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GROUP PRESSURE AND INCONGRUITY IN THE COGNITIVE FIELD AS DETERMINANTS OF CONFORMITY

by
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Abstract

GROUP PRESSURE AND INCONGRUITY IN THE COGNITIVE FIELD
AS DETERMINANTS OF CONFORMITY

Franz Samelson

The aim of the study was to distinguish between several factors contributing to conforming behavior under conditions of group pressure. Earlier experiments on social influence had shown that the ambiguity of the stimulus often permitted the reinterpretation of the stimulus in accordance with what the individual perceived to be the judgment of the majority. But Asch's classical experiment on conformity seemed to indicate that even with unambiguous physical stimuli, group pressure could induce some amount of conformity to wrong majority responses.

In spite of the clearness of the physical stimuli in the Asch experiment, however, the total situation was ambiguous. The subject was confronted with the discrepancy between the evidence of his own senses and the wrong reports of the experimenter's confederates. Unable to explain this contradiction, subjects vacillated between independence of judgment and conformity to majority responses. The hypothesis was, therefore, suggested that in a similar contradictory situation subjects would show less conformity if they were given the possibility of explaining the cognitive conflict.

To test this hypothesis, each of twenty-four subjects in the Experimental group was given the impression, in some "practice" trials, that he had a lower visual threshold than the secretly instructed majority. Twenty-six Control subjects did not receive this treatment. Each subject was then given the task of recognizing nonsense syllables presented tachistoscopically at relatively low speed. He made his judgments publicly in a group situation in which the four confederates of the experimenter gave wrong responses on twelve out of twenty trials.

The results showed a large between-group difference in subjects' ratings of their ability for the task, indicating that the "practice" had succeeded in structuring

the situation differently for the two groups. Since the subjects in the Experimental condition showed significantly less conformity than the Control subjects, the hypothesis was supported.

The absolute difference between conditions, however, was small, mainly due to the extremely wide range of individual variation in both conditions. Some subjects who had been shown to be "better" than others in the practice, and who even rated themselves as better at the end of the experiment, conformed heavily on the test trials.

Therefore, the relationship of several personality measures to differences in conformity was studied. The main variables used were projective measures of need for Achievement and for Affiliation. The analysis showed need for Achievement to be differentially related to conformity in the two conditions. An expected negative, though small, relation to conformity was found in the Control condition; but in the Experimental condition need for Achievement was positively related to conformity. Need for Affiliation by itself was not related to conformity, but together with need for Achievement seemed to differentiate between subjects with different amounts of conformity. The group of subjects showing the largest amount of conformity in both situations consisted of individuals high on both motive measures. Moreover, these subjects were apparently not affected by the "practice" treatment. These results seemed to raise doubts about the current interpretation of high need for Achievement as indicating independence from social influence.

The major conclusion drawn from these data is that the existence of a frame of reference permitting the interpretation of the majority response as in error will, on the whole, reduce the ambiguity of the situation and with it the amount of conformity. Some individuals, however, may not be willing to accept these cues, presumably because disagreement with the majority would arouse too much anxiety.

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CHAPTER I

THE PROBLEM OF CONFORMITY

Introduction

Within the past century, the basic ontological assumptions of Western thinking seem to have undergone considerable modification. From a "materialistic" belief in the physical-mechanical as the ultimate reality the trend, more or less explicitly formulated, has moved in the direction of a vague belief in a more functional or psychological reality; its extremes appear in the form of a spiritual quasi-revival or a complete social relativism.

In line with these changes, psychology turned from the early stage of psychophysics into the age of the ambiguous stimulus. The early experimenters deliberately tried to exclude all disturbing influences from their laboratories in which they attempted to determine simple causal relationships between physical inputs and psychological outputs. Later generations of psychologists have given up the idea of the simple personal equation; they found that such disturbing forces actually represented the more salient factors in man's behavior, complex and puzzling as they might be.

One important insight was gained in this era of the ambiguous stimulus, after the issue of organization and integration had been raised

by Gestalt and field theorists. Man tries to build up, out of the "blooming, buzzing confusion", a stable and familiar world, the working of which he can understand and predict; he will fit his cues together, elaborate, supplement, and if necessary distort; he will take great pains to make his experiences as well as his own behavior understandable --if man is not a rational being, he is at least a rationalizing one (23).

Reflecting the old metaphysical assumptions, early social psychology assumed that man should behave in accord with the promptings of the physical energies impinging upon him. Whenever this correspondence seemed distorted, whenever man saw things differently from what they "really" were, the diagnosis invoked the mysterious and irrational forces of suggestion and imitation. The all-pervading influence of man's social existence won recognition only slowly inthe psychological laboratory. It is probably no overstatement to say that we have not yet fully realized that "social reality" does not constitute some specifiable part of man's total environment; that there is precious little physical reality in his world that is not, at least at some time, socially tested and validated. So much of man's information and knowledge comes from other people. In any but the simplest of his acts other people are implicated. And the central axis of his psychological world to which all but intolerable experiences are referred, the self, develops in intimate relation to the acts and attitudes of other human beings (33). Man is the social being par excellence.

We may therefore find that some conception like Newcomb's "co-orientation" schema (36) is--at least heuristically--an indispensable device for the analysis of human behavior. Briefly, this "co-orientation" or "A-B-X" schema postulates, for the analysis of social interaction,

a system consisting of the subject A, the object (of an attitude, etc.) X, a social reference point (another person, a group) B, and the relations between them; the subject A is simultaneously oriented toward B and X, i.e., the relationships between the three elements of the system influence each other. If we now put our first assumption about man's need to understand into less aphoristical terms, it means that the system tends toward stable states in which the interrelation of the elements is free of contradictions (18, 36).

A Short History of the Problem

While we have claimed that most behavior includes, directly or indirectly, some social referent, traditionally the problem has been treated primarily in a more limited form: the modification of an individual's response through a concrete act of social influence. This is the old topic of imitation and (prestige) suggestion, which in recent years has changed its name to: conformity to group pressure.

On the experimental level, this problem involves measuring the individual's position on somewhat complex issues for which there is no simple right answer or assuming, for very simple tasks, that he would respond correctly without an influence attempt. Then a lead or answer is presented, either purported to come from some person or group not physically present or, in more recent experiments, coming from other secretly instructed members of the experimental group. Finally, the agreement of the subject with the suggested answer is measured.

Many of the early experiments simply tried to demonstrate such an effect for a variety of stimuli and situations. Systematically,

one of the oldest avenues of approach to this problem was the interpretation in terms of personality. In line with its ancestry among pathological phenomena (hypnosis), suggestibility was conceived of as a personality defect, or at least as a general trait. This static conception, however, produced no consistent results and gave way to an interpretation in terms of the attitudinal-motivational structure of the subject which predisposed him to accept certain suggestions and to reject others (7, 9).

The other approach dealt with the determinants of the external situation, consisting of two parts: the task stimulus and the suggestive stimulus. The latter, the change-producing factor, was what brought the problem into the realm of social psychology. Although expectancies built up prior to the critical trials also seemed to produce suggestion --what has been called ideo-motor suggestion (9)--interest focused, after the notion of a general trait was dropped, on social sources and their differential effects. Prestige, expertness, simple group majority were the most frequently used sources; and usually a sizable amount of change was produced.

The earlier interpretations of these results held that an arbitrary addition of social influence, evoking an attitude of submission (1) or restricting the field of behavior through inhibition or dissociation (20), could change people's judgments of the physical world. But since Sherif's (40) and Duncker's (13) studies of social influence, various writers have pointed out that the influence attempt had provided additional information, a new frame of reference, and had thus produced a restructuring in the perception of the stimulus, not simply a grafting on of the prestige suggestion (ibid.). And Asch (2) brought forth a

rather cogent criticism of the early experiments and their generalizations. The selection of task stimuli by the experimenters had been such that the subjects had available only few, or no, intrinsic criteria for the required tasks. Therefore they could not help but use the additional information supplied by the experimenter under the label: suggestion.

Thus the third member of the triad, the task stimulus, described in terms of its ambiguity or difficulty, was recognized as one of the major determinants of the amount of change obtainable--something more or less explicitly accepted rather early at least for the selection of experimental tasks if not for the conclusions drawn from the results. Coffin (9) demonstrated this systematic relationship between the ambiguity of the stimulus and the resulting change of response. And more introspective data obtained by Asch (2), Lewis (26), and Luchins (27) showed that the ambiguity of the stimulus permitted a response change induced by the new frame of reference. Whether such reinterpretations of the stimulus were entirely "rational" as claimed by Asch and Lewis or more of the nature of accompanying rationalizations to justify the change is hard to decide on the basis of their data.

Here we meet again with the old problem of the definition of suggestion (or conformity, since essentially only the group setting distinguishes between these two concepts). McDougall's widely quoted definition of suggestion as "...acceptance...of [a] communicated proposition in the absence of logically adequate grounds..." (32, p. 100) seemed to raise too many difficulties to be satisfactory. Yet the adoption of more operational definitions may not have clarified

the problem. Consider, e.g., Walker and Heyn's definition of conformity as "movement [from an original position] toward some standard or norm" (46, p. 7). While definitions are, of course, arbitrary to some extent, the question of their usefulness is legitimate; and such a definition seems to veil the problems more than to aid in their clarification. Movement toward a norm can be brought about by a variety of conditions; to call agreement on a new but correct solution--after discussion has produced the relevant facts--conformity would not seem quite appropriate. Or, to give a concrete example, to train two groups by differential administration of rewards to choose long or short odds in a simulated horse-race experiment (ibid.) and to call the choice of short odds conformity and that of long odds non-conformity (because short odds, i.e., favorites, represent the norm in actual horse-betting) seems rather forced. It could be argued just as well that both groups learned to "conform" to the norms of their respective groups, which in turn are only reflections of the reward structure of the experimental situation.

It seems that we cannot just impose a social frame of reference on the results if we want to arrive at a satisfactory definition of a genotypically separate class of behavior; we have to find the specific social processes occurring in the situation--if there are any.

Theoretical Analysis

Let us try to put the various factors so far mentioned together again. The operational measure of conformity is a change in response; either actually observed by measuring the response of the same subject

at two times, or inferred from the results obtained from a control group not exposed to social influence. After presentation of the original stimulus, an influence attempt is carried out by presenting some additional stimulus coming from a social source and relevant to the original stimulus--usually an evaluation of it by some other person(s). Finally, the change in response has to be in the direction of the content of the influence attempt; any random change or a systematic one in a different direction is excluded.

Are these three conditions sufficient to call the response change conformity? We are taking the position that they are not; however, this is a matter of definition. Anyhow, it seems that this process is entirely congruent with Gestalt principles of perception, according to which the perception of a stimulus is modified, within limits, by other stimuli in the perceptual field. In our case, the main difference is that the other stimuli have been presented in a different sensory modality. But this is no reason to consider them as not a part of the total field. In our view, therefore, the modification of the perception of a more or less ambiguous stimulus through the presentation of another compatible stimulus, which may serve as a frame of reference, presents essentially no new phenomenon; although conceivably this process might be called "conformity A" whenever the second stimulus comes from a social source. Basically, some new information has been added, and the new response takes it into account. In another context, Lewin has described this process as imbedding (25, p. 263).

The extreme example of such a process is given by Sherif's experiment with the autokinetic phenomenon (40). Why should subjects

have clung to their original judgments when they had no reality basis for them (since the light actually did not move at all), but on the other hand had learned that "four eyes see more than two"? Sherif showed the extension of Gestalt principles, or of the frame of reference concept, to a larger area, and he elegantly demonstrated the creation of social norms; but he hardly described a new process.

Asch (2) has argued the point well enough that in the early social influence experiments subjects usually had no real basis for independent judgments; and since he was interested in showing that people can very well remain independent he devised a new test situation. In this procedure, the original stimulus and the content of the influence attempt were clearly contradictory. Here we find a new requirement for the definition of conformity: the two parts of the stimulus situation must contain clearly contradictory information. Only under this condition do subjects have a chance to remain independent, and only then can we legitimately call a response accepting factually incorrect information from the social source conformity.

Of course, we have now turned full cycle and are back at the original definition of suggestion as acceptance of another's judgment in the absence of "logically" adequate grounds. However, in this process the definition has been operationalized for experimentation; although in a concrete life situation we may have difficulties with its application.

Let us describe Asch's experimental situation in more detail. He presented to a group of students a series of visual stimuli consisting of a "standard" line which had to be matched with one of three other lines of different lengths presented simultaneously. Since the differences between the comparison lines were above threshold, the task was

quite easy; this was demonstrated in the performance of a control group whose subjects made their choices without any social influence. In the experimental situation, however, seven of the eight "subjects" in a group were actually confederates of the experimenter; they had all been instructed beforehand to choose, on certain critical trials, the same wrong comparison line. On some other trials, all of them gave the correct answer. Only one of the participants was naive about the experiment, and he had been placed in the position of responding last. But since all the answers were given publicly, the majority response was known to him before he announced his judgment.

The essential features of the experiment are: the physical stimulus is not ambiguous as, e.g., in the autokinetic experiment but quite well defined; the social stimulus as well is clear and unequivocal since all confederates give the same answer; the discrepancy between the physical stimulus and the majority judgment of it is glaring; and finally, the problem is one of fact, i.e., only one answer can be correct. If the naive subject gives a judgment coinciding with the wrong majority response, he is yielding to the social influence; he does not respond on the basis of the "primary" evidence but conforms.

What were the results of this experiment? Asch hoped to demonstrate "the capacities of men for independence" (2, p. 451); but the results were discouraging. Even in this apparently highly structured situation, one third of the responses in a fairly large sample coincided with the wrong judgments of the majority. Individual differences in reaction were great; some of the subjects remained completely independent; others conformed on every trial. And although the larger number of the responses remained true to the sensory evidence, the fact that the

amount of conformity displayed was palpable seemed to lead to the generalized conclusion that "group pressures" can make men conform in almost any situation.

There are two major points to be discussed in connection with this experiment. One is to follow through our question whether we can find any specifically social processes in this situation.

We had argued that the older social influence experiments, using ambiguous stimuli, had only demonstrated, in an extended setting, the familiar perceptual principle of the influence of the frame of reference on an ill-defined stimulus. Does the fact that now contradictory information has been presented in the different parts of the field introduce anything new?

In the field of perception proper, similar experiments with contradictory cues have been performed--experiments in which the visual frame of reference was in conflict with the specific visual stimuli. An example of this is the distortion room (19); another the extensive study of Witkin et al. on the perception of the vertical (49). In this study, the experimenters presented a lighted bar in a dark field; the position of this bar in relation to the true vertical had to be judged; and the experimenters created conflict between cues by tilting another visual stimulus, a large lighted square (or by tilting the seat of the observer).

The general findings in these perception experiments, as Hilgard (19, p. 104) concludes, are that in the case of incongruence between cues the object will be sacrificed in order to maintain the stability of the frame of reference. In Witkin's experiments, different subjects

adopted different frames of reference. Does anything else happen in Asch's situation?

In the introduction, we stated as one of our assumptions that social validation is an extremely important reference point for human behavior. Is it therefore surprising that at least part of the time the subjects of Asch's experiment used it for the resolution of the conflict they were exposed to? It seems then that this informational function (12) can be served by a visual frame of reference as well as by the opinions of other men, no matter in which sense modality they are communicated; and they are made use of by the observer in order to achieve a veridical perception with its intrinsic rewards.

But it is not the only function that comes into play. Other human beings serve not only as reference points; at the same time, they are the sources or administrators of the major part of rewards in human life; their evaluation of the person's self is extremely important, and the expectations they have about the subject's behavior are often reinforced by sanctions extrinsic to the specific act, i.e., independent of the "objective" justification for it. In other words, other men and their opinions also serve a normative function. These two functions have first been discussed by H. H. Kelley in the slightly different context of reference group theory under the name of "comparison and normative functions of reference groups" (21). This distinction seems to make it necessary to add another dimension to the interrelationships in our triadic system. In the experimental situation, this dimension is introduced through the fact that not only does the subject hear the judgments of the confederates, but they also hear his judgments and may react to his stand by, for all the subject knows, rejecting or ridiculing

him if he does not agree with them. Of course, in these experimental situations the extrinsic sanctions seem to be not very strong in comparison with real life where such sanctions can be much more consequential and painful as well as explicit.

Asch's interview data give some indication of the differential effects of these two factors; some of the subjects did not accept the information contained in the majority judgment, but they changed their response nevertheless under the normative pressure, i.e., in order not to appear different. Deutsch and Gerard (12) have tried to distinguish experimentally between these informational and normative social influences. They employed for this purpose Asch's procedures--with one variation. With the aid of an electrical signal system used to communicate the subjects' responses, they led some of their subjects to believe that it was impossible to determine which of the participants had given a particular response. But if a judgment divergent from the majority response could not be traced back to its source, its proponent was safe from extrinsic sanctions although he still obtained the information from the judgments of the other participants. In other words, the experimenters used the method of anonymous ballot although the content of the vote was made public immediately. They found that under these conditions the amount of conformity was reduced significantly--but not entirely.

What can we conclude on the basis of these findings? Group pressure, as it is currently called in a rather global term, the influence of other people through their capacity to administer rewards and sanctions, is <u>one</u> factor, but not the <u>only one</u> responsible for the conformity obtained. The subject's argument: "Agree so that nothing

happens to you" was not the only one used. As indicated above, this type of reasoning should result in a change of publicized opinion, but secretly the subject should still disagree with the majority. The other argument for conformity is: "Agree in order to be right"; in this case, the subject should either perceptually or judgmentally distort his own sensory evidence.

Obviously, the distinction between the informational and normative functions is only an ideal one; in any situation, both will come into play, possibly in different degrees but thoroughly confounded. Probably, too, both were present in the experiments with ambiguous stimuli discussed earlier. However, we seem to have located one factor which differentiates the social situation from the purely perceptual one. And it seems probable that the threat of extrinsic, social sanctions is largely responsible for the emotional reactions so characteristic of many conformity experiments and even more so of conformity situations in real life. Through the arousal of insecurity and anxiety, the psychological field becomes restricted, critical thinking inhibited, and behavior rigid. These effects of the normative pressure increase in turn the influence of the informational factor since they make it harder for the individual to obtain or evaluate information independently. Under such conditions, he may agree with suggestions the shortcomings of which he can immediately perceive in a calmer state of mind. This affective aspect has been the basis for many of the older definitions of suggestion (20); and its importance should not be underestimated even though it is treated only briefly in this discussion. Yet it should be mentioned that even in the

non-social, perceptual conflict situation some degree of emotional upset may be experienced, as, e.g., Witkin (49) reports.

However, even the reduction of normative pressure in Deutsch and Gerard's experiment did not suffice to make the subjects completely independent. Let us therefore look more closely at the experimental situation, especially at the plight of the naive subject. We said that both stimuli, the physical and the social one, are clear and definite; yet the contradiction between the two is just as definite. Since the point at issue is a factual one, there can be only one correct answer. At the same time, the responses permitted do not represent a continuum but only two discrete alternatives. If the subjects were offered a continuous response medium--as usually, but not always in real life--they probably would give a compromise answer. The situation would be radically changed; this is indicated in some of Berenda's experiments in which she permitted a larger number of graded responses (5). The restrictions of the experimental situation also prevent the subject from taking the action appropriate in such a conflict situation: he is not permitted to take the stimulus under close scrutiny, to measure it, and to try to obtain some more information, since the information supplied so far is obviously conflicting.

