g., "if you choose B you will have to pay the consequences."

We do so by defining a point Exp_{n2}, as the negative aspects of compliance induced by the experimenter (illegitimacy) and cognized as so induced.

Thus in the case of illegitimate coercion, the experimenter generates two kinds of negative aspects of the situation, ones, related by a positive unit-formation to compliance, and the others related by a positive unit-formation to noncompliance. What the results of Cohen and Brehm seem to indicate is that, at least under their experimental manipulations, the second ones were more important than the first ones.

But as we express this possibility we realize how paradoxical it is: if (other aspects being equivalent) at the moment of decision the negative aspects of alternative A exceeded those of alternative B, this one would have been preferred by application of the principle in p. 68; the relations of the two alternatives would have been

$$|\measuredangle \underline{E}EB_p| + |\measuredangle \underline{E}EA_n| + |\measuredangle \underline{E}EExp_{n2}| > |\measuredangle \underline{E}EB_n| + |\measuredangle \underline{E}EA_p| + |\measuredangle \underline{E}EExp_{n1}| \quad (21)$$

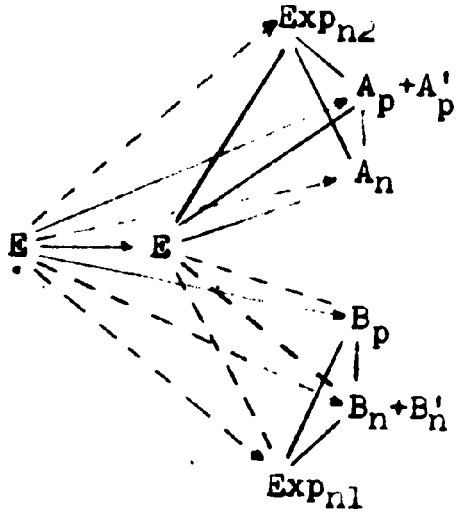
and

$$P_B > P_A \quad (22)$$

so that the decision would have favored decision B (the EB lines would have been EpB, and the EA lines, EnA). But we know this was not the case, since the subjects complied. Is this to be taken as a proof that our formulation is unable to handle the data? We do not think so.

The answer lies in the second column of Table 15, p. 119; above. For some unknown reason, subjects who were illegiti-

mately threatened felt that they had more choice about whether or not to participate in the boring task to which they complied. We do not know why this was so, and, as we said before, Brehm and Cohen's rationale in pp. 201-205 and does not appeal to us. But whatever the concrete reasons for this to happen, we see that [43] the total situation, immediately before the decision, can be represented in terms of our theory by Figure (29):



(3)

We define A'_p as aspects of alternative A which generate positive affective orientations in the subject and are experimenter induced, but not cognized as such by the subject, and B'_n, similarly, for an equivalent set of aspects of

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[43] Similarly to the case of the subjects in the High Choice condition in Cohen and Latane's experiment, see above pp. 80 ff. and diagrams (25), (26) and (27).

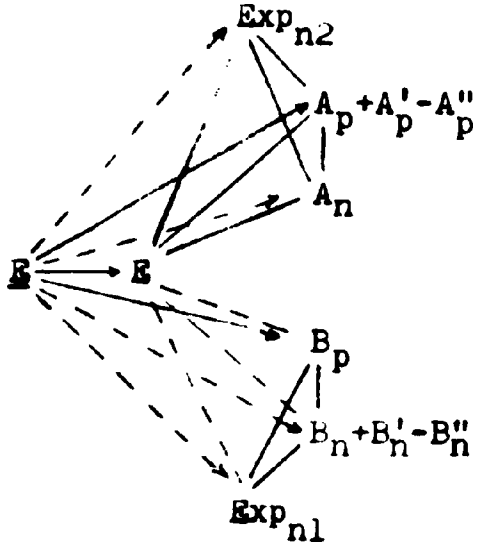
B generating negative affective orientations in the subject and induced by the experimenter, but not cognized as such by the subject. We use $\underset{\cdot}{E}$ because the situation which is represented is a future one. The relation between cycles in the preceding diagram (30) is:

$$|\underset{\cdot}{E}EA_p+A'_p|+|\underset{\cdot}{E}EB_n+B'_n|+|\underset{\cdot}{E}EExp_{n1}| > |\underset{\cdot}{E}EA_n|+|\underset{\cdot}{E}EB_p|+|\underset{\cdot}{E}EExp_{n2}|, \quad (23)$$

and, if $\underline{E}p\underset{\cdot}{E}$,

$$P_A > P_B \quad . \quad (24)$$

But soon after the decision, due to the lability of the A'_p and B'_n aspects (which we will represent, as in pp. 88 ff., above, by subtracting two subsets A''_p and B''_n from $A_p+A'_p$ and $B_n+B'_n$, respectively) the situation will be



(31)

And, in the limiting case in which

$$A''_p = A'_p \qquad (25)$$

and

$$B''_n = B'_n \ , \qquad (26)$$

the situation reduces to the one represented in diagram (29) and the relative desirability of alternatives will be

$$|\Sigma \underline{E}EA_p + A'_p - A''_p| + |\Sigma \underline{E}EB_n + B'_n - B''_n| + |\Sigma \underline{E}EExp_{n1}| < |\Sigma \underline{E}EA_n| + |\Sigma \underline{E}EB_p| + |\Sigma \underline{E}EExp_{n2}| ; \qquad (27)$$

so that

$$P_B > P_A \ . \qquad (28)$$

And we will have 'dissonance,' dissonance reduction' and, in the present case, 'satisfaction,' as a way of 'dissonance reduction' consistent with our model, since it is an increase in the number or importance of the positive aspects of the chosen alternative A, and results in an increase of $\underline{b}\ \underline{E}EA$ cycles.

So the unusual results of their experiment are in complete agreement with what we would predict by using our model and our formulation of 'choice' and, once more, the concept of volition does not seem necessary to account for our findings, and is operationally synonymous to 'choice'.

One more comment about these results. We said before that the reason why the Ss perceived more choice with high

illegitimate coercion than with low illegitimate coercion was unknown to us. A purely ex post facto formal analysis such as the one we may perform at this time is not likely to reveal the factual basis of this result. But it points clearly to the necessity (i) to do empirical research on the direct and indirect choice manipulations of the type generally used in "cognitive dissonance" experiments, which up to now have been taken pretty much for granted, and so (ii) to try to assess the detailed conditions for the emergence of 'perceived choice' or, in our formulation, for the emergence of decisive aspects of the type A'_p and B'_n. The use of illegitimate coercion seems to be a promising approach to such empirical research. And we may offer the hunch that such research will lead us into a more complex model, a multistage one, with two or more levels of awareness, or cognitive subspaces. In such a model our definition of aspects of the type A'_p and B'_n as "aspects of an alternative induced by the experimenter (or any other external agent) but not cognized as such by E" (above, p.79), takes a new meaning: aspects of whose source the subject is not conscious. This ties directly with some explorations we have been making with a multilevel model (which we will not describe here), on the possibility of mapping in terms of balance theory (a) some of the mechanisms of defense and (b) the relationships among different subsystems of cognitive and affective orientations (ego, superego, id, etc.).[44]

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[44] See Cartwright and Harary, 1959.

CHAPTER XIX

COMMENTS ON SOME EXPERIMENTS WHICH APPARENTLY CONTRADICT OUR THEORY

Up to now we have been able to interpret the results of the experiments we have studied as being the effect of changes toward balance generated in configurations of cognitive and affective orientations as a direct function of the preferability of rejected alternatives, and as an inverse function of the preferability of the chosen ones. But there are several experiments which seem to contradict this principle. We refer to the studies by Aronson and Carlsmith (1962), Zimbardo (1961) and Day (1961). Brehm and Cohen comment on these experiments in Chapter 10 (p. 178-187), under the heading "Expectations and inequity: a dissonance approach." In all of them, subjects in some of the experimental conditions chose the--apparently--less preferable alternative (more effort, in Day's experiment; incorrect response, in Aronson and Carlsmith's, etc.). Aronson (1960), and Brehm and Cohen (1962, p. 178 ff.) explain these outcomes as an effect of the prior expectations of the subjects. We think that some of the results may be explained, as in our previous examples, by the analysis of the preferabilities of the alternatives, without involving the expectations of

the subject. In one case, the results are the 'paradoxical' effect of a negative orientation of the subject toward himself (negative self-esteem, mapped in an EnE or Ene line). We will present this case in the first place.

