REINFORCEMENT AND COGNITIVE THEORETICAL PREDICTIONS OF ATTRACTION TOWARD TWO STRANGERS

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REINFORCEMENT AND COGNITIVE THEORETICAL PREDICTIONS OF ATTRACTION TOWARD TWO STRANGERS (Abstract)

Robert P. Murray

A series of experiments was carried out, using a procedure which had experimental subjects tell stories in the presence of two peers, one who rated the stories for "creativity" and the other who was an observer. The dependent variable of interest was interpersonal attraction, and previous investigators using a similar procedure had interpreted their results as supporting a social learning theory explanation. This paper attempted to demonstrate whether cognitive balance theory could account for the experimental results typically found in such a situation, and further whether some facets of the behavior would be explicable only with balance theory.

The hypotheses were broken down into two sets: those demonstrating the dominance of balance vs. reinforcement - predicted influences in the experiment, and those which demonstrated the existance of balance influences. Several personality measures were also used which prior studies had associated with different styles of responding to cognitive balance type situations. Subjects were female undergraduates.

The first two experiments had the Rater physically separated from the Storyteller, and the second experiment had the Observer separated as well. They tested the hypothesis of the dominance of balance vs. reinforcement: basically, reinforcement predicted that if the Rater was positive toward the Storyteller, the latter would like both Rater and Observer. If the Rater was negative to the Storyteller, she would dislike both Rater and Observer. Balance theory predicted the same when Rater and Observer were perceived as similar, but when they were dissimilar then the Storyteller would dislike the Observer when liking the Rater, and like the Observer when disliking the Rater.

Both experiments found that the means conformed to sets of comparisons representing both balance and reinforcement hypotheses (they made a number of predictions in common). The critical means to indicate which theory was stronger, however, were not significantly different. This may have occurred because forces corresponding to the two hypotheses were active and cancelling each other. The third experiment added a test for the existance of balance, as well as the previous test of dominance.

In this experiment the Storyteller was confronted face-to-face with the Rater and Observer. There were two conditions where reinforcement influences only were hypothesized to operate

(the relation between Rater and Observer was unspecified to the subject). The results tended to suggest that balance influences do occur and can be dominant in specific situations, but this was found primarily among high self esteem subjects- a hypothesized optimum circumstance for balance. The weaker results in this experiment may have been largely due to the lack of control inherent in the face-to-face situation. A main effect on the evaluative ratings was found for Machiavillianism in the predicted direction, where high Machiavellian subjects gave lower evaluations. Neither Machiavellianism nor cognitive complexity related to the extent to which subjects conformed to reinforcement or balance predictions.

In general it was found that evidence for reinforcement predictions was persistent, and that there were some situations where balance added further predictive power.

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CHAPTER 1

THEORETICAL INTRODUCTION

Statements about whom we like date at least from Aristotle:

> "They are friends, then, for whom the same things are good and evil, and who are friends and enemies of the same people..... Men like, too, those who have done good to themselves, or those for whom they care.....
> "We like also those who, we think, wish to do us good. We like our friends' friends, and those who like the persons whom we like; and those that are liked by those that are liked by ourselves; and those who are the enemies of our enemies - who hate the persons whom we hate....." (Aristotle, Translated by Jebb, 1909, pp. 77-78.)

Experimental investigations of attraction (reviewed by Byrne, 1971) extend from Sir Francis Galton in the nineteenth century to the present. Social psychological research on this topic began in earnest during the 1930s when investigators tested the similarity of attitudes between husbands and wives to verify the hypothesis that like attracts like. Results were typically positive. Today interpersonal attraction is one of the major concerns of social psychology.

The purpose of the present dissertation was to investigate a laboratory analog of real life attraction. In doing so, this project compared two major theoretical orientations to interpersonal attraction - cognitive consistency theories versus classical conditioning learning theories.

Basically the laboratory situation used in the present research consisted of three people: a naive subject, plus two confederates of the experimenter. During the experimental session, the subject was shown several pictures and asked to create stories about them. One confederate, called the rater, provided feedback to the subject on how good or bad her stories were. The second confederate, called the observer, was present throughout this procedure as an onlooker. After the story-telling, the subject's primary task was to evaluate the rater and observer.

This chapter will introduce the two theoretical orientations for looking at this situation, critically review relevant research, and state the hypotheses that guided the present experiments.

Cognitive Consistency

Cognitive theories of attitude derive from Gestalt psychology, founded by Wertheimer as a protest against earlier German psychology which analyzed consciousness into elements. Gestaltists maintained that the whole was more than the sum of its parts, and that some of the properties of wholes "inhere in no single part but emerge when the parts constitute the whole" (Boring, 1950). Rather than seeing

behavior as a chain of nervous events, Gestalt theorists studied a dynamic system or "field". The events of the system, evidenced by conscious mental processes, followed unique internal laws not derivable from mere combinations of neural responses.

Cognitive Balance Theories

Modern day theories of cognitive balance postulate a basic "need" for consistency, which is based on an assumption of human rationality. Various contemporary theories of cognitive consistency have led to a considerable quantity of research (reviewed in Feldman, 1966; Insko, 1967; Zajonc, 1968; McGuire, 1968; Abelson et al., 1969; Kiesler, Collins and Miller, 1969), suggesting that although some of our behaviors stem from "irrational" causes, a wide range of cognitions and behaviors does stem from attempts to be consistent and rational.

For our present purposes, three theories will be summarized in an attempt to illustrate their similarities and differences with reinforcement principles which have been invoked to describe interpersonal attraction. For an appreciation of their entire intricacies, the reader

is referred to the above sources and to the original statements. We turn first to Heider's theory, it being a pioneering effort in this area. Next we refer to Newcomb, whose theory is a derivative of Heider's, and one that is addressed particularly to the topic of interpersonal attraction. Finally, Rosenberg and Abelson's theory, another descendent of Heider's, is of interest for its greater complexity and operational specificity. Other consistency theories are Festinger's (1957) theory of cognitive dissonance, not directly applicable to interpersonal attraction, and Cartwright and Harary's (1956) extension of Heider, a mathematical model which does not add directly to our present area of concern. Osgood and Tannenbaum's (1955) congruity model applies to the special case of acceptance of a communication. Two more recent and less well known theories are those of Feather (1964, 1966) and Wiest (1965). These latter two have not been widely verified and cited.

Heider's Theory of Cognitive Organization

Heider's (1946, 1958) theory is concerned with relationships between the perceiver (P), another person (O), and an object (X) in a person's phenomenological world. There are two types of relationships: attitudes and "unit" relations. Examples of attitudes are: to like, to love, to esteem, to value. Examples of unit relationships are: similarity,

proximity, causality, membership, possession, belonging, etc. Each relation can have either positive or negative value.

In a triad (P, O and X), a balanced state exists if all possible relations are positive, or if two of the relations are negative and one positive. The basic principle underlying the model is that man prefers balance; balanced states are stable states; unbalanced states are unstable and tension producing. Unresolved balance can lead also to cognitive reorganization, which in turn may lead to restoration of balance.

Although attitude (L) or unit (U) relations are defined as distinct from each other, they are "formally analogous" when balance is to be determined. That is, "p likes o", "o owns x", and "p likes x" is as much a balanced triad as "p likes o", "o likes x", and "p likes x". Heider does make passing mention, however, that "often the U relation is weaker than the L relation". This seems to have no firm consequences, nonetheless, for determining in which manner an unbalanced triad will be returned to balance. For example, the triad "p likes o" (pLo), "o owns x" (oUx), "o dislikes x" (o~Lx), could be resolved to balance by any of the following changes taken individually: "p dislikes o" (p~Lo), "o disowns x" (o~Ux); or "p likes x" (pLx).

Heider suggests that an incomplete triad will tend to be "filled in" to make a balanced structure, implying for example, that if "p likes o" (pLo) and "o likes x" (oLx), p will tend to acquire a positive attitude toward x. Another dynamic force in the model is the tendency toward "symmetry" in the liking relation. That is, if "p likes o" (pLo), then in the opposite direction there is a tendency for the occurrence of "o likes p" (oLp). This occurrence is seemingly what Heider also calls balance in the case of a dyad. However when discussing the triad, he does not emphasize criteria involving two-way relationships.

With reference to our experimental situation, it was expected from Heider's principles that if the Rater - (the confederate who rated the experimental subject's stories) told the Storyteller that the stories were good, then the Storyteller would tend to like the Rater. Then if the Storyteller perceives the Rater as having a positive relation to the Observer - (the confederate who was simply an onlooker), the Storyteller will tend to like the Observer as well to produce a balanced state. If, on the other hand, the Storyteller tends to like the Rater but the Storyteller perceives the Rater as having a negative relation to the Observer, then it should be expected that the Storyteller would dislike the Observer to produce balance and in turn reduce tension.

For another set of predictions, consider the situation where the Rater has a negative unit relation to the Storyteller, that is, where the Rater has judged the Storyteller's stories to be bad. Because of Heider's postulate of "symmetry", we expect the opposite relation to be similar - the Storyteller should dislike the Rater. Again if the Storyteller perceives the Rater to have a positive relation to the Observer, the Storyteller should this time dislike the Observer in order to produce a balanced triad. Finally, if circumstances (the ratings of stories) have induced the Storyteller to dislike the Rater but the Storyteller perceives that the Rater is negatively related to the Observer, then a balanced triad will occur if the Storyteller likes the Observer. These predictions are compared with those of other balance theories, and then serve as one set of hypotheses for the three experiments reported in this paper. The other set of main hypotheses will be derived from a social psychological interpretation of learning theory.

A further point Heider makes is that his discussions of balance in a triad presuppose that the perceiver has a positive liking relationship to p, himself in the structure. This is made more explicit by Rosenberg and Abelson whose theory is described below. For an experimental test of balance hypotheses, this implies that experimental subjects selected to be high in some measure of self esteem might perform more to confirm the hypotheses than subjects low in self esteem.

Newcomb's Theory of Interpersonal Balance

Newcomb (1953, 1956, 1958, 1959, 1961, 1971) is directly concerned with interpersonal attraction. The model depicts the nature of communicative acts from one person (A) to another person (B) about something (X). The components of Newcomb's A-B-X system are: A's orientation (attitude) toward X; A's orientation (attraction) toward B; B's orientation (attitude) toward X; and B's orientation (attraction) toward A.

Newcomb refers to similarities of A's and B's orientations to X as "symmetrical" relationships. He postulates that in the system there is a "strain toward symmetry" of A with B in respect to X. The greater the force inducing this strain toward symmetry, the greater the likelihood of increased symmetry due to one or more communicative acts. This force inducing the strain toward symmetry is aroused by the intensity of A's attitude toward X and his attraction to B.

The theory is primarily concerned with the relation of A and B, the "ego" and "alter" in the structure. The uniqueness of this relation is illustrated by its label of "attraction", while A's and B's orientations toward X are termed "attitudes". Newcomb is primarily interested in how differing attitudes and differing strengths of attitudes affect the attraction between A and B. The various components of the triad are then not interchangeable, as in Heider's model, but are uniquely defined.

An important difference between Newcomb and Heider is that for the latter, all positive relations or any two negative relations consistute balance. For Newcomb, when there are two negative relations in a triad, they must be the two attitudes, i.e., A's and B's orientations toward X. Otherwise AX and BX will not have the same sign and the basic requirement of symmetry will not be met.

In our experimental situation, where the Storyteller is being rated for telling stories by the Rater, and where the Observer is the additional object in Newcomb's system, predictions can be made for the specific instances where the Storyteller has been induced to be positively attracted to the Rater (by having been rated positively by the Rater). Where the Rater is perceived as having a positive attitude toward the Observer, then the Storyteller will tend to regard the Observer positively to produce symmetry and reduce strain. Where the Rater is perceived as having a negative attitude toward the Observer on the other hand, the Storyteller will tend to regard the Observer negatively. The Storyteller's responses in these cases where the Rater rates the Storyteller positively correspond to the hypotheses for the present experiments derived from Heider's theory. In the cases where the Storyteller is expected to react negatively to the Rater (negative attraction), Newcomb does not concur with Heider.

Newcomb (1971) addressed the question of negative attraction, tending to refer to any situation in which the AB attraction is negative as "nonbalanced", characterized by relative indifference. Based on his interpretation of the literature testing Heider's predictions, Newcomb considers all Heider-balanced triads with negative AB attraction to be intermediate in stability between balanced and unbalanced triads. To reiterate then Newcomb would not define as balanced two of the experimental cases here specified under Heider (those with a negative attraction of the Storyteller to the Rater).

In this paper, it will be argued that Newcomb's theory supports the predictions made where the attraction from the Storyteller to the Rater is to be positive, and makes no specific prediction where this is not the case.

In addition to balance, a variety of alternative "intrasystem" changes may occur to reduce strain:

"Hypothetically, strain may be reduced under any of the following conditions: (1) by reduction in the strength of attraction, (2) by reduction of object-relevance, (3) by reduction of perceived ("other's") object-relevance,

(4) by reduction of importance of the object of communication, (5) by reduction of perceived ("other's") importance of the object of communication, (6) by changes in cathexis or in cognitive structuring of own attitudes, such that there is increased similarity with the other's perceived attitudes, (7) by changes in perceived attitudes (cathectic or cognitive) of the other, such that there is increased similarity with own attitudes." (Newcomb, 1959)

Rosenberg and Abelson's Cognitive Balancing

The model of Rosenberg and Abelson (1960) consists of the following components: "cognitive elements" are things or concepts which occur in human thought; "cognitive relations" (positive, negative, or null) are associations among the cognitive elements; "cognitive units" are defined as pairs of elements connected by a relation (i.e. "sentences of attitudinal cognition"); "cognitive balance and imbalance" are defined in terms of the positive and negative affect-arousing significance of the cognitive elements, and the value of the relation between them. A balanced unit is one in which two concepts of identical sign are believed to be positively related, or two concepts of opposite sign are believed to be negatively related. All units with other configurations are unbalanced. An unbalanced unit is hypothesized to be unstable and likely to undergo change in a balancing direction, if the person is attending to the imbalance. In more complex attitude structures, e.g. the triad, the requirement is the same - each unit in the structure must be balanced.

Rosenberg and Abelson's model has an advantage over the models of Heider and of Newcomb in that in complex structures if several changes are possible to produce balance, the authors are able to suggest that the route to balance which is most likely to occur is that involving the fewest changes. No distinction is made between the likelihood of changing a perceived relation or changing the affect associated with an element. Figure 1 gives examples of unbalanced and balanced structures consisting of three elements and the relations between them.

Quite aside from changing the signs of concepts and relations, other methods of redressing imbalance are (1) redefining concepts to reduce the association between them, or (2) to stop thinking. Experimentally these latter two methods do not concern us.

With regard to the Rosenberg and Abelson predictions in our specific experimental situations, it will be argued here that they are consistent with the Heider predictions. The comments make reference to Figure 2.

Balanced Structures

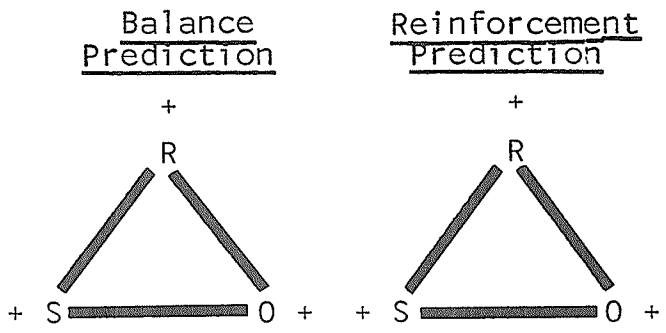
Unbalanced Structures

Symbols A, B, and C represent concepts, signs attached to the symbols indicate their valuations. A solid line denotes a positive relation; a broken line, a negative relation.

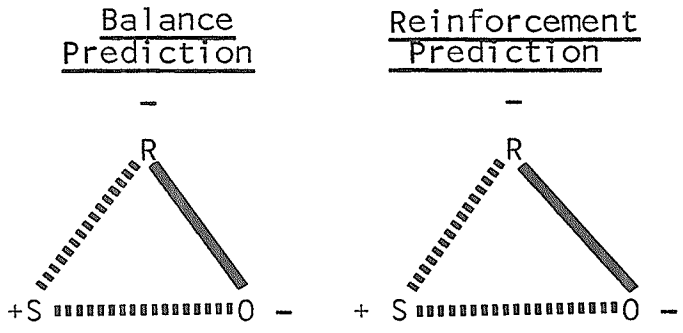
Figure 1. Examples of Balanced and Unbalanced Three-Element Structures in Rosenberg and Abelson's (1960) Cognitive Balancing Model.

Positive Rater-Observer Relation Condition

1). Positive Reinforcement Condition

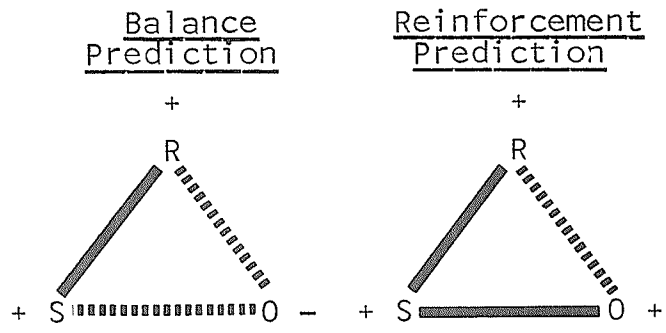


2). Negative Reinforcement Condition

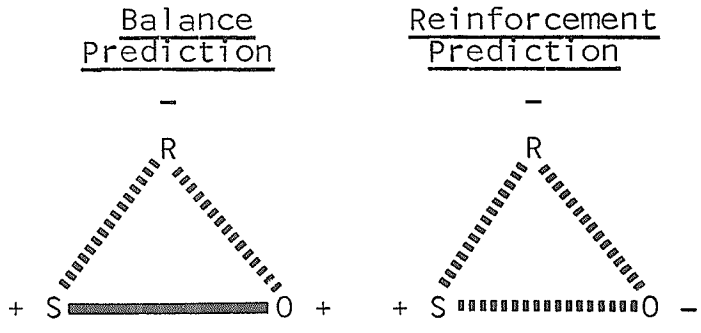


Negative Rater-Observer Relation Condition

3). Positive Reinforcement Condition



4). Negative Reinforcement Condition



R denotes Rater; S - Storyteller; O - Observer

Figure 2. Experimental Conditions in Experiments I and II Represented in Cognitive Structural Terms.