What possibilities are left open to him? He has to make a choice between two mutually exclusive alternatives without really having a sound basis for this choice. In other words, he has to base his response on one part of the stimulus field and to <u>suppress</u> the other one. He can do this only by disregarding it, distorting it, or explaining it away. All he knows is that something is wrong, but he has no cues which

might help him to understand what is wrong, or why. He cannot fit both facts into a consistent frame of reference.

It is our contention that this procedure actually means loading the dice against obtaining complete independence. The contradiction between the two stimuli, together with the absence of any hint of how to reconcile it, makes the total situation highly unstable or ambiguous although--or precisely because--the two stimuli are so unambiguous. Like a reversible figure, the two parts of the stimulus situation are both well enough organized by themselves to evoke a specific response. But they are in competition with each other for dominance over the perceived situation. Therefore it may not have been the mere occurrence of a unanimous majority response--whether or not reinforced by perceived threats of extrinsic sanctions--that forced so many subjects into yielding, into discounting what they themselves saw. Partly at least it may have been this additional condition: the absence of a chance to understand what was going on in connection with the extreme incompatibility between the two pieces of information supplied; or more technically, the absence of a stable frame of reference within which both pieces of information could be placed, evaluated, and reconciled.

All subjects tried, of course, to achieve such a reconciliation. But it was hard to disavow what they saw; it was equally hard to assume that seven people could make the same obvious mistake on so simple a task. The high degree of conflict observed in these subjects is ample evidence for the fact that either solution chosen was not very satisfactory.

Let us repeat: the subject had to choose between the adoption of two frames of reference, one based on past experience with his own

sensory apparatus, the other based on his continuous interdependence with other people; both seemed equally valid but mutually exclusive, and he had to sacrifice one or the other stimulus. Therefore, the situation became highly unstable, somewhat like a projective test, and personality variables (need for Achievement) seemed to account for the major part of the variance in the resulting choice (20, p. 287).

If we want the individual to resist social pressures in such a situation we must give him a chance to understand the events and to fit them together, without too much violence, into one consistent frame of reference. We could also simply reinforce the subject's own responses prior to the group situation; this approach has been used in several recent experiments (22, 24). Yet it does not seem quite appropriate to ask, or to expect, the subject to disregard indiscriminately the social stimuli altogether.

In many conflict situations of this type--and they certainly occur often enough in life, although usually in less extreme form--the individual not only finds himself faced with the contradiction in the evidence; but usually he also has, or will attempt to find in a less restricted situation, some cues for, or some hypotheses about, the possible causes for such a contradiction. These cues or hypotheses will enable him to resolve the conflict in a more satisfactory manner. In other words, the subject will have some secondary information, some idea about who knows what; he will believe that he has different or more information, that he is more, or possibly less, capable for the required task, or possibly that differences in motivation or goals are leading the participants to different conclusions. For instance, disagreements about political matters, even where they deal with facts, will rarely

shake a person's convictions if he knows that his opponents have, in general, different political orientations. The old "argumentum ad hominem", though banned from philosophical disputes, is often an extremely forceful and valid point in real life. Incidentally, the independent subjects in Asch's experiment argued in just this way, of course; that the other subjects may have been an extremely influenceable lot, that some of them wore glasses, etc. But since they had little evidence to support such points, "most hypotheses" were "ad hoc and half-hearted" (2, p. 462). If the extrinsic sanctions are strong enough, the individual may still publicly agree with the majority; but he will usually be aware of the fact that this is only an expedient. On the other hand, one could probably find large individual differences in the willingness and ability to put such secondary information to use.

Summary and Hypothesis

The variables considered in earlier experiments may be classified as:

(A) the external situation:

1. The degree of ambiguity of the physical stimulus.
2. The degree of ambiguity of the social stimulus (unanimity).
3. The discrepancy between physical and social stimulus.

(B) the motivational conditions of the subject:

4. Relatively permanent and general needs of the individual, e.g., to be accepted by other people or to be individualistic, or
5. Situationally induced motives, as increasing the attractiveness of the group or threatening with extrinsic sanctions.

It was our argument that another variable should be added:

6. The incompatibility between the different parts of the perceived situation or the "strain in the system". This is obviously a higher-order variable, representing the relationship between the phenomenally true nature of the physical stimulus and the group's evaluation of it within a given frame of reference. Its values and consequences seem to depend in turn on the trustworthiness and relevance of the majority opinion and the difficulty and definiteness of the task. Variations on this "dimension" should produce different degrees of conformity in spite of a constant consensus of the majority. One example of this is Sperling's variation (44) of Sherif's autokinetic experiment in which "relevance" was manipulated. The experimenter informed his subjects of the subjective nature of the autokinetic phenomenon with the effect that they no longer were influenced by the confederate's judgments--except for some subjects who refused to believe the given explanation.

In order to demonstrate the effect of our new variable, Asch's experimental situation should be varied in such a way as to give the subjects some cues potentially reconciling the contradiction between the two parts of the stimulus field, which--taken by themselves--should remain unchanged in nature, i.e., unambiguous.

The hypothesis to be tested is: Given a situation with a contradiction between a simple physical stimulus and a wrong majority response, there will be less conformity under conditions facilitating the adoption of a consistent frame of reference than under conditions in which no secondary information is supplied, in spite of the fact that the unanimity of the majority remains constant.

Actually, of course, two such consistent frames of reference would be possible; one containing an "explanation" for the majority errors and resulting in more independent behavior; the other containing reasons for discounting the subject's own experience and presumably producing more conformity. We have attempted to produce only the first situation; it would be extremely interesting to see whether the opposite effect can be obtained.

A final word of caution seems in order. It should be obvious that the features of the experimental situation are in many respects different from real life situations in which conformity is a problem. For one, contradictions of this simple and clear type occur very rarely in real life because human beings do tend to agree in such cases; just this fact makes the experimental technique so extremely powerful. But whenever the issues become more complex, disagreements become much more natural and less disturbing; on the other hand, the extrinsic sanctions, e.g., punishment for non-conformist behavior, may increase tremendously in their power. And secondly, in our situation the permitted responses are extremely restricted by the rules of the experimenter. Rarely do such contradictions appear and demand action so instantaneously. Some investigative behavior, some discussion with opponents about the reasons for their judgment and/or some reinforcement from one's own reference group will be possible in most instances. After all, the possibility of agreement--not necessarily with everybody--is an important criterion for the correctness of human judgments, and the lone dissenter is either a genius or a paranoiac. Therefore the findings obtained with this

experimental technique, especially regarding personality factors related to conformity, have to be shown to be generally applicable but cannot be assumed to be such.

CHAPTER II

PROCEDURES

For the test of the proposed hypothesis, we would ideally have used Asch's experimental procedures. However, the intended manipulation of the Ss' cognitive structure appeared to be very difficult in a situation employing simple stationary stimuli for the judgments (comparisons of lines). Therefore, a new task had to be devised which was roughly equivalent to the original one yet gave us enough freedom to manipulate the Ss' perception of the situation. More specifically, the task had to be--objectively--unambiguous and easily solvable; yet at the same time the naive Ss should experience it as sufficiently difficult, so that the assumption that the majority was making mistakes would appear more or less plausible under different conditions. Also, a task producing a somewhat higher proportion of conformity in the initial, the Control, condition seemed desirable in order to make a demonstration of a reduction of conformity under different conditions possible.

It seemed possible to achieve these ends by presenting an easy perceptual task tachistoscopically at a speed well above the threshold value yet fast enough to permit the interpretation that individual differences in speed of recognition had a bearing on the responses--especially since Ss presumably had little experience with such a task. This absence of prior experience was an important assumption which was

not in all cases justified. In the Control condition, the naive S would find himself disagreeing with the majority without any offered explanation; in the Experimental condition, the test trials were to be preceded by a series of "practice" trials. In these, the S's perception of the situation would be manipulated, by a procedure described in detail later, in the following direction: he was to develop the hypothesis that his threshold for recognition was lower than that of the other "subjects". This hypothesis should help him "understand", in the experimental trials, why the majority gave answers at variance with his own.

The Task and its Setting

In order to meet the requirements of (a) relatively clear structure, and (b) potential plausibility of wrong responses, the task stimuli finally selected were series of four letters presented tachistoscopically. The standard three-letter nonsense syllables seemed to be too easily recognizable (although, in the pretests, even such stimuli were distorted under the influence of the majority response by a few Ss). Therefore, a fourth consonant was added to nonsense syllables consisting of three consonants, which had been selected from Witmer's "association value" lists as given in Stevens (45, p. 546). (For a list of these stimuli, see Appendix A.)

These series of letters were typed on cellophane and framed for projection. A three hundred watt projector with semi-automatic slide feeder and a Keystone Flashmeter attachment was used for presentation. The exposure time for the stimulus slides was 1/5"; the distance of the projector from the screen was about 24 feet. The room was a large

classroom, the back half of which was illuminated. This arrangement permitted the Ss to read and write during the experiment; also, it avoided excessive contrast. The five Ss sat in a row approximately 19 feet from the screen. The naive S was always the fourth in the reporting order.

The pretest had indicated that Ss and confederates would occasionally get confused when each of them had to spell out four letters in turn; also, the repetitiveness of this procedure had a rather wearisome effect. Therefore the response required in the experiment was a choice among fixed alternatives. About 2'' after projection of the stimulus slide, another slide with four alternative letter series was presented and left on the screen until all Ss had made their response. The four series consisted of (1) the correct series (e.g., FDMR), (2) a series in which one letter had been changed (PDMR), (3) the correct four letters two of which had been reversed in order (FDRM), and (4) a series with the errors of (2) and (3) combined, i.e., two letters reversed in position and one changed (PDRM). These four series were numbered from 1 to 4; and the Ss reported, in fixed sequence, the number corresponding to the series which they thought was the correct one, i.e., had been flashed on the screen before. Of course, the position of the correct series among the four alternatives as well as the position of the wrong or reversed letters within the series were randomized.

The experimental session consisted of twenty trials, presented in two series of ten each with a short pause for reloading the projector between them. At twelve of the trials the majority, always judging unanimously, gave a wrong answer; eight of the trials were neutral,

i.e., the alternative chosen by the majority was correct. Four neutral trials were given in each of the two series; the first trial in each was a neutral one. The sequence of neutral and critical trials differed slightly from the order used by Asch who systematically alternated one neutral and two critical trials. In our experiment, their position in the sequence varied slightly in order to exclude this possible source of discovery of the true nature of the experiment.

The Experimental Treatment

The aim of the experimental treatment administered to one half the total number of Ss was to give them the impression that their recognition threshold was lower than that of the other members of the experimental session. The following procedure was used for this purpose.

After instructions for the experiment had been given, the E announced that there would be a few practice trials before the real experiment began. As presented to the Ss, the purpose of this practice was to give them some idea about the task as a whole as well as about the effect of different projection speeds. The Ss were also told that these trials should not be marked on their rating scales (which will be described later); neither had the reporting order to be observed.

A slide with five digits was flashed on the screen at 1/100''; and the Ss were asked whether they had seen anything. Ideally, the naive S reported the correct five digits while the confederates professed their inability to recognize the stimulus at such a speed, one of them reporting the correct first or last digit of the five. The E then announced that he would slow down the speed and showed the <u>same</u> slide at 1/50''. While the naive S repeated his earlier answer, the confederates

reported several of the digits but were still not able to recognize the whole slide. After another increase in exposure time (the shutter speed was now 1/25''), the confederates reported the correct digits and agreed that the naive S had been correct the first time the slide was shown. This process was repeated with two more slides of the same type, whereupon the experimental trials were begun.

Actually, of course, it was impossible to hold this procedure physically constant. Some Ss really needed slower speeds, at least with the first slide, to recognize the stimuli; others would not report even when they had recognized them and needed considerable prodding till they would give a response when--or because--the other "subjects" claimed they were unable to see anything. However, the attempt was made to hold this treatment psychologically as nearly constant as possible by keeping the distance (in terms of speeds of presentation) between S and confederates at two shutter stops. Actually, whenever an S still experienced considerable difficulty at 1/50'', the decrease in speed was only announced while in fact the shutter setting remained unchanged; otherwise the speeds needed to keep up the difference between S and confederates would have become too slow and implausible. Also, presentation of the second and/or third slide was in such cases begun at 1/50'' instead of 1/100'' in order to avoid too many failure experiences. The effectiveness of this procedure will be discussed in Chapter 3.

Certain differences with older experimental procedures should be pointed out here. The task in this "practice" treatment was not exactly the same as that in the test trials. It contained a stimulus slide with

five digits in contrast with four consonants in the experimental series; speeds varying from 1/100'' to 1/10'' as against a constant speed of 1/5'' in the experiment; reporting the stimulus or part of it whenever recognized against selection from alternatives reported by all Ss in fixed order. Thus the effects of this practice had to be generalized to the new though similar situation; and therefore these effects were less of the nature of familiarity with physical reality (or learning) than considerations about the relative ability of the Ss. Secondly, the results were inferences made by the S himself in a reality-testing process. Since the slides were presented repeatedly at decreasing speeds, the S could find out for himself that he had been right; usually in experiments of this type the E reports performance or other norms attributed to some group. In our situation, the E refrained from any comment.

It is obvious that the result of this treatment could be described in terms of variables other than the ones used in our theoretical discussion. For instance, the S's confidence in himself was boosted, he saw himself as an "expert" (34), while the group may have become less "attractive" (14). However, in order to arrive at such effects, the overall structure of the situation had to be cognized by the S in terms of our triadic relationship; that his relation to the physical stimulus was different from that of the other Ss, and that therefore their judgments might not have to be taken at their face value.

Additional Data Collecting Procedures

The Uncertainty Rating.--It was stated in the theoretical discussion that in the conflict-producing conformity situation there should be a

difference between what has been called the "public", i.e., communicated, opinion and the "private" opinion (15). Only if the needs (e.g., for integrity of the self or for acceptance by the group) of the conformer are too strong should this difference be obliterated by distortion. In order to obtain data about this problem the following procedure was adopted.

A rating scale was prepared on which the Ss indicated, after giving their public responses, their uncertainty about the correct answer. They did this by marking points on five-point graphic scales (one for each trial). The increase in uncertainty was given by the descriptions of the points: (0) I am dead sure, (1) pretty sure, (2) doubtful but still believe to be right, (3) possibly wrong, (4) probably wrong (see Appendix A).

Enough has been said in the literature of late about the questionable assumptions made in the inter-individual comparison of rating scale data (e.g., 10). Also, it did not seem to follow from our prediction of less conformity in the Experimental group that these Ss should feel more certain about their independent answers, since their greater independence might well raise their anxiety. Therefore, no hypotheses were proposed about between-group differences in certainty. However, intra-individual comparisons based on simple order relations should be more nearly legitimate. Specifically, it was predicted that responses on critical trials on which the S conformed should be rated as more uncertain than responses on neutral trials; although outwardly the response patterns were the same on both types of trials, all Ss being in agreement. Actually, this was a test of our procedure, since it

would indicate that the conforming Ss were at least dimly aware of giving a wrong answer, and that conformity was not due to an extreme ambiguity of the visual stimulus.

An additional purpose of the rating was to occupy the Ss between trials and thus prevent them from giving too much thought to the procedures.

Post-Experimental Questionnaire and Interview.--The older suggestion experiments (39, 40)--and others, notably Maier's reasoning experiments (28)--have shown that usually introspective reports are not valid accounts of the actual events in such situations. Few people ever admit publicly that they were influenced by suggestions; also, the situation is too confusing to permit the Ss to give consistent reports. However, it seemed desirable to obtain an independent index of the effectiveness of the experimental treatment. This was attempted in the following manner.

While the Ss were still ignorant of the true purpose of the experiment--actually led to believe that it was not yet over--they were asked to rate, on a post-experimental questionnaire, their ability for the experimental task in comparison with other people. If the treatment of the practice had been effective, i.e., if the Ss had developed the hypothesis that their threshold was lower than that of the majority, the Ss in the Experimental group should rate themselves better than those in the Control group.

Other items of the questionnaire were "fillers" (questions about the difficulty of the task, about the Ss' visual acuity). In addition, there was a question about influence experienced and one which tried to

draw out any suspicions the Ss might have about the experimental setup (asking them to state how they could account for the disagreement between the judgments). (See Appendix A.)

Subsequently, the Ss were interviewed about their experiences. This part began with a group discussion in which the confederates participated; the discussion quickly came to focus on the naive S and ended with a full explanation of the nature of the experiment. The areas covered by the interview were: whether the S had entertained any suspicions about the setup; what explanatory hypotheses he had developed about the events; whether he had realized, or would admit, that he had been influenced (before and after he had been informed about the purpose of the experiment); and finally, whether he was conscious of the effects of the "practice".

The Confederates

Whereas most of Asch's experiments were carried out with the help of eight confederates of the E, he reports that, beyond the number of three, this variable has little influence on the amount of conformity obtained (3). In our experiment, four confederates per session were used in all cases.

These confederates were recruited partly from students of the E's class in the fall of 1954, and partly from Ss run in the early part of the experiment. Altogether, twelve different individuals participated, three of them only a few times. The others were scheduled whenever they were free, so that the groups attending the experiments on different days were rarely composed of exactly the same individuals. The confederates came, for all practical purposes, from the same population as the

the naive Ss; however, they never were closely acquainted with the Ss. Since the experimentation took up a large part of their time, they were paid.

The confederates were instructed not to betray their knowledge of the situation, but neither to act too demonstratively naive. In order to relieve the strain of the rather repetitive enacting of their roles, small wooden partitions were set up between the seats of all Ss; therefore, the confederates had to produce only the appropriate sounds once they were seated. Constancy of the (wrong) majority responses over all sessions was obtained through handing subject "A", i.e., the one to report first, a rating scale form on which the numbers to be reported on each trial had been marked. The other confederates were instructed simply to give the same answer as the first S. Since they were hidden from the naive S by the partitions, they were also told not to watch the screen too closely because some of them had reported some difficulty with giving a wrong response when they saw clearly what the correct answer was.

The confederates were acquainted with the design of the experiment. But the knowledge of the predicted outcome could introduce only little systematic bias--in terms of differential strength of pressure on the Ss in the two different conditions--since they reported only one number on each trial. They were also instructed to give their report neither too monotonously nor too hesitatingly. Whenever one of the confederates answered in too sleepy a voice, the group as a whole was asked to speak up "in order to avoid recording errors by the E". Naturally, there was some variation in the tone of voice in which the confederates gave their

reports. It seemed, however, that subjective factors were much more important for the interpretation and effect of the confederates' behavior on the naive S than any variation, more or less random, of their actual behavior. (For instructions to confederates, see Appendix B.)

Camouflage of the Experiment

In order to carry out the experiment it was imperative to hide the actual procedures as well as its true purpose from the Ss as long as possible. In the following, some details used in this connection will be indicated. This can best be done by tracing the steps in the sequence of events as the Ss experienced them.