Aronson started with an extension of dissonance theory to the problem of expectations (Aronson, 1968). According to him, if we want to determine what, for a given individual, is consistent or inconsistent with what, we must take account of the subject's expectancies: "...events that confirm expectancies are consonant, sought out, while... events that disconfirm expectancies are dissonant, to be avoided, minimized or cognitively distorted so as to render them more consonant."

In their experiment, Aronson and Carlsmith (1962) gave subjects sets of photographs to judge.

> The subjects were told that one of three photographs on a card was that of a hospitalized schizophrenic and that the test was designed to measure their ability to judge accurately. There were 100 cards in all; they were grouped into five sets of 20 cards each. After the subject had made 20 judgements, the experimenter scored his performance, and the subject moved on to the next set. By false feedback, half the subjects were led to believe that they had scored consistently high on this "personality attribute"; half were made to believe that they had scored consistently low. Thus, when beginning the fifth section, some subjects expected to score high, while others expected to score low. On the fifth and final set, half the subjects in each condition had their expectancies confirmed by false feedback; half had their expectancies disconfirmed. Then, under a pretext, the experimenter allowed the sub-

> ject to judge the fifth set again. The dependent variable was the number of judgements the subject made on the repeated fifth trial that differed from the ones he made the first time.
>
> Aronson's theory leads him to expect that those subjects whose expectancies are confirmed will be content with their score, while those whose expectancies are disconfirmed will change their responses in an attempt re-establish a consistent self-concept regarding their performance. For those whose performance is less than their expectation, the prediction is straightforward, but for those whose performance exceeds their expectations, the startling prediction is that they would prefer to believe that their sensitivity is low and thus change their responses, rather than have their expectations of failure disconfirmed. Aronson's data strongly support his contentions in this regard (Brehm and Cohen, 1962, p. 179).

In their comment on their experiment, Brehm and Cohen introduce as an independent motive the "expectancy motive":

> It should be clear that in the expectation model presented by Aronson, the motive to resolve the inconsistency between expectations and performance is seen as an overriding social motive, so strong, in fact, as to take precedence over such a powerful social motive as achievement (1962, p. 180).

and

> ...the dissonance arising from the discrepancy between expectations and, for example, successful performance, as in the Aronson and Carlsmith (in press) experiment, is presumably resolved in favor of satisfaction of the expectation motive rather than the achievement motive on an a priori basis. But the central question here is: What are the relative strengths of the motives involved (i.e., expectancy-fulfillment and achievement) in relation to the discrepancy-producing behavior of the person? That is, if the person makes some commitment to a given behavior (succeeding) that is discrepant from his prior cognitions (the expectation that he will fail), why does he resolve that dissonance by failing on the next trial, in other words, by

fulfilling his expectancy motive and frustrating his achievement motive? (Id., id., p. 181).[45]

Our model points to an alternative interpretation of the results of Aronson and Carlsmith's experiment which does not need to create a new motive.[46]

Our explanation is based on the EE affective orientation, which up to now, in our experimental comments, we have always assumed to be EnE. It is plausible that the false feedback by the experimenters convinced the subjects in the Low Performance condition that they had, indeed, "scored consistently low on their ability to judge accurately." We do not believe that this resulted, for the subjects in a total negative orientation toward themselves, EnE, but it did result in a partial one, at the level relevant to their performance in this experiment.

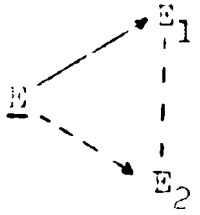
Our previous remarks (pp. 32-33, above) about the EE orientation are relevant here. We believe that a negative affective orientation toward one's self is always partial, and circumscribed to one or more configurations

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[45] We quote from Brehm and Cohen, 1962, p. 178, since Aronson's paper has not been published.

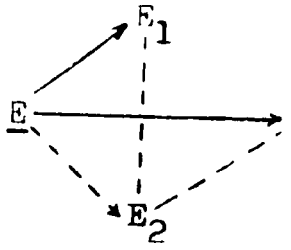
[46] We tend to be cautious about using ad-hoc motives as explanatory devices. We feel that if a psychological theorist permits himself to invoke a new motive each time he has a set of results to interpret he may end up giving new names to the phenomena he is trying to explain (i.e., to relate to other phenomena). A case in point is what happened at an earlier time with the proliferation of "instincts" as explanatory constructs.

of orientations, or at most, predominant in a subsystem of orientations (conscious or unconscious parts of the ego, conscious or unconscious parts of the superego, etc.). We assume a less than complete isolation between (i) configurations or subsystems in which EnE and (ii) those in which EpE. We believe that the simultaneity of both types of orientations in the same configuration or subsystem is quite possible: a real ambivalence toward the self. This is probably the case in Aronson and Carlsmith's experiment: the negative feedback given the Low Performance subjects about an incidental performance depressed their self-esteem in a given context, or level. So that, possibly, their orientations toward E were of the type:



(32)

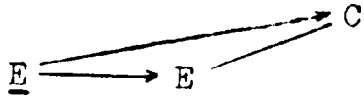
where E_2 represents the cognized aspects of the subject with regard to his performance in the experiment and E_1 the rest of the cognized aspects of the subject. We map the correct answer to the experimenter's question into a point C (leaving aside, for a moment, its possible negative aspects), and we represent the situation of the subject in the Low Performance condition as



(33)

a more balanced situation than would exist with E_2pC. There is a zero line between C and E_1 and a negative unit-relation between E_1 and E_2, as a representation of the fact that, as we said before (a) some degree if isolation exists between a configuration in which EnE prevails and the rest of the subsystem or system of orientations, and (b) E_2, and not E_1, was relevant to the performance in question.

To the extent that this (admittedly simplified) mapping is correct, EnC will result, for subjects in this condition, in a more balanced situation than EpC. For subjects in the High Performance condition the situation will, of course, be



(34)

The second experiment which apparently contradicts our propositions was performed by Zimbardo (1,61). We will report in extenso Brehm and Cohen's summary of this experiment, because the original is an unpublished manuscript:

Zimbardo solicited the opinions of undergraduates at

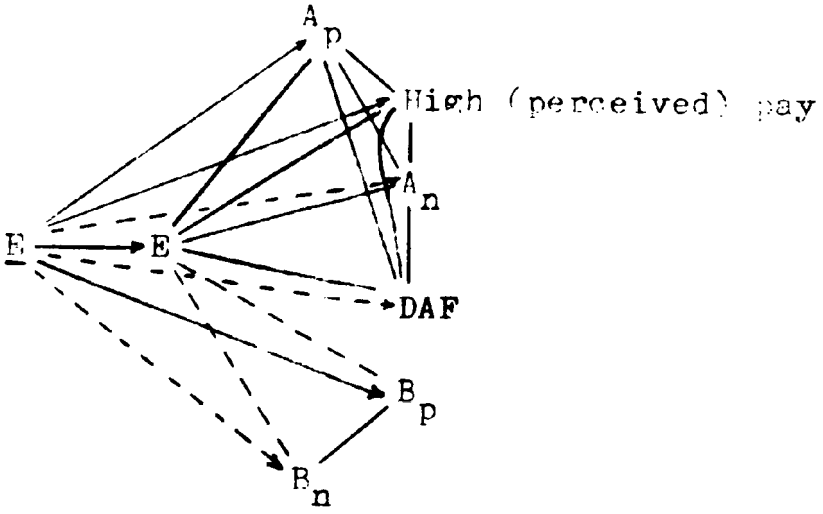
New York University on a number of important issues. We chose 75 subjects who rated the "adoption of a numerical grading system" as the most important issue presented and who were all very strongly in favor of adopting a numerical system. Several weeks later the subjects individually participated in a study of "verbal behavior under various experimental conditions." They were told that as a part of the study they would have to read a report which was in fact a series of arguments against the numerical grading system which they favored. To create variations in dissonance, half the subjects read the report under conditions of high effort, while half read the report under conditions of low effort. Effort was manipulated by having the subjects read the report aloud under varying conditions of delayed auditory feedback: In the high effort condition subjects received a delay interval of .3 seconds; in the low effort condition, their delay interval was .01 seconds. Pretesting had shown that the .3 second delay, compared with the .01, would create more disruption of the subject's speech, make comprehension more difficult, and hence increase the effort necessary to perform adequately. Immediately after reading the report opposing his own stand on the grading system, the subject was given the postquestionnaire regarding his opinion on the grading system. The data show that the effort manipulations were entirely successful, and though the effort conditions did not differ in recall of the information given in the report or in change on irrelevant attitude issues, they did differ in the amount of relevant attitude change obtained: The high effort subjects became significantly more opposed to the numerical grading system than the low effort subjects (Brehm and Cohen, 1962, pp. 30-31).