In Cell 1, there is a strong cognitive relation between the Rater and the Storyteller. That it is associated by a positive evaluation of the Rater by the Storyteller is not surprising, and this too should be a relatively frequent occurrence. The relation between the Rater and the Observer is manipulated in the experiment, and is in this case positive. We might expect that in any change toward balance, the relation of the Storyteller to the Observer and the evaluation of the Observer might be the most weakly held, and so the most likely to give way and change to result in balance. In this case the most direct way to have balance is for them both to be positive. In Cell 2, if the Storyteller-Rater and the Rater-Observer relations are manipulated negative and positive, respectively, and if we strongly expect the evaluation of the Rater to be negative, then the easiest route to balance is for the Storyteller-Observer relation and the evaluation of the Observer to be both negative. In Cell 3, the Storyteller-Rater and the Rater-Observer relations are positive and negative respectively, and the evaluation of the Rater is positive, so the easiest way to balance the structure is to have the Storyteller-Observer relation and the evaluation of the Observer both negative. Finally, in Cell 4, both the Storyteller-Rater and the Storyteller-Observer relations and the evaluation of the Rater are all negative. Assuming again that our change will occur with the Storyteller-Observer relation and the attitude to the Observer, the easiest balance is to have them both positive.

There is the alternate possibility in Cells 3 and 4 that the subject may balance either of these structures by making the Rater-Observer relation cognitively positive. Because of the difficulty of experimentally measuring all the valuations and relations reliably, allowing an individual assessment of each subject's structure and whether they achieved any balanced state, the experimental procedure of choice was to attempt to make the Rater-Observer relation a strong one so that balancing processes would predominantly leave it intact.

Social Learning Theory

At about the same time that Gestalt psychology was founded by Wertheimer, a protest in a different direction was Watson's behaviorism. Watson deplored the inclusion of the data of consciousness in psychology. To develop psychology as a science with a rigorous and objective point of view, behaviorism restricted its practice to a study of behavioral phenomena that could be observed objectively. The Hull-Spence learning theories evolved in the behavioristic tradition, providing the reinforcement notions which are referred to here.

Two excellent reviews of the reinforcement-based attraction literature are provided by Byrne (1969, 1971). It has been pointed out, however, that Byrne's own research is not clearly based on either the operant conditioning model or the classical conditioning model (Wright, 1971). Most of the work is discussed with some form of classical conditioning basis, however, and in this paper the classical conditioning explanations are favored since it is these that have been extended to the three-person experimental situation.

Lott and Lott (1960) described the conditioning process under which attraction (or an attitude) may be formed with respect to other people:

> "1. Persons may be conceptualized as discriminable stimuli to which responses may be learned.
> 2. A person who experiences reinforcement or reward for some behavior will react to the reward, i.e. will perform some observable or covert goal response (R_g or r_g).
> 3. This response to reward will become conditioned,, like any other response, to all discriminable stimuli present at the time of reinforcement.
> 4. A person who is present at the time that Individual X, for example, is rewarded thus becomes able in a later situation, to evoke R_g or, what is more likely, its fractional anticipatory component, $r_g - s_g$. This latter response, which Hull has called "expectative"....is the underlying mechanism of an attitude."

Lott and Lott (1972) defined several learning concepts in "liberalized" social terms. They consider a reward to be any stimulus which a person judges to be desirable, whether it serves to satisfy some physiological need, or some learned psychological need. For this adapted theory, goal response is not simply consummatory activity, but a combination of "evaluative, verbal, autonomic, and central reactions" which humans make to rewarding situations. An implicit anticipatory response is used as an intervening variable denoting either positive or negative affect. This affect might be labelled expectation, hope, fear or anxiety.

To refer specifically to the type of predictions that social learning theory will be providing in the following experiments, we note that Lott and Lott (1960) have argued:

> "Being in the presence of a discriminable person (or some symbolic representation of him) when one attains satisfaction of any drive or succeeds in reaching any desirable goal, regardless of whether the discriminable person has any instrumental relationship to this state of affairs, is a sufficient condition for the acquisition of liking for the contiguous person."

Lott and Lott (1972) outline as well a series of propositions. Liked persons are expected to evoke a variety of overt and covert responses classifiable as approach, whereas disliked persons will evoke a variety of overt and covert responses classifiable as avoidance. Some of these responses are reflexive and unlearned in nature, but most have been learned since they successfully mediate the attainment of positive goals or the avoidance of pain or frustration.

Liked or disliked persons can function as a positive or negative incentive, and in either case raise the general drive level in the individual who responds. As well, liked and disliked persons may function directly as positive or negative reinforcers. The paradox in Hull's theory where the same positive reinforcer may both increase general drive and strengthen new behavior by functioning as a reward, and presumably reducing drive, remains in Lott and Lott's social learning theory.

A generalization proposition suggests that persons who resemble, or are similar to liked and disliked individuals on salient characteristics can also function as positive and negative secondary reinforcing stimuli, but to a lesser extent.

Byrne and Clore (1970) in a theoretical discussion of Byrne's widely reported learning-inspired attraction paradigm, generally acknowledged agreement with Lott and Lott, but preferred in their research to use a looser, more limited heuristic application of learning theory.

In his early research, Byrne typically studied the relation of attraction to the manipulated attitude similarity between his subjects and a fictitious stranger. Byrne (1961) anticipated that the greater the proportion of stranger's attitudes that were similar to those of the subject, the more attracted the subject would be toward the stranger. With reference to learning theory, he theorized that the perceived similarity and dissimilarity of attitudes in a dyad is a special case of reciprocal administration of positive and negative reinforcements. This occurs in our culture, he suggests, since individuals have well established learned drives to be logical and make a correct report of their environment. Interaction with a stranger who has similar attitudes offers validation of this report of the environment, and so is a positive reinforcement. Conversely, interaction with a stranger who has dissimilar attitudes calls into question our intelligence or morality and so is a punishing interaction.

Byrne (1971) comments that he has made liberal use of existing reinforcement theory:

> "There was by the way a rather deliberate neglect of systematic theoretical development in favor of the search for empirical stability and generality.
> ".....The research was thus guided by a rather vague reinforcement theory and by the desire to establish an empirical law to serve as the foundation for an eventual theoretical superstructure.
> ".....the language and concepts remained at a more general level (i.e., Thorndike and Pavlov) and, hence, not necessarily committed to the demands of any current theoretical framework." (Pp. 268-269.)

Byrne's typical experimental paradigm involved showing experimental subjects a fictitious attitude questionnaire, supposedly filled out by a former subject but actually with responses differing in a controlled degree from those of the subject himself. The subjects then responded to an Interpersonal Judgment Scale (IJS), (Byrne, 1961), which served as a measure of interpersonal attraction. The often confirmed hypothesis is that the proportion of similar attitudes held by the subject and the stranger has a direct linear relationship to the amount of attraction toward a stranger as indicated by the IJS. This statement was expressed more quantitatively by Byrne and Nelson (1965), who, on the basis of data from 790 subjects in experiments of the above design, reported the equation of the linear regression of attraction to the proportion of similar attitudes as the Law of Attraction ($Y = 5.44X + 6.62$).

Returning once more to the specific laboratory situation used here (pp. 1, 2) Byrne's attraction theory would predict that the Storyteller's attraction toward the Rater would be directly related to the proportion of positive reinforcement (judgments) administered.

From Lott and Lott's theory we expect that since the Observer is discriminable to the Storyteller while the Storyteller receives positive or negative stimuli from the Rater, then the Storyteller will acquire an implicit anticipatory response (represented by positive or negative affect, as the case may be) to the Observer as well as to the Rater. Since Byrne predicts that the Storyteller's attraction toward the Rater should be directly related to the proportion of positive reinforcement administered, we expect a similar functional relationship between the Storyteller's attraction toward the Observer and the proportion of positive reinforcement from the Rater.

This theoretical deduction does not take into account any result of the Storyteller's perception of the relation between the Rater and the Observer. Both the Rater and the Observer, being present in the same stimulus situation, should according to Lott and Lott come to elicit the same implicit anticipatory response.

Another phenomenon which in this case would be a competing one is generalization. It might be argued that if the Rater has been conditioned to evoke liking, and the Observer has been presented as dissimilar to the Rater, that the Observer should then evoke less liking. The question becomes one of whether the Observer comes to function as a secondary reinforcing stimulus through contiguity to the Rater during the conditioning, or through generalization after the conditioning. The latter process seems less likely since the phenomenon of generalization is most probable when the two persons are most similar, and should occur to a lesser extent otherwise. Further, while the effect of generalization here may attenuate the Storyteller's affect toward the Observer, it would not be hypothesized to reverse it. As will become evident in later discussion, our measure of attraction does not have a true zero point to allow a test of generalization.

The predictions used here for learning theory are shown in Figure 2. It was assumed that between groups there would be no important effect due to generalization, so that the predictions are influenced by the positive-negative reinforcement treatment, but not by the Rater-Observer relation treatment.

Research on Attraction Triads

Griffitt and Guay (1969) had experimental subjects participate in a "creativity" experiment where they were to create stories about seven TAT pictures. One experimental confederate rated the subject for creativity on a ten-point scale of lights, while another confederate was simply present as an observer. The subject did not see either confederate (in fact both roles were played by one person), but saw a list of each subjects' attitude responses. At the completion of the storytelling, subjects were asked to rate the "Rater" and the "Observer" on a modified form of the Interpersonal Judgment Scale (IJS). The more often the Rater had evaluated the Storyteller positively (directly reinforcing the Storyteller), the better the Storyteller liked both the Rater and the Observer.

McGinley and McGinley (1972) conducted an extension of the Griffitt and Guay study, applying to advantage some of the notions of vicarious conditioning in a social context. They used the same triad of Storyteller, Rater and Observer. This time, however, instead of both the Rater and the Observer being confederates of the experimenter, the Observer was recruited as a real subject and provided some interesting data.

Both the Storyteller's and the Observer's liking for the Rater was related to the proportion of positive reinforcements. The Storyteller's liking for the Observer was positively related to the proportion of positive reinforcements administered by the Rater. The Observer's evaluation of the Storyteller was not directly related to the proportion of positive reinforcements, and shows a relatively high attraction toward Storytellers poorly rated. McGinley refers to a feeling of pity for losers as an influence here.

McGinley and McGinley used the IJS as one of their dependent measures, but made distinct hypotheses for the "likability" and "desirability as a work partner" items which sum together to yield the IJS. Their results indicated a highly significant item effect. This may be because in earlier paper and pencil experiments the two questions were hypothetical and related generally to a construct of attraction, whereas in experiments in which the "others" are real participants the "desirability as a work partner" item takes on specific added reference to the immediate situation.

Comparison of Balance and Reinforcement

It is probably self evident that balance theory and reinforcement theory do not typically refer to the same kinds of behaviors. For this reason, the following comparison is not a general one but is highly specific. Returning to the experimental situation described for each of the balance theories and the reinforcement predictions, we have a person (the Storyteller) who has just received an evaluation by another person (the Rater) about himself. A third person is in the immediate situation as an observer. Lott and Lott would say that the Storyteller would learn an "expectative" response or attitude toward the Rater and to other discriminable stimuli present at the time of reinforcement, including the Observer. Balance theorists would say that the Storyteller would be cognizant of an attitude relation extended to him by the Rater, and that very likely this relation would be reciprocated. Then whatever the relations that might exist between the Rater and the Observer, the Storyteller will form an attitude toward the Observer to balance the triad. Further, an incomplete triad will tend to be filled in with the relation required to make a balanced structure. Table 1 represents the predictions of how well the Storyteller will like the Observer as a function of the various other possible relationships in the triad. Predictions are based on both cognitive and reinforce-

ment theories. Balance theory and reinforcement theory concur on two of the four cases, but on the remaining two they lead us to expect that the Storyteller's evaluation of the Observer will be influenced in opposite directions: balance predicts one influence and reinforcement the other.

Table 1

Predictions of an Attraction Relationship in a Triad as a Function of the Other Two Relationships.

Case	Rater's Response to the Storyteller	Rater's Relation with the Observer	Storyteller's Predicted Evaluation of the Observer	
			Balance	Reinforcement
1.	+	+	+	+
2.	-	+	-	-
3.	+	-	-	+
4.	-	-	+	-

In Cases 3 and 4, since balance and reinforcement make opposing predictions, an empirical result where the evaluation in Case 3 is more positive than in Case 4 would imply that the reinforcement predictions were more powerful in this situation.

If the reverse were true (Case 4 more positive than Case 3) the balance predictions would be considered more powerful. There is another possibility in which both reinforcement and balance influences may in fact be operating simultaneously. If they are close to equal in influence, the Rater-Observer relation manipulation may not influence the evaluation of the Observer by the Storyteller. A comparison providing for greater confidence in the simultaneous occurrence of reinforcement and balance is possible as follows:

Two cases providing a useful comparison to the cases where balance and reinforcement influences are hypothesized to oppose each other would be situations where reinforcement alone would be expected to operate. A near approximation to such a situation would be that where no Rater-Observer relationship is specified for the Storyteller. Since one of the relations needed to define balance in the triad is missing, the tendency for the Storyteller to balance should be much reduced (dissociation of objects being an alternate way of reducing tension without balancing). The implication is that in Case 3 where balance and reinforcement have been expected to oppose each other, a new condition identical to Case 3 except for the missing Rater-Observer relation should elicit evaluation of the Observer by the Storyteller which is even higher than that in Case 3.

The same line of argument may be followed in the other direction with respect to Case 4, giving a new condition with the Storyteller's evaluation of the Observer even lower than that in Case 4.

Need for the Present Research

In the Griffitt and Guay (1969) study, where subjects evaluated both the Rater and the Observer and the evaluations of both were found to be positively related to the proportion of positive reinforcements administered by the Rater, it was concluded that the results supported the authors' reinforcement interpretation. However, if the Storytellers saw the relation between the Rater and the Observer as positive, then the results would also follow from a balance interpretation. Unfortunately, Griffitt and Guay did not report evidence on how the Storytellers perceived this Rater-Observer relation, although the Storytellers were provided with some attitude information about the Rater and the Observer. It seemed that the potential role of balance forces in this experiment (and in its replication by McGinley and McGinley, 1972) warranted a more definitive test. Only then could an unambiguous explanation of the data be offerred.

A further point mentioned above is that if the Story-tellers saw the Rater-Observer relation as negative and tended to regard the Observer differently from the Rater, then a reinforcement explanation might refer to a generalization gradient. Studies of this sort have not so far emphasized this possibility.

The purpose of the present research might also be seen in a wider context. The question of whether balance influences can be demonstrated to occur in a reinforcement theory-generated experimental situation might be seen as asking whether hypotheses about some non-overt behavioral events inside the organism (rational thought processes) add predictive power in this situation.

Chapter Summary

Paying particular attention to an experimental situation which has been used to study interpersonal attraction of a subject toward two strangers, reinforcement and cognitive balance theories of attraction were reviewed and the following predictions derived: With reference to Table 1 and/or Figure 2, when the subject has been primarily positively rewarded by a Rater, and when the subject perceives that the Rater has a positive relation to an Observer, both theories agree that the subject should be positively attracted to the Observer. If the subject has been positively rewarded but perceives that the Rater and Observer are negatively related, the two theories make conflicting predictions - reinforcement

predicts a positive attraction toward the Observer, and balance a negative attraction. Two more sets of predictions are where the subject has been primarily punished by the Rater. If the perceived relation between the Rater and Observer is positive, then both theories anticipate a negative evaluation of the Observer by the subject. If the Rater and Observer are negatively related, again the two theories make differing predictions - reinforcement predicts a negative Observer evaluation, balance a positive.

If the influence of the two theories is to be opposed in two of the above conditions, then a verification of their simultaneous occurrence would be provided by two conditions where reinforcement alone is hypothesized to operate, since no Rater-Observer relation is provided for the subject. In this case, if the Rater is positively rewarding to the subject the Observer evaluation should be even higher than it was when reinforcement and balance made conflicting predictions, and if the Rater is punishing the subject the Observer evaluation should be lower than in the comparable condition where the two theories had opposing influences.

Because of the real nature of the face-to-face situation, as opposed to the hypotehtical stranger situation in which the IJS was developed, there was expected a significant main effect for scale type within the IJS, with both scales taking on more specific meaning.

CHAPTER II

EXPERIMENTAL COMPARISON OF DOMINANCE BETWEEN TWO THEORIES

Experiment 1

This experiment was designed to empirically compare the two sets of predictions (Table 1 and Figure 2) of interpersonal attraction of a person toward two "others", derived from cognitive balance theory and reinforcement theory. There were two experimental conditions where the two theories made similar predictions, and two conditions where the predictions were opposed.

Method

The procedure followed in this experiment was adapted from Griffitt and Guay (1969) and McGinley and McGinely (1972). One experimental subject served in the role of the Storyteller, while the other was the Observer. The Observer was a genuine subject and provided data of interest in replicating the findings of McGinley and McGinley, which those authors accounted for only partially with a reinforcement theory explanation. The "rater" participated in the experiment from another room. There were three levels of positive reinforcement (.25, .50, and .75)- the proportions of positive reinforcement and punishment totalling 100%, and the Storyteller was advised that the Observer was

preselected as either similar or dissimilar to the Rater. Subjects were 108 female undergraduates at the University of Manitoba enrolled in introductory psychology, and participating as a part of their course requirement.