The E contacted each S individually by telephone and scheduled him for an experiment on the next day. More precisely, the S was told that all Ss for the experiment would meet in the Psychology students' lounge, since they would be more comfortable there if they had to wait a few minutes for the experimenter. Appearing, the next day, at the designated place, the S found one or two other undergraduates waiting there, and a few more came in after a short while. Soon after, the E entered the room and read off a list of five names. He then thanked all of them for appearing and took them to another room. This was a large classroom, darkened except for the lights in the back half, with wooden partitions set up on one row of benches in the front third of the room. The Ss were told to put down their coats and books near the entrance and then to find a seat between the partitions. In the meantime, the four confederates had maneuvered themselves unobtrusively into the

strategic positions, so that the S could choose only the second or the fourth seat in the row (of five). This feat was remarkably easy to arrange and never aroused any suspicion.

After all Ss were seated, the E gave a few general explanations about the experiment--that it dealt with "perception, or more specifically with the span of apprehension, or how well you can see several things at a single glance"--adding that he would explain its purpose in detail afterwards. He then proceeded to give the specific instructions (see Appendix B). After showing a sample stimulus slide and one with the four response alternatives he handed out the uncertainty rating forms to all Ss. He also designated the Ss as "subject A" to "E", starting on either end of the row depending on which one of the two "permitted" seats the naive S had chosen--so that he was always "subject D". After the E had ascertained that everybody understood the instructions (the confederates would ask an occasional question), the experiment began for the Control group. In the Experimental group, some practice trials were given first.

After the Ss had gone through twenty trials at a relatively fast pace, the E interrupted the session (one page of the rating form was still unused). He asked the Ss to fill out a questionnaire. When everybody had returned his sheet, the E stated that, before proceeding with the experiment, he would like to discuss the task used up to that point. He began the discussion by asking whether the Ss had found the task difficult. Usually this question was answered in the negative. Then, the E or one of the confederates remarked that he seemed to recall some disagreements about the correct response. The discussion quickly

centered on the naive S. He was asked such questions as whether anything was wrong with his vision, whether he thought he had been right, etc. The E professed ignorance about the correct answers, stating that he would have to check the slides later in order to determine which alternative was correct. But he intimated that it seemed reasonable to assume that the majority had been correct. If the S was rather convinced of the correctness of his choices, he was asked how four people could possibly have given the same wrong answer. After the S was sounded out in this way about any possible suspicions he might have about the setup, he was informed about the real procedures as well as about the purpose of the experiment. Almost all the Ss took the deception in good spirit and were rather intrigued by the experiment. However, Ss who had conformed excessively were not pushed into admitting the full extent of their conformity, since they seemed to feel rather guilty already. Instead, they were told that in such a situation most people conformed to some extent. All Ss were asked once more about their impressions and thoughts during the experiment, and with a final request for secrecy they were dismissed.

The Subjects

Fifty Ss were used in the experiment. They were all students of the University of Michigan, enrolled in several sections of the Elementary Psychology course in the spring of 1955.

Since other results (11) as well as the pretests had given some indication of sex differences in the reactions to the situation, only male Ss were used. Furthermore, in order to keep the group homogeneous,

a few Junior and Senior volunteers were excluded. And since the Elementary Sociology course at the University of Michigan contains a discussion of Sherif's and Asch's experiments, it was decided to exclude volunteers who had taken this course since they might be "contaminated". In order to prevent "contamination" through the Psychology course itself, the experiment was run in the first half of the semester, and the teaching fellows of the sections concerned were asked not to discuss, during that time, topics or experimental procedures that might have a bearing on the experiment.

In the actual recruiting procedure, the students were told nothing about the content of the experiment. They were simply urged to sign up as Ss for some experiments with a rather general appeal: to further science and to gain some first-hand experience with psychological experiments. They were asked to indicate their free time, together with name, sex, phone, and whether they had taken any psychology or sociology courses before, on a form handed out to them. The Ss were not aware of the selection procedures employed since all students had been asked to volunteer. The recruitment had been a joint enterprise, and Ss excluded by the above definition of the population were used by a colleague in his experiments.

Out of six sections of Elementary Psychology with an average of thirty students, fifty-five volunteers met the specifications. They were assigned at random to the Experimental or the Control condition. Subsequently, the E assigned them tentatively to specific experimental sessions on the basis of their time schedules and contacted them by telephone. Although several Ss failed to appear for the first appointment,

no one refused a second call. Several prospective Ss, however, were too occupied at the proposed times and had to be dropped for reasons of scheduling. One student who had originally volunteered decided that he would rather not participate at all since he was "too busy". And finally, one volunteer told the E, when he was called up for scheduling, that a close friend of his had revealed the nature of the experiment to him and that therefore he could no longer be of any use as an S.

At this point, the question of the naiveté of the Ss might be raised. In spite of strong fears on the part of the E that word of the true purpose of the experiment might spread rapidly through the dormitories, the above occurence is the only known instance of a "leak". The Ss--most of whom were rather interested in the experiment--were asked at the end of the session to talk to nobody about its secret but, if asked directly, only to describe it as a perception experiment. When questioned whether they had been informed beforehand, all Ss denied it. Usually, their involvement in the experiment and their surprise after initiation into its secret seemed to corroborate these statements. In two instances, Ss spontaneously gave vent, in a joking way, to their annoyance with a close friend of theirs who had been an S in the experiment but had not warned them about its pitfalls. Therefore the writer--although possibly guilty of wishful thinking--is willing to assume that for all practical purposes the results were not influenced by some Ss' knowledge of the actual procedures.

This, however, does not rule out the possibility that Ss became suspicious during the course of the experiment. Actually, a number of them stated at the end, when all cards were on the table, that they had

in some way come to suspect that the experiment might not be quite what it purported to be. However, no one guessed at the extent of the deception (i.e., that all other Ss present were confederates). Also, it was impossible to determine whether these suspicions had developed during the experiment proper or--more likely--while the Ss were filling out the questionnaire, which naturally had some effect in this direction although the questions were as noncommittal as possible. In any case, it seems that no S came, during the experiment, to accept the deception as a fact and to behave consistently along this line. On the other hand, many Ss became so involved in the conflict that they needed some time to understand the E's explanation. Their surprise was definitely genuine. And the Ss who stated that they had come to suspect the social nature of the experiment at some point during the session did, in general, not at all become more independent of the social influence.

Since there was no clear-cut case of discovery of the experimental design, and since it was impossible to draw a line between those Ss who might have become suspicious during the experiment and those who only said so afterwards, the data from all Ss were used in the analysis. The S coming closest to a discovery had participated earlier in a Group Dynamics experiment. He stated at the end that he had suspected from the beginning that one or two of the other Ss were "plants". However, he belonged to the Control group; and the inclusion of his responses in our data works against the proposed hypothesis.

Personality Measures

The main purpose of the experiment was to test the hypothesis of differences in the amount of conformity obtained under two different

cognitive conditions. However, in order to explain the expected large residual variance, personality data were obtained from the Ss. Actually, the Ss in our experiment were volunteers drawn from a large pool of Elementary Psychology students who were used in another experiment performed in class. Since it seemed impossible to burden our Ss with any more measuring procedures, the personality data were obtained from this larger experiment. This procedure seemed justified because the variables supposedly measured there should have been good predictors of our dependent variable. The four different measures used will now be described.

Need for Achievement and need for Affiliation (hereafter abbreviated as nAch and nAff, respectively) are two projective measures obtained from stories which are written in response to TAT pictures presumably containing cues arousing these needs and scored according to conventions developed by McClelland, Atkinson, et al. for nAch (30), and by Atkinson, Heyns, and Veroff for nAff (4).

The nAch scores presumably are indices of the strength of motivation "concerned with performance in competition with some standard of excellence" (30, p. 111); nAff, or motivation to be socially accepted, is conceived as "a disposition to move toward others to elicit positive affective responses from them" (4, p. 409) and is operationally defined by stories showing "concern over establishing, maintaining, or restoring a positive affective relationship with another person(s)" (ibid., p. 406).

Our experimental situation clearly seemed to involve nAch since it required the Ss to select a correct response in competition with other students. At the same time, the social situation should have

aroused nAff, since judgments were given publicly, and the disagreement of the naive S with the majority was likely to arouse a desire for acceptance as well as fear of rejection or ridicule on the part of the Ss with high affiliative motivation. Unfortunately, neither the definition of nAff nor earlier experimental results have given a precise indication of the meaning of nAff--especially who the referent to the social relationship is: whether one specific key person in the S's life-space is the target of the desired affective relationship, or whether the desire for approval is general, i.e., is concerned with approval from any person or group that might be present. Thus, it was not clear whether in the experimental situation the concern over the positive relationship would center on the group of "subjects" or possibly on the E--two possibilities which might produce diametrically opposite results.

Both need measures have been used before in conformity situations. McClelland et al. report in their book (29) that in Asch's experiment nAch scores predicted exceedingly well; conformity was negatively related to nAch. This result is congruent with the theories about the acquisition of the achievement motive and its relation to early independence training (ibid.)--although the empirical evidence for these theories is rather sparse.

The nAff measure has been employed in another study of conformity (17) in which its relation to conformity seemed to be curvilinear; the Ss in the middle of the nAff range showed the greatest change after the influence attempt.

However, both variables have not yet been used together in this type of situation,[1] although it seems plausible to assume that the various possible combinations of these two motives might explain a large part of the individual variance in conformity. Yet no explicit hypotheses about the relationships were set up, mainly because of the indicated difficulties with the definition of nAff. The rather uneducated guess was that nAff should be positively related to conformity, since Ss strongly motivated to affiliate would be more conscious of, and/or more receptive to, the social influence. On the basis of the theory of the achievement motive as well as Asch's findings, nAch was expected to be negatively related to conformity--in spite of several differences between Asch's and the present experiment in relation to the nAch scores.

The other personality measure for which data from our Ss were available was a questionnaire-type measure developed by Donald E. P. Smith. Drawn from Cattell's "Sixteen Personality Factor Inventory", the eighty items of the questionnaire presumably give scores on two relatively orthogonal personality dimensions. These are defined as: (a) an "anxiety-stability" dimension, and (b) a "permeability or fluidity of structure-rigidity" dimension, also described as "sociability versus independent self-sufficiency" (42, p. 3). Actually, the questionnaire items (reproduced in Appendix C) are of the straightforward personality inventory type ("Do you worry much?") and probably a better index of

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[1] The only such study known to the writer, by Walker and Heyns (46), used only data from female Ss, and these seem to be not strictly comparable. Also, the experimental task would not fit the present conception of conformity.

the ideal self percept than of actual behavior. However, since the data were available, they were used in the analysis of our results in a rather exploratory fashion. It was assumed, though, that conformity should correlate positively with permeability as well as anxiety, if the measures were taken at their face value.

Both the projective as well as the questionnaire measures were obtained during class periods. The projective stories were written in response to the standard nAch and nAff pictures, presented in an alternating sequence under neutral conditions; i.e., no attempt was made to arouse either of the motives except through the picture cues. (See Appendix C for identification of pictures and sequence of presentation.)

Since the major objective of the study was the comparison between two experimental conditions, and since it was not possible to obtain scores on the projective measures before experimentation was begun, no matching of the Ss in the two conditions on the basis of motive strength was attempted. But since Ss were assigned to the conditions at random, the two groups were expected to be of similar composition in terms of the personality variables measured; and no significant differences between the groups on these variables were found afterwards.

Summary of Procedures

Early in the spring semester of 1955, two types of personality measures, (a) a projective measure of need for Achievement and need for Affiliation, and (b) a personality inventory measuring "Social Approach" and "Anxiety", were administered in several sections of the Elementary Psychology course at Michigan. Later, fifty Freshman and Sophomore

volunteers from these sections were recruited for an experiment and assigned at random to either the Experimental or the Control group. Each of the volunteers met with four other "subjects" who actually were confederates of the E for an experiment on the "span of apprehension". Their task was to recognize a nonsense syllable projected on the screen at 1/5'' and to select it from four alternative syllables presented immediately afterwards. All Ss announced their choice publicly in a fixed sequence. The naive S was always fourth to report. Twenty trials were given. On twelve, the confederates all gave the same wrong answer; on the remaining eight, all of them chose the correct alternative. Since the naive S heard the answers of three confederates before he responded, he had the choice of either reporting what he himself perceived as correct or agreeing with the incorrect majority response on the critical trials. In the latter case, his response was classified as "conformity".

Prior to these test trials, the Ss in the Experimental condition were given some "practice". Three slides with five digits each were shown to the group at decreasing speeds, beginning with 1/100''. All Ss were asked to report what they had recognized. The confederates had been instructed to give correct responses only after the naive S had given an accurate report, and the speed of presentation of the same slide had been decreased twice. Through this procedure, the Experimental Ss presumably gained the impression that their recognition thresholds were lower than those of the other participants. In the Control condition, no such practice was given. It was predicted that the secondary information supplied to the Ss in the Experimental condition would reduce, for them, the ambiguity of the total situation and consequently the

proportion of conformity responses relative to the Control condition, although in both situations four confederates gave the same wrong answers.

All Ss also gave ratings of their uncertainty about the correct responses after each judgment. After twenty trials, they were asked to indicate on a questionnaire their judgments of the difficulty of the task, their visual acuity, their ability for the task relative to other people, as well as their experiences in the group situation. A discussion of the same topics followed, at the end of which the Ss were informed of the true purpose and procedure of the experiment.

CHAPTER III

RESULTS: A. GROUP DIFFERENCES

Differences on the Independent Variable

Before proceeding to test the hypothesis about differences in conformity between the Experimental and Control group, let us ask another question. Is the assumption justified under which a test of the hypothesis would be valid? Were our experimental manipulations effective in establishing different cognitive conditions in the two groups?

The test of this assumption was question 3 of the post-experimental questionnaire: "How good do you think you are on a task like the one you just did? (Check scale)." If the treatment of the "practice" trials induced, as intended, the Ss of the Experimental group to develop the hypothesis that their threshold values were lower than those of the majority, they should rate their ability higher than the Control Ss.

The results show that this was the case (see Table 8, p. 62). Whereas only three Ss of the Control group rated themselves as "better than average", fifteen (more than three-fifths) of the Experimental Ss gave such a rating; and none of them rated themselves as below average as against three such ratings in the Control group. The difference is statistically significant beyond the .0005 level for the fivefold response classification, using Mood's maximum likelihood procedure. Collapsing the scale into a two-by-two table with gross classifications of "better" vs. "average or below" results in a corrected chi-square

value of 11.94, representing a chance probability smaller than .001. Both probability values are taken from one tail of the distribution since we predicted the direction of the difference.

Thus we find that most Experimental Ss rated themselves better than the Control Ss, and since the treatment was the only systematic difference between the two groups, we can conclude that the manipulation produced, in general, the intended effect. The details of the ratings on this question will be discussed later; now we will proceed to test the main hypothesis.

Differences on the Dependent Variable

Our dependent variable is the amount of conformity obtained on the critical trials. Two ways of testing for a difference between the two experimental variations are possible: (a) a test of the difference in mean amount of conformity per subject over all trials, and (b) a test of the difference between the proportions of conformity per trial over all subjects in each condition.

Analysis by Subjects.--The distribution of total amount of conformity per subject is given in Table 1. We find that inter-individual variation is very large so that the distributions for the two groups largely overlap. Both distributions are positively skewed and both, but especially that of the Experimental group, show some indication of bimodality. In each group, at least one S conformed 11 out of 12 times possible; no one conformed on every trial. In the Control group, the least amount of conformity obtained is two times; none of these Ss remained completely independent, whereas in the Experimental group a

number of Ss conformed never or only once. The mean amount of conformity is 4.73 and 3.50 for the Control and the Experimental group, respectively.

TABLE 1

TOTAL AMOUNT OF CONFORMITY PER SUBJECT IN TWO EXPERIMENTAL VARIATIONS

Condition	Amount of Conformity													N	Mean
	0	1	2	3	4	5	6	7	8	9	10	11	12		
Experimental	3	6	3	2	1	1	4	2	1	-	-	1	-	24[a]	3.50
Control	-	-	9	3	1	5	2	2	-	1	1	2	-	26[a]	4.73

[a]Since Ss had been assigned at random to the two groups, scheduling difficulties left the groups slightly imbalanced when the total number of 50 cases was reached.

Since our theoretical argument was based on Asch's results, and since we assumed that the situation of our Control group would be equivalent to his experiment, let us compare these figures to his data. Actually, Asch reports two sets of data, for two slightly different experiments. In "Groups, Leadership, and Men" he reports an experiment with twelve critical trials (3). For several series of experiments with different numbers of confederates, the mean amount of conformity obtained in the different series varies around 3.8; i.e., it is less than in our control group. Also, the distribution obtained is markedly more skewed, with one-fourth of the Ss remaining completely independent throughout. These two facts indicate that our stimulus situation was somewhat more ambiguous.

The other experiment reported by Asch (2) contained only seven critical trials, yet proportionally the mean amount of conformity, 2.3, is slightly larger. Also, the distribution of scores is different; less

than one-fifth of the Ss remained completely independent. The main difference between these two experiments seems to be that the second one demanded more difficult discriminations. (The mean amount of error per subject in Asch's "alone" control group is .08 for the first and .5 for the second experiment in spite of the smaller number of trials in the latter.) Altogether, the results of the second experiment seem to be more nearly comparable in mean amount of conformity to our Control group (if adjusted for the different number of trials or compared with the first half of our experiment); yet the frequency of complete independence is decidedly larger for Asch's experiments using a stationary stimulus.[1]

This indicates that the situations are more or less equal in overall ambiguity, but that the tachistoscopic presentation may have introduced some extraneous factors--momentary shifting of attention, incorrect focusing—which caused something like a regression toward the mean. Yet the difference between our Experimental and Control groups seems to show that these factors were not purely accidental ones, but that they combined with the cognitive evaluation of the situation. Therefore, we conclude that the two situations (as well as the Ss) are not strictly equivalent, but that differences are slight and a generalization of our findings to the other situation is probably permissible. On the other hand, it was fortunate that a smaller amount of independence, and especially complete independence, was shown in our experiment; otherwise a reduction in the

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[1] Deutsch and Gerard obtained a mean of 3.0 on twelve trials with Asch's procedures. They attribute this reduction of conformity to the fact that, contrary to Asch's experiment, confederates and Ss were not acquainted with each other, which fact may have decreased the social pressure (12). Olmstead and Blake, using auditory stimuli, obtained almost 50 per cent conformity; yet again, complete independence was more frequent (37).

amount of conformity through the experimental treatment would have been hard to demonstrate.

We have seen that the mean difference between our two conditions was in the predicted direction; however, it was not very large. In order to test its statistical significance, we will employ parametric methods. Since the raw data are not true measures but "zero-one" data (independence or conformity on each trial) the resulting distributions are of a binomial type. To make a t-test legitimate we have to transform these raw data in order to obtain independence between mean and variance. The appropriate transformation for such count data--occurrences among a definite total counted--is the transformation of percentages to angles, or the arc sin $\sqrt{\%}$ transformation as given by Snedecor (43).