Zimbardo found that those subjects who felt that they were overpaid for committing themselves to the discrepant behavior perceived that they had actually exerted more effort in the delay apparatus than those subjects who did not feel that they were overpaid (Id., p. 186).

Brehm and Cohen relate these results to Adams' theory of overcompensation and inequity (1961) which assumes that "a person will experience the discomfort of inequity when he is relatively overcompensated as well as when he is relatively undercompensated." (Brehm and Cohen, Id.,

p. 147). From Brehm and Cohen's exposition (which we must use, since both originals are unpublished), Adams' theory of overcompensation and Aronson's theory of expectation appear to be rather closely related. Instead of having recourse to the concepts of expectations or inequity, we think our usual explanation in terms of the relative preferabilities of compliance and noncompliance is applicable here.

If we map into a point High (perceived) pay, as an aspect of alternative A (compliance) and into another point DAF (delayed auditory feedback), as a negative aspect of the same alternative, we have that, for subjects "who felt that they were overpaid for committing themselves to discrepant behavior" the situation may be represented thus:



(35)

where B represents noncompliance, and A_n includes, as in previous diagrams, the resistance to reading a report which was in fact a series of arguments against the system they

favored.

We see now clearly that what Brehm and Cohen believe to be an atypical result, requiring a special rationale in terms of 'equity,' is instead the normal result in cases of high reward: low dissonance. The 'overpaid' subjects perceived their effort in the DAF apparatus more realistically than the subjects who perceived they were overpaid, because in their case (i) High (perceived) pay (an external A_p aspect) increased the b EEX cycles and (ii) fewer changes toward balance [47] were necessary for them than for subjects who perceived the situation as one of low reward. It is probably in this latter group of subjects that EnDAF was minimized, as could be predicted by our propositions III and IV.[48] In summary, in the High (perceived) pay situation the chosen alternative is more preferable, and less 'dissonance'--and distortion--takes place.

In the last of the experiments we will study in this chapter, as apparently contradicting our propositions about preferability of alternatives, Day (1961) trained children to obtain a given amount of candy according to the force with which they pushed a plunger. After they had stabil-

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[47] In this aspect of the experiment, through minimization of EnDAF.

[48] See pp. 68-69, above.

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[47] In this aspect of the experiment, through minimization of EnDAF.

[48] See pp. 68-69, above.

ized the strength of their response, they were given for the next five trials a high reward (a marked increase in the usual amount of candy) irrespective of the force with which they pushed the plunger.

In terms of our formulation, the results are paradoxical, and more difficult to explain than those of the previous two studies reviewed in this chapter. 64% of the children suddenly rewarded with an increase in the amount of candy increased the strength of their push on the plunger.[49] These results seem to go directly against what we would have predicted.

However, although we do not have a rationale to explain them, we believe that this apparent contradiction with the principles of our theory stems basically from a conception of effort as a purely negative aspect of the situation. We do not believe this to be an adequate conceptualization because in this experiment the effort of pushing (i) does not seem to be extremely negative and (ii) it seems to have also positive aspects.

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[49] "When only the oldest third of the population is isolated (children between 5.2 years and 6.4 years), 80% of the subjects increase their response strength whereas only 20% decrease it." (Brehm and Cohen, 1-62, p. 183).

CHAPTER XX

EXPERIMENTS INCLUDING NEGATIVE SELF-EVALUATION (Bn$)

Up to now, only Aronson and Carlsmith's experiment (1962) has involved considerations of self-evaluation and changes in the $E relation. The present chapter will deal with other examples in which this relation is relevant to the experimental results.

The first one will be an experiment by Cohen and Zimbardo, reported originally in Brehm and Cohen, 1962, p. 143:

> Subjects' needs for achievement were aroused, and they were then given a disturbing 5-minute failure experience with a task on which it was extremely difficult to conceive of the possibility of success....They were then asked to commit themselves to a further 50-minute session under the same conditions. This situation was supposed to produce dissonance, since subjects whose motives were to avoid a failure situation would then be committing themselves to experiencing further failure. The magnitude of the dissonance was manipulated by varying the subject's expectations of how well he would do in the next session. Half the subjects were told that they would probably do "very poorly," half were told that they would do "not too badly." Changes in the subject's behavior associated with approach or avoidance of the failure situation could then be taken as an index of the change in motivation serving to reduce dissonance. (Brehm and Cohen, 1962, pp. 144-145).

Procedure

Subjects were...individually...taken into a soundproof room where they donned earphones.

1. (They) were given instructions designed to create a high level of motivation to succeed. They were told, through the earphones, that this was "a study of students' ability to memorize, interpret, and understand some materials under adverse conditions." These instructions stressed the creativity, sensitivity, and general ability needed to perform well under certain disruptive speech conditions.

2. The subjects were then given a poem to read aloud and 3 minutes to memorize it.

3. All subjects were then required to recite the poem from memory and to discuss its psychological implications under conditions of delayed auditory feedback. Specifically, a delay of .2 seconds was mechanically interpolated between their speaking and the return of their speech sounds over the earphones. Delayed auditory feedback (DAF) usually produces speech, emotional and thought disturbances, and, because of the novelty of the experience, subjects do not have established standards for "good" performance on this task.

Manipulation of Dissonance

...All subjects were told that, "In a second session for which we are asking our subjects to volunteer, we will be studying the same phenomenon but for a full 50-minute period and not for only 5 minutes as in the initial session. Although participation in this initial session is part of your course requirements, volunteering for the second session is entirely up to you. Since it will be after the regular term is over, we are giving all of our subjects $2.00, a nominal fee for returning for the second session. Now, before I ask you whether you wish to return at a time convenient to you, let me tell you that from our experience and analysis of several response

measures obtained from you today, we can tell you that, compared to all of the other students we have tested, next time you will:

(High Dissonance:) perform very poorly, among the worst subjects we have ever run.

(Low Dissonance:) perform not too badly, about average or a little less than the average subjects we have run. In spite of this, we would like you to return for a second session. Will you be able to come?" At this point the subjects' freedom of choice was stressed several times. If subjects agreed to return (and all experimental subjects did agree except for one additional subject in the High Dissonance condition), they were scheduled for the alleged second session, filled out a petty cash voucher, and committed themselves by signing their names.

Measurement of Motivation

DAF DIAL SETTING. After agreeing to return, subjects were told that the initial testing was over and they were brought into the "apparatus room" and shown the DAF equipment. They were shown the recorder and the dial indicating the delay interval. They were told that in the initial session the interval was extreme and constant at point 13 on the 15-point scale. It was stressed that the size of the delay determined the amount of speech disruption and presumably the amount of failure the subject experienced and that a shorter delay would enable one to perform much better. Subjects were then told that, since they knew their own subjective reaction to the situation, we would like them to choose the point on the dial with which they would like to begin the next session (and keep for at least half the session). The subject then adjusted the dial himself in response to the request that he select the interval he wanted to experience in the second session. The subject could see how the tape loop changed speed as a function of the direction and extremity of dial setting.

RECALL OF INFORMATION. After the subject had set the dial, he was taken out of the "apparatus room" and given an essay to read. This essay was a two-page article purportedly written by Hebb and dealing with the advantages of research on auditory feedback. After 5 minutes, subjects were asked to recall the advantages and disadvantages of research on auditory feedback by listing points specifically mentioned in the article as well as any others of which they could think. They did this on a sheet with two columns labeled "advantages" and "disadvantages." It was assumed that a count of the ratio of disadvantages to the total number of items would indicate the strength of the subject's avoidance motivation for the task.