Apparatus. The apparatus consisted of a modified intercom and a rating scale. The intercom, through several relays, was connected to a tape recorder so that when the experimenter closed a small hidden switch in the experimental room, a female voice responded after a five second delay with, "OK, I'm ready". The intercom also operated in its normal mode to enable the experimenter to listen to the stories. The rating scale was constructed in a similar fashion to that of McGinley and McGinley (1972) with ten translucent windows bordered in black, the three windows at each end having white lights behind them, and each of the 3 inch squares having one of the following inscriptions in 5/16 inch high black letters: terrible, very bad, bad, poor, neutral to poor, neutral to fair, fair, good, very good, excellent. Switches in another room permitted the experimenter to selectively illuminate the scale intervals for a timed three second period.

Procedure. At a given time, two subjects from different introductory psychology classes reported to two different waiting rooms. One was taken first to the experimental room, seated in front of the rating scale, and told that her role in the experiment was to be that of the Storyteller. Further she was told that there would be another subject in the same room with her whose role was that of the Observer, and that this subject had been pre-selected on an earlier questionnaire as being similar (or dissimilar) in attitudes and responses to the Rater in the other room. (In fact the Observer had filled out no such questionnaire.) The second subject was then seated and the story-telling task was described in more detail:

E to S: Your task will be to tell stories, each for about 2 minutes, about each of 4 pictures. A Rater in another room will listen to you over the intercom and judge each story for creativity. Her judgment will come up via this scale (E indicates scale to S), where one of the squares will light up. The Rater is a female undergraduate student, and she is physically and visually separated from you so that your physical appearance will not influence her ratings of the stories. Be "natural" in telling your stories - don't purposely worry about telling stories you think will be creative because the Rater is using highly selective criteria for creativity, and you will not likely be able to discern the criteria with just four stories.

E to O: Your task for the moment is to observe the experiment. Later you will both be asked to fill out a questionnaire about the experiment.

E to S: Each of your stories may take about 2 minutes. If you finish before 2 minutes are up, indicate that fact clearly over the intercom. You don't have to press any button for the Rater to hear you. Any questions?

Here are the 4 pictures (E hands S TAT pictures 1, 4, 9GF, and 6GF). You can begin now - after you've been rated for each story, you can begin the next without being told. Do them in this order.

E to R: Are you ready to start, Rater?

R to E: OK, I'm ready.

E to S and O: I'll go to the other room so as not to disturb you. One final thing: the two of you are not to talk to each other during the experiment. Begin now.

After each of the stories the Rater responded with either a positive (P) or negative (N) rating. (The Rater did not actually exist but the role was played by E who had by this time gone to another room to operate the reinforcing apparatus.) In the .75 positive reinforcement condition, the responses to the four stories were rotated among PPPN, PPNP, PNPP, and NPPP. In the .50 reinforcement condition the responses were PPNN, PNPN, PNNP, NPNP, NNPP, NPPN, and in the .25 positive condition NNNP, NNPN, NPNN, and PNNN. A deviation from systematic rotation was that within the constraints of the number of subjects needed with each permutation of responses, if the first couple of stories were either very good or very bad in the subjective judgment of the experimenter, they were responded to as such as done by McGinley and McGinley (1972) to increase the probability of the subjects' belief in the manipulation. On the rating scale when one positive response was used, it was very good. When there were two positive responses they were good and excellent, and when there were three positive responses they were good, very good, and excellent, in random order.

After the storytelling both subjects were asked to complete a questionnaire in which the first questions asked for their evaluation of the Rater on a modified IJS (see Appendix A). The IJS used was a five item seven-point rating scale dealing with a person's intelligence, knowledge of current events, adjustment, likeability, and desirability as a work partner. Normally the last two items of the IJS are summed to provide a measure of attraction ranging from 2 to 14 where 14 represents strong positive attraction. Next subjects (both the Storyteller and the Observer) were asked to evaluate the "other person who is taking the experiment in the same room as you are" on the same scale. Then "How do you perceive the relationship between the Rater and the other person....." on a seven-point scale from "very negative" to "very positive". This was intended as a check on the Rater-Observer relation manipulation. Finally they were questionned about their awareness of the object of the experiment, and asked if they were acquainted with either of the other people in the experiment. Subjects were debriefed, with particular attention being paid to the explanation that the story ratings were not of creativity at all but were predetermined. Subjects also had the opportunity to self-address an envelope and receive later a more detailed description of the experiment.

Two pairs of subjects were discarded from further analysis because they reported being friends, another two pairs were discarded because one of the two belonged to an ethnic minority and had obvious difficulty speaking English. One pair was discarded because the Storyteller showed extreme discomfort from attempting to tell stories, and the session was terminated early. No subjects were discarded on the basis of awareness.

Results: The mean responses of the Storytellers in the two Rater-Observer relation conditions differed in the expected direction on the independent measure of how they perceived the relationship between the Rater and the Observer ($t = 2.43$, $df = 52$, $p < .02$). It was considered that the relation manipulation influenced the subjects' responses, although the difference between the mean responses (4.3 and 3.7) to the question, "How do you perceive the relationship between the rater and the other person?" was not large.

The two selected comparisons, one for each of the sets of theoretical predictions (Table 2), were evaluated as a part of an overall mixed analysis of variance.

Table 2

Weights for Non-orthogonal Comparisons of Balance against Reinforcement Predictions, Experiment 1.

Condition		Reinforcement		Balance	
		Rater	Observer	Rater	Observer
	Relation+ (Case 1)	+1	+1	+1	+1
Rf+ (.75)	Relation- (Case 3)	+1	+1	+1	-1
	Relation+ (Case 2)	-1	-1	-1	-1
Rf- (.25)	Relation- (Case 4)	-1	-1	-1	+1

It was anticipated that the results would support the cognitive balancing or the reinforcement predictions to the extent that the data conformed to either of the non-orthogonal comparisons on the analysis of the Storytellers' evaluations, measured by the IJS. Because of their non-orthogonality, a modification of Dunn's procedure (Kirk, 1968, 79-81) was used, where the alpha level for significance was shared between the tests. A third comparison was made directly contrasting the two means on which the balance and reinforcement predictions differed. Each of these three comparisons was carried out on

both the "likability" and "desirability as a work partner" items of the IJS, making a total of six non-orthogonal tests in all. Dunn's procedure suggests sharing alpha between the tests, so it was decided that a reasonable and convenient approximation would be to require a tabled value of alpha = .01 for significance of any single comparison in place of the usual .05.

On this basis the Storytellers' evaluations of the Rater and Observer conformed to the set of reinforcement theory predictions for both "likability" and "desirability as a work partner" items. The evaluations also conformed to the balance theory predictions for both items (Table 4). A large part of this result must necessarily come from the specific predictions that both theories had in common. In fact it can be seen that the only predictions which differ are those of the Observer valuation when the Rater-Observer relation is negative (Table 2). The comparisons between these means for both scale items failed to reach significance, leaving us without a demonstration of the dominance of either balance or reinforcement inspired predictions (Table 4; means are shown in Table 3).

Table 3

Mean Storytellers' Evaluative Responses in Experiment 1 as a Function of Proportion of Positive Reinforcement, Rater-Observer Relation, Stimulus Object and Attraction Scale

Proportion of Reinforcement	Rater-Observer Relation	Object	
		Rater	Observer
	Scale 1 (Like)		
.75	(Case 1) Positive	5.78[a,b]	5.67
	(Case 3) Negative	6.00	5.78
.50	Positive	5.33	5.78
	Negative	4.89	5.44
.25	(Case 2) Positive	3.78	4.89
	(Case 4) Negative	5.11	5.56
	Scale 2 (Desire)		
.75	(Case 1) Positive	5.11	5.33
	(Case 3) Negative	5.56	5.22
.50	Positive	4.67	5.56
	Negative	4.56	5.00
.25	(Case 2) Positive	4.00	4.67
	(Case 4) Negative	4.44	5.44

[a]The possible scores range from 1 to 7 with 7 representing high positive attraction.

[b]Each mean represents 9 subjects.

Table 4

Summary of Analysis of Variance for Story-tellers' Evaluative Data in Experiment 1

Source	df	MS	F
Between Ss			
A (R-O Relation)	1	2.24	1.10
B (Proportion Rf^+)	2	12.09	5.92**
AB	2	6.14	3.01
Error 1	48	2.04	
Within Ss			
C (Object Rated)	1	9.80	7.50**
AC	1	0.67	<1
BC	2	4.12	3.15
ABC	2	0.04	<1
Error 2	48	1.31	
D (Attraction Scale)	1	7.41	19.22***
AD	1	0.17	<1
BD	2	0.45	1.17
ABD	2	0.26	<1
Error 3	48	0.39	
CD	1	0.17	<1
ACD	1	0.00	<1
BCD	2	0.01	<1
Comparisons			
Likability Scale			
Reinforcement Predictions[a]	1	17.02	41.64++
Balance Predictions[a]	1	13.35	32.68++
Reinforcement vs. Balance[b]	1	0.22	<1
Desirability Scale			
Reinforcement Predictions[a]	1	8.00	19.58++
Balance Predictions[a]	1	10.89	26.65++
Reinforcement vs. Balance[b]	1	0.22	<1
Error 4	48	0.41	

** = $p < .01$ *** = $p < .005$ ++ = $p < .001$

[a]Predictions test one set of theoretical hypotheses expressed by weights in Table 2. Each set of predictions tests eight means.

[b]This test compares two means only where predictions are opposite.

As expected there was an effect of proportion of positive reinforcement (means were 4.7, 5.2 and 5.6 in the predicted direction). There was as well a significant tendency for the Storytellers to evaluate the Observers more positively than the Raters (5.4 vs. 4.9). This is interesting from a reinforcement standpoint in that response to the direct reinforcement from the Rater should be more extreme than response to the indirect or secondary effects from the Observer. If the Storytellers' evaluations are considered to be simply a function of the reward (reward and punishment in Byrne's arrangement used here) conditions of the experiment, then it can be deduced that the overall positivity of the Observer evaluations results from the punishment being more effective than the reward in this experiment. That is, the greatest difference between the Storytellers' evaluations of the Rater and Observer occurs in the 25% positive reinforcement (75% punishment) condition (Table 3). In other words the direct punishment by the Rater causes him to be evaluated more extremely from the Observer than does reward by the Rater in the 75% positive condition.

As McGinley and McGinley (1972) found, there was a main effect due to scale items (Likability Scale mean = 5.3, Desirability Scale mean = 5.0). Auxiliary analyses were carried out with the two attraction scales summed together and reported in Appendix B.

The Observers' responses were also considered in a separate analysis since the subjects' role in the experiment was confounded with the application of the Rater-Observer relation manipulation. In this analysis the object rated (Rater or Storyteller) resulted in significant differences in evaluation (F = 15.54, df = 1/51, $p < .001$, mean Storyteller evaluation = 10.5, mean Rater evaluation = 9.4) but neither the proportion of positive reinforcement (F = .51, df = 2/51) nor the interaction (F = .46, df = 2/51) reached significance (Appendix B).

Discussion

The data conformed to a significant degree to the expectations of the reinforcement theory and cognitive balance theory based models. There was, however, no difference between the two sets of predictions.

It has been suggested above that if the means discriminating between the two sets of theoretical predictions are not different, then the expectations of both theories may be operating, but in their opposing directions so as to balance each other out. (There is some possibility also, that in the negative Rater-Observer relation conditions, the Observer evaluation is the result of generalization, resulting in less extreme group means. This alternative was not considered very likely.) Some peripheral evidence for the operation of reinforcement influences in this situation comes from a significant main effect for reinforcement condition. A main effect was not hypothesized for the Rater-Observer relation condition. A further test however will be carried out (Experiment III) to separately identify the occurrence of balance.

The problem might be broken into two separate ones: that of demonstrating the existance of both balance and reinforcement influences, and that of demonstrating the predominance of one set of forces over the other (which Experiment I was designed to do). In the first case since where the two predictions differ (see Figure 2) they exactly oppose each other, then it might be expected that if both kinds of forces (balance and reinforcement) are operating simultaneously that the outcome in the two places might be approximately equal, which it was in Experiment I.

To illustrate this point, refer back to Condition 3 in Figure 2. The experimental condition created positive reinforcement by the Rater to the Storyteller, and a negative relation (i.e. dissimilarity) between the Rater and Observer. Our concern is specifically with the Storyteller-Observer relation or evaluation. Since balance theory requires two negative relations rather than one for a stable state, the Storyteller might be expected to evaluate the Observer low on the semantic differential scales. If we refer to secondary reinforcement processes, the Storyteller might evaluate the Observer high on the semantic differential scales due to her positive affective state, which in turn is due to the high proportion of positive reinforcements received from the Rater. We have hypothesized then, that these influences may both operate simultaneously, and their opposition may result in an intermediate value for the resultant evaluation of the Observer by the Storyteller.

Indeed it should be possible to test the existence of balance by using four theoretical structures which should be ordered from high to low in the amount of positive affect which they elicit for the Observer in the evaluations of the Storyteller, and the evaluation in Structures 2 and 3 should be about equal: 1) Positive reinforcement to the Storyteller,

no Rater-Observer relation specified (balance forces presumed to be not operating), 2) Positive reinforcement to the Storyteller, negative Rater-Observer relation (balance and reinforcement opposed - Structure 3 in Figure 2), 3) Negative Rater-Observer relation, negative reinforcement to the Storyteller (balance and reinforcement opposed - Structure 4 in Figure 2), and 4) Negative reinforcement to the Storyteller, no Rater-Observer relation specified (balance forces presumed to be not operating).

Fragmentary evidence is available for this test. In the Griffitt and Guay (1969) study where the data were scaled in the same manner as in this paper, the means for Structures 1 and 4 above were 11.33 and 9.25 respectively. In Experiment 1 where the Rater-Observer relation was manipulated, the means for Structures 2 and 3 above (summing both scale items together) were 11.00 and 11.00. Were this data collected in one study, and were the means for Structures 1 and 4 shown to be higher and lower respectively than the means for Structures 2 and 3, it would be taken as evidence for the existance of balance forces in the experiment. Further, if the means for Structures 2 and 3 were significantly different, this could be taken as a demonstration of the predominance of either balance or reinforcement in this situation.

The Storytellers' evaluations of both Rater and Observer were influenced by the proportion of positive reinforcement as found previously by both Griffitt and Guay (1969) and McGinley and McGinley (1972). Contrary to expectations here, the Observers' responses were not influenced by proportion of positive reinforcement. The Observers' evaluations of the Rater at least were weakly related to the proportion of positive reinforcements in the McGinley experiment, a process which those authors attributed to vicarious reinforcement. In addition to the assumption that vicarious processes may be expected to be weaker than direct reinforcement, another factor which may have contributed to the failure here to replicate this finding was a fairly high incidence during debriefing of Observers reporting disbelief of any real creativity criterion existing for the Rater's judgments. The Storytellers, on the other hand, virtually never reported this disbelief. There may be some relation between this and their need to operate in the experiment as though they believed that a creativity criterion existed in order to comply with the expectations of their role in the experiment.

The Observers' high valuation of Storytellers who were negatively reinforced was evident, as it was in the McGinley paper, and seems likely to weaken this experiment as a test of

balance versus reinforcement. It seems probable that the Observer's vicarious position with respect to reinforcement influences contributes to the differences between the Observer and the Storyteller responses, but a further influence could be from the fact that the Observer-Storyteller spatial relationship was different in this experiment from the spatial relationship of either subject to the Rater. The absence of the experimenter during the storytelling phase of the experiment, combined with the Observers' relative disbelief of experimental conditions likely led to some discreet communication (non-verbal and verbal) between the Observer and Storyteller during the experiment (indeed the experimenter occasionally overheard some). Those pairs of experimental subjects who did communicate to any extent probably gave the Observer evidence to believe that the Storyteller was not nearly so "negative" as the negative reinforcement condition made out, and reciprocally may have raised the Observer ratings.

In addition to this it would seem a more elegant control situation, when we are comparing the Storytellers' evaluations of the Rater to their evaluations of the Observer, if we could somehow produce relationships of a more equal footing. A second experiment was conducted to incorporate some of the implied changes.

Experiment II

In order to control for the spatial relationship between the Storyteller and the Observer, and make it more similar to that between the Rater and the Storyteller, the Storyteller in this experiment saw neither the Rater nor the Observer. Further as a measure against the Storyteller receiving sympathetic disbelieving comments from the Observer, the Observer in this experiment was a paid confederate of the experimenter. It was felt, however, that a more serious drawback in Experiment 1 was the apparent failure of the manipulation to produce a strong difference in the perceived relationship between the Rater and Observer. Procedures were introduced to attempt to remedy this problem.

Method

As in Experiment 1, the same specific predictions of reinforcement theory and cognitive balance theory were to be tested as they applied in this situation by the use of the nonorthogonal selected comparisons used previously (see Table 2). Forty female undergraduates served in the role of Storyteller, and the Observers were two female confederates.

Procedure. The procedure corresponded closely to that used in Experiment 1 except for the following departures: When experimental subjects arrived for the experiment, they were told that the other participants were already present. They entered a room with plywood partitions such that they were seated at the end of a five-foot-long table with the Observer seated at the other end, but they were never able to see more than the feet of the Observer. First they were asked to respond to an eight-item scale of attitudes (from Byrne, 1971, Appendix A, using items that had been selected on the basis of a pretest on the same population as having high variability and means near the mid-point of the six interval scale), (see Appendix A). They were told that the others had already completed the scale. While the experimenter was in the other experimental room responding to the stories, two other attitude scales were completed, each 50 percent similar to the attitude responses of the Storyteller. One of these questionnaires was labelled "Rater" and the other "Observer". In the positive relation condition they were 100 percent similar (similarity being defined as two responses on the same side of the mid-point, and within this limitation responses were randomly varied), and in the negative relation condition they were 0 percent similar.