TABLE 2

MEAN DIFFERENCE IN CONFORMITY BETWEEN TWO EXPERIMENTAL VARIATIONS (AFTER TRANSFORMATION OF SCORES)

	Condition		Difference
	Experimental	Control	
Mean[1]	29.84	38.66	8.82
Variance[1]	354.09	242.71	296.04
N	24	26	50

$t = 1.81$ $df = 48$ $p < .05$ (one-tailed)

[1]in arc sin $\sqrt{\%}$

Since we had predicted the direction of the difference, the obtained t of 1.81 is significant beyond the .05 level (one-tailed). It

can therefore be concluded with reasonable certainty that the obtained difference in conformity is not due to chance and that our hypothesis is supported. On the other hand, we should remember in interpreting these results that the absolute magnitude of this difference is not very large and that inter-individual variation is sizeable.

Analysis by Trials.--There is another procedure to test the difference between the two conditions. Whereas in the former test we obtained a total conformity score over all trials for each individual, we can also look at the differences between the two groups on each trial separately.

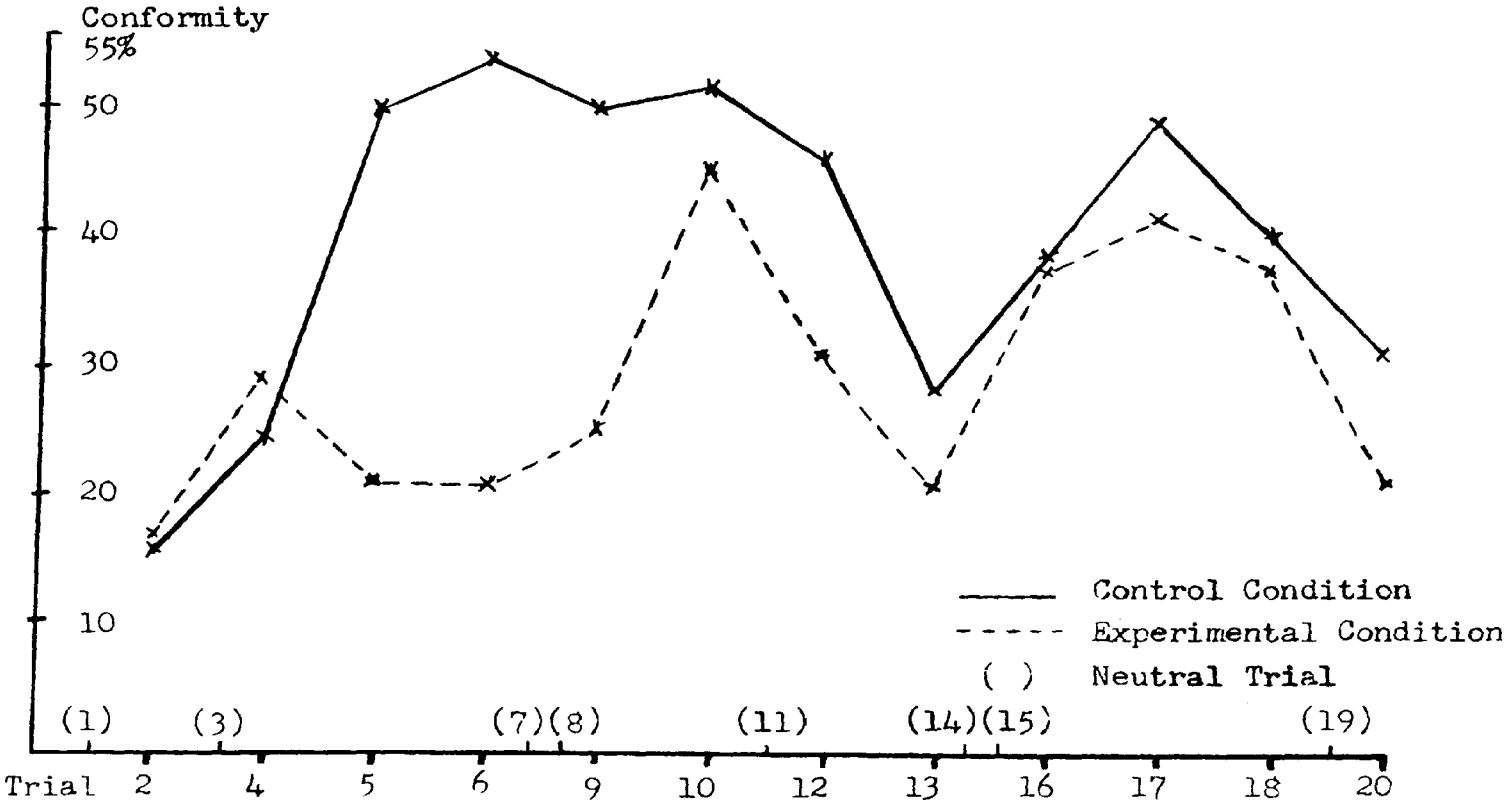


Fig. 1. Percentage of Conformity on Successive Critical Trials for Two Experimental Variations.

Figure 1 shows a plot of the percentage of conformity obtained in each condition for successive trials. Inspection of the figure shows that the percentages of conformity in both conditions co-vary, to some extent, over trials. However, the Experimental group shows the smaller percentage on ten out of twelve trials. Dispensing with the assumptions required for the use of parametric methods, we can test the null hypothesis with a simple, i.e., non-parametric, sign test. We find that the distribution of the positive and negative differences--ten against two--is probably not due to chance ($p = .025$ for a one-tailed test). If we want to make somewhat more efficient use of the obtained data and are willing to assume that we have a constant unit of measurement (which does not seem unreasonable) we can employ the Wilcoxen U-test for related measures (48). We include in our analysis a rank order of the absolute magnitudes of the differences and find that the two negative differences between the Control and the Experimental group are the second and the fourth smallest ones of the twelve. The probability for such a result if the true mean difference were zero or negative is .005. On this basis, we obtain substantial support for the hypothesis that the experimental treatment would reduce the amount of conformity.

It should be pointed out that we obtained a higher significance level with the statistically more primitive tests, because in the first analysis method we used the "random" variation between individuals within each group as error term; and since this variation was rather substantial, even the stronger parametric method resulted in a satisfactory but not impressive significance level. In the second procedure, we do not compare individuals but trials, and our error term is the

variation between trials. Here we can capitalize on the covariation between the two groups over successive trials (which is, of course, entirely legitimate) thus decreasing the random variance as well as the degrees of freedom. The fact that our measures for each trial are not independent because we used the same Ss on all trials is no serious handicap, since we did not predict a difference between conditions on a single trial. The conclusion which we can draw from this analysis is that for the treatment groups as a whole there is a reliable difference in the predicted direction over a series of twelve trials.

Of course, the treatment differences are confounded with other possible differences between the two groups of Ss. However, the groups were random samples from the same population, and no significant differences were found on any of the control variables used.

Therefore, we can conclude on the basis of the two different methods of analysis that the proposed hypothesis is reasonably well supported, and that the incompatibility between different parts of the cognitive field is, on the whole, a significant factor, producing more conformity on perceptual judgment tasks than the factor of majority opinion alone.

Additional Results of the Analysis by Trials.--The trial-by-trial results bring out several additional features of interest. Inspection of Figure 1 shows that the amount of conformity obtained on the first two trials was rather low in either group. Yet on both (and only on these) the relationship between the two groups is the reverse of the predicted as well as the obtained overall results, although the magnitude of the difference is negligible. Beginning with the third trial,

the Control Ss conformed much more while conformity in the Experimental group decreased again--with the effect that the difference between the two groups becomes, for the first time, sizeable. How can we explain this trend?

This result was not predicted; however, it seems to serve well to reject one potentially serious objection which could be raised against the experimental procedures. The finding that treatment differences are not present at the outset indicates that the greater overall independence of the Experimental Ss is not a simple practice effect. It is not due to the fact that these Ss had some experience with tachistoscopic presentations--if not exactly of the same type--in the practice trials and therefore had adjusted their sensory apparatus to the physical stimulus situation. The Control Ss, on the other hand, who had seen only one sample slide, might have been mechanically unprepared, at least initially, to cope with the required task. But we find that, on the contrary, the Control group performed at least as well on the first two critical trials. Actually, both groups were about equally low in conformity. This seems to indicate that the impact of the wrong majority response had not yet made itself felt. But on the third trial, the Control Ss could no longer disregard the majority opinion, and approximately half of them were swayed. The Experimental Ss, however, applying the hypothesis they had developed during--or on the basis of--the practice trials, became more independent than they had been on the preceding trial.

Later in the experiment, the gross trends in the two groups changed. After the establishment of a large difference, the two groups began to approach each other again over subsequent trials. And when we

disregard the random fluctuations, we find that the Experimental group became more and the Control group less conformist as time went on.

If we look at the difference between the two groups in each half of the session, we find that the mean difference in conformity per trial is twice as large for the first half than for the second half;[1] this occurs in spite of the fact, discussed previously, that the first two trials showed a reversed relationship between the groups. And if we test the amount of conformity per subject, we find that in the first half significantly more Ss in the Experimental group were independent than in the Control group (as tested with a simple chi-square test using a near-median break on the conformity variable); in the second half, the difference is no longer significant although still in the predicted direction (see Table 3).

Thus it appears that experimentally the use of a large number of trials, i.e., twelve, operated against a large difference between the two groups. Of course, we can be accused of capitalizing on chance fluctuations if we claim that the large number of trials reduced the clearness of the difference. But it seems possible to maintain that for theoretical interpretations and conclusions the earlier part of the experiment provided the better test of the hypothesis. The data may not justify a lengthy discussion of this point; therefore, we will only summarily indicate our reasoning.

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[1]Tested with parametric methods, both differences are still significant beyond the .05 level (one-tailed) in the predicted direction.

TABLE 3

DIFFERENCES IN CONFORMITY UNDER TWO EXPERIMENTAL CONDITIONS FOR FIRST AND SECOND HALF OF EXPERIMENT

Condition	First Half		Second Half		N
	Conformity		Conformity		
	Low	High	Low	High	
Experimental	14	10	11	13	24
Control	8	18	10	16	26
Total	22	28	21	29	50
Chi-square	3.85		0.28		
p (one-tailed)	.025		n.s.		

We must not forget that the experimental situation is a trick situation. The procedures used for the operationalization of the hypothesis provided some of the Ss with some "understanding" of the total situation; but this understanding was factually wrong, and its incorrectness probably became more glaring during the course of the experiment. The Ss in the Control condition were also deceived; the majority gave a fixed incorrect response. Since for these Ss the initial situation was highly ambiguous, many of them adopted in the early trials the tentative interpretation that the majority was right. But later on, the strain in the system--due to the conflict between the Ss' perception of the stimuli and the majority response--may have forced them to abandon this frame of reference and to take the other part of the field, their own sensory experience, as reference point more often than before.

In other words, we are trying to account for the two opposed trends with the same factor: strain in the system. As in the perception of a reversible figure, which part of the stimulus field was seen as figure and which as ground fluctuated. But since for the Experimental group the original figure-ground relationship--set up through the treatment--was opposite to the one perceived by the Control group--for whom figure and ground were established later, in the test trials--the trends moved over time in opposite directions.

So far, we have tried to account for the gross trends in the behavior of the two groups. Figure 1 shows also some fluctuations from trial to trial which apparently were not purely random since they occurred in both groups. There are at least two separate factors responsible for this fluctuation. One of them is obviously the specific difficulty of the stimuli, depending partly on the discriminability of the different letters and partly on the type of wrong alternative chosen by the majority, i.e., the form and place of the "error". Unfortunately, the design of our study confounded this factor with the effect of another one, namely the position in the sequence of neutral and critical trials.

The Uncertainty Ratings

It will be recalled that the experimental procedure included an additional task: Ss indicated their uncertainty about each response on a graphic five-point rating scale. As mentioned earlier, we had been doubtful from the beginning whether inter-individual comparisons on this measure would be meaningful because of the absence of a constant unit of

TABLE 4

MEAN UNCERTAINTY PER SUBJECT FOR DIFFERENT RESPONSE CATEGORIES IN TWO EXPERIMENTAL VARIATIONS

Condition	Average of Mean Ratings per Subject			
	All Trials	Critical Trials		Neutral Trials
	All	Correct	Majority	Correct Responses
Control	1.11	1.29	1.47	.54
Experimental	.93	1.10	1.38	.48
Variance(Pooled)	.19	.33	.62	.23
N	50	49[a]	47[b]	50
t	1.57	1.18	.39	.48
p	.2 > p > .1	n.s.	n.s.	n.s.

[a]The N is only 49 in this category since one S gave no correct independent response; he chose a wrong alternative at the one time he disagreed with the majority on critical trials. In order to check whether poor eyesight was responsible for this poor performance, the S was shown--after the twenty experimental trials--the first ten slides again. He was asked this time not to announce his judgments but to note them on his rating scale. It is highly improbable that the S had learned the correct responses at the first presentation. However, at this second presentation without social pressure he did not make a single mistake.

[b]Three Ss gave no conformity response.

measurement across Ss. Another difficulty with the analysis of these data was the varying number of responses in the two categories of conformity and independence for different Ss. Therefore, mean values of uncertainty per subject were calculated for these response categories

as well as for the responses on neutral trials.[1] This procedure was based on the assumption that at least for each S the measurement units remained relatively constant.

Inspection of the data showed that inter-individual variation was rather large; also that there was practically no relation to the dependent variable. As presented in Table 4, a comparison of the two groups by means of t-tests produces no significant differences for the three response categories. The mean uncertainty for all responses combined shows the largest difference: the Experimental Ss were more certain about their judgments than the Control Ss. However, even this difference is not significantly different from chance.

These results probably mean that the interpretation of the scale values, which were defined only verbally, varied too much over individuals to admit consistent results. Also, it should be pointed out once more that these ratings were not simple measures of the stimulus ambiguity as used by others (e.g.,6). Instead, they were given after all Ss present at the session had responded publicly; therefore, they are indices of the original uncertainty as well as of the perceived social influence.

An intra-individual analysis shows, however, that the ratings were not given purely at random. If we compare, for each individual, the mean ratings on neutral trials (when all participants agreed on the correct answer) with conformity trials (when all agreed on the

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[1]Occasionally, Ss gave simply wrong responses on critical or neutral trials. Although such errors on critical trials may have incorporated parts of the wrong majority response, they were not counted as conformity. For the calculation of uncertainty values, however, such incorrect responses were excluded.

TABLE 5

INTRA-INDIVIDUAL COMPARISON OF MEAN UNCERTAINTY RATINGS FOR DIFFERENT RESPONSE CATEGORIES

Direction of Difference	Response Categories Compared: a. Conformity b. Neutral		a. Independence b. Neutral		a. Independence b. Conformity	
Mean Uncertainty for a:	Condition: Exp.	Cont.	Exp.	Cont.	Exp.	Cont.
Higher	18	22	20	22	7	11
Equal	1	3	1	1	1	2
Lower than b	2	1	3	2	13	12
N	21[a]	26	24	25[b]	21[a]	25[b]
p (Sign Test)	.005[c]	.005[c]	.01	.01	n.s.	n.s.

[a]See Table 4, footnote b.

[b]See Table 4, footnote a.

[c]One-tailed because in the predicted direction.

wrong response), we find that in both groups almost every S was more certain about his responses on neutral than on conformity trials. As evaluated by the sign test, the direction of these differences, which had been predicted, is significantly different from chance for both groups (see Table 5). The same result is obtained in a comparison between neutral and independence trials: Ss were significantly more often more uncertain when they disagreed with the majority than when all gave the same correct response. The third comparison possible, within the critical trials, is one between correct independent responses

and wrong majority responses. Here we find no significant difference in either direction for both groups with a sign test; although, as Table 3 shows, the mean uncertainty is higher for conforming than for independent responses in both groups.

These results seem to support our assumption: Ss did not conform because of excessive ambiguity of the visual stimuli; they were aware of the fact that they were following the majority in the wrong direction whenever they conformed. That they also were more uncertain when disagreeing with the majority than on the neutral trials is hardly surprising. Finally, the absence of clear differences, between the two groups as well as within groups, on the comparison between independent and conforming responses probably indicates that the ratings were the results of a complex combination of influences from the physical as well as social stimulus situation.

Responses to the Situation

We have already mentioned the results of one of the questions asked at the end of the experiment, since we used this question as an independent test of the experimental manipulations. Let us now consider in more detail the data obtained from the post-experimental questionnaire and interview.

The first question asked dealt with the difficulty of the task. The results appear in Table 6.

We find that the Experimental Ss tended to rate the task as easier than the Control Ss, although this tendency is only of borderline significance. In the interpretation of this finding, we meet with one problem. Is the difference in reactions due to the presence or absence

TABLE 6

PERCEIVED DIFFICULTY OF TASK IN TWO EXPERIMENTAL VARIATIONS

Response	Condition					
	Control				Experimental	
	Conformers*		Total	Total	Conformers*	
	Low	High	Control	Experimental	Low	High
Very Difficult	-	-	-	-	-	-
Difficult	4	3	7	4	1	3
Not Particularly Difficult or Easy	7	9	16	12	6	6
Easy	2	1	3	4	4	-
Very Easy	-	-	-	4	1	3
N	13	13	26	24	12	12
Chi-square	.72		7.01		7.64	
p	n.s.		.1 > p > .05		.05	

*The median of each group was used for the division of its Ss into Low and High Conformers. Because of the group differences in conformity, these cutting points are not identical.

of the experimental treatment directly or to its effects? Did the Control Ss rate the task as more difficult because they had no prior practice, because they lacked an explanatory hypothesis for the disagreement, or because they were on the whole more influenced by the majority responses?

The last explanation seems unlikely, since there is no relationship between the amount of conformity obtained and the perceived difficulty in the Control group. In the Experimental group, we do find an indication of a relationship between these two variables. But it is

not a linear one; instead, we find that the High Conformers tended to give more extreme ratings. It would be intriguing to follow up these either "defensive" or "realistic" ratings; however, the number of cases is obviously too small for this purpose. Yet interestingly enough, the difference between the two groups is at least partly due to these "defensive" ratings by High Conformers in the Experimental group. This fact in combination with the absence of a general relationship to conformity seems to indicate that the structuring of the situation given by the practice trials is primarily responsible for the obtained difference.

Question 2: "How good is your vision?" was mainly intended as a distractor, designed to keep the Ss thinking about other explanations for the disagreement than the correct one. Also, no independent measure of the Ss' vision was available; yet the experiment was based on the assumption that the visual stimuli were clearly perceptible. If this assumption was not met and any visual defects influenced the obtained results, it should become apparent in the answers to this question. However, as Table 7 shows, there is no evidence for a relationship between the amount of conformity and visual acuity as rated by the Ss. Also, there is no significant difference between the two groups on this variable, although there is a slight tendency for a "superior" rating by the Experimental group.

At the beginning of this chapter, the gross results of question 3, about the relative ability of the Ss for the task, were presented. We found that the difference between the two groups was highly significant, and we interpreted this finding as indicating that the experimental

TABLE 7

SELF-RATINGS OF VISUAL ACUITY
IN TWO EXPERIMENTAL VARIATIONS

Response	Control		Condition		Experimental	
	Conformers*		Total	Total	Conformers*	
	Low	High	Control	Experimental	Low	High
Excellent	3	2	5	9	3	6
Good	6	5	11	10	6	4
Average	3	4	7	4	3	1
Somewhat impaired	1	1	2	1	-	1
Definitely poor	-	1	1	-	-	-
N	13	13	26	24	12	12
Chi-square	1.82		3.64		3.85	
p	n.s.		n.s.		n.s.	