CHECK ON THE MANIPULATION AND COGNITIVE AVENUES OF DISSONANCE REDUCTION. The subjects were then asked to indicate on 81-point scales:

(a) "When you were asked to return for an additional 50 minutes and told how well you would probably perform, how well did you actually anticipate performing in the 50-minute session to follow?" This scale ran from "Extremely poorly" to "Very well."

(b) "How well do you want to do when you go into the experimental room and speak into the earphones?" The scale varied from "Not at all well" to "Very well."

(c) "Considering that you had to participate in this initial session as part of the course, how much choice do you feel you had in whether or not to put in the additional time on the tape recorder feedback task?" The scale here ran from "No choice at all" to "Complete choice."

(d) "How obliged did you feel to participate in another session with the tape recorder feedback task?" The subjects rated their perception of the obligation on a scale that ran from "Completely obliged" to "No obligation at all."

> CHANGE OF TASK ALTERNATIVE. When the subject sat in the sound cubicle, he had placed his finger on an electrode and was told that this was measuring autonomic responses. The procedure gave no data but was merely instituted as a device to measure change of task laternative. After the checks on the manipulations, the subjects were shown a typical PGR record and a scale used to measure deflections on the record. They were told that: "We have a great many such records to analyze and it is a somewhat tedious job, which has to be done." They could help out equally well during the next session by being a subject in the DAF experiment, as they were in the present session, or by spending the same amount of time for the same $2.00 in analyzing the PGR records. They indicated their wishes on a five-point a priori scale that ran from "Much rather be a subject in the DAF part of the study" to "Much rather assist in analyzing the PGR records." (Brehm and Cohen, 1962, pp. 145-148).

Brehm and Cohen analyze the results according to their assumption that the dependent variable in their case is the change in the "avoidance motivation" of the subjects.

We transcribe Cohen and Zimbardo's findings, which we will later summarize in a table:

> Results
>
> The check on the prospect of failure manipulation showed that the mean of the High Dissonance subjects was 4.50, while the mean for the Low Dissonance subjects was 5.51. While the means are in the right direction, indicating a tendency for the High Dissonance subjects to expect more failure, the difference between conditions is not a very reliable one (p is less than .20). We can only tentatively conclude that the dissonance manipulations may have been effective, though they seem not to have been as clear as one might wish.
>
> The major issue in the present experiment concerns the changes in actual behavior that are assumed to reflect dissonance-produced changes in motiva-

tion. When we examine the major dependent variable, we see a strong effect of the dissonance manipulation: Nine out of ten subjects in the Low Dissonance condition decreased the DAF interval whereas only two out of ten in the High Dissonance condition decreased it. In fact, those in the High Dissonance condition kept the dial pretty much as it was set, while the Lows reduced the interval considerably, presumably as a function of their stronger avoidance motivation. The mean change for the high group is +.03; for the Low group, -3.42. The difference between the conditions, with an N of 10 in each condition, is significant at less than the .05 level by t test (t = 2.35).

The data on task change also indicate a lessened avoidance motivation on the part of the High Dissonance subjects. When the subjects are broken into those who want to change and those who want to change and those who want to remain with the DAF task, the High Dissonance subjects show a greater tendency to stay with the DAF task than the Lows. Not one of the Highs wants to change tasks, while four out of ten Lows prefer to change to the PGR task (p is less than .10 by chi-square test). The data on recall of disadvantages associated with the task also show a trend in the same direction. The difference is unreliable (p is less than .20 by chi-square), but the High Dissonance subjects tend to list fewer disadvantages of the DAF task than the Low Dissonance subjects: 13.3% of the items listed by the Highs are disadvantages, while 22.8% of the items listed by the Lows are disadvantages.

Although the data on task change, and especially on recall, are rather weak, they are quite consistent with the DAF dial-setting data. Thus, the High Dissonance subjects decrease the DAF interval less, want to change tasks less and tend to recall relatively more positive qualities of the task. This consistent range of behaviors appears to be directly related to the amount of deprivation to which subjects committed themselves. When committing himself to failure, the greater the subject's promised failure, the more the dissonance and the more the consequent reduction in motivation to avoid the failure situation, so as to make his commitment consistent with his motivation.

> This greater decrement in motivation to avoid the situation is reflected in a greater behavioral involvement in the DAF situation.
>
> In addition to providing some behavioral evidence for the effects of dissonance on motivational change, the present experiment also shows that dissonance can be reduced through cognitive change. The measure of the subject's desire to do well and the measures of choice and obligation are relevant here. The former measure indicates that, for subjects with greater dissonance, there is less cognized intensity of success motivation. Though the difference between conditions is not very reliable ($p < .20$), the mean for the High Dissonance condition was 5.0; for the Low, 6.1. The data also show that subjects in both conditions generally felt a great deal of choice and little obligation to commit themselves to further deprivation. However, the experimental groups differ in the degree to which the subjects felt they were "coerced." With high means indicating more choice and less obligation, the means for the High Dissonance condition on the choice and obligation items, respectively, were 4.94 and 5.02, while for the Lows they were 6.67 and 6.77 ($p < .10$, $p < .05$). These data tend to support the notion that the Highs reduced dissonance more than the Lows by increasing their feelings that they were "forced" into commitment and by saying that they have less motivation to succeed. (Brehm and Cohen, 1962, pp. 148-150).

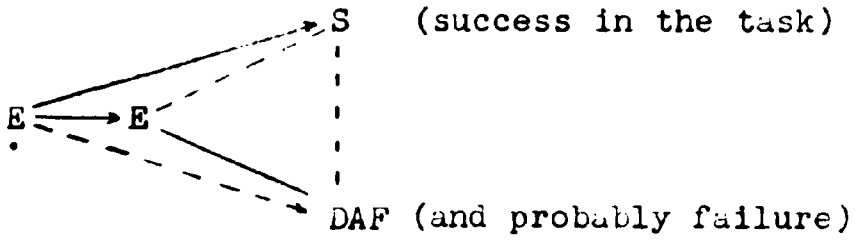
We will interpret the same results, as we did before with the ones in Aronson and Carlsmith's (1962) experiment, as being the effect of a difference in self-esteem between experimental conditions. With negative feedback ("we can tell you that, compared to all of the other students we have tested, next time you will perform very poorly, among the worst subjects we have ever run") we believe a partial negative orientation toward themselves was obtained in the 'Low

Performance' subjects. All the limitations of this notion we stressed before (p. 130, above) are pertinent here: the EnE orientation is probably partial, isolated, restricted to a configuration or set of configurations relevant to the experimental performance, etc. What we want to avoid by these qualifications is the crude image of a negative orientation toward the self as being some kind of "revese gear" which indiscriminately changes the sign of all cycles in all configurations. Things never happen in this wholesale way, and one of the first tasks of an experimental exploration of the impact of decreased (or reversed) self-evaluation on balance, dissonance, motivation, etc., will be to chart the limitations of such a "reversing" process.

If our interpretation is correct, we may condense Cohen and Zimbardo's findings in the following table:

	Decrease in difficulty of DAF setting	Recall of disadv. of DAF.	Change to a different task	Desire to do well next time
EpE Ss ('High Performance')	90 %	High	40 %	High
EnE Ss ('Low Performance')	20 %	Low	None	Low
	($p. < .05$)	($p < .20$)	($p. < .05$)	($p. < .20$)

The differences between the EpE and the EnE subjects may be summarized thus: the EnE subjects showed a greater tendency to commit themselves to work with an unchanged (and quite difficult) DAF interval, while the EpE subjects decreased the interval and in general tended to reject more the most difficult forms of the task. How would we represent this in our model? We believe that the situation, for the EpE subjects, in a simplified way, is the following one:

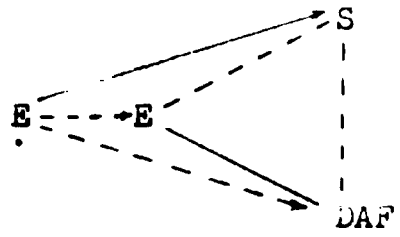


(36)

We have omitted the negative aspects of S and the positive ones of DAF, which will not change in the course of the experiment and may be included in a ceteris paribus proviso. We see that for EpE subjects commitment to High Difficulty in the DAF setting results in all EEX cycles being unbalanced. We expect changes toward balance, and we find them in the preceeding table: (a) decrease in the difficulty of the DAF setting (decrease in the intensity of the E-DAF relationship), (b) high recall of the disadvantages of DAF as a research tool (equivalent to a decrease of the relevance of the whole situation), (c) high change to a different task (affecting again both the relevance of DAF and the E-DAF line, which is transformed into a zero line), and, (d) high desire to do

well next time (which for them is more probable, according to the feedback, and will hence result in a b EEX cycle).