At the completion of the storytelling, subjects were advised that although they would not get to meet each other they would later be given a questionnaire about the experiment, and in order to have more information for this they would see each others' attitude questionnaire responses. Storytellers saw the bogus Rater's and Observer's questionnaires in sequence.

Results and Discussion

The measure of the relation manipulation, the question asking how Storytellers perceived the relationship between the Rater and the Observer, showed no significant difference between positive and negative relation conditions (t = .46, df = 38). It was concluded that the changes in procedure to increase the strength of this manipulation did not do so.

The overall analysis of Storytellers' responses (see Tables 5 and 6) showed a significant main effect of proportion of positive reinforcement as expected (means: 5.0 in Rf+ condition, 4.4 in Rf- condition). Again there was a strong main effect due to scale item (means: 4.9 for Likability scale, 4.5 for Desirability Scale). In the selected comparisons made, the data significantly conformed to the reinforcement predictions with both attraction scale items.

Table 5

Mean Storytellers' Evaluative Responses in Experiment II as a Function of Proportion of Positive Reinforcement, Rater-Observer Relation, Stimulus Object and Attraction Scale

Proportion of Reinforcement	Rater-Observer Relation	Object	
		Rater	Observer
	Scale 1 (Like)		
.75	(Case 1) Positive	5.10[a,b]	5.30
	(Case 3) Negative	5.20	5.20
.25	(Case 2) Positive	4.40	4.80
	(Case 4) Negative	4.30	4.60
	Scale 2 (Desire)		
.75	(Case 1) Positive	4.80	4.40
	(Case 3) Negative	5.00	4.80
.25	(Case 2) Positive	4.10	4.60
	(Case 4) Negative	3.80	4.40

[a]The possible scores range from 1 to 7 with 7 representing high positive attraction.

[b]Each mean represents 10 subjects.

Table 6

Summary of Analysis of Variance for Story-tellers' Evaluative Data in Experiment 11

Source	df	MS	F
Between Ss			
A (R-O Relation)	1	0.03	<1
B (Proportion Rf+)	1	14.40	5.29*
AB	1	1.23	<1
Error 1	36	2.72	
Within Ss			
C (Object Rated)	1	1.23	<1
AC	1	0.00	<1
BC	1	3.03	2.46
ABC	1	0.00	<1
Error 2	36	1.23	
D (Attraction Scale)	1	5.63	8.75**
AD	1	0.10	<1
BD	1	0.23	<1
ABD	1	0.40	<1
Error 3	36	0.64	
CD	1	0.10	<1
ACD	1	0.23	<1
BCD	1	0.90	2.65
Comparisons			
Likability Scale			
Reinforcement Predictions[a]	1	9.11	26.78++
Balance Predictions[a]	1	2.81	8.27+
Reinforcement vs. Balance[b]	1	1.80	5.29
Desirability Scale			
Reinforcement Predictions[a]	1	5.51	16.20++
Balance Predictions[a]	1	2.11	6.21
Reinforcement vs. Balance[b]	1	0.80	2.35
Error 4	36	0.34	

* = $p < .05$ ** = $p < .01$ + = $p < .01$ ++ = $p < .001$

[a]Predictions test one set of theoretical hypotheses expressed by weights in Table 2. Each set of predictions tests eight means.

[b]This test compares two means only, where predictions are opposite.

The fit to the balance predictions was significant for the "likability" scale but failed to reach significance for the "desirability" scale. Comparisons of the two sets of predictions are not highly meaningful in view of the absence of the manipulation, and were not significant in either case. If it is not clear from the measure testing the success of the manipulation that the experimental conditions differed from each other, then it is unlikely that differences in the dependent measure can be attributed to the influences hypothesized from the two theories. Auxiliary analyses with both attraction scales taken together are tabled in Appendix B.

An incidental difference between the two experiments was reflected in the result that the grand mean of Story-tellers' evaluations in the second experiment (9.35) was almost one scale interval lower than in the first experiment (10.30). This seems a large difference on a scale that Byrne and Nelson (1965) lead us to believe should change not more than about three units between extreme groups in a similarity-attraction experiment. In this paper, Experiments I and II were conducted about three weeks apart on the same population. If the IJS reflects general affect in an experiment as McGinley and McGinley (1972) suggest, then this difference probably resulted from subjects' finding that sitting behind plywood partitions is more unpleasant than sitting with a peer in a

room with considerable opportunity for nonverbal communication. This may be related to the finding of Griffit (1970) that environments rated as unpleasant influence attraction responses.

Chapter Summary

In a mixed factorial design, direct reinforcement was varied from positive to negative in the Rater's evaluation of a Storyteller. A third person, the Observer, was present and the Observer's relation to the Rater was manipulated as either positive or negative. There were as a result four experimental conditions of interest, and the balance and reinforcement predictions concurred for two of them and differed for two others. The experimental data showed no significant difference between the two groups where theoretical predictions differed. A main weakness was that the Rater-Observer relation manipulation was not very powerful. The overall pattern of data predicted by each theory occurred to a significant extent, due to the fulfillment of predictions that both theories had made in common.

A second experiment was carried out to differentiate between the success of the predictions of the two theories.

A different procedure was followed to manipulate the relation between Rater and Observer in the eyes of the Storyteller, but this procedure, if anything, was weaker than the one employed in the first study. Clearly further work was needed on this problem.

It was also suggested that indeed there may be forces acting in accord with the predictions of each theory in such a way as to balance each other out. It was suggested that the experimental problem be broken into two parts: that of demonstrating the existence of both balance and reinforcement forces, and that of demonstrating the predominance of one over the other.

CHAPTER III

EXISTENCE AND DOMINANCE OF TWO SETS OF INFLUENCES

Experiment III

In Experiment I, both sets of predictions accounted for the data to a significant degree, due to a number of predictions that both theories made in common. The critical means which compared the predictive success of the two theories were not significantly different. In Experiment II, the data followed the reinforcement predictions to a significant degree on both attraction scale items, and followed the balance predictions on one item. Again the critical means for comparing the two sets of predictions were not different. It seemed that influences hypothesized from both learning theory and balance theory may have been operating, and in opposition to each other, since they made some opposing predictions but the means from the comparison groups did not differ.

Specifically, the mean Observer evaluation in Condition 4 (Figure 2) should have been higher than in Condition 3 if balance predictions were upheld; the mean Observer evaluation in Condition 3 should have been higher than in Condition 4 if reinforcement predictions were upheld. The result that

the means for the two conditions were not different suggested that influences corresponding to both predictions may have been operating simultaneously and cancelling each other.

Our suspicion that forces corresponding to the two sets of predictions may have been acting in opposition was due to the absence of a difference between means. A more direct test of this suspicion was required.

In all related previous experiments (Experiments 1 and 11, Griffitt and Guay, 1969, McGinley and McGinley, 1972 etc.), a main effect of reinforcement had occurred. What was designed next was, in effect, a test of the existence of influences hypothesized by cognitive balance theory. This was arranged by adding two conditions where most of the likelihood of balance occurring was subtracted out. In these experimental conditions, the Rater-Observer relation was left undefined. These two "reinforcement only" conditions (1 and 2 in Figure 3) were compared to two "reinforcement vs. balance" conditions (3 and 4 in Figure 3), to test whether the occurrence of balance could be demonstrated. (Again there is theoretically a certain probability that what are here called balance predictions might have been predicted with generalization.)

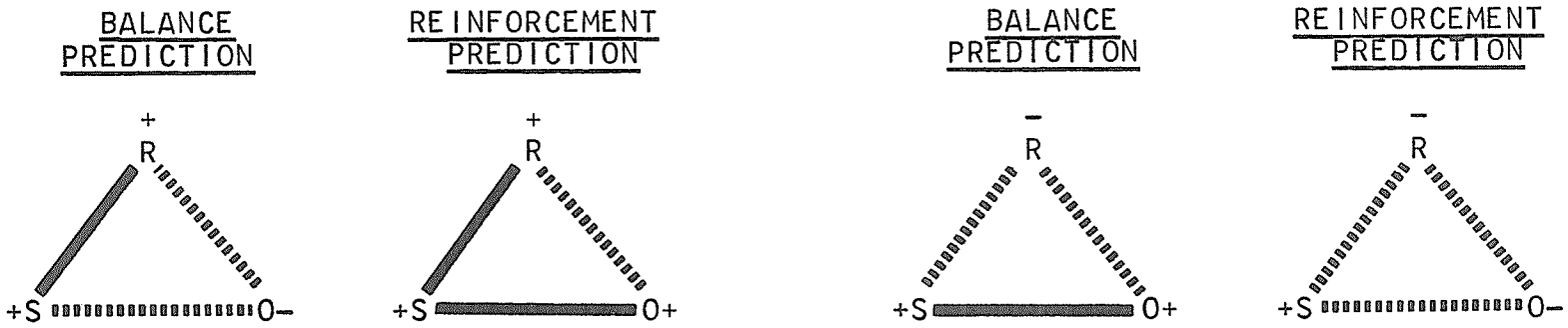
1). POSITIVE REINFORCEMENT CONDITION

2). NEGATIVE REINFORCEMENT CONDITION

NEGATIVE RATER-OBSERVER RELATION CONDITION

3). POSITIVE REINFORCEMENT CONDITION

4). NEGATIVE REINFORCEMENT CONDITION



R denotes Rater; S - Storyteller; O - Observer

Figure 3. Experimental Conditions in Experiment III.

Experiment III also tested a series of personality hypotheses, which were drawn from the literature on how individual differences may affect responses to situations of cognitive inconsistency. It was expected that the use of these constructs would add to the understanding of how balance may operate in this experimental attraction situation.

Personality and Cognitive Balance

Although cognitive balance theories focus on situational variables giving rise to inconsistency, and then on the modes of inconsistency resolution, the situational variables in question do not necessarily affect all individuals in the same way. It seems evident, for example, that no definition of inconsistency ensures that a situation which is inconsistent for one individual may not be for another individual; individual reactions may vary across types of inconsistency; and individuals may differ in responses to different contents of inconsistency (Abelson, 1968). There should be some value in exploring research reported on the question of how individual differences affect the resolution of cognitive inconsistency. A study of variables related to personality is expected to help identify the balance processes operating in this triad situation.

Glass (1968) hypothesizes that ego-defensive style is a likely determinant of differences in the way in which individuals reduce inconsistency. He favors Byrne's (1961b) R-S Scale and proposes a program of experimentation to compare "repressors" and "sensitizors" on their dissonance-reducing responses.

Several studies are reviewed by Miller and Rokeach (1968) from which they conclude that "authoritarian and dogmatic persons possess less tolerance for inconsistency, at least wherein they are required to assess themselves and others." They rationalize these findings by arguing that such individuals have a major tendency to engage in simple black-and-white thinking.

Steiner (1968) reviews studies which permit the subject relatively unrestricted experimental conditions in which to pursue response strategies, looking for personality determinants of response preferences. Repeated evidence demonstrated that different subjects respond differentially to inconsistency, but no traditional personality variables were identified strongly in the discussion. Rather the consistency responses were seen as analogous to the personality "mechanisms" described by classical psychoanalytic theorists.

A series of hypotheses related to individual differences was generated for this experiment.

It has already been mentioned that Heider's theory assumes that the perceiver has a positive liking relationship to himself. This is indicated clearly again with the Rosenberg and Abelson model where each of the sets of predictions made in Figure 2 presupposes that the Storyteller has a positive self-evaluation. Experimental subjects in the Storytellers role who are high in self esteem should perform more in accord with balance expectations than subjects in the Storytellers' role who are low in self esteem.

Christie (1970a) developed an instrument to measure the attributes which he felt characterized people who are manipulators in interpersonal dealings. These characteristics included such things as unconcern with conventional morality and lack of affect toward others in interpersonal relationships. Christie chose to construct a scale with items drawn largely from the writings of Machiavelli, because of the latter's highly specific assumptions about the nature of man.

Bogart, Geis, Levy, and Zimbardo (1970) reported that subjects high in Machiavellianism tended to be less susceptible to the influence of cognitive dissonance. Given that low Machiavellian subjects have been more responsive to cognitive forces in past research, perhaps this is also true in their interpersonal relations. Another general finding of interest with the Machiavellianism construct is that high as contrasted to low Machiavellians have a negative view of people in general. In the present research it was expected that this would be reflected in an overall difference in evaluative ratings of others.

Bieri (1968) relates the cognitive structure of an individual to his reactions to inconsistent information. He argues that information has more structure if it has greater dimensionality and if the manner in which these dimensions are combined is inconsistent. The latter can be illustrated, in the unidimensional case, by asserting that information identifying several positions on a dimension provides more stimulus alternatives than information occupying similar scalar positions. For example describing an individual as meek and timid is less structured than describing him as meek and dominant. Bieri proceeds to cite empirical support for his proposition that the structure of the cognitive system

of an individual, reflected in a measure of cognitive complexity, influences his differential reactions to inconsistent and consistent information. The more complex judge discriminates better among inconsistent stimuli, and will be more certain of his judgments based on inconsistent information.

Press, Crockett, and Rosenkrantz (1969) found an interaction between cognitive complexity and whether subjects learned balanced or unbalanced structures most easily. Subjects low in complexity learned balanced structures most easily, while subjects high in complexity showed no difference in the rate of learning balanced and unbalanced structures. It was argued that subjects high in complexity should be better able than lows to combine the desirable and undesirable attributes into an integrated description. Lows, on the other hand, should be more dependent on balance in learning the structures. Earlier studies on the learning of balanced versus unbalanced social structures (Zajonc and Burnstein, 1965a, 1965b; Zajonc and Sherman, 1967) had not consistently demonstrated that subjects learned balanced structures more easily. The Press et al study controlled structures for whether they were capable of being described by a simple rule, as well as for cognitive complexity.

Since less complex subjects have been found to be more responsive to balance, it was expected in this study comparing balance and learning predictions that less complex subjects would perform more in accord with balance hypotheses.

Method

The experimental subject was seated in a room in full view of two confederates of the experimenter. Each person was at an individual table, and on the subject's (Storyteller's) table was the McGinley rating scale of lights used in Experiments I and II, where scale intervals indicate the Rater's judgments of creativity. The control panel with the switches was apparently on the Rater's table, but in fact the Rater had only one switch and did not directly know what feedback was given to the Storyteller. Four ratings for each subject were pre-programmed on an apparatus in another room before each session by the experimenter. The apparatus on each table was not visible to the people seated at any other table.

Experimental subjects were 72 women enrolled in Introductory Psychology at the University of Manitoba and participating as part of the course requirement.

Procedure. The experimental procedure was similar in general to that described in Experiment 1. In Conditions 2 and 3 where the Rater-Observer relation was to be negative, subjects were advised before entering the experimental room that the Rater and the Observer had been selected because of their dissimilarity on a prior attitude questionnaire. This was the relation manipulation which worked to a partial degree in Experiment 1. Subjects in the conditions where no relation was to be specified simply heard a general comment that there were two other people in the experiment, one a Rater and one an Observer.

In addition, subjects in the negative Rater-Observer relation condition first completed an eight-item attitude survey upon arriving in the experimental room (the same survey used in Experiment 11, see Appendix A). During this time the Rater and Observer spontaneously discussed their answers to the questionnaire, "discovering" that they were very different on four of the eight items. Confederates were chosen from a non-professional drama group and followed a pre-arranged script. The espoused attitudes and the individuals were counterbalanced between the two roles.

e.g.: O to R: What do they mean by welfare legislation?
R to O: I don't really know. Isn't it some kind of government assistance for people who can prove they're poor?
O to R: I think I'm mildly in favor of increased welfare legislation.
R to O: I am opposed to increased welfare legislation. What did you put for science fiction?
O to R: I dislike science fiction.
R to O: I really enjoyed 2001, so I put I enjoy science fiction very much. What do you think of number eight?
O to R: Good question. I heard somewhere that women adjust to stress better than men.
R to O: I put that men adjust better.
O to R: Number seven seems rather out of place.
R to O: I put I enjoy gardening to a slight degree.
O to R: I've never done much gardening, but I don't think I would like it.

In conditions 1 and 4, this section of the procedure was omitted.

During the storytelling and rating, all three participants were visible to each other. At the completion of the experiment, subjects completed (in individual rooms) a questionnaire with evaluation measures (IJS), an independent measure of the Rater-Observer relation manipulation, a measure of self esteem (Fiedler, Hutchins and Dodge, 1959), Machiavellianism (Christie, 1970b), and cognitive complexity (Crockett, 1965), and questions of their perceptions of what the experiment was about (see Appendix C). Subjects were then debriefed.

Four subjects were discarded from further analysis because they belonged to ethnic minorities and showed obvious difficulty in using English. Two subjects were discarded from the analysis because they failed to complete the experiment. No subjects reported being acquainted with either of the confederates. Twenty of the final 72 subjects were judged aware but were not discarded. Awareness failed to correlate significantly with any of the response measures used in this study.

Results

An overall analysis of variance was calculated (Table 9) with the factors: (1) proportion of positive reinforcement, (2) Rater-Observer relation, (3) object rated, and (4) attraction scale. The only significant effect in this analysis was the item effect (F = 12.54, df = 1/68, $p < .005$). (The mean for the Likability scale was 5.2, for Desirability 4.9).