*For procedures, see footnote, Table 6.

manipulations had been effective. However, the same problem as in the interpretation of question 1 arises. We do not know what precisely was the basis for the difference in ratings. Were the better ratings of the Experimental group based directly on their experience in the practice trials? Or did the effect of this treatment, their greater independence on the test trials, lead them to the conclusion that they were better than the other participants?

As we see in Table 8, the relationship between actual performance and ability rating is rather weak. Ss in the Control group who conformed only a little tended to rate themselves as average, whereas some Experimental Ss rated themselves as better in spite of the fact that they had conformed quite heavily.

TABLE 8

SELF-RATINGS OF ABILITY FOR TASK
IN TWO EXPERIMENTAL VARIATIONS

Response	Condition					
	Control				Experimental	
	Conformers*		Total	Total	Conformers*	
	Low	High	Control	Experimental	Low	High
Tops	1	-	1	1	1	-
Better than Average	2	-	2	14	9	5
Average	8	12	20	9	2	7
Worse than Average	2	1	3	-	-	-
Very Poor	-	-	-	-	-	-
N	13	13	26	24	12	12
Chi-square	5.30		18.48		5.49	
Degrees of Freedom	3		3		2	
p	.2 > p > .1		.0005 (one-tailed)		.1 > p > .05	

*For procedures, see footnote, Table 6.

It seems therefore, that the generally higher ratings in the Experimental group were a result of the inference drawn, as intended, on the basis of the practice trials. For most Low Conformers in the Control group the situation was still too ambiguous to justify such a higher rating on the basis of their actually superior performance alone. Therefore, most of these Ss chose the non-committal "average" as their answer.

On the other hand, not all Ss in the Experimental condition rated themselves as better, in spite of the treatment, while a few

Control Ss did give such a rating. Several factors probably account for this. Some variation in the effect of the treatment on different personalities was of course to be expected. Also, for some Ss sanctions against rating oneself publicly as better than others may have been too strong. Some others actually conformed quite heavily even in this condition and thus received cues contradictory to a higher rating. We do find an indication of a relationship to the actual behavior, approaching the .05 level in the Experimental group; still, as mentioned above, even some of these High Conformers gave the expected higher rating, possibly supported by recalling their independence on at least a few trials. And finally, the assumption that Ss had no prior experience with such a task--and thus no other reality basis to evaluate their performance--was demonstrated to be incorrect in a few cases.

One of the Experimental Ss was enrolled in a remedial reading course and had found out there, on a similar test, that his recognition threshold was rather high even in comparison with other slow readers. Therefore, he found it hard to accept the apparent conclusion of the practice and rated his ability as average. (In fact, he had first marked the category of "better", but subsequently changed this.) On the other hand, one S in the Control group had taken, a week before the experiment, a tachistoscopic test in airplane identification at the NROTC and learned that his performance was superior. He rated himself as better and also remained rather uninfluenced during the experiment. These two extreme cases really support the hypothesis, but <u>de facto</u> operate against the predicted group difference since they reverse the assumptions made about the cognitive conditions in the two groups.

Question 4 asked whether the Ss had been influenced by the reports of others. The answers were coded into four categories as given in Table 9.

TABLE 9

PERCEIVED INFLUENCE OF OTHERS' JUDGMENTS ON SUBJECTS IN TWO EXPERIMENTAL VARIATIONS

Response	Condition					
	Control				Experimental	
	Conformers*		Total Control	Total Experimental	Conformers*	
	Low	High			Low	High
No Influence	6	5	11	12	8	4
Once or Twice	3	4	7	7	4	3
Some Influence	3	2	5	2	-	2
Yes	1	2	3	3	-	3
N	13	13	26	24	12	12
Chi-square	.78		1.29		8.43	
p	n.s.		n.s.		$.05 > p > .02$	

*For procedures, see footnote, Table 6.

The assumption that the indicated sequence of response categories represents a rank order of the amount of influence experienced (or admitted) is tenuous. There are some indications that the question can be interpreted in two ways: the answers, especially a flat "yes", may mean either that the Ss changed their responses to coincide with those of the majority, or simply that they experienced some pressure from the group without necessarily changing their answers.

But for a chi-square test the assumption of a rank order of the categories is unnecessary. We find that there are no differences between the two conditions as well as between Low and High Conformers in the Control Condition. In the Experimental condition, we find again an indication of a relationship with a chance probability smaller than .05. It is interesting to note that on all four questions the relationship between the responses and the amount of conformity was higher in the Experimental than in the Control group. This may well be an additional indication that the treatment succeeded in structuring the situation for these Ss even though the induced structure did not correspond to reality.

The last question, finally, asking for an explanation of the disagreements, produced few results. The usual statement made here was that "some people must have seen things differently"; that because of the speed of presentation of the stimuli somebody had mistaken some letters for similar ones--without specifying who had been wrong.

The interview immediately following the questionnaire showed in more detail that the Ss quite understandably did not have a clear and consistent view of the events. The modal response of the naive Ss was that they thought they had been right whenever they disagreed. But immediately afterwards, many of them admitted that the majority might have been correct, since this seemed to be the "logical" conclusion--unless, some added, the others had been influenced by the report of the first S. Practically all insisted at first that they had given their responses "the way they saw it", adding that sometimes, when

they had not seen the slide too clearly, they picked the alternative chosen by the others. Some of the Ss were quite eager to find out who had been right; others seemed to feel rather uneasy about the situation and did not want to commit themselves. The statements made during the interview were more or less contradictory to each other; and the fact that the Ss' understanding of the situation changed during its course made it all the more difficult to categorize their positions.

Asch has tried to classify the various reactions of his Ss into several groups: the Independents with or without confidence, and the Yielders who distorted either their perceptions, their judgments, or their actions (2, pp. 465ff.). We found it very hard to arrive at such classifications on the basis of our observations, since the attitudes of most of the Ss seemed to vacillate and only a few extreme cases presented such definite syndromes.

Most of the Low Conformers were, of course, rather sure of themselves. But even of those Ss insisting that they had been right, several showed great surprise when the E finally told them that indeed they had been correct. One of them expressed this surprise by wondering aloud if the E might still not be telling them the truth. And a few of the Low Conformers had more or less accepted the fact that they were wrong but had given these "wrong" responses because they felt they were expected to report what <u>they</u> saw.

On the other hand, some of the High Conformers presented a clear picture of an intrapunitive attitude, admitting readily that they must have been wrong whenever they disagreed with the majority. One expressed

this attitude concisely: "I felt quite guilty when the first disagreement occurred"; and another: "Something is wrong with me."

We have found in the analysis of the uncertainty ratings that practically everyone was at least subliminally aware of the fact that he conformed to wrong responses of the majority. But while most Ss admitted in the private interview at the end that they had been influenced, in the group discussion they had denied this insinuation.

What made different Ss conform or remain independent? We will discuss the results of the personality measures in the next chapter. In the interview, two types of motivation appeared, though not too clearly. One of them we might call ego-involvement. Ss saw the experiment as a test of their ability, and they wanted to be right. Often, this desire seemed to push them into conforming; when they were not certain of their answer they went along with the majority. Yet this did not always happen. Others who also "liked to see who is best" did not give in to this pressure.

The other attitude was one of task-orientation. Several of the Low Conformers stated that they had been in conflict about the disagreement. But they stood by the responses originally selected, since this was what the E--presumably--expected. They reported what they saw, because otherwise "the test would have been invalid." However, they often added spontaneously that in the given situation there was nothing to win or lose by giving different and possibly wrong answers. In other situations involving rewards or sanctions they might behave differently.

No palpable differences in the attitudes of Ss between the two experimental variations were found. In the Experimental group, several Ss spontaneously referred back to the results of the practice trials to support the claim that they had been correct when they disagreed with the majority. All of the others recalled these events when asked about them or when told about the design of the experiment. And most of them agreed that this treatment might have made a difference in their reactions to the group situation. Only two of the independent Ss insisted that they would have behaved in the same way even without the treatment.

Summary

The treatment given to one half of our Ss succeeded in producing different cognitive conditions in the two groups, as indirect evidence from the post-experimental questionnaire indicated. The uncertainty ratings showed that Ss usually rated their conforming answers as more likely wrong than their answers on neutral trials, indicating their recognition of the fact that they had conformed to wrong majority responses. Therefore, the conditions necessary to test our hypothesis seemed to have been met. On the dependent variable, conformity, we found statistically significant differences in the predicted direction between the two experimental variations in two different analyses, by Ss and by trials. These results were taken as supporting the hypothesis that conformity with wrong majority responses could be reduced by giving Ss some secondary information potentially reconciling the incompatibility between their own visual experience and the majority responses.

However, we also found that the difference between the two conditions decreased over trials. This decrease was attributed to the nature of the testing situation, especially to the fact that both groups had been deceived by the E, though in different ways. This effect may have been partly responsible for the smallness of the absolute difference between means on the dependent variable. But the range of individual variation is so wide, within either group, that this explanation alone is insufficient. Especially startling to the E was the result that some Ss who had been shown in the practice trials to be "better" than the rest of the group broke down after the first disagreement and conformed heavily throughout the experiment. It seems that some individuals will conform in practically any situation. Such Ss appeared to be rather insecure and easily disturbed. But this post facto description is without much value; and no clear and distinct differences in their reactions to the interview were found which could explain such behavior. However, we had obtained some independent data on the personalities of our Ss. Let us see whether they help us understand this problem.

CHAPTER IV

RESULTS: B. PERSONALITY DIFFERENCES

It will be recalled that we obtained from our Ss two independent sets of data tapping two different levels of personality structure. The stories written in response to TAT pictures were projective measures of the Ss' motivation on an unconscious level, or at least a level of incomplete awareness. The other measure was a personality inventory, consisting of rather straightforward questions; it supplied some data about the Ss' conscious perception of themselves.

On both levels, the data collected were relevant to two different dimensions approximately orthogonal to each other. The motive measures involved were need for Achievement (nAch), i.e., striving for good performance in competition with standards of excellence, and need for Affiliation (nAff) or concern over affective relationships with other people. The correlation between nAch and nAff has generally been reported to be negligible. For our data (i.e., for the total group of students from which our samples were drawn) it was -.04 (38). The two dimensions of the questionnaire items were Social Approach or Permeability (SA)--which is based on questions rather similar to older Extroversion-Introversion scales--and a Stability-Anxiety dimension (S). These two, likewise, have not shown any significant correlation in prior studies (41).

The analysis of the effect of these four variables proceeded in several steps. The first was to determine first-order correlations with our dependent variable, conformity. Then, analyses of variance were carried out in order to determine possibly curvilinear relationships as well as to evaluate the relative effects of the personality factors, the treatment variable, and their interaction. The latter was especially important because the relationships between the personality variables and conformity turned out to be different in the two experimental variations. Finally, the projective measures were used in combination in a three-factorial analysis. This procedure was not undertaken for the questionnaire measures since it seemed highly unlikely that much additional information could be obtained from it.

The personality data were collected during class hours. Therefore, not all of our Ss are represented. Three of them were absent when the projective measure was administered; four were not present at the questionnaire administration. The scoring of the latter data, an objective procedure, was carried out by the E in accordance with the scoring key (42). The projective stories presented more difficulties. They have to be evaluated according to more or less definite conventions developed by the authors of the measures. The reliability between trained scorers is reported by McClelland et al. to be "usually in the neighborhood of .90 or better" for nAch (30, p. 187). For the Affiliation motive, Atkinson et al. report an inter-scorer reliability of .96 for total scores derived from five stories (4, p. 406). These data indicate that the scoring reliability of these projectives is extremely high. However, it must not be overlooked that the two sets of scores

were obtained from scorers who usually had had considerable practice with the task, or who had even worked together in developing the scoring system.

Our data were scored by four students who had received some training with the scoring system and had achieved reliabilities around .9 in this process. Each of the four scored, for each motive, all stories written in response to one of the four pictures by our Ss as well as by a considerably larger number of other students. As a reliability check, Dr. R. A. Clark rescored independently all our Achievement stories. For purposes of identification, we designate this latter set of nAch scores "score II". The product-moment correlation between the two sets of nAch scores obtained in this way is .73 (N = 47)--disappointingly lower than the figures reported above. However, while all scorers had used scoring system C (30), it appears that positive scores for stories containing only "fear of failure" imagery had been included in score II, but not in score I (8). Therefore, the depression of the reliability coefficient probably indicates not only random error but also a systematic difference between the two sets. This interpretation is supported by the fact that, although the correlations with the dependent variable are slightly different for the two sets of scores, this difference seems to be systematic over the two experimental conditions--as we will see in the results presented below. Also, one of the four original scorers rescored, after an interval of one month, all four Achievement stories for twenty Ss. He obtained a correlation of .91 with the original scores (set I).

However, the existence of two different sets of scores raised a practical problem. Which of the two sets should we use for our analysis? We could not find a rationale for the preference of one set over the other one. Therefore, the relationships of both with the dependent variable were determined. For the final analysis of variance of the effects of nAch and nAff together, a combination of both sets of nAch scores was used. In the hope of canceling out some random variation, the two scores for each S were combined by taking the arithmetic mean--a procedure which may not be entirely justifiable but which seemed to be the best one possible. However, since the personality variables were dichotomized for purposes of this analysis, we excluded three Ss whose two nAch scores were symmetrical around the cutting point so that they could not be assigned to either of the two groups. The cutting points used for establishing categories on the projective measures were obtained from the distributions of scores in the larger group of 180 Ss from which our samples had been drawn. The classification of the Social Approach and the Anxiety scores into groups was carried out on the basis of the distribution in the norm group reported by Smith and Wood (41).

Results of Correlational Analysis

Table 10 gives the product-moment correlations of the four personality measures and one control variable, age, with our dependent variable. Two results become quickly apparent. The first one is the absence of sizable correlations for two of our personality measures, Anxiety and nAff, as well as for age.[1] The other two personality

[1]The absence of a stronger relation of age to conformity is probably due to the restricted range of the age variable (cf. Berenda, 5).

measures are related to some extent to conformity, although not always at a statistically significant level.

The second, more surprising result is that for these two variables the direction of the relationship with conformity is different under the two experimental conditions, but equally so for both variables. The same divergence appears even in the rather insignificant correlations of the nAff measure with conformity. And although, as stated earlier, the different scoring methods for nAch result in slightly different correlation coefficients, the divergence between the two treatment groups remains approximately constant and is statistically more or less significant throughout.

The obvious conclusion is that some personality factor(s) interacted with the treatment effects. While this was not expected, it is per se not an unreasonable result. However, before we can proceed with the analysis of these findings, we have to compare them with Asch's data. On the basis of his results--as well as of McClelland's theory about the origin of the Achievement motive--we had predicted that nAch should show a strong negative relationship with conformity at least under conditions similar to Asch's, i.e., in our Control condition. But we obtained for this group only a very low coefficient, though in the predicted direction. No satisfactory explanation for this outcome can be given. However, we will indicate some possible determinants.

On closer inspection of the data we found an indication of a curvilinear relationship between nAch and conformity in the Control group, although the scatter is quite large. The highest conformers have nAch scores in the middle of the range (-4 to +15), while high

TABLE 10

CORRELATIONS OF CONFORMITY WITH PERSONALITY VARIABLES

Variables		Condition		Probability of
Correlation of Conformity with:		Control	Experimental	Difference
Need for Achievement				
Score I	r	-.05	+.51**	.05
Score II	r	-.21	+.34	.1 > p > .05
Score III (Mean of I and II)	r	-.12	+.45*	.05
	N	25	22	
Need for Affiliation	r	-.09	+.08	n.s.
	N	25	22	
Social Approach (SA)	r	-.36	+.39	.02
	N	24	22	
Anxiety (S)	r	+.01	+.24	n.s.
	N	24	22	
Age	r	- .06	-.07	n.s.
	N	26	24	

*Significant at .05 level **Significant at .02 level

nAch Ss as well as those with negative scores tended to be more independent. This result, which fails to reach statistical significance, is not contrary to all theoretical expectations. Several studies (e.g., 31, 35) have indicated that the middle nAch group is composed of individuals with ambivalent, conflicting motivation, and that it differs most from the high nAch Ss in performance on various experimental tasks, more so than the low nAch Ss. In Asch's results this trend is not apparent (30, p. 286). But there the data are presented only in the form of categories of High and Low nAch scorers, and the cases selected

for this analysis are, according to unpublished information (P), the extremes on the conformity variable. Other possible sources of the disagreement between the two findings are the difference in the populations from which the Ss were selected, the stimulus material used for the projective tests, and finally the method of its administration.

There is also some indication that our sample contained a relatively large number of Ss with low--or actually negative--nAch scores. The exclusion of the four Ss with the highest negative nAch scores results in raising the correlation of nAch (score I) with conformity from -.05 to -.40. Finally, several students in an undergraduate course replicated our procedure for the Control condition, introducing some minor variations but using the same stimulus material. They found a larger negative correlation between nAch and conformity (-.37 for 27 df, which is significant at the .05 level). However, they had only one S with a negative nAch score in their sample. Therefore, it may be either that the correlation between nAch and conformity in what we called the Control condition becomes curvilinear when the whole range of nAch scores is represented as in our case; otherwise the relationship will be more strongly and more linearly negative. The other possibility is that the negative scores in our sample were "false negatives", i.e., that for some extraneous reason (temporary interference of another motive or briefness of record) the stories written did not contain any scorable Achievement cues.

However, whether these post facto explanations of the Control group results are correct or not, the more significant finding is that of the interaction of a personality factor with the experimental conditions.

A similar interaction appears in the correlations of the Social Approach (Extroversion) scores with conformity. The obvious question is: are we here dealing with the same personality factor, whatever it may be, or can we raise the predictive quality of the two personality measures by combining them?

An analysis of the interrelation between the personality measures on different levels shows that there is a significant positive correlation between nAch and Social Approach. For all Ss combined, the coefficient is +.38 (significant at the .01 level). It seems that this communality is mainly responsible for the correlation of each variable, taken separately, with conformity; a multiple correlation hardly increases the relationship with the latter. In other words, it seems that both the projective as well as the questionnaire measure contain a common factor which was related to the behavior in our experimental situation.

These results raise some difficult questions. Why is nAch related positively to conformity in the Experimental condition--contrary to our expectations? It is also not clear why Social Approach, or an extrovertive tendency, should be negatively related to conformity in the Control condition. The (tentative) interpretations of these results will be postponed until later. At this point, the important finding is that the two measures, which are experimentally completely unrelated, both indicate the interaction of a personality factor with the experimental conditions.

Analysis of Variance Results

Obviously, the relationships between the personality scores and conformity need not be linear. Also, the interaction between experimental treatment and personality makes an evaluation of both treatments together by correlational methods impossible. Therefore, variance analyses for the different measures were carried out, using three levels (High, Medium, Low) of the personality scores.

The results of these analyses are not very clear-cut; and discussion of details would consume too much space. The principal outcomes, however, are these:

Both sets of nAch scores show that the interaction component between treatment and nAch is significant. This interaction component is in both cases sizable, so that the treatment effect is no longer significant if tested against the interaction term. But it remains significant ($p < .05$ and $.1 > p > .05$, respectively for the two sets of scores) if tested against the combined random variation within all levels of nAch.