The situation for EnE subjects is



(57)

and it is apparent that they have no reasons to change it, since it is balanced; this is confirmed by the experimental results, which follow the opposite pattern from the one of EpE subjects.

The second example of an study in which negative self-evaluation was induced, is an experiment by Gerard (1961). In it subjects were first made to fail or to succeed in judging a series of perceptual stimuli. The next experimental step was a situation analogous to Asch's studies on group pressure and individual judgements. In this situation the subjects perceived quite clearly an unambiguous perceptual stimulus, but two other 'subjects' apparently gave unanimous but often wrong responses. The subject had an 'electrode' placed on his arms, and he was informed that it was used to measure the implicit movements of his muscles, recording his "first impulses" for each of the next series of judgments on a panel placed in front of him and on

similar panels in front of the other two 'subjects.' The subject was always the last of the three to make a judgment, so that he knew the responses of his partners and his own 'first impulse' before voicing his opinion. In the trials that followed, the signal on the subject's panel was manipulated according to the experimental condition to which he belonged. Part of the subjects were made to believe that their 'first impulse' was to conform to the two other subjects; the rest was made to believe that they tended to deviate from the other two. If we combine these two experimental conditions with the previous two we have subjects who cognized themselves as

(a) Success Conformers;

(b) Success Deviates;

(c) Failure Conformers;

(d) Failure Deviates.

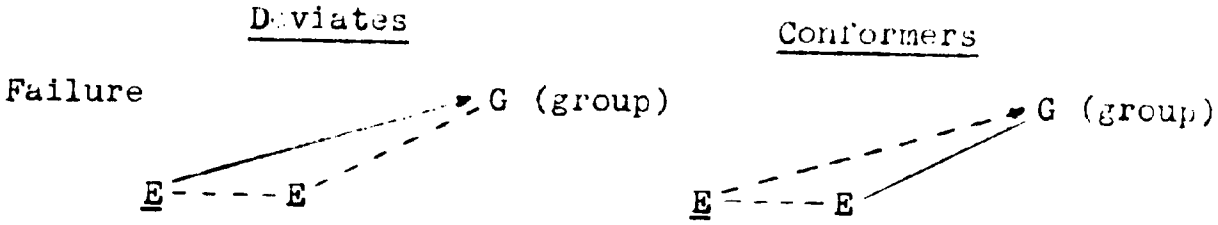
Gerard measured attraction to the group as a way of dissonance reduction. We present his rationale and his results as reported by Brehm and Cohen, because Gerard's study has not been published:

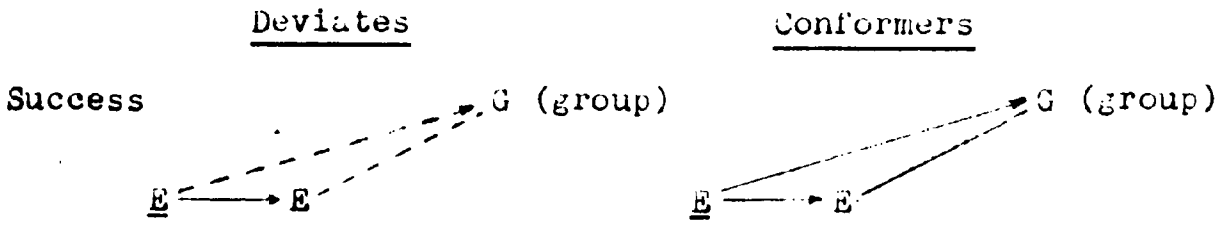
> Gerard was interested in the subject's attitude toward the group as a means of reducing dissonance in this situation. He measured attraction to the group by a projective "test" given to the subjects after the conformity manipulation. In this case,

> having "conformed," the subject can reduce the dissonance between his "behavior" and cognitions about himself by increasing his attraction to the group to which he presumably "conformed." The higher the subject's ability, the greater the dissonance and consequent attraction. Thus one's behavior is made consistent with one's attitudes: behavior and cognitions are seen to be consonant when conformity to a group to which one is attracted occurs (brehm and Coehn, 1962, p. 40).

> For the subjects who were led to believe that they conformed to the group (i.e., acted in a manner inconsistent with their perception of the physical stimulus)...the higher their ability, the more the...consequent attraction and conformity to the group. On the other hand, those subjects who were led to believe that they had not conformed (i.e., had acted in a manner consistent with their perception of the physical stimulus)...the higher their ability, the less attractive they found the group that communicated the discrepant information... (brehm and Cohen 1962, p. 112).

The simplest way to map these results is by the following balanced situations, representing the cognitive and affective orientations of typical subjects in each of the four experimental conditions:





where EpE is high self-evaluation relevant to the task (equivalent to high perceived ability), EnE is low self-evaluation, EnG is non-conformity with the group, EpG is conformity, EpG is High attraction to the group and EnG, Low Attraction to the group.

Our final example is the study by Malewski (1962). We will describe it in some detail because it is published in a narrowly circulated journal (the Polish Sociological Bulletin). Malewski's theoretical assumptions are quite similar to the ones which may be deduced from our model:

> If we assume that people have a need to reduce cognitive dissonances, and if, moreover, we assume that their cognitions concerning themselves play a key role among the total number of their cognitions then it may be expected that people will defend themselves not only against information less favourable than their own self concept, but also against more favourable information. In particular, it may be expected that people who have a very positive self-evaluation will defend themselves against information which might put them in an unfavourable light. People, on the other hand, who have a very unfavourable self-evaluation will be likely to defend themselves against information which might present them in a more favourable light. (Malewski, 1962, p. 39).

and, after describing the usual 'dissonance' formulation of the changes in attractiveness of the chosen and the rejected alternatives after a decision, he goes on to say:

> ...The psychological meaning of this mechanism is clear: its purpose is to defend the decision-maker from the conviction that he has made a wrong choice--a conviction that might hurt his self-esteem.
>
> It should be expected, however, that this defense mechanism will occur only in people who have a positive self-evaluation. In people who have a negative self-evaluation the opposite mechanism should occur--namely, a mechanism defending them against the conviction that the choice they have made was a correct and proper one. For a flattering view of their own decisions would be dissonent with their basically negative evaluations of their own abilities.
>
> These considerations lead to two hypotheses.
>
> 1. Among people who have a positive self concept, directly after decision-taking the predominant tendency is for the attractiveness of the rejected alternative to decrease.
>
> 2. Among people who have a negative self concept, directly after decision-taking the predominant tendency is for the attractiveness of the chosen alternative to decrease, and for the attractiveness of the rejected alternative to increase. (Malewski, 1962, p. 40).

Malewski conducted a free-choice experiment quite similar to Brehm's study on "Post-decision changes in the desirability of alternatives" (1956), by having his subjects rank a series of desirable objects before and after choosing

among two of them. He then obtained direct and indirect measures of self-esteem consisting in a self-evaluation questionnaire, sociometric data, and questionnaires in which the subjects (girls aged 11 to 14) rated each other on need domination and need achievement.

His results are reported as follows:

> According to (the usual)...hypothesis referred above, directly after decision making there is a tendency for the chosen alternative to gain in attractiveness and for the rejected alternative to lose in attractiveness. Our data show that this tendency is indeed much stronger than the reverse. Among the 46 girls whose choices showed a change in attractiveness, 28 evinced the tendency described by Brehm, and 18 the reverse tendency. The difference is not very strong, however, and is rather less than significant (p —0.05).
>
> The situation changes, however, when we break up the given population in terms of sociometric position. The sociometric position is measured by the sum of sociometric choices accorded to each of the subjects, and by the number of non-reciprocal choices. Since the number of subjects was very small, very wide categories were used. Those girls who received a higher number of sociometric choices than the median were placed in the category of high popularity, while those who received a smaller number of sociometric choices than the median were place in the category of low popularity. Analogously, those girls whose number of non-reciprocal sociometric choices was lower than the median were classified in the in the category of high acceptance in the group, while those girls whose number of non-reciprocal sociometric choices was greater than the median were placed in the category of low acceptance in the group. The numerical distribution of the various types of reaction to a made decision are given in Table 1. (Malewski, 1962, pp. 43-44).