The specific interpersonal attraction hypotheses of this experiment were tested by means of a series of non-orthogonal selected comparisons with the use of weighting coefficients. The experimental conditions discussed in Chapter II describe one where positive reinforcement acts unimpeded by opposing balance forces giving a high Observer

evaluation; one condition where negatively valued reinforcement acts unimpeded by opposing balance forces and gives a low Observer evaluation; and two conditions with opposing forces and intermediate means. If for the question of the existence of balance influences the two intermediate means are taken together, and tested against the two means which are expected to be more extreme, then the weights to be applied should be those for a linear progression of three means. These weights are -1, 0, and 1 (Kirk, 1968, 538), and do not provide any test of the location of the middle mean. It was decided rather to combine the test of the existence of balance influences with the test of the dominance of balance or reinforcement, using the two sets of weights of Table 7.

Table 7

Weights for Non-orthogonal Comparisons of Balance against Reinforcement Predictions, Experiment III

	Reinforcement		Balance	
Condition	Rater	Observer	Rater	Observer
Relation- (Condition 2)	+2	+1	+2	-1
Rf+ (.75) Relation 0 (Condition 1)	+2	+2	+2	+2
Relation- (Condition 3)	-2	-1	-2	+1
Rf- (.25) Relation 0 (Condition 4)	-2	-2	-2	-2

As in the earlier experiments, the non-orthogonality of the sets of comparisons required sharing the probability of Type 1 error between the tests. For each test the significance level is about $p = .01$ since the two items of the attraction measure were tested separately.

Of the four comparisons made (Table 9), expressing the existence of balance influences with either reinforcement dominant or balance dominant, and each of these with data from either the "likability" or "desirability as a work partner" scales, none reached significance at the .01 level. The means entering into the comparisons are shown in Table 8.

There was no main effect for proportion of reinforcement.

An auxiliary analysis was carried out (Tables 10, 11 and 12) dividing each experimental condition into two subgroups of equal size on the basis of whether each subject's self esteem score was high or low. It was predicted that subjects high in self esteem would conform more to balance predictions. One comparison reached significance at the .01 level, with high self esteem subjects, the likability scale, and balance predictions dominant ($F = 9.32$, $df = 1/64$).

Table 8

Mean Storytellers' Evaluative Responses in Experiment III as a Function of Proportion of Positive Reinforcement, Rater - Observer Relation, Stimulus Object and Attraction Scale

Proportion of Reinforcement	Rater-Observer Relation	Object	
		Rater	Observer
	Scale 1 (Like)		
.75	(Case 3) Negative	5.11[a,b]	5.33
	(Case 1) Unspecified	5.39	5.39
.25	(Case 4) Negative	4.89	5.28
	(Case 2) Unspecified	5.06	5.39
	Scale 2 (Desire)		
.75	(Case 3) Negative	4.94	4.89
	(Case 1) Unspecified	5.06	5.00
.25	(Case 4) Negative	4.78	4.94
	(Case 2) Unspecified	4.56	4.89

[a]The possible scores range from 1 to 7 with 7 representing high positive attraction.

[b]Each mean represents 18 subjects.

Table 9

Summary of Analysis of Variance for Story-tellers' Evaluative Data in Experiment III

Source	df	MS	F
Between Ss			
A (Proportion Rf+)	1	2.00	<1
B (R-O Relation)	1	0.35	<1
AB	1	0.35	<1
Error 1	68	2.54	
Within Ss			
C (Object Rated)	1	2.00	1.42
AC	1	1.39	<1
BC	1	0.01	<1
ABC	1	0.13	<1
Error 2	68	1.41	
D (Attraction Scale)	1	8.68	12.54***
AD	1	0.01	<1
BD	1	0.50	<1
ABD	1	0.22	<1
Error 3	68	0.69	
CD	1	0.35	<1
ACD	1	0.01	<1
BCD	1	0.22	<1
Comparisons			
Likability Scale			
Bal. occurs; Reinf. dominates[a]	1	0.94	2.07
Bal. occurs; Bal. dominates[a]	1	0.77	1.70
Desirability Scale			
Bal. occurs; Reinf. dominates[a]	1	1.56	3.42
Bal. occurs; Bal. dominates[a]	1	1.79	3.94
Error 4	68	0.45	

*** = $p < .005$

[a]Predictions test one set of theoretical hypotheses expressed by weights in Table 7. Each set of predictions tests eight means.

Mean Evaluative Responses of Storytellers in Experiment III as a Function of Self Esteem, Proportion of Positive Reinforcement, Rater-Observer Relation, Stimulus Object, and Attraction Scale.

Proportion of Reinforcement	Rater-Observer Relation	Object		Object	
		Rater	Observer	Rater	Observer
Scale 1 (Like)		High Self Esteem		Low Self Esteem	
.75	(Case 3) Negative	5.00[a,b]	5.22	5.11	5.44
	(Case 1) Unspecified	5.67	5.78	5.11	5.00
.25	(Case 4) Negative	5.11	5.56	4.67	4.00
	(Case 2) Unspecified	5.00	4.89	5.11	5.89
Scale 2 (Desire)					
.75	(Case 3) Negative	4.44	4.89	5.44	4.89
	(Case 1) Unspecified	5.33	5.44	4.78	4.56
.25	(Case 4) Negative	4.67	5.22	4.89	4.67
	(Case 2) Unspecified	4.67	4.89	4.44	4.89

[a]The possible scores range from 1 to 7 with 7 representing high attraction.
[b]Each mean represents 9 subjects.

Table 11

Summary of Analysis of Variance in Experiment III of Storytellers' Evaluations with Self Esteem as a Factor

Source	df	MS	F
Between Ss			
A (Proportion Rf+)	1	2.00	<1
B (R-O Relation)	1	0.35	<1
AB	1	0.35	<1
C (Self Esteem)	1	1.13	<1
AC	1	0.35	<1
BC	1	0.89	<1
ABC	1	10.89	4.37*
Error 1	64	2.49	
Within Ss			
D (Object Rated)	1	2.00	1.38
AD	1	1.39	<1
BD	1	0.01	<1
ABD	1	0.13	<1
CD	1	0.35	<1
ACD	1	0.68	<1
BCD	1	1.39	<1
ABCD	1	0.89	<1
Error 2	64	1.45	
E (Attraction Scale)	1	8.68	12.66***
AE	1	0.01	<1
BE	1	0.50	<1
ABE	1	0.22	<1
CE	1	0.00	<1
ACE	1	0.50	<1
BCE	1	2.35	3.42
ABCE	1	0.35	<1
Error 3	64	0.69	
DE	1	0.35	<1
ADE	1	0.01	<1
BDE	1	0.22	<1
ABDE	1	0.00	<1
CDE	1	2.00	4.54*
ACDE	1	0.00	<1
BCDE	1	0.35	<1
ABCDE			a
Error 4	64	0.44	

* = $p < .05$ *** = $p < .005$

[a]This effect is not independent of the comparisons.

Table 12

Summary of Comparisons of Storytellers' Evaluations under High and Low Self Esteem

Source	df	MS	F
High Self Esteem; Likability			
Bal. occurs; Reinf. dominates[a]	1	2.24	5.09
Bal. occurs; Bal. dominates[a]	1	4.11	9.32+
High Self Esteem; Desirability			
Bal. occurs; Reinf. dominates[a]	1	1.38	3.13
Bal. occurs; Bal. dominates[a]	1	1.88	4.26
Low Self Esteem; Likability			
Bal. occurs; Reinf. dominates[a]	1	0.07	<1
Bal. occurs; Bal. dominates[a]	1	0.62	1.40
Low Self Esteem; Desirability			
Bal. occurs; Reinf. dominates[a]	1	0.62	1.40
Bal. occurs; Bal. dominates[a]	1	0.43	<1
Error	64	0.44	

+ = $p < .005$

[a]Predictions test one set of theoretical hypotheses expressed by weights in Table 7. Each set of predictions tests eight means.

There were two significant three way interactions, one between proportion of positive reinforcement, Rater-Observer relation, and self esteem ($F = 4.37$, $df = 1/64$, $p < .05$). High self esteem Storytellers gave higher ratings overall when reinforcement was positive than when reinforcement was negative, when there was no specified Rater-Observer relation. When the Rater-Observer relation was negative then high self esteem subjects differed very little in their ratings when reinforcement varied. The low self esteem subjects differed very little in response to these same manipulations. High self esteem subjects appeared more changeable in this experiment, responding to the Rater-Observer relation when it was presented, responding to reinforcement when the relation was not presented. They were perhaps less apprehensive about becoming involved (Figure 4). A second interaction was between self esteem, scale type, and object rated ($F = 4.54$, $df = 1/64$, $p < .05$). With the "likability" scale, the Storytellers tended, regardless of their self esteem, to like the Observers better than the Raters. High self esteem subjects also reported they would "work" with the Observer rather than the Rater, but low self esteem subjects tended to report the opposite. This may be due to a greater acceptance by low self esteem subjects of poor creativity ratings from the Rater, when they were given (Figure 5).

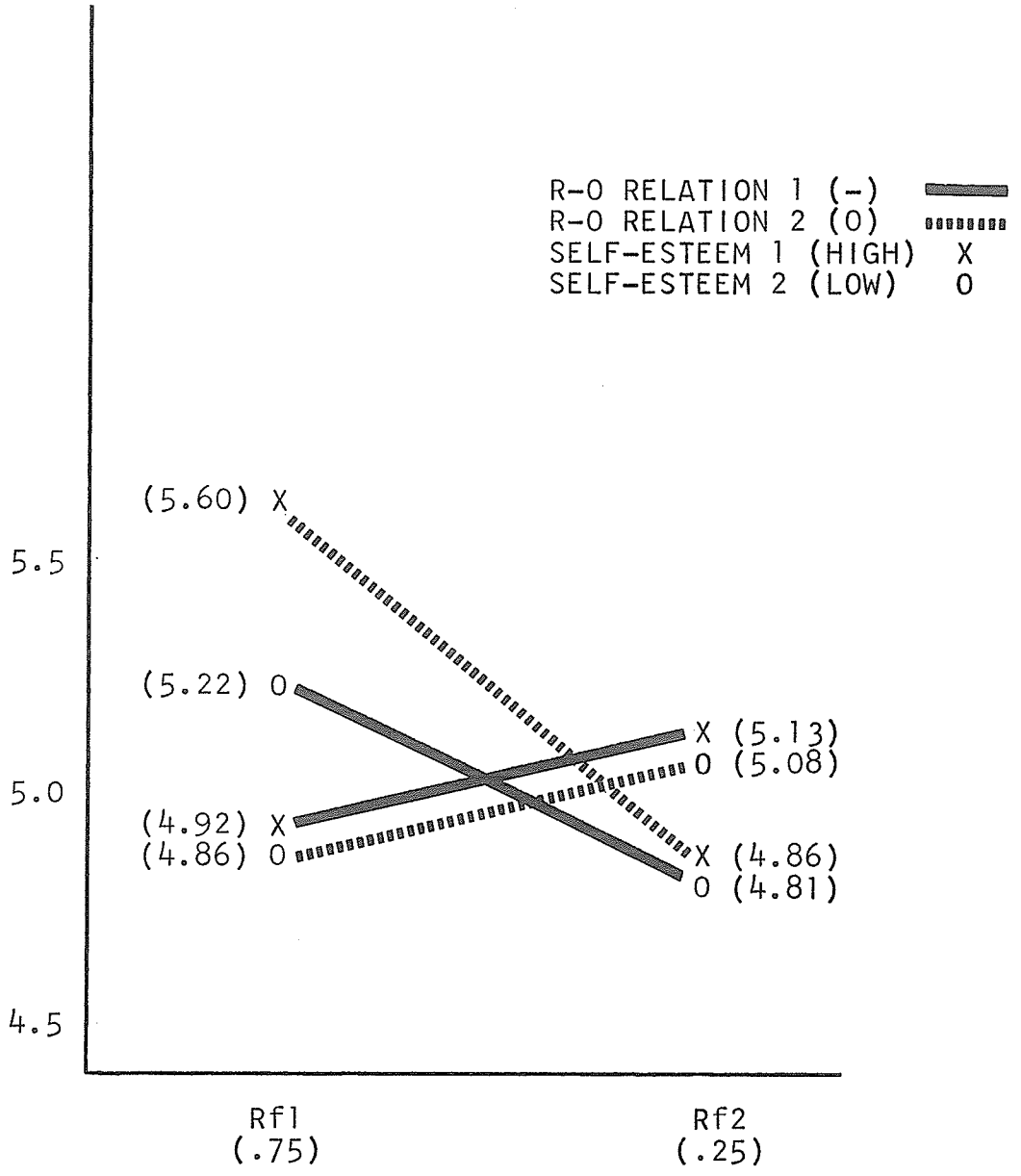


Figure 4 - Storytellers Evaluations in Experiment III as a Function of Reinforcement Condition, Rater-Observer Relation, and Self Esteem.

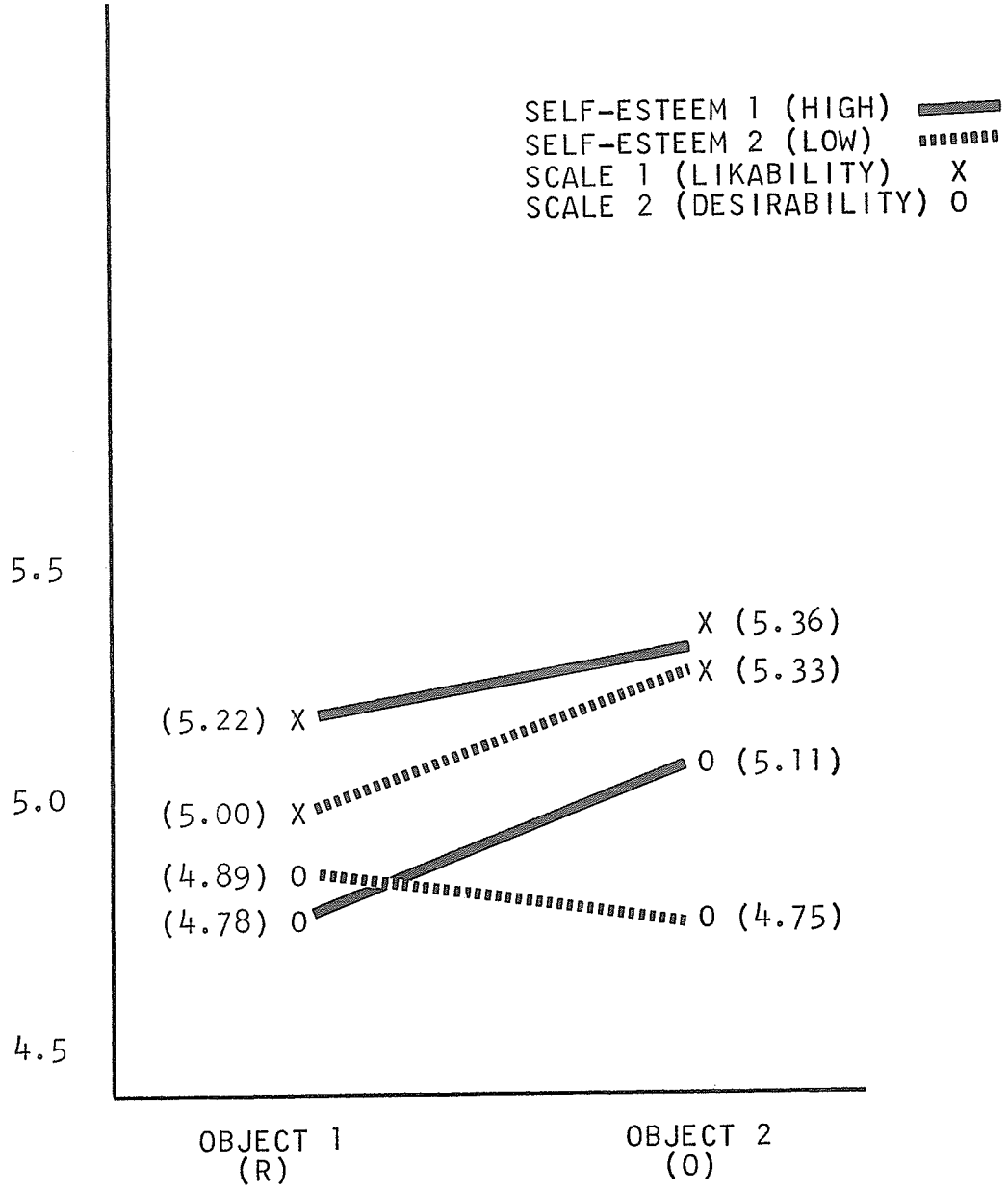


Figure 5 - Storytellers Evaluations in Experiment 111 as a Function of Self Esteem, Scale Type, and Object Rated.

Several additional auxiliary analyses were carried out. To test the expectation that subjects high in Machiavellianism should be less susceptible to cognitive influences, an analysis was calculated including high vs. low Machiavellianism as a factor. As predicted, there was a highly significant main effect due to Machiavellianism (F = 12.87, df = 1/64, $p < .005$), with high Machiavellian Storytellers giving lower evaluative ratings (mean high Mach evaluation = 4.8, low Mach evaluation = 5.3), but the selected comparisons showed no significant conformity to the main experimental hypotheses by any of the subgroups created (Appendix D).

To test whether differences in cognitive complexity between subjects were reflected in the way they responded to a cognitive balancing situation, an auxiliary analysis incorporated cognitive complexity as a factor (Appendix D). There was no main effect due to complexity, although there was a significant interaction between proportion of positive reinforcement, Rater-Observer relation, and cognitive complexity (F = 7.49, df = 1/64, $p < .01$).