For nAff, the interaction component is not significant. The treatment difference is significant at about the .05 level if tested against the within-cell random variance, and between the .05 and .1 level if tested against an error term combining interaction and within-cell variance. The difference between levels of motivation is not significant.

The Social Approach variable gives results of the same statistical form, although the interaction effect occurs at the High score level--again similar to the nAch results.

With the Anxiety measure, finally, there is no interaction at all. In both conditions, conformity varies in the same way, but not significantly, over the three levels of Anxiety. The treatment difference is again significant at the .05 level.

Essentially, little information is gained beyond what we learned from the correlational analysis. If tested against the random variance, the difference between the experimental treatments is generally significant. nAch is clearly related in different ways to the conformity variable in the two treatments. Therefore, we have to modify our original conclusion about the effect of different cognitive conditions on conformity. The predicted effect of the "practice", a significant reduction of conformity, does not occur at all levels of motivation for Achievement.

More specifically, there is no significant difference in the amount of conformity shown by High nAch Ss between the two conditions. For the Low nAch groups, the difference between conditions is highly significant in the predicted direction ($p < .01$). For the middle nAch groups, the difference in the predicted direction falls just short of the .05 level of significance if tested against the random variation on this level; it becomes significant beyond the .05 level, however, if tested against the combined random variance of all three levels, which presumably constitutes a more stable estimate of the error variance with more degrees of freedom. In other words, the treatment seems to have affected the Ss with high nAch scores either not at all or negatively. It was progressively more effective in the predicted way for Ss with lower nAch scores.

Effects of Combination of Motives

So far, we have not found any significant relationship between the measure of affiliative motivation and conformity. To some extent, this may have been due to the rather poor discrimination between our Ss on this dimension. The distribution of nAff scores is markedly skewed; more than one third of our Ss received a score of zero. Yet, as stated in Chapter II, theoretically it seemed likely that a combination of the two motive measures would produce meaningful results. Also, a study recently completed indicates that such a procedure might be fruitful. Groesbeck analyzed the relations of Achievement and Affiliation motives to a variety of personality data obtained from a large group of clinical psychology trainees at Michigan. He found that most correlates of either one of the motives were associated more strongly with one of the motive combinations, and that several other variables were related significantly to the motive combinations but not to the motives separately (16).

Therefore, we proceeded to classify our Ss as belonging to one of the four possible combinations of High and Low nAch and nAff. The way in which the two nAch scores obtained for each S were used has been described earlier (see p. 73).

The analysis of the resulting three-dimensional table raised several problems. We had not been able to match the Ss in the two conditions for motive scores prior to the experiment. For this reason, the N's in the different cells of the table are not equal (see Table 11). While this inequality does not result in biased estimates of the mean values in the cells (which are indicated in Figure 2), it introduces

TABLE 11

NUMBER OF CASES PER CELL FOR ANALYSIS OF VARIANCE IN CONFORMITY IN RELATION TO MOTIVE COMBINATIONS

Condition	Motive Combination				N
	High nAch		Low nAch		
	High	nAff Low	High	nAff Low	
Control	5	7	7	4	23
Experimental	6	4	5	6	21
Total	11	11	12	10	44

Chi-square = 1.57 df = 3 $p > .5$

a bias into the estimates of the variance components. The logic of analysis of variance is based on equal or proportional representation of the various factor combinations. Snedecor gives a method to correct for the bias introduced by slight deviations from equality (43). (A simpler procedure, recommended by Walker and Lev [47], gives only grossly approximate corrections and was therefore not used.)

However, even Snedecor's method is usable only for a two-dimensional analysis. Therefore, our three-dimensional table had to be split up into three two-dimensional tables by combining two different factors on one of the dimensions in each table. The tables were then analyzed separately.

The other problem arising in connection with this analysis is that of the obviously small number of cases in the various cells. Any result on this basis must therefore be regarded as highly tentative, especially so because our results are complicated as well as hard to

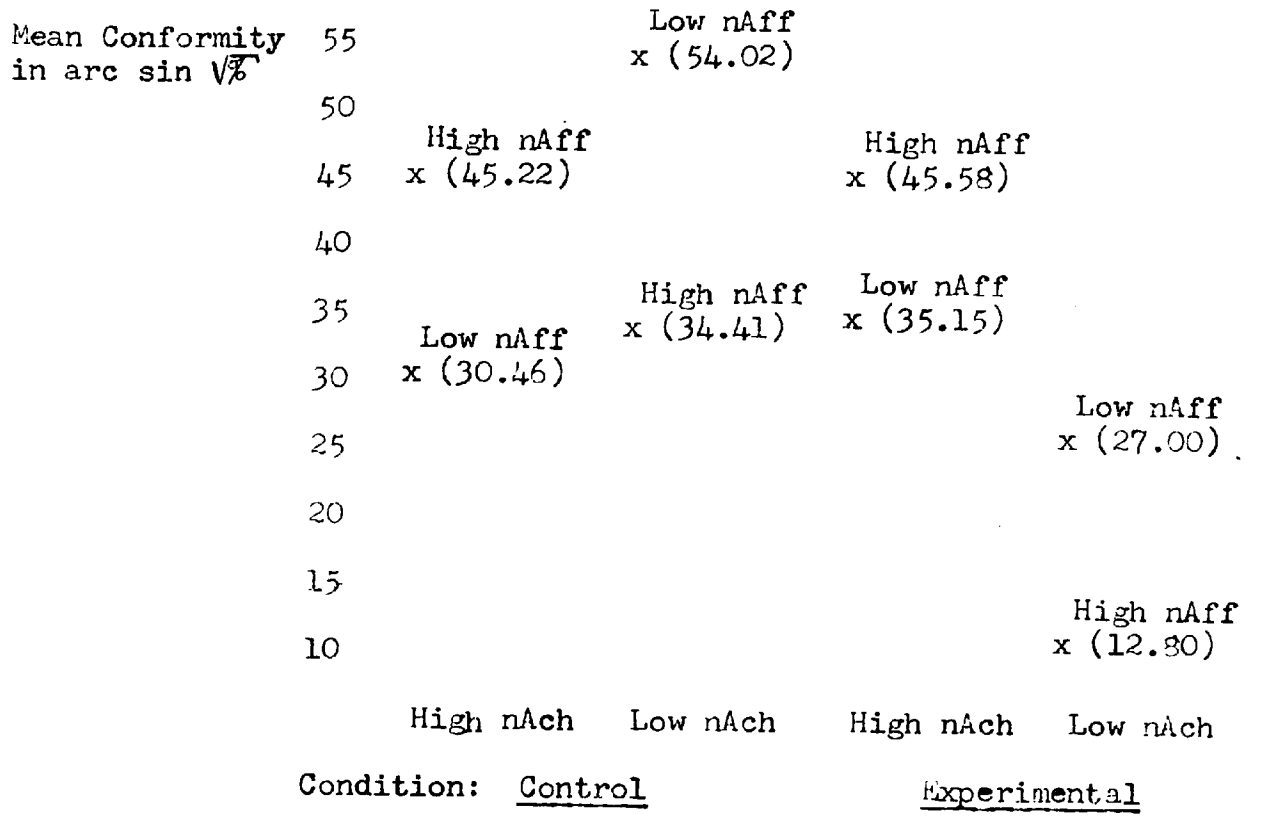


Fig. 2.--Mean Amount of Conformity for Motive Combinations in Two Experimental Variations

interpret. On the other hand, even with these few cases, we do obtain statistically significant results; this fact seems to give some justification for the analysis presented below.

As Fig. 2 and Table 12 show, the results do not fall into one clear pattern; they are complicated by several interactions. Because of the adjustment for different N's in the cells, the variance components in the three tables do not sum up to the same total. It is therefore impossible to determine the exact values of the interaction components. However, the results of the various F-tests indicate that the major factors are (a) treatment, (b) interaction between treatment and nAch, and (c) interaction between nAch and nAff. Fig. 2 shows these relationships in graphical form. Let us now try to put them into words.

TABLE 12

RESULTS OF VARIANCE ANALYSIS FOR THREE FACTORS AS OBTAINED FROM THREE TWO-FACTORIAL TABLES

Source of Variance	df	MS	F*	p
Single Factors				
Treatment	1	1252.96	6.00	.02
nAch	1	521.60	2.50	n.s.
nAff	1	49.44	.24	n.s.
Compound Factors and Interactions				
Motivation (nAch, nAff, nAch x nAff)	3	1011.25	4.84	.01
Interaction of Table 1 (Tr. x Mot.)	3	640.87	3.07	.05
nAff, Treatment, nAff x Treatment	3	433.85	2.08	n.s.
Interaction of Table 2 (nAch x others)	3	1410.28	6.75	.01
nAch, Treatment, nAch x Treatment	3	1239.27	5.93	.01
Interaction of Table 3 (nAff x others)	3	795.05	3.81	.05
Within Cells	36	208.89		
(Total for each Table: 43)				

*Tested against within-cells error variance

The first result is that again nAff by itself is not related to conformity. But its combination with nAch, i.e., the classification of Ss into four motive types, produces differences and reduces the error variance to a smaller estimate than those obtained in the earlier variance analyses (although this reduction is not statistically significant). The association of the four motive types with differences in

conformity is pronounced in the Control condition. It is smaller in the Experimental condition. Here, instead, the difference between the two nAch levels is rather large; yet the interaction between motives is still present.

Specifically, the rank order of the four motive types from highest to lowest conformity is the following:

Control		Experimental	
nAch	nAff	nAch	nAff
Low	Low	High	High
High	High	High	Low
Low	High	Low	Low
High	Low	Low	High

If we compare the effects of our treatment on the different motive types, we find that it was most effective for the Low-Low group and almost as strong for the Low-Highs (the first category always refers to nAch, the second to nAff). But both groups in the High nAch category are apparently not affected by the treatment, or only in a negative way. However, even the larger increase in conformity--in the High-Low group--does not reach significance.

This differential effect of the treatment is the major result of the analysis of our personality data; and it is one which is hard to explain. The possibility comes to mind, of course, that this result is spurious. One source of error is the rather small number of cases in some of the cells. The other one is the fact that we did not use the same Ss in both conditions, but instead Ss classified similarly on the basis of two personality measures. It must be kept in mind, therefore, that it is only an abbreviation of the more complex facts when we discuss, in the following, the changes from one condition to the other.

For both nAff groups at the Low level of nAch we found a significant reduction in conformity as a result of the experimental treatment. This is in correspondence with our hypothesis. During the practice trials, these Ss realized that they gave correct judgments before the other participants were able to respond. This presumably reduced the ambiguity of the situation for them and led them to assume that they might be able to perform the new task better than the other people. They applied this induced assumption during the test trials toward the resolution of the conflict in which they found themselves, by evaluating the majority responses as likely to be wrong whenever their own experience disagreed with it. (This behavior was associated with a slight tendency to rate the task [question 1] as easier than in the Experimental condition.)

The difference between these two nAff groups, however, remained approximately constant over the conditions. The Low-Low group showed, in the Control situation, the largest amount of conformity obtained from any subgroup (see Fig. 2). While this may have been due to a lack of any motivation for good performance, the description of such persons as conflict-ridden, showing self-deprecating attitudes, and lacking in responsibility (16) may help to throw more light on the reasons why they reacted with a high amount of conformity to the ambiguous situation. But once they had some reassurance that they were better than the other Ss, they showed only little conformity.

The trend in the Low-High group was identical, although these Ss conformed less in both conditions than the Low-Lows. It seems then that their strong affiliative need does not invariably tie them to the

shackles of majority opinion. It may be that they had become assured, in the practice trials, of the E's appreciation if they gave their own--and correct--answers. Groesbeck's characterization of the Low-High personalities depicts them as cautious, looking over all aspects of the situation, and keeping their opinions to themselves (ibid.). This description may again help to understand why they conformed to some extent in the ambiguous situation, until they had some basis for the judgment that their opinions were better than those of the other members of the group. Their less negative attitudes toward themselves may account for the difference from the Low-Lows.

The result that requires but seems to defy explanation is the behavior of the High nAch groups. They did not show any less conformity after they presumably had recognized that their performance was better than that of the other Ss; their conformity seemed even to increase slightly under this condition. How can we reconcile this result with McClelland's interpretation of the High nAch person as hard-working, independent, self-reliant, and following his own high standards (29)? Why was the moderate amount of conformity shown by these groups in the Control situation not reduced through the treatment, as it was for the Low nAch groups? What happened to them as a result of the experimental manipulation?

Two general possibilities suggest themselves at this point. One is, of course, that they were not affected at all by the manipulation. This would be in congruence with their description as "inner directed" (ibid). But the fact that they did conform--some of them quite extensively--makes this explanation implausible. And there are some

indications that indeed their behavior was different under the two conditions and affected by the treatment: more or less significant differences in the questionnaire responses and in the trends of the different subgroups over successive trials of the experiment.

Another attempt at explanation would have to postulate some intervening variable as result of the experimental treatment which could account for the higher degree of conformity than that shown by the Low nAch groups. Did the early success experience in the practice satisfy their desire to be better, with the effect that their motivation decreased and they were no longer interested in competing with the group? We cannot rule out this possibility, although we feel that it is not a very likely one. The conflict in the experimental situation was quite strongly felt by all Ss. And the general conception of the High nAch person as the hardworking individual--which is used in the validation studies of the nAch measure--does not make this sudden loss of interest appear likely.

Somehow their anxiety may have been aroused in the early stage. Or the sudden change in the situation may have thrown them off their balance. They were motivated to be right, and better than others. These expectations presumably had been confirmed in the past. During the practice again, they received this confirmation of their expectations since they were the first to report and the other Ss later agreed with their responses. They probably expected this to continue; but instead they found themselves--in the test trials--in almost continual disagreement with the majority. Did this sudden change "unnerve" them, with the effect that they developed doubts about their ability to identify the stimuli correctly? Still motivated to be right, they then changed

their report into the majority response. When we look at the trends of the subgroups over successive trials, we find that in the Experimental condition the High-High group was completely independent on the first critical trial; but the second disagreement already produced a sizable amount of conformity. And from there on, the trend of this group goes roughly toward more and more conformity up to the end of the twenty trials--a trend which seems quite specific to this group.

Can Groesbeck's findings help us to understand this behavior? His data on the Ss with high motivation on both dimensions are curious. The self-ratings as well as the staff ratings sound very favorable. The Ss see themselves as "unshakeable" and "independent-minded"; the staff perceives them as possessing high "ethical sense" and as being relatively free from emotional tensions. But their fellow students paint a different picture: they reject them and judge them as lacking in integrity and independent-mindedness. This--their peers'--unfavorable conception of the High-Highs is one of the very few ratings and predictions made in this study which seem to be corroborated three years later by the validation procedures (16).

The assumption that the presence of both needs is likely to create conflicts in many situations may help us to understand the behavior of these Ss. Was their need for Achievement satisfied in the practice trials, so that later on the affiliative motive gained control over their behavior? Did the fact that they no longer seemed to be able to satisfy both needs at the same time--as they had been able to before--arouse this conflict to a sufficient degree to wipe out any intended effect of the treatment? Did the conflict make them just sufficiently

insecure to force them to agree with the majority whenever they were not completely certain that they themselves were right?

Yet if effects of this nature might help us to understand the behavior of this subgroup, why do the results of the High-Low subgroup have a similar form--although for those Ss the conflict between motives would have been at least much weaker? It should be pointed out, however, that our data for this last-named group are the most ambiguous ones. In the Experimental condition, there were only four Ss with this motive combination. And their variation on the conformity dimension is rather

TABLE 13

ASSOCIATION OF MOTIVE COMBINATIONS WITH HIGH AND LOW CONFORMITY IN TWO EXPERIMENTAL VARIATIONS

Motive Combination			Condition			
			Control		Experimental	
nAch	nAff	Conformers*	Low	High	Low	High
High	High		1	4	0	6
High	Low		5	2	2	2
Low	High		5	2	5	0
Low	Low		0	4	4	2
N			11	12	11	10
Chi-square (3 df)			10.1		15.8	
p			< .02		< .01	
High nAch vs. Low nAch			n.s.		p <.01	
High nAff vs. Low nAff			n.s.		n.s.	

*Again, different cutting points for the separation into Low and High Conformity were used in the two conditions because the medians were different.

large (although a test for homogeneity of variances for the subgroups does not result in rejection of the null-hypothesis). This variation is also indicated in Table 13 which gives once more a summary picture of the results for the four motive combinations under our two conditions.

The significant chi-square values obtained from this table show once more that the motive combinations are related to conforming behavior in the experiment. The changes in the subgroups from one condition to the other are indicated by the data presented; but the N's are too small for any significance test. The data for the High-Low subgroup are obviously not sufficient to warrant even a tentative interpretation--all the more so because our attempts have not been very successful in the case of the High-Highs for whom the data are much less ambiguous.

Summing up, we must confess that our results are puzzling, and that our data will not permit us to draw any valid conclusion about the factors responsible for this outcome. But if we assume that these results are not spurious, they seem at least to throw some doubt upon the interpretation of the high nAch score as indicating independence from social influence. Such behavior seems to vary much more with the situation than is assumed in a statement of this kind.

Actually, the published evidence for this interpretation of high nAch is not very substantial. It consists mainly of some findings indicating that Ss with high nAch scores tend to have been trained earlier in independent behavior, that they tend to describe their parents as more distant, unhelpful, and unsuccessful, and of a correlation between early independence training and achievement-related content of folk tales in

a crosscultural comparison (29). The major pièce de resistance, of course, is the result of Asch's study of conformity which was reported earlier in this chapter.

The experiments validating the nAch scores have usually employed situations which were competitive in nature but free of direct social pressure or of conflict with other persons. The results of this competitive activity were not announced publicly. The experimenter was the judge of performance, and the Ss complying most with the instructions, i.e., the hardest-working persons, would be judged successful. Whether this type of behavior is a good indicator of independence may be questionable. Burdick (6, p. 74) has already suggested that independent behavior may be shown by the High nAch group only if it is seen as instrumental to achievement; the corollary of this statement is that, if conformity is seen as instrumental to achieving, being "right" if not "better", this may be the path chosen by the person highly motivated to be successful. But why conformity should be perceived in this way by the High nAch group in the Experimental condition is an open question.

It should be pointed out in closing that a similarly curious result has been reported in the literature, although the situation in which it occurred was somewhat different. Kelman (22) investigated "suggestibility" in the autokinetic experiment and tried to determine the effects of prior reinforcement on the behavior in the test situation. Ss judged the size of the apparent movement of the light first in an "alone" situation, and one group of them was told that their judgments had been correct. In the subsequent social situation, in which a confederate gave divergent estimates, the Ss in this "success" group deviated less from their original judgment norms than other Ss who had not been

positively reinforced before. The E also obtained some personality data from his Ss. More specifically, he obtained scores on the I, A, and N dimensions (lack of Inferiority feelings, Ascendancy, and lack of Nervous tenseness, respectively) of the Guilford-Martin Inventory of Factors (GAMIN). And while the other three groups showed the expected relationship between high scores on these dimensions and low change under social influence, in the "success" group this relationship was reversed. The personality factors and the experimental conditions interacted, just as in our experiment. Yet certainly the specific personality factors measured as well as the details of the experimental situations were quite different.