Table 1. Changes in attractiveness of chosen and rejected alternatives in the total group, and among girls of high and low popularity in the group.

Category of subjects	No. of subjects in whom there were changes of attractiveness consolidating the decision	No. of subjects in whom there were changes of attractiveness weakening the decision
1. Entire sample	28	18*
2. Subjects with a large number of sociometric choices	16	5**
3. Subjects with a small number of sociometric choices	12	13
4. Subjects with a small number of non-reciprocal choices	16	***
5. Subjects with a large number of non-reciprocal choices	12	12

Note: All the probabilities were calculated with the aid of the sign test (see S. Siegel, Non-parametric Statistics. New York, McGraw-Hill, 1956).

*p = 0.08

**p = 0.01

***p = 0.02

Table 2. Mean changes of attractiveness of chosen and rejected alternatives in the entire group and among popular and unpopular girls in the group.

Category of subjects	Changes in attractiveness of chosen alternative	Changes in attractiveness of rejected alternative	Sum of changes towards consolidation of decision made
1. Entire Group (N = 53)	+0.23	-0.18	0.41
2. Subjects with a large number of sociometric choices (N = 27)	+0.74	-0.6	1.34
3. Subjects with a small number of sociometric choices (N = 26)	+0.11	+0.15	-0.04
4. Subjects with a small number of non-reciprocal choices (N = 27)	+0.67	-0.63	1.30
5. Subjects with a large number of non-reciprocal choices (N = 26)	+0.19	+0.19	0.00

> The same tendencies are observed if we take into consideration not the number of people in whom the aforesaid changes in attractiveness occurred, but the mean magnitude of the change in attractiveness of the chosen and rejected alternatives (see Table 2). (Malewski, 1962, p. 45).

The data up to now seem to prove only that the usual processes of 'dissonance reduction' are limited to highly popular girls (popularity is assumed to be a possible indirect measure of high self-evaluation). But they do not prove that a "reversed" or " paradoxical" process of 'dissonance reduction' takes place in subjects with low sociometric status (and, perhaps, low self-evaluation).

Malewski does not present the numerical data on reactions to decision making of his High Self-evaluation and Low Self-evaluation subjects (or a similar breakdown) but he says in p. 47: "In the group which we investigated, those girls who had a less favourable self-evaluation did not differ in their reactions to decision-taking from those girls who had a more favourable self-evaluation."

We believe Malewski's result to be more significant than he thinks, for the following reasons:

(a) He did not manipulate his subjects' self-evaluation: he only measured it in a general way. It is probable that sociometric status, ratings by peers, and even self-ratings are not the best possible measures of self-evaluation as related to the kinds of decisions and attitudes

studied in Malewski's experiment. The manipulations used by Aronson and Carlsmith (1962), Cohen and Zimbardo (1962) and Gerard (1961) were much stronger and more direct, and produced much clearer results.

(b) These three experiments had another aspect which probably produced more clear-cut differences between conditions: the clearer relevance of the particular field in which the self-evaluation was manipulated. By relevance we mean evaluation of a particular aspect of the self which is related to performance, ability for a given task, etc. We referred to the possibility of the self-evaluation having different intensities and sign in diverse contexts in p. 130, above. Malewski is also aware of this possibility of partial negative self-evaluation, in a partially isolated field of relevance: "So far we have taken it for granted that every individual has either a favourable or an unfavourable self-evaluation. We know, however, that this is only a very rough approximation to the truth. The same person may have a favourable self-evaluation in one sphere, and yet an unfavourable self-evaluation in another sphere." (Malewski, 1962, p. 48).

(c) Malewski dichotomized his subjects instead of splitting them at the point of zero esteem, as the theory demands. Thus the 26 subjects who are low in sociometric position include a substantial number with positive self-esteem.

Table 4 separates them and the findings corroborate Malewski's second hypothesis:

Table 4. Low popularity in the group and declared self-evaluation, in relation to changes of attractiveness of chosen and rejected alternatives.

Category of subjects	Changes in attractiveness of chosen alternative	Changes in attractiveness of rejected alternative	Sum of changes towards consolidation of decision
Subjects with small number of received choices			
Rating of own person:			
High (N = 7)	+0.57	-0.86	1.43
Low (N = 19)	-0.05	+0.53	-0.58
Subjects with large number of non-reciprocal choices			
Rating of own person:			
High (N = 8)	+0.87	-0.63	1.50
Low (N = 18)	-0.06	+0.56	-0.62

Malewski did not include the same breakdown for High Popularity subjects. Only stronger manipulations or measurements of more relevant aspects of self-evaluation will provide an appropriate test of Malewski's theory. In any case, Malewski's hypotheses and his general theoretical approach in this area are the clearest and closest ones to the predictions of our model that we have found up to the present.

CHAPTER XXI

DIFFERENCES BETWEEN SELF-EVALUATION AND SELF-INVOLVEMENT

The experiments which we have reviewed in the last chapter dealt with (a) the direct manipulation of self-evaluation by negative feedback about the subjects' performances, abilities, etc., in one of the experimental conditions. This should not be confounded with (b) manipulations of self-involvement in which the importance of the issue is enhanced by saying to the subjects that their performance will be an index of sensitivity, ability, etc. E.g., in Brehm and Leventhal (Brehm and Cohen, 1962, pp. 192 ff); Cohen, Brehm and Latane (1959) in which the self-involvement was manipulated by making public the gains or losses of the subjects in one of the experimental conditions; Deutsch, Krauss and Rosenau (1962), in which the importance of a choice between foods was enhanced for some of the subjects by making the choice relevant to valued attributes of the self ("stressing the relationship between people's ability to judge subtle differences in the quality of foods and their judgmental ability in other areas, such as leadership aptitude, executive potential and artistic judgment.")

Zimbardo (1960), in which the importance of the opinions on a case of juvenile delinquency was varied by telling some of the subjects that their judgments were expressions of "basic values, personality, and outlook on important life problems," while other subjects were told that their opinions did not mean much.

The important difference between the two types of manipulation is that in the first case, (a) direct manipulation of self-evaluation, we have a EnE condition (more or less intense, depending on the success of the manipulation) while in the second case, (b) manipulations of importance through self-involvement, we have differences in the importance of the situation, opinion, issue, etc., across conditions, but the changes toward balance usually prevent the emergence of an EnE situation. Only the first type of manipulation is then apt to test the implications of our model for the case of EnE.

CHAPTER XXII

THE ROLE OF COMMITMENT, DECISION AND BEHAVIOR IN THE AROUSAL OF DISSONANCE

All the experiments we have studied up to now involve decisions, whether among negative alternatives, as in the 'forced-compliance' cases, or among positive alternatives, as in the 'forced-choice' experiments (see above, pp. 62-63, Chapter XII, for a characterization of the 'forced-compliance' paradigm and the 'free-choice' paradigm in the literature on dissonance). These decisions are instances of what Brehm and Cohen define as commitment:

> For the purposes of this discussion we assume that a person is committed when he has decided to do or not to do a certain thing, when he has chosen one (or more) alternatives and thereby rejected (one or more) alternatives, when he actively engages in a given behavior or has engaged in a given behavior. Any one or a combination of these behaviors can be considered a commitment. (Brehm and Cohen, 1962, p. 7).

What is the role of commitment, as defined, in the arousal of dissonance? In their first chapter, Brehm and Cohen adopt the position that commitment (a) generally provides a clear specification of psychological implication and (b) increases the resistance to change of some cognitive elements. (1962, p. 7-10).

(a) The specification of psychological implication by commitment.

According to Brehm and Cohen, commitment

> ...allows us to say, at least roughly, that certain cognitive elements are consonant with each other and that certain other elements are dissonant with each other (1962, pp. 7-8).