The means forming the interaction indicate that high complex Storytellers gave higher evaluations overall when the Rater's judgments were negative than when they were positive, under the condition where the Rater-Observer relation was negative (a response opposite to reinforcement predictions in a "reinforcement vs. balance" situation). Low complex subjects, on the other hand, responded in the opposite way when the Rater-Observer relation was negative. No direct and simple association between Rater-Observer relation and evaluative responses to reinforcement conditions was predicted, but it was predicted that low complex subjects would respond more in accord with balance principles. An indirect assessment of this expectation within this interaction is found looking at the unspecified Rater-Observer relation "reinforcement only" conditions. Here high complex Storytellers respond to reinforcement where their evaluative judgments are directly related to the proportion of positive rewards. Low complex ("balance prone") Storytellers, on the other hand, respond opposite to reinforcement predictions and evaluate the negatively responding Rater and Observer relatively highly. Low complex subjects exhibit an unpredicted failure to respond to reinforcement. It is possible that they were responding to some simplifying rules of their own (Figure 6).

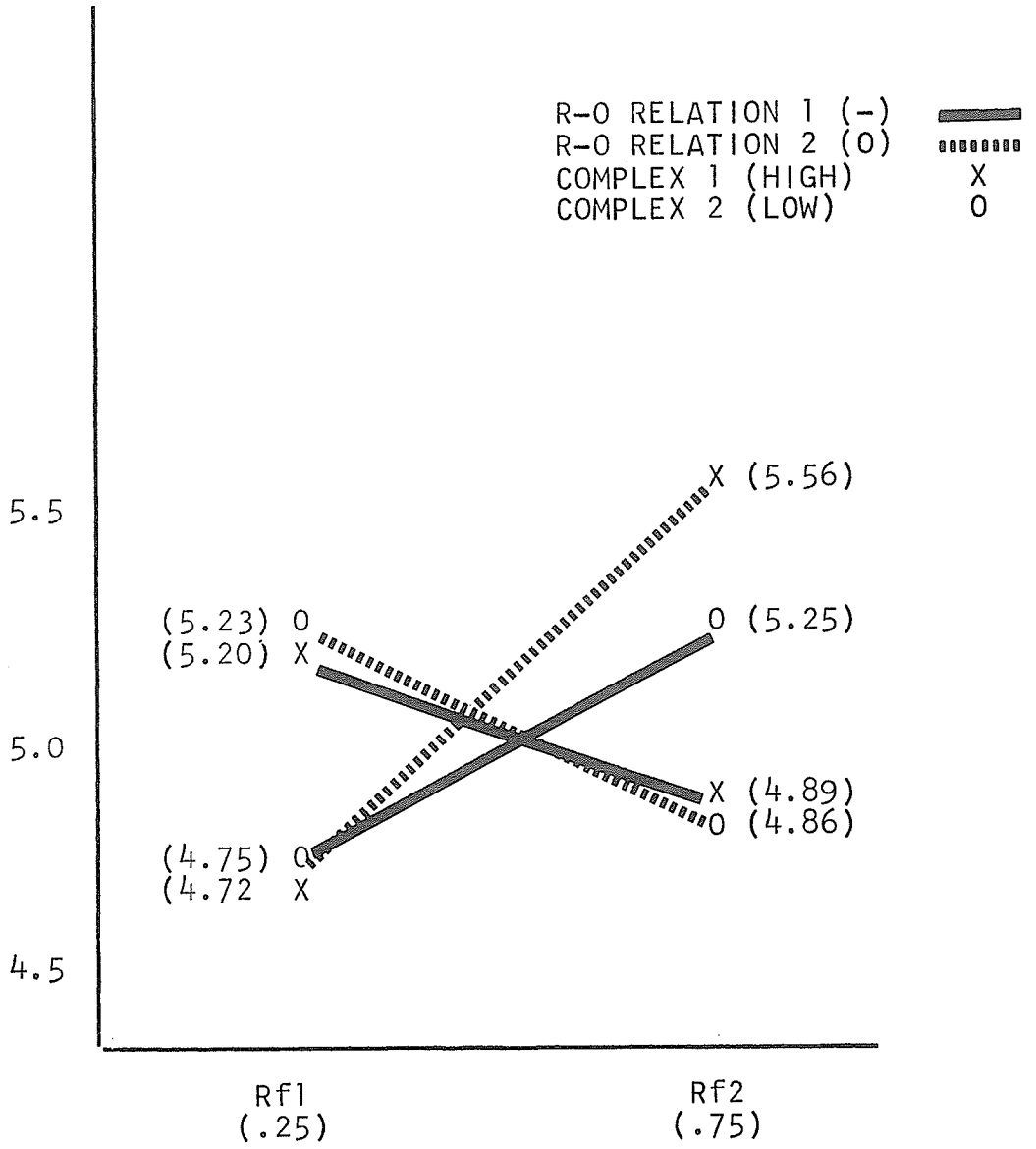


Figure 6 - Storytellers Evaluations in Experiment III as a Function of Reinforcement Condition, Rater-Observer Relation, and Cognitive Complexity.

Due to the relative scarcity of confirmation for the hypotheses in this third experiment, several further analyses were conducted to attempt to find some explanation for the results. Subjects had responded in their questionnaire to four 7-point scales under the question, ".....place a check mark on the scale where you would honestly rate the creativity of each of your stories." Subjects' responses to these items were rescaled to range from 1 to 10, and for each subject the mean difference was calculated between his self-ratings of creativity and the ratings administered by the Rater. This index was used as a measure of "belief" where a small difference between the two sets of ratings was considered high belief. An overall analysis of variance was again calculated with belief included as a factor (Appendix D). There was no main effect of belief. Two selected comparisons were significant. With the "desirability" evaluative scale and with subjects low in belief, the means conformed significantly to the weights representing expected results when balance influences exist and are dominant as well ($\underline{F}$ = 11.29, $\underline{df}$ = 1/64, $\underline{p} < .005$). Although the means were in the direction expected when balance is dominant, they were not strongly in this direction and the comparisons for dominant reinforcement influences were also significant ($\underline{F}$ = 10.04, $\underline{df}$ = 1/64, $\underline{p} < .005$). This is again due to the fact that many of the occurring trends were those predicted by both theoretical positions in common.

Because of the dependence of this experiment on deception, and on the good will of the subjects after debriefing, an analysis was carried out including as a factor the subjects participating in the early half of the sample against those participating in the late half. There was no main effect due to time of participation, but there was a significant interaction between time of participation and attitude scale item ($F = 7.10$, $df = 1/64$, $p < .01$). In the selected comparisons, there was significant conformity to the main hypotheses with early subjects responding on the "desirability as a work partner" scale. Again both balance and reinforcement dominant comparisons were significant ($F = 8.90$, $df = 1/64$, $p < .01$, $F = 7.78$, $df = 1/64$, $p < .01$) but the means were in the direction predicted for balance being dominant, and so the mean square was larger for that comparison.

Discussion

In this third experiment the results were weaker than in the first two experiments in the sense that on the same sort of analysis this one did not support the main hypotheses. Where it was hypothesized that subjects would respond more in accord with balance predictions in the high self esteem group, this group did in fact respond with balance dominant, but the low self esteem group did not conform to any set of predictions.

In auxiliary analyses where the means conformed to a set of hypothesized weights (high self esteem; low belief; early participation) the results suggested the existance of balance influences, and the means in each of these cases were in the direction indicating that balance influences were dominant. There was, however, no significant difference between the means in the negative relation condition that would have verified this dominance. With reference to the earlier comment that balance hypotheses in this experiment may have been also explicable with the learning concept of generalization, it can be added here that there seems to be no learning theory argument which would have made the self esteem prediction.

With the Machiavellianism variable, there was the expected significant main effect but besides this there was no evidence of a specific effect indicating that high Machiavellians were less susceptible to balance influences. With the cognitive complexity variable there was no evidence of support for the expectation that subjects low in complexity would respond more to complexity cues.

As the second experiment reported here was more controlled than the first one against distracting cues in the experimental situation, this one was less controlled than either. When there is otherwise an expectation of success of the manipulations, then a decrease in control can readily be justified when it brings to the experiment more of an approximation of a real life situation. This decrease in control in this experiment apparantly contributed to the weakness of the results.

A further influence that may have decreased the effectiveness of the experiment is the attitude similarity between the Storyteller and the Rater and Observer. Attitude information was supplied to Storytellers with the Rater-Observer relation manipulation. It is well established that similarity on attitude questionnaire responses can influence IJS-measured attraction toward a stranger, and that attitude information can combine with other information to indicate overall attraction (Byrne, 1971). Within the framework of reinforcement predictions in this experiment, if Storytellers happened to be similar to Observers, say, in the punishment condition and dissimilar in the reward condition then the effect of the reinforcement conditions would be diminished.

Similarity did differ in this direction, but the means (.57 and .53) were not far apart and the difference did not approach significance (t = .52, df = 34). This data is for the negative Rater-Observer relation conditions. In the unspecified relation conditions, Storytellers were not given attitude information.

A procedural difference between this experiment and the two before it was the total objectivity in the assignment of Raters' responses to stories, described above. Whereas in the first two experiments the ratings had a certain amount of freedom to follow the subjective creativity judgments of the experimenter (and so to possibly increase the level of belief of Storytellers) in Experiment III the ratings were preset and no deviation was possible from the program.

Evaluative responses have been found to be related to environmental variables (e.g. Griffitt, 1970), and have varied overall with changes between the experiments reported here. The sensitivity of evaluative measures to these manipulations suggests a need for further study of the effects of "common-place" variables in the attraction situation.

As mentioned earlier, Wright (1971) criticized Byrne for his lack of clear attention to either classical or instrumental conditioning in evolving his paradigm. He further criticizes Byrne's maintenance of his abstract experimental technique as one which discourages generalization of the paradigm, and tends to inflate the importance of the variable under consideration by its atypical degree of control over the degree of information which the subject receives. Byrne's (1971b) reply was more witty than informative, but defended his record of generalization. As Linder (1973) points out, however, Byrne's research on attraction and similarity has almost exclusively tested variations in some independent variable. The dependent variable (IJS) is not given the same scrutiny. The occurrence of a strong main effect for scale within the IJS in each of the three experiments implies that the assumption that both scales are measuring the same construct of attraction deserves further investigation.

A procedural point which these experiments borrowed from the earlier ones of the same design was the use of the ten-point response scale for the Rater, where the counter-balancing scheme used makes an assumption of linearity. A positive response can be "very good", or "good" and "excellent", or "good", "very good" and "excellent" depending on how many positive responses are

needed for the same subject. The scaling properties of this arrangement deserve investigation. The sequencing of these Rater responses provides some further interesting questions. One of the combinations used in Experiment 1 for example was two negatives followed by two positives (NNPP). This particular combination seems to be similar to one of the experimental conditions used by Aronson and Linder (1965), where it was found that subjects liked an experimental confederate more when she evaluated them first negatively and then positively, than when she evaluated them uniformly positively.

Interestingly, Stapert and Clore (1969) found comparable results with similar data when each response was attributed to a different stranger. They considered this evidence for a reinforcement explanation since the early negative strangers contributed arousal which later enhanced the positive strangers when the negative cues had been removed.

Only twenty of the 72 subjects were judged to be aware on a questionnaire adapted from one used by John Adair at the University of Manitoba (Appendix C). It was not attempted to analyse the responses of these subjects separately. However, the finding that subjects conformed to the experiment's hypotheses in the low but not in the high "belief" subgroup was

tentatively associated with awareness. In an experimental study of two dependent measures of interpersonal attraction, Murray and McGinley (1972) found that for each prediction aware subjects tended to conform more to expectations in every case than aware subjects, although there was no significant awareness effect demonstrated.

Chapter Summary

An experiment was described which would (a) test for the occurrence of balance and reinforcement forces as distinct from the test for the dominance of these forces, (b) increase the salience of the Rater-Observer relation manipulation, (c) test for several personality constructs which have been shown elsewhere to relate to how individuals respond to cognitive balance situations, and (d) place the participants in a face-to-face situation with the intention of making their ratings of two others more on an equal footing, and to create an environment somewhat closer to a real life attraction problem.

The results seem to support the occurrence of balance as well as reinforcement forces, and the trend in this experiment was for balance forces to be dominant, although this was not found to a significant degree. The balance and reinforcement

hypotheses were supported primarily under the high self esteem condition, which is the hypothesized way in which balance, at least, should appear. Machiavellianism had a strong effect on evaluations in general but neither it nor cognitive complexity added to our understanding of how balance influences may operate. The Rater-Observer relation was statistically successful, but the face-to-face situation of the participants seemed to cause the experiment to lose power.

CHAPTER IV
IMPLICATIONS

Can a balance explanation be used to describe the interpersonal attraction in these experiments? It would seem that it can, although the trends are that the relative power of the balance or reinforcement explanations varies between different experimental situations. In Experiments I and II, there was a strong effect due to reinforcement and the confirmation of balance was not clearcut. In Experiment III there was no main effect due to proportion of positive reinforcement, and there was some evidence of balance in subsidiary analyses. It is possible that the tighter controls and more specific definition of the role of the subject in Experiments I and II were facilitating to the straightforward reinforcement effects, whereas Experiment III with its greater number of extraneous cues provided a situation more suited to cognitive problem

solving or balancing behavior. If this is the case, since generalizability is close to the basic aims of science the face-to-face type of situation should not be discarded but rather studied even more intensively.

For a laboratory model of interpersonal attraction in a triad, the questions of the existance of balance and the dominance of balance could likely be answered more rigorously if the hypotheses and conditions of Experiment III were tested in the more controlled situation of Experiment I. A further refinement from a balance theory point of view would be to attempt to either block off or measure some of the alternate means of reducing stress due to imbalance, discussed by Newcomb and summarized in Chapter I.

In review, it seemed that evidence for the reinforcement predictions occurred quite reliably. The data in Experiment III further suggested that some situations can be defined where the use of balance constructs adds predictive advantage.

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Appendix A

Questionnaires from Experiments 1 and 11

NAME_____
(please print)

POST-EXPERIMENTAL QUESTIONNAIRE

On the following pages, you are asked to make some judgments about the other people in this experiment, based on how you "feel" about them now that the experimental task is completed.

You are given groups of seven statements, and are to check off the one statement in each group that most closely indicates your feeling about the person.

You should respond as frankly as possible, and you should not find it necessary to spend very much time on any one question.

Now turn the page, and begin.

On this section of the questionnaire, respond with your feelings toward the Rater, the person in the other room who graded the stories for creativity.

INTERPERSONAL JUDGMENT SCALE

1. Intelligence (check one)
   _____I believe that this person is very much above average in intelligence.
   _____I believe that this person is above average in intelligence.
   _____I believe that this person is slightly above average in intelligence.
   _____I believe that this person is average in intelligence.
   _____I believe that this person is slightly below average in intelligence.
   _____I believe that this person is below average in intelligence.
   _____I believe that this person is very much below average in intelligence.

2. Knowledge of Current Events (check one)
   _____I believe that this person is very much below average in her knowledge of current events.
   _____I believe that this person is below average in her knowledge of current events.
   _____I believe that this person is slightly below average in her knowledge of current events.
   _____I believe that this person is average in her knowledge of current events.
   _____I believe that this person is slightly above average in her knowledge of current events.
   _____I believe that this person is above average in her knowledge of current events.
   _____I believe that this person is very much above average in her knowledge of current events.

3. Adjustment (check one)

_____I believe that this person is extremely maladjusted.
_____I believe that this person is maladjusted.
_____I believe that this person is maladjusted to a slight degree.
_____I believe that this person is neither particularly maladjusted nor particularly well adjusted.
_____I believe that this person is well adjusted to a slight degree.
_____I believe that this person is well adjusted.
_____I believe that this person is extremely well adjusted.

4. Personal Feelings (check one)

_____I feel that I would probably like this person very much.
_____I feel that I would probably like this person.
_____I feel that I would probably like this person to a slight degree.
_____I feel that I would probably neither particularly like nor particularly dislike this person.
_____I feel that I would probably dislike this person to a slight degree.
_____I feel that I would probably dislike this person.
_____I feel that I would probably dislike this person very much.

5. Working Together in an Experiment (check one)

_____I believe that I would very much dislike working with this person in another experiment.
_____I believe that I would dislike working with this person in another experiment.
_____I believe that I would dislike working with this person in another experiment to a slight degree.
_____I believe that I would neither particularly dislike nor particularly enjoy working with this person in another experiment.
_____I believe that I would enjoy working with this person in another experiment to a slight degree.
_____I believe that I would enjoy working with this person in another experiment.
_____I believe that I would very much enjoy working with this person in another experiment.

On this section of the questionnaire, respond with your feelings toward the other person who is taking the experiment in the same room as you are. Your answers, of course, will be kept confidential, so I remind you to respond as frankly as possible.

INTERPERSONAL JUDGMENT SCALE

1. Intelligence (check one)
_____I believe that this person is very much above average in intelligence.
_____I believe that this person is above average in intelligence.
_____I believe that this person is slightly above average in intelligence.
_____I believe that this person is average in intelligence.
_____I believe that this person is slightly below average in intelligence.
_____I believe that this person is below average in intelligence.
_____I believe that this person is very much below average in intelligence.

2. Knowledge of Current Events (check one)
_____I believe that this person is very much below average in her knowledge of current events.
_____I believe that this person is below average in her knowledge of current events.
_____I believe that this person is slightly below average in her knowledge of current events.
_____I believe that this person is average in her knowledge of current events.
_____I believe that this person is slightly above average in her knowledge of current events.
_____I believe that this person is above average in her knowledge of current events.
_____I believe that this person is very much above average in her knowledge of current events.

3. Adjustment (check one)

_____I believe that this person is extremely maladjusted.
_____I believe that this person is maladjusted.
_____I believe that this person is maladjusted to a slight degree.
_____I believe that this person is neither particularly maladjusted nor particularly well adjusted.
_____I believe that this person is well adjusted to a slight degree.
_____I believe that this person is well adjusted.
_____I believe that this person is extremely well adjusted.