Kelman tried to explain this interaction effect in terms of the higher drive strength of the low scorers, the more insecure and anxious Ss. This higher drive level made the effect of the reinforcement stronger; once these Ss had made successful responses, they stuck to them and resisted the social pressure. The Ss with high scores, he claimed, were less ego-involved and offered therefore less resistance to the suggestion (22, p. 282 f.).

It seems quite clear that such an explanation in terms of drive strength would be contrary to the assumptions made about the meaning of the nAch scores. Not the unmotivated but (at least according to our motive measure) the highly motivated Ss conformed more in our "success" condition. And the fact that, in our experiment, the contradiction between the visual stimuli and the group response was quite obvious and aroused considerable conflict makes this explanation of the behavior of the more "secure" individuals even less applicable. But if Kelman's explanation

were correct, it would support that interpretation of our results according to which the motivation for achievement was reduced through the effects of the practice trials.

While it is impossible to make a final decision about the interpretation, it was interesting to find another indication of the interaction effect in a related situation. It does not help us much to understand our results; yet it seems to support the notion that they are not spurious, but that they may indicate a real phenomenon which should be investigated further.[1]

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[1]Some of Hardy's results (17) may be related to this interaction effect.

CHAPTER V

SUMMARY AND CONCLUSIONS

Earlier experiments on social influence employing, like the autokinetic experiment (40), ambiguous task stimuli have shown that Ss used the responses of other persons as new frames of reference for the reinterpretation of the stimuli (e.g., 26). In this way, the Ss could be induced to change their original judgments. Asch's classical experiment on conformity, however, employed very clear and definite stimuli for an easy perceptual task. Nonetheless, the wrong responses of a secretly instructed majority produced, even under these conditions, a sizable amount of conformity on the part of the naive Ss (2).

In the discussion of Asch's experiment the following interpretation was suggested. The conformity responses may not have been due simply to the pressure of the majority opinion but also to what we termed the incompatibility between the parts of the total stimulus field. This incompatibility, between clear visual stimuli and similarly unequivocal but contradictory majority responses, had reintroduced a high degree of ambiguity into the Ss' perception of the situation. In other words, the stimulus-situation could be compared to a reversible figure, both parts of which had a relatively well organized Gestalt but were competing with each other for the attention of the Ss. The following hypothesis was proposed on the basis of this analysis. The amount of conformity would be reduced if the Ss were given some secondary information potentially reconciling the incompatible stimuli and enabling the Ss to evaluate the majority response as possibly wrong.

The study design provided for two different conditions under which Ss were in disagreement with a secretly instructed majority about tachistoscopically presented stimuli. In one, our Control, condition the Ss were put--as were Asch's Ss--into the conflict situation without any additional information. In the other, our Experimental, condition the Ss were first given the opportunity to infer that their recognition thresholds were lower than those of the other participants; subsequently, they found themselves in the same conflict with the majority as the Control Ss.

Fifty students were used as Ss, assigned at random to either of the two conditions. Each of them met with four other "subjects", who in fact were confederates of the E, for an experiment on the "span of apprehension". Their task was to recognize a nonsense syllable projected at 1/5'' and to select it from four alternative syllables presented immediately afterwards. All Ss announced their choice publicly in a fixed sequence; the naive S was always fourth to report. Twenty trials were given. On twelve, the confederates all gave the same wrong answer. On the remaining eight trials, spaced in an irregular order through the experiment, they chose the correct alternative.

The experimental treatment, designed to provide one group of Ss with a frame of reference potentially reducing the conflict between the visual and the social stimuli, consisted of the following procedures. Prior to the test for conformity, the Ss in the Experimental condition were given some "practice" trials. Three slides (with five digits) were shown to the group at decreasing speeds, beginning with 1/100''. The Ss were asked to report what they had recognized; but the confederates

had been instructed to give correct responses only after the naive S had given an accurate report, and after the speed of presentation of the same slide had been decreased twice. Through this procedure the Ss in the Experimental condition presumably gained the impression that their recognition threshold was lower than that of the other group members. In the Control condition no such "practice" was given. The group pressure toward conformity, i.e., the wrong responses of the majority in the test trials, remained constant over both conditions.

Additional data were obtained in the form of Ss' ratings of their uncertainty about the correct responses given after each judgment. At the end of the twenty trials the Ss answered some questions about the difficulty of the task, their visual acuity, their ability for the task, and the social influence experienced.

The following results were obtained. A large between-group difference in the Ss' ratings of their ability for the task indicated that the practice trials had succeeded in structuring the situation in different ways for the two groups of Ss. The difference on our dependent variable, conformity, was tested in two different analyses, by Ss and by trials. In both we found significantly less conformity in the Experimental than in the Control condition. We concluded that our hypothesis, predicting a decrease in conformity through the induction--by the manipulations of the practice trials--of a frame of reference with explanatory potential, was supported. Evaluation of the uncertainty ratings showed that most Ss rated their conforming responses as more likely to be wrong than their correct responses in agreement with the majority on the neutral trials; yet in both cases all participants

had given the same response. This significant difference in uncertainty was taken as substantiation of one of our assumptions: The conforming Ss were at least subliminally aware of agreeing with wrong responses; they did not conform simply because the visual stimuli by themselves were too ambiguous.

In spite of its statistical significance the absolute magnitude of the mean difference in conformity between conditions was not very large. To a degree, this was due to the fact that the difference between the two groups on single trials decreased toward the end of the experiment. This decrease of the difference was attributed to the nature of the testing situation, specifically to the fact that both groups of Ss had been deceived by the E through the different manipulations. Whatever their hypotheses about the reasons for the disagreements were, these hypotheses did not correspond to the true facts and became progressively less able to explain the events.

But in the extremely wide range of individual variation on the conformity dimension we found another factor contributing to the smallness of the mean difference between conditions. Especially startling was the fact that some Ss who had been shown to be "better" than the rest of the group during the practice, and who even rated themselves as better on the post-experimental questionnaire, conformed heavily on the test trials.

Therefore the relationship of several personality measures to the amount of conformity shown by different Ss was studied. The principal variables used for this purpose were projective measures of motivation for achievement and for affiliation. The first major result of this part of the study was that nAch was differentially related to conformity

in the two experimental variations. The relationship was slightly negative in the Control group; but in the Experimental group it was strongly positive. The interaction between the experimental conditions and what appeared to be a personality factor was statistically significant. The same type of interaction was indicated in the relation of conformity to a different, experimentally independent personality measure, obtained from a personality inventory presumably measuring a Social Approach tendency or extroversion. This recurrence of the effect seemed to indicate that the interaction between nAch and experimental conditions was not spurious.

The measure of affiliative motivation showed no direct relation to conformity. However, a fourfold classification of the Ss on the basis of the two motive measures indicated that nAff scores were related to the dependent variable if they were used in combination with the other motive measure, nAch. More specifically, the results showed an interaction between nAff and nAch in both conditions. Between conditions, however, nAch was the factor related to conformity. The predicted decrease of conformity through the experimental treatment occurred only in the group with low nAch scores. The Ss with high nAch scores showed, on the average, the same amount of conformity under both conditions.

Several possible but tentative interpretations of these results were given, and were related to descriptions of the four personality types reported by another investigator (16) in a study of these motive measures. In the present experiment, the group of Ss with high scores on both measures showed the largest amount of conformity under both conditions. This was interpreted as due to a strong conflict between

the desire to be correct and the fear of rejection by the group. This conflict did, in the given situation, not permit a compromise solution other than vacillation between conformity and independence on different trials.

The group showing the largest decrease in conformity in response to the treatment was composed of the Ss with low scores on both motive measures. These Ss presumably were not strongly motivated for good performance in the control condition, possibly because of their negativistic and self-deprecating attitudes. But once they had obtained some reassurance, they successfully resisted the pressure of the majority. The group low in nAch and high in nAff reacted similarly to the treatment, but showed less conformity under both conditions than the Low-Lows. The latter fact may be interpreted as indicating that this group is less insecure than the Low-Lows; yet why they were able to resist the social influence in spite of their high motivation to be accepted is not clear. The last group, Ss high on nAch but low on nAff, seemed to be little influenced by the experimental treatment; yet the smallness of this category in our sample of Ss, especially in the Experimental condition, did not justify any interpretation.

If we assume that these results were not spurious, they seem to raise serious questions about the interpretation of the projective measures, especially of the achievement motivation. Although we have not been very successful in explaining why the two motives were related in an unexpected way to the behavior in the test situation, the relationships obtained indicate that the conception of high need for achievement as synonymous with independence or "inner-directedness" may not be

correct; at the least, this association seems to be more specific to certain situations than was originally assumed (29).

It may be that achievement in our culture is much more dependent on the evaluation by other persons than on the success of independent striving for private and self-set goals. If we accept this assumption, the Ss scoring high on nAch may be the persons most sensitive to the external demands for good performance. And if conformity seems to lead to good performance, they may conform. These implications of our results, which of course need additional conformation, seem to deserve some further investigation.

In relation to the major hypothesis about the determinants of conformity, our conclusion was that the existence of some frame of reference permitting the interpretation of the majority opinion as in error will, on the whole, reduce the ambiguity of the situation and with it the amount of conformity. However, some individuals may not be willing or able to <u>accept</u> these cues, probably because a disagreement with the majority would arouse their anxiety too much. They prefer, therefore, to agree with the majority even though they may realize--but not admit--that this opinion is wrong. And in a wider definition of conformity, applicable to a more complex social setting, the absence of any attempts to <u>obtain</u> information potentially showing public opinion to be wrong might also be taken as a way of conforming.

However, generalizations of our results to real life should be made with caution, since the experimental situation used was a rather artificial one. The Ss were forced to disagree with the majority through a collusion between the E and the confederates. Certainly, disagreement

and collusion do not occur only in the laboratory. But the Ss entered the experiment with a strong and justifiable expectation of observer-agreement on such a simple task; and this fact seems to have made the technique so powerful. In real life other factors, especially social sanctions for non-conformist behavior, may be much stronger and more explicit than in the experiment in which they were only implicitly present. The cognitive factor which we tried to manipulate experimentally is probably effective in other situations, too. But there, the strength of its effect relative to the effect of social sanctions is very difficult to assess. For the same reasons, the personality variables associated with conformity in our data may not be the crucial ones in everyday life.

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APPENDIX A

MATERIAL USED IN EXPERIMENT

1. List of Stimuli and Response Alternatives

(An asterisk indicates the stimulus originally presented. Underlining indicates the alternative selected by the majority. Neutral trials are identified by parentheses.)

Trial	Alternatives: 1	2	3	4
(1)	PDMR	PDRM	FDRM	FDMR*
2	BCKL	BKGI	BGKL*	BKCL
(3)	CHTS	HCTS*	HGTS	GHTS
4	CJNP	CJNB	CJBN	CJPN*
5	GKNS*	GKSN	JKSN	JKNS
6	GJTB	GJTP	GJPT*	GJBT
(7)	LHSX*	FHSX	HLSX	FLSX
(8)	KDGT	VGDT	KGDT*	VDGT
9	JDPM	DJPM	DJPN	JDPN*
10	ZBSM	ZPSM	MBSZ*	MPSZ
(11)	BFMR	FBMP	FBMR*	BFMP
12	CFPX*	CFPK	CPFX	CPFK
13	BGSN	BSGN	BSJN	BJSN*
(14)	HSZT	HZCT*	HZST	HCZT
(15)	DKMQ*	KDMQ	BKMQ	KBMQ
16	GJPX	JGPX*	JGRX	GJRX
17	DXQK	BXQK	BXKQ	DXKQ*
18	KMZF	KMFZ	KMHZ*	KMZH
(19)	MZCL*	MZLG	MZLC	MZGL
20	LJSZ*	FJSZ	LSJZ	FSJZ
(Reserve Slide:)				
21	JSPX	JPSX	JBSX	JSBX*

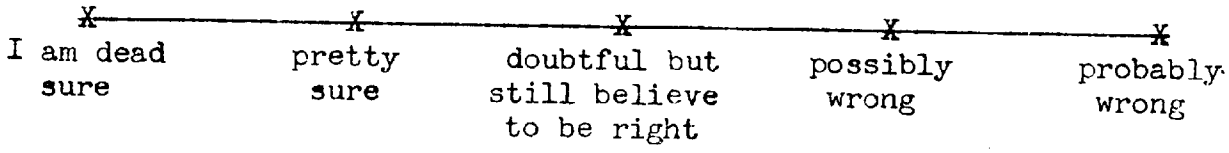
2. Uncertainty Rating Scale

Span of Apprehension Study

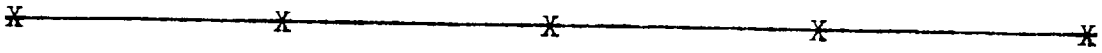
Subject_____

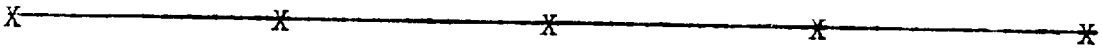
Name_____

After giving your response, check on the scales below, for each trial, how convinced you are that you chose the correct alternative.

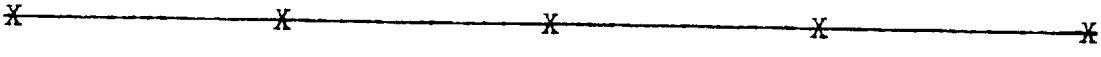


Trial:

1. 

2. 

. . . . . .

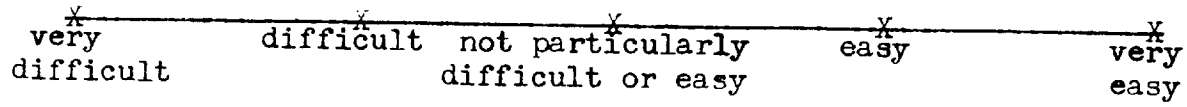
10. 

Remarks: e.g. was not ready at trial X.

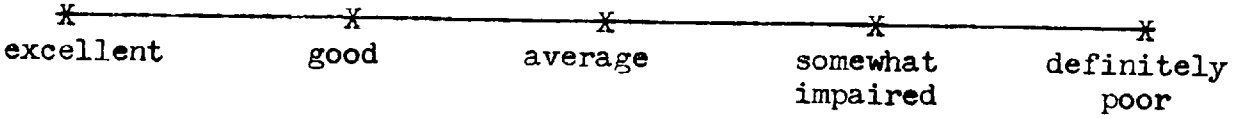
3. Post-Experimental Questionnaire

Please check or answer all questions: Name_____

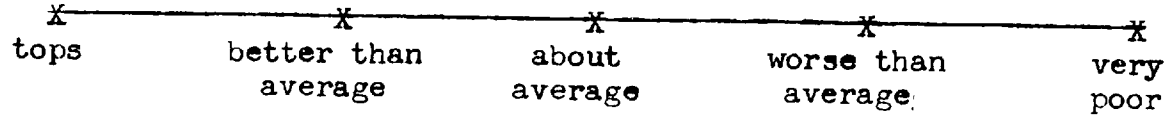
1. How difficult did you feel this task was? (Check scale)



2. How good is your vision (with glasses, if you wear them)? (Check scale)



3. How good to you think you are at a task like the one you just did? (Check scale)



4. Were you influenced by what some of the other subjects reported?

5. (If there were any disagreements between your and other subjects' answers) how do you account for them?

6. Other comments:

APPENDIX B

INSTRUCTIONS

1. Instructions for Subjects

This is an experiment in perception and has to do with the span of apprehension, or more simply: how well can you see several things at a single glance--a task which is harder for some people and easier for others. I will tell you more about the whole idea afterwards; right now I will just tell you what you have to do.

(1) I will project some things on the screen at a relatively fast speed, and you have to try to recognize them. The material I will show in the first part will be sequences of four letters per slide--but they are no words of the English language. It will go like this: when I give the "ready" signal, you watch the screen. After a second I will flash the letters on the screen and you try to read them (silently, of course). If you are not ready at my signal, holler. O.K.?

(2) In order to make the reporting easier, I will, right afterwards, show you a slide with four alternative series of letters numbered from one to four, one of which is the correct one. From this set of four series you pick the one you think was flashed on the screen before and report its number. O.K.? (Shows sample stimulus and response alternative slides.)

(3) To avoid confusion in the reporting I will call you: subjects A, B, C, D, and E, and ask you to report your number in this sequence. Using this procedure, I can record all the data together here. This was the main task--any questions?

(4) In addition, I give you this rating scale on which you check, after each trial, how sure you are that you gave the correct answer. Any questions?

Additional Instructions in Experimental Condition

(5) Now, before we start with the real experiment, I will first show you some slides, this time with numbers on them, at different and very fast speeds--to give you a little practice and also to give you some idea how fast you can see such things. I will start out pretty fast. Don't mark these trials on your rating scale, this is just practice. Here we go.

2. Instructions for Assistants

(1) Seating: the subject should be maneuvered into such a position that three of you are seated on one side and one on the other side of him. Therefore, three people should move in ahead of him; the last one follows him and goes into the appropriate aisle to prevent him from sitting on the outside. The center person, if he is quick, can correct any wrong developments. I will help in directing the subject to the appropriate seat.

(2) Responses: The first person in the line (subject A) will have your answers marked on his "rating scale". Check off each trial so that you don't get lost. All others give the same answer as the first person--not too hesitatingly nor monotonously. Please watch out so that you don't make mistakes. Whenever the rating scale calls for marking or writing something, pretend to do so (also at "remarks").

(3) In the experimental condition, i.e., where I show first some slides with numbers at faster speeds, let the subject report first (probably at 1/100''), and say or imply that you saw nothing. At the next slower speed (if he was correct before) one of you may give a couple of numbers, preferably a wrong one in it (but plausibly). After the second "slowdown" give the correct number or say: "he was right". I.e., let the subject always be at least two steps ahead, depending on when he answers correctly; but vary it a bit among yourselves.

(4) In general, don't betray your knowledge of the situation, but don't show your "naiveté" too much, either. When I give the instructions, ask a sensible question if you can think of one.

(5) Please, don't tell anybody what we do here or drop any hints (or let this sheet lie around). If somebody wants to know what the experiment is about, just say that some slides are shown at fast speed and that you are supposed to recognize them. And if you hear anybody talk about this stuff, please let me know.

Thanks a lot!

APPENDIX C

STIMULUS MATERIAL FOR PERSONALITY MEASURES

1. Projective Measures of Motivation

The pictures used to elicit stories were the following (with code numbers):

scored for Need for Achievement:

- IB. Two men in a shop working at a machine. Fig. 3.1.A in (30).
- IA. Two male faces, "father and son". Card 7 BM from Murray TAT.
- IH. Boy in checkered shirt at a desk. Fig. 3.1.B in (30).
- IG. Boy with vague operation scene in background. Card 8 BM from Murray TAT.

scored for Need for Affiliation:

- 3A. The heads of two young men facing each other. Picture (a) in (4), reproduced as picture 1 in (17).
- 3I. Man standing in open doorway looking at a landscape. Picture (b) in (4).
- 3C. Group of six men seated around a table. Picture (c) in (4), reproduced as picture 2 in (17).
- 3F. Man standing by lamppost at night. Card 20 from Murray TAT.