They analyze the following hypothetical example in terms of this aspect of commitment

> ...if a person decides to chew gum rather than smoke cigarettes, his knowledge that gum-chewing helps to prevent tooth decay is clearly consonant with this commitment (i.e., commitment to chew gum follows from knowledge that gum-chewing reduces decay), and knowledge that a close friend is offended by gum-chewing is clearly dissonant with the commitment. What should be noticed in these examples is that without the commitment to one of the two behaviors, the various knowledges concerning the benefits or penalties involved in gum-chewing and smoking may have no power at all to arouse dissonance. Knowledge that gum-chewing is socially offensive does not lead either to the knowledge or its obverse--that gum-chewing reduces tooth decay. But when a person actually does chew gum, these cognitions become relevant and are either consonant or dissonant with the knowledge of the (committed) behavior. (1962, p. 8).

According to this part of Brehm and Cohen's conceptualization, then, commitment facilitates the specification of what is consonant with what, and of what cognitive and affective orientations will be dissonant.

(b) The increase in resistance to change of some cognitive elements by commitment. For Brehm and Cohen, "commit-

ment increases the resistance to change of an element (or set of elements) and thereby affects the kinds of attempts to reduce dissonance that may occur." (1962, p. 8). If a person decided in favor of an alternative or behavior in a given way his cognitions about his own behavior are usually resistant to change, and this will help to determine what parts of his configurations of orientations will be affected by changes toward increase of balance.

Brehm and Cohen's position is summarized by them as follows:

> In summary, our position is that commitment is a condition under which: (1) The specification of dissonance and the manner in which it is likely to be reduced are relatively unequivocal; and (2) The implications are relatively unique in comparison with other theoretical approaches and frequently nonobvious in terms of common sense. This volume, then, will be primarily devoted to considerations of various implications of dissonance theory where commitment is involved (1962, p. 10).

Although these notions about the role of commitment in the arousal of dissonance are rather moderate, in the analysis of concrete examples Brehm and Cohen are sometimes carried to more extreme propositions (e.g., "...commitment provides the condition necessary for inconsistent information to arouse dissonance...", 1962, p. 195).

And their previous moderate position gives place, in p. 217, to this statement:

We have tried to show that commitment is a necessary

condition for the arousal of dissonance.

It is therefore relevant to analyze whether the role of commitment in dissonance theory should be the limited one advocated by Brehm and Cohen in their initial pages of their study on the basic one we have just seen. Is commitment (i) a useful experimental tool for a clearer specification of the relevance of inconsistencies and of possible changes, or (ii) a necessary condition for the arousal of dissonance?

Festinger's original notions about the nature of dissonance and its arousal may be an appropriate starting point for a conceptual analysis of these questions. His first definitions were quite ample, and no specification of decision or behavior on the part of the subject was included as a necessary aspect of dissonance:

> Two elements are dissonant if, for one reason or another, they do not fit together (1957, p. 12).
>
> ...two elements are in a dissonant relation if, considering these two alone, the obverse of one element would follow from the other (p. 13).

In p. 14, he gives a series of examples "...where dissonance between two cognitive elements stems from different sources" (logical inconsistency, cultural mores, inclusion of one specific opinion in a more general opinion and past experience). Most of those examples do not include decision or behavior ('commitment', in Brehm and Cohen's

terms) as a source of dissonance. And this conclusion can be extended to the whole of Chapter I (1957, pp. 1-31). Moreover, in his Foreword, Festinger recalls his very first inkling of dissonance theory in the following terms:

> The first hunch that generated any amount of enthusiasm among us came from trying to understand some data, reported by Prasad, concerning rumors subsequent to the Indian earthquake of 1934...The fact reported by Prasad which puzzled us was that following the earthquake, the vast majority of the rumors that were widely circulated predicted even worse disasters to come in the very near future. Certainly the belief that horrible disasters were about to occur is not a very pleasant belief, and we may ask why rumors that were "anxiety provoking" arose and were so widely accepted. Finally a possible answer to this question occurred to us-- an answer that held promise of having rather general application: perhaps these rumors predicting even worse disasters to come were not "anxiety provoking" at all but were rather "anxiety justifying." That is, as a result of the earthquake these people were already frightened, and the rumors served the function of giving them something to be frightened about. Perhaps these rumors provided people with information that fit the way they already felt. (Festinger, 1957, pp. vi-vii).

The victims of an earthquake, or the people near its area, are not committed to the catastrophe, in Brehm and Cohen's terms: it did not happen because of their choice, behavior or decision. But they are suddenly forced to accept it as an alternative to the usual state of affairs. It is a huge fact, the cognition of which is tremendously resistance to change. It involves powerful drives and motives and produces strong imbalance ('dissonance'). And the rumors about future disasters are a result of changes toward balance, conceptualized by Festinger in the passages

we quoted, and in Chapter X, pp. 235-243, as dissonance, and attempts at dissonance reduction.

What kind of experimental evidence could throw light on the question of whether or not commitment is a necessary condition for the arousal of dissonance?

We have not found, in the published literature on cognitive dissonance, a clear-cut study in which a condition involving decision or behavior on the part of the subject was compared to a similar condition without decision or behavior (commitment, in Brehm and Cohen's terms). However, Brehm's classical study on the post-decision changes in the desirability of alternatives (1956, and comments by Festinger, 1957, p. 61-71) contains some relevant data. A control situation was set up in which a gift was given to the subject, without his decision or behavior. No evidence of dissonance or dissonance reduction was found in subjects under this condition. But, as Festinger points out in p. 68, <u>no alternative gift was made relevant to the subject</u>. Under these circumstances, we would not expect dissonance to be aroused since preferability between alternatives was not involved. But this design suggests a possible experiment which could throw light on the question of whether

dissonance arousal is possible without commitment (i.e., without relevant decision or active behavior).

This could be the case in which the experimenter had the subjects, as in the usual free-choice paradigm, rank-order or in any other way assess the relative desirability of a series of attractive objects. He would then select two (or more) of them, point to them as the ones from which a gift would be made to the subject (and perhaps in some other way underline their relevance, as alternatives) and then flip a coin to determine which one the subject would receive. The preferabilities of the alternatives could be varied between subjects by selecting objects either quite similar or very dissimilar in attractiveness (as given in each case by the subject's rankings of the objects). We predict that with such design the reception of the gift, selected by chance between two (or more) relevant alternatives, will arouse 'dissonance' as a direct function of the preferability of the non-selected alternative and as a inverse function of the preferability of the selected alternative. We predict then, that the arousal of dissonance will be high in cases in which chance determines that the subject will receive the less attractive alternative of the two relevant ones. We also predict that in this case the greater the difference between alternatives, the greater will be the dissonance. When the subject is favored by chance with his preferred alternative (of the relevant ones) then the

smaller the difference in preferabilities, the greater the arousal of dissonance we will expect. The dissonance aroused, and its reduction, may be measured, as is usual in free-choice experiments, by changes in the rating of the attractiveness of the objects (increased attractiveness of the one the subject receives, and decreased attractiveness of the one he does not receive).

Our predictions stem directly from what our model seems to suggest. We do <u>not</u> think that only when the EX lines map a decision should propositions I through VI (above, pp. 38, 58, 69, and 71) hold. Obviously, only experimental evidence of the general type suggested by us in the present chapter will settle this question and decide whether the model has proved to be heuristically useful, or whether its application must be restricted to the mapping of post-decisional processes.

CHAPTER XXIII

POSSIBLE ORIENTATIONS FOR FUTURE RESEARCH

We have tried, in the preceeding chapters, to present some of the features of a model for configurations of cognitive and affective orientations. It is not a fully developed model, nor a complete one: (i) many of its implications have not been worked out, and (ii) it is partial, because, as it has been presented here, it is predominantly concerned with configurations of conscious affective and cognitive orientations.

These observations suggest the following possible orientations for future theoretical and empirical research based in the model:

(1) To explore more fully the formal implications of the model, in terms of graph theory;

(2) To expand it, so as to include not only conscious cognitive and affective orientations, but also other levels of awareness. In this connection, we plan to follow up the present study with a study of the possibility of using a more complex model to map diverse mechanisms of defense.

Other possible directions of study are:

(3) A more detailed analysis of the implications of different types of measurements for the mapping of importances into the lines and cycles of the model.