4. Personal Feelings (check one)

_____I feel that I would probably like this person very much.
_____I feel that I would probably like this person.
_____I feel that I would probably like this person to a slight degree.
_____I feel that I would probably neither particularly like nor particularly dislike this person.
_____I feel that I would probably dislike this person to a slight degree.
_____I feel that I would probably dislike this person.
_____I feel that I would probably dislike this person very much.

5. Working Together in an Experiment (check one)

_____I believe that I would very much dislike working with this person in another experiment.
_____I believe that I would dislike working with this person in another experiment.
_____I believe that I would dislike working with this person in another experiment to a slight degree.
_____I believe that I would neither particularly dislike nor particularly enjoy working with this person in another experiment.
_____I believe that I would enjoy working with this person in another experiment to a slight degree.
_____I believe that I would enjoy working with this person in another experiment.
_____I believe that I would very much enjoy working with this person in another experiment.

How do you perceive the relationship between the Rater and the other person who is in the room with you now? (check one)

_____very negative
_____negative
_____slightly negative
_____neutral
_____slightly positive
_____positive
_____very positive

The experimenter usually conducts a study expecting certain results. This is referred to as the hypothesis.
a. What did you think the hypothesis for this experiment was?

b. What did you think this experiment was designed to measure?

Did you recognize either of the other subjects in this experiment as an acquaintance or a friend of yours?

_____Yes
_____No
If so, which one?
_____Rater
_____Other

SURVEY OF ATTITUDES

NAME: _____

ROLE IN EXPERIMENT: _____

1. Science Fiction (check one)

_____I enjoy science fiction very much.
_____I enjoy science fiction.
_____I enjoy science fiction to a slight degree.
_____I dislike science fiction to a slight degree.
_____I dislike science fiction.
_____I dislike science fiction very much.

2. One True Religion (check one)

_____I strongly believe that my church represents the one true religion.
_____I believe that my church represents the one true religion.
_____I feel that probably my church represents the one true religion.
_____I feel that probably no church represents the one true religion.
_____I believe that no church represents the one true religion.
_____I strongly believe that no church represents the one true religion.

3. Preparedness for War (check one)

_____I strongly believe that preparedness for war will not tend to precipitate war.
_____I believe that preparedness for war will not tend to precipitate war.
_____I feel that perhaps preparedness for war will not tend to precipitate war.
_____I feel that perhaps preparedness for war will tend to precipitate war.
_____I believe that preparedness for war will tend to precipitate war.
_____I strongly believe that preparedness for war will tend to precipitate war.

4. Welfare Legislation (check one)

_____I am very much opposed to increased welfare legislation.
_____I am opposed to increased welfare legislation.
_____I am mildly opposed to increased welfare legislation.
_____I am mildly in favor of increased welfare legislation.
_____I am in favor of increased welfare legislation.
_____I am very much in favor of increased welfare legislation.

5. College Education (check one)

_____I strongly believe it is very important for a person to have a college education in order to be successful.
_____I believe it is very important for a person to have a college education in order to be successful.
_____I believe that perhaps is is very important for a person to have a college education in order to be successful.
_____I believe that perhaps it is not very important for a person to have a college education in order to be successful.
_____I believe that it is not very important for a person to have a college education in order to be successful.
_____I stringly believe that it is not very important for a person to have a college education in order to be successful.

6. Divorce (check one)

_____I am very much opposed to divorce.
_____I am opposed to divorce.
_____I am mildly opposed to divorce.
_____I am mildly in favor of divorce.
_____I am in favor of divorce.
_____I am very much in favor of divorce.

7. Gardening (check one)

_____I enjoy gardening very much.
_____I enjoy gardening.
_____I enjoy gardening to a slight degree.
_____I dislike gardening to a slight degree.
_____I dislike gardening.
_____I dislike gardening very much.

8. Men's Adjustment to Stress (check one)

_____I strongly believe that men adjust to stress better than women.
_____I believe that men adjust to stress better than women.
_____I feel that perhaps men adjust to stress better than women.
_____I feel that perhaps men do not adjust to stress better than women.
_____I believe that men do not adjust to stress better than women.
_____I strongly believe that men do not adjust to stress better than women.

Appendix B

Supplementary Analyses

Experiments I and II

Table 1

Mean Evaluative Responses as a Function of Proportion of Positive Reinforcement, Rater-Observer Relation and Stimulus Object, with Combined Scales, Experiment 1.

Storyteller's Responses				
Stimulus Object	Relation	Proportion		
		.25	.50	.75
Rater	Positive	7.78[b]	10.00	10.89
Rater	Negative	9.56	9.44	11.56
Observer	Positive	9.56	11.33	11.00
Observer	Negative	11.00	10.44	11.00
Observer's Responses[a]				
Rater		9.55	9.17	9.16
Storyteller		11.11	9.95	10.65

[a]The relation manipulation was not carried out in the presence of Observers.

[b]The possible scores range from 2 to 14 with 14 representing high attraction.

Table 2

Experiment 1

Summary of Analysis of Variance

for Storytellers Evaluative Data

Source	df	MS	F
Between Ss			
A (R-O Relation)	1	4.48	1.10
B (Proportion Rf+)	2	24.18	5.92**
AB	2	12.29	3.01
Error 1	48	4.09	
Within Ss			
C (Object Rated)	1	19.59	7.50**
AC	1	1.33	.51
BC	2	8.23	3.15
ABC	2	.08	a
Error 2	48	2.61	

** = $p < .01$

[a] This effect is not independent of the comparisons made and referred to in the text.

Table 3

Mean Evaluative Responses of Storytellers as a Function of Proportion of Positive Reinforcement, Rater-Observer Relation and Stimulus Object, Experiment II

Stimulus Object	Relation	Proportion	
		.25	.75
Rater	Positive	8.50	9.90
Rater	Negative	8.10	10.20
Observer	Positive	9.40	9.70
Observer	Negative	9.00	10.00

Table 4

Experiment II

Summary of Analysis of Variance

for Storytellers Evaluative Data

Source	df	MS	F
Between Ss			
A (R-O Relation)	1	0.05	.01
B (Proportion Rf+)	1	28.80	5.29*
AB	1	2.45	.45
Error 1	36	5.44	
Within Ss			
C (Object Rated)	1	2.45	1.00
AC	1	0.00	.00
BC	1	6.05	2.46
ABC	1	0.00	a
Error 2	36	2.46	

* = $p < .05$

[a] This effect is not independent of the comparisons made and referred to in the text.

Appendix C

Questionnaires from

Experiment 111

NAME_____
(please print)

POST-EXPERIMENTAL QUESTIONNAIRE

On the following pages, you are asked to make some judgments about the other people in this experiment, about yourself, and about other people in general.

You should respond as frankly as possible, and you should not find it necessary to spend very much time on any one question. It is most important for the success of the experiment that you try to answer every question. If you find it difficult to answer any question because it seems inappropriate to you, or because the alternative answers provided do not include the answer you wish to give, then respond to the answer that is closest to your own and in a note in the margin indicate your difficulty with the question.

One further thing. When answering the questionnaire you are to proceed in order through it. Specifically, when you have completed a page, you should not return to it later and change your earlier answers.

Your responses will be kept entirely confidential.

Next, turn the page and begin.

On this section of the questionnaire, respond with your feelings toward the Rater, the person who graded your stories for creativity.

You are given groups of seven statements, and are to check off the one statement in each group that most closely indicates your feeling about the person.

INTERPERSONAL JUDGMENT SCALE

1. Intelligence (check one)
   _____I believe that this person is very much above average in intelligence.
   _____I believe that this person is above average in intelligence.
   _____I believe that this person is slightly above average in intelligence.
   _____I believe that this person is average in intelligence.
   _____I believe that this person is slightly below average in intelligence.
   _____I believe that this person is below average in intelligence.
   _____I believe that this person is very much below average in intelligence.

2. Knowledge of Current Events (check one)
   _____I believe that this person is very much below average in her knowledge of current events.
   _____I believe that this person is below average in her knowledge of current events.
   _____I believe that this person is slightly below average in her knowledge of current events.
   _____I believe that this person is average in her knowledge of current events.
   _____I believe that this person is slightly above average in her knowledge of current events.
   _____I believe that this person is above average in her knowledge of current events.
   _____I believe that this person is very much above average in her knowledge of current events.

3. Adjustment (check one)
_____I believe that this person is extremely maladjusted.
_____I believe that this person is maladjusted.
_____I believe that this person is maladjusted to a slight degree.
_____I believe that this person is neither particularly maladjusted nor particularly well adjusted.
_____I believe that this person is well adjusted to a slight degree.
_____I believe that this person is well adjusted.
_____I believe that this person is extremely well adjusted.

4. Personal Feelings (check one)
_____I feel that I would probably like this person very much.
_____I feel that I would probably like this person.
_____I feel that I would probably like this person to a slight degree.
_____I feel that I would probably neither particularly like nor particularly dislike this person.
_____I feel that I would probably dislike this person to a slight degree.
_____I feel that I would probably dislike this person.
_____I feel that I would probably dislike this person very much.

5. Working Together in an Experiment (check one)
_____I believe that I would very much dislike working with this person in another experiment.
_____I believe that I would dislike working with this person in another experiment.
_____I believe that I would dislike working with this person in another experiment to a slight degree.
_____I believe that I would neither particularly dislike nor particularly enjoy working with this person in another experiment.
_____I believe that I would enjoy working with this person in another experiment to a slight degree.
_____I believe that I would enjoy working with this person in another experiment.
_____I believe that I would very much enjoy working with this person in another experiment.

On this section of the questionnaire, respond with your feelings toward the Observer, the other person who was in the experiment when you were.

Check off the statement in each group that most closely indicates your feeling about the person.

INTERPERSONAL JUDGMENT SCALE

1. Intelligence (check one)
   _____I believe that this person is very much above average in intelligence.
   _____I believe that this person is above average in intelligence.
   _____I believe that this person is slightly above average in intelligence.
   _____I believe that this person is average in intelligence.
   _____I believe that this person is slightly below average in intelligence.
   _____I believe that this person is below average in intelligence.
   _____I believe that this person is very much below average in intelligence.

2. Knowledge of Current Events (check one)
   _____I believe that this person is very much below average in her knowledge of current events.
   _____I believe that this person is below average in her knowledge of current events.
   _____I believe that this person is slightly below average in her knowledge of current events.
   _____I believe that this person is average in her knowledge of current events.
   _____I believe that this person is slightly above average in her knowledge of current events.
   _____I believe that this person is above average in her knowledge of current events.
   _____I believe that this person is very much above average in her knowledge of current events.

3. Adjustment (check one)
_____I believe that this person is extremely maladjusted.
_____I believe that this person is maladjusted.
_____I believe that this person is maladjusted to a slight degree.
_____I believe that this person is neither particularly maladjusted nor particularly well adjusted.
_____I believe that this person is well adjusted to a slight degree.
_____I believe that this person is well adjusted.
_____I believe that this person is extremely well adjusted.

4. Personal Feelings (check one)
_____I feel that I would probably like this person very much.
_____I feel that I would probably like this person.
_____I feel that I would probably like this person to a slight degree.
_____I feel that I would probably neither particularly like nor particularly dislike this person.
_____I feel that I would probably dislike this person to a slight degree.
_____I feel that I would probably dislike this person.
_____I feel that I would probably dislike this person very much.

5. Working Together in an Experiment (check one)
_____I believe that I would very much dislike working with this person in another experiment.
_____I believe that I would dislike working with this person in another experiment.
_____I believe that I would dislike working with this person in another experiment to a slight degree.
_____I believe that I would neither particularly dislike nor particularly enjoy working with this person in another experiment.
_____I believe that I would enjoy working with this person in another experiment to a slight degree.
_____I believe that I would enjoy working with this person in another experiment.
_____I believe that I would very much enjoy working with this person in another experiment.

How do you perceive the relationship between the Rater and the Observer (i.e., the two other participants in the experiment) ?

(check one)
_____very negative
_____negative
_____slightly negative
_____neutral
_____slightly positive
_____positive
_____very positive

If you were to compare the Rater and the Observer on the basis of the attitudes they seem to hold, would you feel that

(check one)
_____they have very similar attitudes
_____they have similar attitudes
_____they have slightly similar attitudes
_____their attitudes are neither similar nor dissimilar
_____they have slightly dissimilar attitudes
_____they have dissimilar attitudes
_____they have very dissimilar attitudes

What personal feelings might the Rater and the Observer have about each other?

(check one)
_____they would probably like each other very much.
_____they would probably like each other.
_____they would probably like each other to a slight degree.
_____they would probably neither particularly like nor particularly dislike each other.
_____they would probably dislike each other to a slight degree.
_____they would probably dislike each other.
_____they would probably dislike each other very much.

INSTRUCTIONS

The questions on the next page are designed to investigate the way in which people think about themselves. The results which are obtained will be completely confidential and will not affect you in any way. Please give your frank and immediate reactions to the items.

Each of these items will consist of two words which are opposite in meaning, separated by seven spaces. Your task will be to use items of this type to describe yourself.

For example, if you think of yourself as being extremely confident you would put a check mark in the space nearest the word Confident, as shown here:

Confident ✓ : : : : : : Unsure

If you think of yourself as being definitely confident, but not extremely confident, you would place the mark one space further away from the word Confident, as shown here:

Confident : ✓ : : : : : Unsure

If you think you are somewhat more confident than unsure you would put your check mark on the Confident side of the middle.

Confident : : ✓ : : : : Unsure

If you think you are neither confident nor unsure you would put your check mark in the middle space, like this:

Confident : : : ✓ : : : Unsure

Similarly, if you think of yourself as being somewhat more unsure than confidant, you would use the first space on the Unsure side of the middle.

Confident : : : : ✓ : : Unsure

Finally, if you think of yourself as being definitely unsure, you would place your check one space away from the Unsure side of the scale, and if you think you are extremely unsure, you would use the space which is nearest to the word Unsure.

Please remember that there are no right or wrong answers. We want your first frank reaction to each of the items. Please do not omit any items and mark each item only once.

SCALE SHEET

Cooperative_____:_____:_____:_____:_____:_____:_____Uncooperative

Quitting_____:_____:_____:_____:_____:_____:_____Persevering

Stable_____:_____:_____:_____:_____:_____:_____Unstable

Confident_____:_____:_____:_____:_____:_____:_____Unsure

Seclusive_____:_____:_____:_____:_____:_____:_____Sociable

Immature_____:_____:_____:_____:_____:_____:_____Mature

Adventurous_____:_____:_____:_____:_____:_____:_____Timid

Thankless_____:_____:_____:_____:_____:_____:_____Grateful

Friendly_____:_____:_____:_____:_____:_____:_____Hostile

Energetic_____:_____:_____:_____:_____:_____:_____Subdued

Impatient_____:_____:_____:_____:_____:_____:_____Patient

Softhearted_____:_____:_____:_____:_____:_____:_____Hardhearted

Unreflectful_____:_____:_____:_____:_____:_____:_____Thoughtful

Frank_____:_____:_____:_____:_____:_____:_____Secretive

Meek_____:_____:_____:_____:_____:_____:_____Forceful

Impulsive_____:_____:_____:_____:_____:_____:_____Deliberate

Easygoing_____:_____:_____:_____:_____:_____:_____Short-tempered

Practical_____:_____:_____:_____:_____:_____:_____Impractical

Boastful_____:_____:_____:_____:_____:_____:_____Modest

Intelligent_____:_____:_____:_____:_____:_____:_____Unintelligent

Depressed_____:_____:_____:_____:_____:_____:_____Cheerful

Reliable_____:_____:_____:_____:_____:_____:_____Undependable

Unrealistic_____:_____:_____:_____:_____:_____:_____Realistic

Much interest in opposite sex_____:_____:_____:_____:_____:_____:_____Little interest in opposite sex

The next group of questions asks what you believe on a number of common statements. There are no correct answers. Check one alternative only for each question, and please do not omit any items.

1. Never tell anyone the real reason you did something unless it is useful to do so.
_____strongly agree
_____somewhat agree
_____slightly agree
_____no opinion
_____slightly disagree
_____somewhat disagree
_____strongly disagree

2. The best way to handle people is to tell them what they want to hear.
_____strongly agree
_____somewhat agree
_____slightly agree
_____no opinion
_____slightly disagree
_____somewhat disagree
_____strongly disagree

3. One should take action only when sure it is morally right.
_____strongly agree
_____somewhat agree
_____slightly agree
_____no opinion
_____slightly disagree
_____somewhat disagree
_____strongly disagree

4. Most people are basically good and kind.
_____strongly agree
_____somewhat agree
_____slightly agree
_____no opinion
_____slightly disagree
_____somewhat disagree
_____strongly disagree

5. It is safest to assume that all people have a vicious streak and it will come out when they are given a chance.
_____strongly agree
_____somewhat agree
_____slightly agree
_____no opinion
_____slightly disagree
_____somewhat disagree
_____strongly disagree

6. Honesty is the best policy in all cases.
_____strongly agree
_____somewhat agree
_____slightly agree
_____no opinion
_____slightly disagree
_____somewhat disagree
_____strongly disagree

7. There is no excuse for lying to someone else.
_____strongly agree
_____somewhat agree
_____slightly agree
_____no opinion
_____slightly disagree
_____somewhat disagree
_____strongly disagree

8. Generally speaking, men won't work hard unless they're forced to do so.
_____strongly agree
_____somewhat agree
_____slightly agree
_____no opinion
_____slightly disagree
_____somewhat disagree
_____strongly disagree

9. All in all, it is better to be humble and honest than important and dishonest.
_____strongly agree
_____somewhat agree
_____slightly agree
_____no opinion
_____slightly disagree
_____somewhat disagree
_____strongly disagree

10. When you ask someone to do something for you, it is best to give the real reasons for wanting it rather than giving reasons which might carry more weight.
_____strongly agree
_____somewhat agree
_____slightly agree
_____no opinion
_____slightly disagree
_____somewhat disagree
_____strongly disagree

11. Most people who get ahead in the world lead clean, moral lives.
_____strongly agree
_____somewhat agree
_____slightly agree
_____no opinion
_____slightly disagree
_____somewhat disagree
_____strongly disagree

12. Anyone who completely trusts anyone else is asking for trouble.
_____strongly agree
_____somewhat agree
_____slightly agree
_____no opinion
_____slightly disagree
_____somewhat disagree
_____strongly disagree

13. The biggest difference between most criminals and other people is that criminals are stupid enough to get caught.
_____strongly agree
_____somewhat agree
_____slightly agree
_____no opinion
_____slightly disagree
_____somewhat disagree
_____strongly disagree

14. Most men are brave.
_____strongly agree
_____somewhat agree
_____slightly agree
_____no opinion
_____slightly disagree
_____somewhat disagree
_____strongly disagree

15. It is wise to flatter important people.
_____strongly agree
_____somewhat agree
_____slightly agree
_____no opinion
_____slightly disagree
_____somewhat disagree
_____strongly disagree

16. It is possible to be good in all respects.
_____strongly agree
_____somewhat agree
_____slightly agree
_____no opinion
_____slightly disagree
_____somewhat disagree
_____strongly disagree

17. Barnum was very wrong when he said there's a sucker born every minute.
_____strongly agree
_____somewhat agree
_____slightly agree
_____no opinion
_____slightly disagree
_____somewhat disagree
_____strongly disagree

18. It is hard to get ahead without cutting corners here and there.
_____strongly agree
_____somewhat agree
_____slightly agree
_____no opinion
_____slightly disagree
_____somewhat disagree
_____strongly disagree

19. People suffering from incurable diseases should have the choice of being put painlessly to death.

_____strongly agree
_____somewhat agree
_____slightly agree
_____no opinion
_____slightly disagree
_____somewhat disagree
_____strongly disagree

20. Most men forget more easily the death of their father than the loss of their property.

_____strongly agree
_____somewhat agree
_____slightly agree
_____no opinion
_____slightly disagree
_____somewhat disagree
_____strongly disagree

EIGHT ROLE CATEGORY QUESTIONNAIRE

Instructions

To complete the following questionnaire you are required to identify in your own mind eight individuals who are known to you, one of which fits each of the following categories:

1. an older man whom you like
2. an older man whom you dislike
3. a man about your own age whom you like
4. a man about your own age whom you dislike
5. an older woman whom you like
6. an older woman whom you dislike
7. a woman about your own age whom you like
8. a woman about your own age whom you dislike

Once you have assigned one of your acquaintances to each of the eight categories, spend a few minutes comparing and contrasting the personal characteristics of these eight individuals in preparation for your next task:

Your task is to describe each individual in writing as fully as you can within a 3-minute time limit. Following this page there is a page for each role, and you should write a description of each one in turn, limiting yourself to three minutes for each. You should be readily able to do this without specifically revealing the identity of the individuals you are writing about.

1. an older man whom you like (three minutes)

2. an older man whom you dislike (three minutes)

3. a man about your own age whom you like (three minutes)

4. a man about your own age whom you dislike (three minutes)

5. an older woman whom you like (three minutes)

6. an older woman whom you dislike (three minutes)

7. a woman about your own age whom you like (three minutes)

8. a woman about your own age whom you dislike (three minutes)

Now referring back to the experiment in which you participated today, please place a check mark on the scale where you would honestly rate the creativity of each of your stories.

STORY NO. 1

Very Uncreative_____:_____:_____:_____:_____:_____:_____Very Creative
Neutral

STORY NO. 2

Very Uncreative_____:_____:_____:_____:_____:_____:_____Very Creative
Neutral

STORY NO. 3

Very Uncreative_____:_____:_____:_____:_____:_____:_____Very Creative
Neutral

STORY NO. 4

Very Uncreative_____:_____:_____:_____:_____:_____:_____Very Creative
Neutral

The results of an experiment are more meaningful to us if we know what your ideas, thoughts, and understandings of the experiment just completed were. Please answer each of the following questions frankly and honestly.

1. The experimenter usually conducts a study expecting certain results. This is referred to as the hypothesis.

   a. What did you think the hypothesis for this experiment was?

   b. Exactly how did you think you were expected to respond?

2. Every psychological experiment is designed to measure some variable or variables. What did you think this experiment was designed to measure?

3. When and where did you get this idea of what the purpose and hypothesis of the experiment was? (please rank each of those which had an influence on your understanding of the hypothesis, e.g., put a 1 for the one which influenced you the most, a 2 for the next, etc. You do not have to put a number by every one).

_____from the survey of attitudes you completed
_____from the experimenter's description of the experiment
_____during the time you were telling stories
_____from this questionnaire
_____from other students who told me about the experiment before I came

4. Did you recognize either of the other subjects in this experiment as an acquaintance or a friend of yours?
_____Yes
_____No
If so, which one?
_____Rater
_____Observer

5. Did you respond to give the experimenter the results you thought he wanted? The results opposite to what he wanted? Or did you not respond in any particular manner?

When you have completed this questionnaire, the experimenter will give you a brief description of the experiment. Feel free at this time to ask any questions which you may have concerning the experiment. Because it is desirable for all participants in this experiment to begin their participation with as closely as possible the same amount of prior knowledge of what the experiment will be about, you will not receive a complete description of the experiment until some weeks later. At this later time you will get a written summary of both the purpose and the results of the experiment if you have expressed an interest in receiving such a summary. After you have read the summary, you are again encouraged to contact the experimenter if you have any questions about the nature of the experiment.

The experimenter will stamp your experimental credit card before you leave.

Thank you for participating.

Appendix D

Supplementary Analyses

Experiment 111

Table 1

Mean Evaluative Responses of Storytellers in Experiment III as a Function of Machiavellianism, Proportion of Positive Reinforcement, Rater-Observer Relation, Stimulus Object, and Attraction Scale

Proportion of Reinforcement	Rater-Observer Relation	Object		Object	
		Rater	Observer	Rater	Observer
Scale 1 (Like)		High Machiavellianism		Low Machiavellianism	
.75	Negative	4.89[a,b]	5.44	5.33	5.22
	Unspecified	5.33	5.11	5.44	5.67
.25	Negative	4.67	5.00	5.11	5.56
	Unspecified	4.89	5.00	5.22	5.78
Scale 2 (Desire)					
.75	Negative	4.44	4.78	5.44	5.00
	Unspecified	4.56	4.56	5.56	5.44
.25	Negative	4.67	5.00	4.89	4.89
	Unspecified	4.22	4.44	4.89	5.33

[a]The possible scores range from 1 to 7 with 7 representing high attraction.
[b]Each mean represents 9 subjects.

Table 2

Summary of Analysis of Variance in Experiment III of Storytellers Evaluations with Machiavellianism a Factor

Source	df	MS	F
Between Ss			
A (Proportion Rf+)	1	2.00	<1
B (R-O Relation)	1	0.35	<1
AB	1	0.35	<1
C (Machiavellianism)	1	17.01	7.08**
AC	1	0.01	<1
BC	1	2.00	<1
ABC	1	0.05	<1
Error 1	64	2.40	
D (Object Rated)	1	2.00	1.38
AD	1	1.39	<1
BD	1	0.01	<1
ABD	1	0.13	<1
CD	1	0.13	<1
ACD	1	0.68	<1
BCD	1	2.00	1.38
ABCD	1	0.22	<1
Error 2	64	1.45	
E (Attraction Scale)	1	8.68	12.87***
AE	1	0.01	<1
BE	1	0.50	<1
ABE	1	0.22	<1
CE	1	0.89	1.31
ACE	1	2.00	2.97
BCE	1	0.68	1.01
ABCE	1	0.35	<1
Error 3	64	0.67	
DE	1	0.35	<1
ADE	1	0.01	<1
BDE	1	0.22	<1
ABDE	1	0.00	<1
CDE	1	0.50	1.06
ACDE	1	0.00	<1
BCDE	1	0.01	<1
Comparisons			
High Mach; Likability			
Bal. occurs; Reinf. dominates	1	1.38	2.92
Bal. occurs; Bal. dominates	1	0.43	<1
High Mach; Desirability			
Bal. occurs; Reinf. dominates	1	0.15	<1
Bal. occurs; Bal. dominates	1	0.02	<1
Low Mach; Likability			
Bal. occurs; Reinf. dominates	1	0.35	<1
Bal. occurs; Bal. dominates	1	0.04	<1
Low Mach; Desirability			
Bal. occurs; Reinf. dominates	1	2.67	5.64
Bal. occurs; Bal. dominates	1	2.26	4.78
Error 4	64	0.47	

** = $p < .01$ *** = $p < .005$

Table 3

Mean Evaluative Responses of Storytellers in Experiment III as a Function of Cognitive Complexity, Proportion of Positive Reinforcement, Rater-Observer Relation, Stimulus Object and Attraction Scale.

Proportion of Reinforcement	Rater-Observer Relation	Object		Object	
		Rater	Observer	Rater	Observer
Scale 1 (Like)		High Complexity		Low Complexity	
.75	Negative	4.78[a,b]	5.56	5.44	5.11
	Unspecified	5.78	5.67	5.00	5.11
.25	Negative	5.56	5.22	4.22	5.33
	Unspecified	4.56	5.11	5.56	5.67
Scale 2 (Desire)					
.75	Negative	4.56	4.67	5.33	5.11
	Unspecified	5.33	5.44	4.78	4.56
.25	Negative	5.11	4.89	4.44	5.00
	Unspecified	4.22	5.00	4.89	4.78

[a]The possible scores range from 1 to 7 with 7 representing high attraction

[b]Each mean represents 9 subjects.

Table 4

Summary of Analysis of Variance in Experiment III of Story-tellers Evaluations with Cognitive Complexity as a Factor

Source	df	MS	F
Between Ss			
A (Proportion Rf+)	1	2.00	<1
B (R-O Relation)	1	0.35	<1
AB	1	0.35	<1
C (Cognitive Complexity)	1	0.35	<1
AC	1	0.68	<1
BC	1	0.06	<1
ABC	1	18.00	7.49**
Error 1	64	2.40	
D (Object Rated)	1	2.00	1.49
AD	1	1.39	1.03
BD	1	0.01	<1
ABD	1	0.13	<1
CD	1	0.13	<1
ACD	1	1.68	1.25
BCD	1	1.39	1.03
ABCD	1	6.72	5.00*
Error 2	64	1.35	
E (Attraction Scale)	1	8.68	12.61***
AE	1	0.01	<1
BE	1	0.50	<1
ABE	1	0.22	<1
CE	1	0.06	<1
ACE	1	0.50	<1
BCE	1	2.35	3.41
ABCE	1	0.13	<1
Error 3	64	0.69	
DE	1	0.35	<1
ADE	1	0.01	<1
BDE	1	0.22	<1
ABDE	1	0.00	<1
CDE	1	0.22	<1
ACDE	1	0.50	1.09
BCDE	1	0.35	<1
Comparisons			
High Complexity; Likability			
Bal. occurs; Reinf. dominates	1	1.89	4.14
Bal. occurs; Bal. Dominates	1	0.96	2.11
High Complexity; Desirability			
Bal. occurs; Reinf. dominates	1	1.71	3.75
Bal. occurs; Bal. dominates	1	1.09	2.40
Low Complexity; Likability			
Bal. occurs; Reinf. dominates	1	0.07	<1
Bal. occurs; Bal. dominates	1	0.00	<1
Low Complexity; Desirability			
Bal. occurs; Reinf. dominates	1	0.52	1.14
Bal. occurs; Bal. dominates	1	0.35	<1
Error 4	64	0.46	

* = $p < .05$ ** = $p < .01$ *** = $p < .005$

Table 5

Mean Evaluative Responses of Storytellers in Experiment III as a Function of Belief, Proportion of Positive Reinforcement, Rater-Observer Relation, Stimulus Object, and Attraction Scale

Proportion of Reinforcement	Rater-Observer Relation	Object		Object	
		Rater	Observer	Rater	Observer
Scale 1 (Like)		High Belief		Low Belief	
.75	Negative	5.00[a,b]	5.56	5.22	5.11
	Unspecified	5.44	5.22	5.33	5.56
.25	Negative	5.11	5.44	4.67	5.11
	Unspecified	5.11	5.67	5.00	5.11
Scale 2 (Desire)					
.75	Negative	4.56	5.11	5.33	4.67
	Unspecified	5.33	5.11	4.78	4.89
.25	Negative	5.44	5.11	4.11	4.78
	Unspecified	4.67	5.22	4.44	4.56

[a]The possible scores range from 1 to 7 with 7 representing high attraction.

[b]Each mean represents 9 subjects.

Table 6

Summary of Analysis of Variance in Experiment III of Storytellers Evaluations with Belief as a Factor

Source	df	MS	F
Between Ss			
A (Proportion Rf+)	1	2.00	<1
B (R-O Relation)	1	0.35	<1
AB	1	0.35	<1
C (Belief)	1	5.56	2.18
AC	1	3.56	1.40
BC	1	0.01	<1
ABC	1	0.68	<1
Error 1	64	2.55	
D (Object Rated)	1	2.00	1.44
AD	1	1.39	<1
BD	1	0.01	<1
ABD	1	0.13	<1
CD	1	0.22	<1
ACD	1	0.50	<1
BCD	1	0.13	<1
ABCD	1	6.13	4.40*
Error 2	64	1.39	
E (Attraction Scale)	1	8.68	12.44***
AE	1	0.01	<1
BE	1	0.50	<1
ABE	1	0.22	<1
CE	1	0.68	<1
ACE	1	0.13	<1
BCE	1	0.22	<1
ABCE	1	1.39	2.00
Error 3	64	0.70	
DE	1	0.35	<1
ADE	1	0.01	<1
BDE	1	0.22	<1
ABDE	1	0.00	<1
CDE	1	0.01	<1
ACDE	1	0.68	1.47
BCDE	1	0.05	<1
Comparisons			
High Belief; Likability			
Bal. occurs; Reinf. dominates	1	0.04	<1
Bal. occurs; Bal. dominates	1	0.11	<1
High Belief; Desirability			
Bal. occurs; Reinf. dominates	1	0.15	<1
Bal. occurs; Bal. dominates	1	0.15	<1
Low Belief; Likability			
Bal. occurs; Reinf. dominates	1	2.46	5.31
Bal. occurs; Bal. dominates	1	2.46	5.31
Low Belief; Desirability			
Bal. occurs; Reinf. dominates	1	4.66	10.04++
Bal. occurs; Bal. dominates	1	5.24	11.29++
Error 4	64	0.46	

* = $p < .05$ *** = $p < .005$ ++ = $p < .005$

Table 7

Mean Evaluative Responses of Storytellers in Experiment III as a Function of Time of Participation, Proportion of Positive Reinforcement, Rater-Observer Relation, Stimulus Object, and Attraction Scale

Proportion of Reinforcement	Rater-Observer Relation	Object		Object	
		Rater	Observer	Rater	Observer
Scale 1 (Like)		Early		Late	
.75	Negative	5.00[a,b]	5.44	5.22	5.22
	Unspecified	5.44	5.56	5.33	5.22
.25	Negative	4.44	5.56	5.33	5.00
	Unspecified	5.11	5.11	5.00	5.67
Scale 2 (Desire)					
.75	Negative	4.22	4.67	5.67	5.11
	Unspecified	5.22	5.00	5.89	5.00
.25	Negative	4.44	4.78	5.11	5.11
	Unspecified	4.22	4.33	4.89	5.44

[a]The possible scores range from 1 to 7 with 7 representing high attraction

[b]Each mean represents 9 subjects.

Table 8

Summary of Analysis of Variance in Experiment III of Storytellers Evaluations with Early vs. Late a Factor

Source	df	MS	F
Between Ss			
A (Proportion Rf+)	1	2.00	<1
B (R-O Relation)	1	0.35	<1
AB	1	0.35	<1
C (Time of Participation)	1	6.13	2.44
AC	1	1.68	<1
BC	1	0.89	<1
ABC	1	3.56	1.42
Error 1	64	2.51	
D (Object Rated)	1	2.00	1.44
AD	1	1.39	1.00
BD	1	0.01	<1
ABD	1	0.13	<1
CD	1	1.13	<1
ACD	1	0.13	<1
BCD	1	5.56	4.01*
ABCD	1	0.50	<1
Error 2	64	1.39	
E (Attraction Scale)	1	8.68	13.70***
AE	1	0.01	<1
BE	1	0.50	<1
ABE	1	0.22	<1
CE	1	4.50	7.10**
ACE	1	0.00	<1
BCE	1	0.35	<1
ABCE	1	1.68	2.65
Error 3	64	0.63	
DE	1	0.35	<1
ADE	1	0.01	<1
BDE	1	0.22	<1
ABDE	1	0.00	<1
CDE	1	0.22	<1
ACDE	1	0.22	<1
BCDE	1	0.01	<1
Comparisons			
Early; Likability			
Bal. occurs; Reinf. dominates	1	2.26	5.03
Bal. occurs; Bal. dominates	1	2.68	5.95
Early; Desirability			
Bal. occurs; Reinf. dominates	1	3.50	7.78+
Bal. occurs; Bal. dominates	1	4.00	8.90+
Late; Likability			
Bal. occurs; Reinf. dominates	1	0.02	<1
Bal. occurs; Bal. dominates	1	0.15	<1
Late; Desirability			
Bal. occurs; Reinf. dominates	1	0.02	<1
Bal. occurs; Bal. dominates	1	0.02	<1
Error 4	64	0.45	

* = $p < .05$ ** = $p < .01$ *** = $p < .005$ + = $p < .01$