(4) A theoretical and empirical study of the problems of measurement of self-evaluation (the affective orientation mapped into the EE line) and of the mechanisms which limit to isolated subsystems of orientations the effect of a negative self-evaluation (EnE).

(5) A series of empirical studies, derived from the model, for some of which we have suggested a more or less detailed design in the preceeding chapters.

(6) An exploration of the possibility of using the model to map collective systems of interpersonal orientations (Newcomb, 1961, pp. 11, 14 ff.), analyzed in terms of degree of similarity or difference between the cognitive and affective orientations of the members of a group or collectivity of persons (i.e., of common, and eventually shared, cognitive and affective orientations).

CHAPTER XXIV

SUMMARY AND CONCLUSIONS

This study is an investigation of a formal model for the mapping of the configurational properties of cognitive and affective orientations in individual systems of orientation.

Each cognized aspect of the subject and of his present and past environment is mapped into a point in a cognitive space. The cognized relationships between all possible pairs of aspects are conceptualized as negative or positive unit-formations (Heider, 1958), and mapped into lines joining the respective pairs of points. Positive lines (represented by solid lines) are used to map the cognition of a positive unit-formation between two aspects, negative lines (represented by dashed lines) to map the negative unit-formations, and the absence of a cognized relationship between two aspects is represented by a zero line.

The affective orientations of the subject toward cognized aspects of himself or of the environment are mapped into lines joining (i) a point of origin, outside the cognitive space, with (ii) the point in the space corresponding to the aspect in question.

The mappings previously described result in the

representation of each psychological situation, or configuration of orientations, by a graph formed by points connected by positive lines, zero lines (the absence of a line) or negative lines.

'Cycles' and 'subgraphs' are defined in terms of Harary and Norman's formulations (1953), and 'balance' is defined in terms of Cartwright and Harary's formulations (1956). The model in general is formulated in terms of graph theory.

Concrete ways are proposed to represent (i) importances of cognized relationships between aspects (unit-formations), and (ii) intensities of affective orientations toward cognized aspects, in terms of magnitudes assigned to the lines joining two points of the graph. A rule is also proposed to determine the importance of each cycle, by multiplying the magnitudes assigned to its lines. Different types of analyses of psychological situations in terms of (a) accuracy of cognitions, (b) balance of the graph and subgraphs in which the situation is mapped, and (c) importance of these graphs and subgraphs, are studied.

Three general propositions are advanced, referring to: processes of change toward balance (propositions I and II, pp. 38 and 58), and decisions among alternatives in order to minimize imbalance (proposition III, p. 68).

As a test of the applicability of the model to empirical studies it has been used to reformulate and

analyze in detail the results of a number of experiments on phenomena of 'cognitive dissonance' (as formulated by Festinger, 1957, and Brehm and Cohen, 1962). Three special propositions have been advanced, referring to preferability of alternatives (proposition IV, p. 69), relation between changes toward balance and preferability of alternatives (proposition V, p. 71), and 'dissonance' as a function of the preferabilities of the chosen and the rejected alternative (proposition VI, p. 71).

The first experiment analyzed in terms of the proposed model is Cohen and Latane's study on "Choice in commitment to counter-attitudinal behavior." A new conceptualization of 'choice,' as a conditioning variable in dissonance arousal, is advanced, the notion of 'preferability' is defined and the principle is formulated that dissonance is a direct function of the preferability of the rejected alternative and an inverse function of the preferability of the chosen alternative. The model fits the data of Cohen and Latane's experiment accurately and suggests the possibility of new experimental designs.

This new formulation of 'choice' is compared to Brehm and Cohen's concepts of choice and volition (1962). Arguments are advanced in favor of abandoning Brehm and Cohen's notions and replacing them by a conceptualization of phenomena of dissonance as depending on the preferability of the chosen and the rejected alternatives. An ordering

of experimental findings on a dimension of preferability of the chosen alternative is proposed in Chapter XVI as a first attempt at obtaining parametric data and comparing results across experiments.

The results of various experiments, apparently contradicting the basic principle of dissonance as a direct function of the preferability of the rejected alternative and an inverse function of the preferability of the chosen alternative, are studied, and shown to be consistent with the model, when particular experimental circumstances are taken into account.

Three experiments (Cohen and Zimbardo, 1962; Gerard, 1961; and Malewski, 1962) are studied as proof that, as predicted by the model, the relation between dissonance and the preferabilities of the chosen and rejected alternatives is reversed when the subject has a negative affective orientation toward himself (negative self-esteem).

On the basis of the general characteristics of the model a straightforward extension of the dissonance paradigm to situations not involving previous decisions or active behaviors on the part of the subject is proposed, together with the design of an experiment to test such an extension.

Possible orientations for future research are discussed.

GLOSSARY

A	Aspect or aspects of object, event, course of action of alternative A.
A_p	Aspects of A, which generate a positive affective orientation in the subject.
A'_p	Aspects of A (which generate a positive affective orientation in the subject) induced by the experimenter, but not cognized as such by the subject.
A''_p	Subset of A'_p which is substracted from A'_p in some moment between (i) the decision in favor or against alternative A and (ii) the measurement of the dependent variable, in a experiment on dissonance.
A_n, A'_n, A''_n	Same as A_p, A'_p and A''_p, respectively, for aspect or aspects of object, event, course of action or alternative A which generate a negative orientation in the subject.
B, B_p, B'_p, B''_p, B_n B'_n, B''_n	Same as A, A_p, A'_p, A''_p, A_n, A'_n, and A''_n, respectively, for object, event, course of action or alternative B.
Balanced cycle	A cycle in which there are no negative lines, or an even number of negative lines.
Balanced graph	A graph in which all cycles are balanced.
Balanced subgraph	A subgraph in which all cycles are balanced.
b	balanced.

Cluster of cognitive elements, or cognitive cluster	Any set of cognized aspects of the situation indissolubly related because of their empirical relationships. Especially important clusters are those formed by the aspects of the same object, the same event, the same alternative or the same course of action.
Cycle	"A cycle of a graph is a collection of lines of the form PA, AB, ..., CP where all the points P, A, B, ..., C are different from each other." (Harary and Norman, 1953, p. 40).
E	Aspects of the subject, relevant to a situation, as cognized by himself.
$\dot{E}$	Point of origin of affective orientations when the graph maps the potential relationships of the subject to the cognized aspects of the situation.
$\underline{E}$	Point of origin of affective orientations when the graph maps the actual relationships of the subject to the cognized aspects of the situation.
$\underline{E}E$	(1) the line joining $\underline{E}$ to E; (2) the affective orientation mapped into that line; (3) the numerical value (or intensity) of that affective orientation.
EX	(1) the line joining E to X; (2) the unit-formation mapped into that line; (3) the numerical value (or importance) of that unit-formation.
$\underline{E}$EX cycle	A length-3 cycle including the points $\underline{E}$, E, and any other point in the graph.
$\lvert\xi\underline{E}E\rvert$	The sum of the importances of the affective orientation $\underline{E}E$ in all cycles included in a given expression or term.
$\lvert\xi\underline{E}X\rvert$	The sum of the importances of all the $\underline{E}X$ affective orientations in all the cycles included in a given expression or term.

$\lvert \mathcal{E} EX \rvert$	The sum of the importances of all the EX unit-formations in all the cycles included in a given expression or term.
Exp_p and Exp_n	Experimenter-induced new aspects of the situation which generate a positive or negative affective orientation in the subject, respectively, and are cognized by him as experimenter-induced.
$\lvert \mathcal{E} \underline{E}EX \rvert$	The summation of the number of cycles of type EEX combined with the summation of the absolute importance of all cycles of type EEX in terms of the importance of each relationship between pairs of points.
iff	If and only if.
Root	A root is a distinguished point of the graph (Harary and Norman, 1953, p. 42). In our graphs E or E will be treated as roots, to distinguish them from the rest of the graph.
Rooted graph	A rooted graph is one in which there is a distinguished point (Id., id., p. 42).
Subgraph	Any part of a graph.
u	unbalanced (not balanced, as defined above).
unit-formation	Any cognized relationship between two aspects. The unit-formations are mapped into positive or negative lines.
XpY	A positive relationship (either affective orientation or unit-formation) exists between X and Y.
XnY	A negative relationship exists between X and Y.

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