The sequence in which these pictures were shown was: 3A - IB - 3I - IA - 3C - IH - 3F - IG. I.e., nAff and nAch pictures were alternated, beginning with a nAff picture.

2. SA-S Personality Inventory

Note: The first forty items yield the SA (Social Approach) score, the remaining forty the S (Stability) score. The alternatives scored plus one if chosen are indicated by underlining. Some items are not scored at all.

DIMENSIONS SA-S

DIRECTIONS: Your answers to the following questions will enable us to help you in your efforts toward improvement. There are no "right" or "wrong" answers, for each person's nature is different. Begin at question one and read on at your own rate, indicating on the answer sheet the choice for each which is true for you. Do not spend time "pondering" questions. There are three alternatives, usually YES, NO, BETWEEN. You should mark the middle answer only when it is impossible to say Yes or No--perhaps once in every two or three questions.

BE SURE TO ANSWER EVERY QUESTION (guess an answer if you are not absolutely sure)

1. In a mate would you prefer someone who (a) is artistically gifted? (b) can achieve prestige socially?
   a Between b

2. Do you think that the majority of people really resent putting themselves out for others, however politely they may deny it?
   Yes Between No

3. Are you fairly well satisfied with your capacities to make an effort to meet emergencies whenever they occur?
   Yes Between No

4. On social occasions do you (a) readily come forward and speak or (b) stay quietly in the background?
   a Between b

5. In general would you rather read about some social event or adventure than experience it?
   Yes Between No

6. Have you been troubled by people saying bad things about you behind your back when there has been no ground for such remarks?
   Yes Between No

7. Can you become so absorbed in creative work or some interesting job that you do not mind a lack of intimate friends?
   Yes Between No

8.	Do you (a) remain unperturbed if people do not show that they appreciate you enough? (b) get down-hearted if people do not show that they appreciate you enough.	a	Between	b
9.	Can you generally solve a problem better by (a) studying it out alone? (b) discussing it with others?	a	Between	b
10.	Does your natural reserve generally stand in the way when you want to start a conversation with an attractive stranger of the opposite sex?	Yes	Between	No
11.	Do you enjoy being at really large gatherings, as at parties or dances?	Yes	Between	No
12.	Do you have periods of feeling grouchy, when you don't want to see anyone (a) very rarely? (b) quite often?	a	Between	b
13.	If you have to learn about something, would you rather do so through (a) class discussions? (b) reading a book on the subject on your own time?	a	Between	b
14.	When asked to do extra jobs after you've done your share and a full day's work do you (a) never show resentment? (b) show definitely that you are displeased?	a	Between	b
15.	Do you tend to have as many (or more) friends of the opposite sex as of your own sex?	Yes	Between	No
16.	Would you prefer the job of a waiter to that of a carpenter (other things being equal)?	Yes	Between	No
17.	Do you worry, tremble, and perspire when you have some difficult task ahead?	Yes	Between	No
18.	Would you describe yourself as a sociable, talkative person?	Yes	Between	No
19.	Do you take a prominent part in social affairs?	Yes	Between	No
20.	If you were in an engineering firm would you rather have the job of (a) carefully setting up the blueprints? (b) interviewing prospective buyers of the product?	a	Between	b
21.	Do you suspect that your friends think you are a difficult person to get to know really well?	Yes	Between	No

22. Would the statement that you are a talkative person who feels relieved by any opportunity to talk to someone be (a) incorrect? (b) a good description?

a Between b

23. Would you rather have a teacher who (a) neglects you and leaves you to your own devices? (b) continually watches you and makes suggestions?

a Between b

24. If you could have three hobbies, would you choose (a) playing in a band, playing bridge and playing touch football? (b) photography, rock collecting and sailing?

a Between b

25. Do you find that you have (a) very little difficulty or (b) great difficulty, in starting up conversation?

a Between b

26. Do you (a) perfer occasions of high excitement? (b) like to avoid occasions of high excitement?

a Between b

27. Do you feel that your personality is comparitively easy to understand and that many people understand you sympathetically?

Yes Between No

28. Would you rather spend a free afternoon in (a) an art gallery? (b) a game of cards?

a Between b

29. In social situations are you bothered by self-conscious shyness?

Yes Between No

30. If you had a good moral reason, could you lie with a perfectly straight face?

Yes Between No

31. Would you prefer to (a) have a vacation at a well-attended resort? (b) rent a cottage away from the beaten track?

a Between b

32. Do you think that inherited, racial characteristics have more real importance in shaping the individual and the nation than most people are ready to admit?

Yes Between No

33. Do you generally make a point of saying a word or two to the speaker or whoever is the important person at a reception to which you are invited?

Yes Between No

34. Do you find it very difficult to take no for an answer even when it is obviously impossible to do what you want?

Yes Between No

35.	Do you have difficulty in grasping the meaning of some people's remarks because of the way they use even simple words?	Yes	Between	No
36.	Have you been known to talk in your sleep?	Yes	Between	No
37.	If you are annoyed by something do you (a) keep it to yourself? (b) find it absolutely necessary to talk to somebocy to "let off steam"?	a	Between	b
38.	Do you get as many ideas from reading a book as from discussing it with others later?	Yes	Between	No
39.	Would you be willing to spend extra money in order to keep up with the fashions?	Yes	Between	No
40.	When a number of decisions have to be made in a comparatively short time would you rather make them (a) alone? (b) with the help of others?	a	Between	b
41.	Do you tend to be slow and deliberate in movement?	Yes	Between	No
42.	Do you frequently get in a state of tension and turmoil when thinking over the day's happenings?	Yes	Between	No
43.	Do you believe in being careful to understate your powers, leaving people to find out for themselves just how good you really are?	Yes	Between	No
44.	Do you generally succeed in keeping your emotions of all kinds under very good control?	Yes	Between	No
45.	Is it quite usual for you to spend time pondering on the ultimate purpose of human life?	Yes	Between	No
46.	When the odds are against you succeeding in some enterprise, do you think it worth while to take a chance?	Yes	Between	No
47.	Do you have times when you cannot refrain from a mood of self-pity?	Yes	Between	No
48.	Do you think there are a good many scientific experiments, e.g. vivisection or the invention of high explosives, that could with advantage be prohibited?	Yes	Between	No
49.	Have you a sense of being well adjusted to life and its demands?	Yes	Between	No

50.	Do you generally have enough energy at times when you need it most?	Yes	Between	No
51.	Do you think that through tenseness you use up more energy than most people in getting things done?	Yes	Between	No
52.	Are your nerves sometimes "on edge" so that particular sounds, e.g., a squeaky hinge, are unbearable and "give you shivers"?	Yes	Between	No
53.	Have you ever tried to bluff your way past a guard or doorman when you felt you had a right to be inside?	Yes	Between	No
54.	Do quite small setbacks sometimes irritate you unduly?	Yes	Between	No
55.	Are you inclined to worry without any reason for doing so?	Yes	Between	No
56.	Do you often take medicines on your own rather than on the advice of a doctor?	Yes	Between	No
57.	Do you feel that you are no good and will never make a success of your life (a) very rarely? (b) rather often?	a	Between	b
58.	Do you feel that a sudden emergency might find your mind unable to cope with it?	Yes	Between	No
59.	Does it discourage you to be made the object of jokes?	Yes	Between	No
60.	If you are upset by something do you regain your composure very quickly?	Yes	Between	No
61.	Do you think it more important to solve (a) the political difficulties in the modern world? (b) the question of moral purpose in the modern world?	a	Between	No
62.	Do your emotions sometimes make you seem unreasonable even to yourself?	Yes	Between	No
63.	Are you embarrased if you are suddenly made the center of attention in a social group?	Yes	Between	No
64.	Are you frequently very dissatisfied with yourself, feeling that you are not as capable as most?	Yes	Between	No

65. Do you find that conversation with very conventional people upsets you, because of their insensitiveness (a) very rarely? (b) quite often? a Between b

66. Are you able to concentrate easily on anything to which you set your mind? Yes Between No

67. Do you worry, tremble, and perspire when you have some difficult task ahead? Yes Between No

68. Do you often have vivid dreams which disturb your sleep? Yes Between No

69. Do failures tend (a) to spur you to new efforts? (b) discourage you from going on in that line of work? a Between b

70. Do you find it difficult to address or recite to a large group? Yes Between No

71. Are you sometimes burdened by the number of your responsibilities and interests? Yes Between No

72. If you are convinced that a person is unjust and selfish do you try to show him up, even if it costs you a lot of trouble? Yes Between No

73. Would you rather read (a) an account of actual military or political battles? (b) a sensitive imaginative novel? a Between b

74. Do you sometimes awaken in the night and through worrying have difficulty in going to sleep again? Yes Between No

75. Do you often feel quite fatigued when you get up in the morning? Yes Between No

76. Do you often avoid meeting people on the street because you are not in the mood for conversation? Yes Between No

77. When you have a rival or competitor can you compete strongly with him without feelings of jealousy or hostility? Yes Between No

78. Do you (a) express your emotions easily and readily in social situations? (b) bottle them up within yourself? a Between b

79. On social questions are you regarded as (a) soft-hearted and idealistic? (b) tough and practical? a Between b

80. Have you ever had a sudden sense of dread and of vague danger for no ascertainable reason? Yes Between No

APPENDIX D

RAW DATA

Experimental Condition

S #	(1)	2	(3)	4	5	6	(7)	(8)	9	10	(11)	12	13	(14)	(15)	16	17	18	(19)	20	21
	Response Alternative Chosen on Trial:																				
2	4	3	2	4	1	3	1	3	4	3	3	3	4	2	1	2	4	1	4	3	
4	4	3	2	4	1	3	1	3	4	3	3	3	4	2	1	2	4	3	1	1	
6	4	3	2	4	1	3	1	3	4	3	3	1	4	2	1	2	1	3	1	1	
8	4	3	2	3	1	3	1	3	4	4	3	3	1	2	1	3	3	3	1	2	
10	4	3	3	4	4	3	1	1	4	4	3	1	3	4	1	2	4	3	1	1	
11	4	1	2	1	4	3	1	3	3	4	3	2	4	2	1	3	4	1	1	1	
16	4	1	2	4	4	3	1	3	1	4	3	3	4	2	1	3	4	2	1	1	
17	3	2	2	3	1	3	1	3	3	3	3	2	4	2	1	2	3	3	1	1	
18	4	3	2	4	1	2	1	3	3	4	3	1	1	2	1	3	3	1	1	2	
20	4	3	2	4	1	3	1	3	4	4	3	1	1	2	1	2	4	3	1	1	
21	4	1	2	1	1	3	1	3	1	4	3	x	4	x	1	3	3	3	1	1	1
22	4	3	2	1	4	2	1	3	1	4	3	3	1	2	1	3	3	1	1	2	
24	4	3	2	1	4	2	1	3	4	4	3	3	4	2	1	3	4	1	1	2	
27	4	3	2	3	1	3	1	3	4	3	3	1	1	2	1	2	4	3	1	1	
28	4	3	2	4	1	3	1	3	4	3	3	1	4	2	1	2	4	3	1	1	
29	4	3	2	4	1	3	1	3	4	3	3	1	4	2	1	2	3	3	1	3	
30	3	1	2	2	1	3	2	1	4	3	3	1	4	2	1	2	4	3	1	1	
32	4	3	2	4	1	3	1	3	4	3	3	1	4	2	1	2	3	3	1	1	
36	3	3	2	1	2	2	1	3	1	3	3	3	3	2	1	2	4	1	1	1	
43	4	3	2	4	1	2	1	3	4	3	3	1	4	2	1	3	4	1	1	1	
44	4	3	2	1	1	3	1	3	1	3	3	2	4	2	1	2	3	3	1	2	
46	4	3	2	4	1	3	1	3	4	3	3	1	4	2	1	2	4	3	1	1	
49	4	3	2	4	1	3	1	3	4	4	3	1	4	2	1	2	3	1	1	1	
50	4	3	2	1	1	3	1	3	1	4	3	1	4	2	1	3	3	1	1	1	

Note: Underlining indicates responses identical with majority response.
x: Trial failed for mechanical reasons.
R: S refused to choose an alternative ("I did not see it"). } In such cases the reserve slide was shown at the end in order to obtain responses to twelve critical trials. In three cases, all in the Control condition, this was not possible. Since our measure is the total number of times conformed, this gives the S the benefit of the doubt.

Control Condition

S #	Response Alternative Chosen on Trial: (1)	2	(3)	4	5	6	(7)	(8)	9	10	(11)	12	13	(14)	(15)	16	17	18	(19)	20	21
1	4	3	2	4	4	3	1	3	1	3	3	3	4	2	1	2	3	3	1	2	
3	4	3	3	4	4	3	1	3	4	4	3	3	4	2	1	2	3	3	1	1	
5	4	3	2	4	4	3	1	3	1	4	3	1	1	2	1	2	4	1	1	1	
7	3	2	2	4	1	2	1	3	2	4	3	1	4	2	1	3	4	2	1	1	
9	4	1	3	1	4	2	1	3	1	4	3	3	1	2	1	3	3	1	1	1	
12	4	3	2	4	1	2	1	3	4	4	3	1	4	2	1	2	1	2	1	1	
13	3	3	2	1	4	3	1	3	1	4	3	x	1	2	1	2	3	1	1	1	
14	4	2	2	4	4	2	1	3	4	4	3	3	4	2	1	3	4	1	1	2	
15	4	3	2	4	2	2	1	3	4	3	3	3	4	2	1	2	4	1	1	1	
19	4	3	2	4	1	3	1	3	1	3	3	x	4	2	1	2	R	3	1	1	1
23	4	1	2	4	1	3	1	3	4	3	3	1	4	2	1	2	4	3	1	2	
25	4	2	2	1	4	3	1	3	4	4	3	2	4	4	1	3	4	1	1	1	
26	4	3	2	4	1	2	1	3	4	3	3	2	4	2	1	2	3	3	1	1	
31	3	2	2	4	1	3	1	3	4	4	3	3	4	2	1	2	4	3	1	3	
33	3	3	3	R	1	2	1	3	4	3	2	3	4	4	1	2	4	3	1	3	
34	R	3	3	1	4	2	1	3	1	3	3	3	1	2	1	3	3	1	1	2	
35	4	3	2	4	1	2	1	3	1	3	3	1	1	2	1	2	3	1	1	3	
37	4	3	2	4	4	3	1	3	1	4	3	3	1	2	1	2	4	1	1	1	
38	2	2	2	1	1	2	1	3	4	3	3	1	4	R	1	2	2	3	1	1	
39	3	3	3	3	1	2	1	3	4	3	3	1	R	2	1	2	3	3	1	3	4
40	4	3	2	4	1	3	1	3	4	3	3	1	4	2	1	2	3	3	1	2	
41	4	1	2	2	4	2	1	3	1	4	3	3	1	2	1	3	3	1	1	2	
42	4	3	2	1	4	2	1	3	1	x	3	3	4	2	1	3	3	2	1	2	1
45	4	1	2	4	4	3	1	3	1	4	3	1	4	2	1	3	4	3	1	2	
47	4	3	2	4	4	3	1	3	1	4	3	1	4	2	1	3	3	3	1	1	
48	3	3	2	4	1	2	1	3	1	3	3	1	4	2	1	3	1	R	1	1	4

Experimental Condition

S #	Mean Uncertainty on All Trials				Response to Question #				Personality Measures							Total Conformity
									nAch			nAff		SA	S	
	All	Ind.	Conf.	Neut.	1	2	3	4	I	II	High /Low	High /Low				
2	1.00	.78	2.00	.86	2	0	0	1	4	1	L	H	2	18	16	2
4	1.30	1.72	2.00	.88	2	1	1	0	-2	2	L	H	6	8	12	1
6	.45	.73	--	.12	3	2	1	0	2	2	L	H	6	15	14	0
8	2.15	2.60	2.66	1.40	2	1	2	3	7	5	H	H	4	8	14	6
10	.65	.30	1.50	.00	3	1	2	0	3	2	L	H	4	16	11	2
11	.45	.25	.50	.00	4	0	2	0	4	4	L	L	0	21	20	6
16	1.15	1.20	1.50	.75	4	2	1	0	-	-	-	-	-	-	-	6
17	1.40	1.57	2.00	.43	3	1	1	1	-3	4	L	L	1	7	17	1
18	.50	1.50	.30	.12	2	0	2	0	9	7	H	H	10	11	18	7
20	.70	.80	.50	.62	2	2	1	1	7	4	H	L	1	16	26	2
21	.95	.80	1.40	.57	2	1	2	2	4	3	L	L	0	15	11	7
22	.60	1.00	.91	.12	1	0	1	1	9	8	H	H	4	17	6	11
24	1.50	1.50	1.88	1.40	1	0	1	3	12	14	H	L	0	18	19	8
27	1.20	1.20	1.00	1.25	2	0	1	1	14	15	H	L	0	7	14	1
28	.40	.58	--	.12	3	0	1	0	6	3	-	H	2	10	28	0
29	.50	.90	.00	.00	2	2	1	0	3	3	L	L	0	11	19	1
30	1.00	.70	1.00	.80	1	1	1	0	-2	3	L	L	0	19	23	1
32	.80	1.10	2.00	.25	2	1	2	0	-2	-1	L	L	1	3	9	1
36	1.05	1.00	1.60	.57	2	3	1	0	7	4	H	H	2	25	15	5
43	1.10	1.33	2.33	.38	1	0	2	2	8	14	H	H	10	20	19	3
44	.50	1.00	.50	.12	2	1	1	1	10	12	H	H	6	27	18	4
46	.25	.25	--	.25	4	1	1	0	1	7	L	H	2	13	15	0
49	1.60	2.33	2.33	.50	2	0	2	3	-	-	-	-	-	22	22	3
50	.70	1.33	1.00	.00	4	1	2	1	5	8	H	L	0	17	24	6

Control Condition

S #	Mean Uncertainty on All Trials	Ind.	Conf.	Neut.	Response to Question # 1	2	3	4	Personality Measures nAch I	nAch II	nAch High /Low	nAff High /Low	nAff	SA	S	Total Conformity
1	1.11	.71	2.40	.25	2	1	2	0	9	10	H	H	7	22	21	5
3	.75	1.00	1.50	.12	2	3	2	1	2	10	H	L	1	10	9	4
5	.20	.57	.00	.00	1	2	2	2	8	5	H	L	0	15	15	5
7	1.85	2.16	2.33	1.14	1	2	3	3	-4	-3	L	H	2	12	25	3
9	1.10	1.00	1.36	.57	2	1	2	2	-1	-2	L	L	1	14	23	11
12	.75	1.00	1.00	.25	2	0	1	0	10	6	H	L	0	28	19	2
13	1.40	1.25	2.00	1.14	2	1	2	3	3	3	L	L	0	21	14	7
14	1.30	1.25	2.00	.50	2	1	2	1	5	-2	L	L	0	15	19	7
15	.40	.00	1.66	.00	3	0	0	1	8	3	H	H	10	20	26	3
19	.89	1.66	.00	.00	1	1	3	0	-3	-2	L	H	2	20	25	2
23	1.60	1.00	3.50	1.88	2	1	2	2	15	14	H	L	0	20	6	2
25	.90	1.00	2.00	.00	1	4	2	0	5	3	L	H	3	10	12	5
26	1.35	1.67	2.00	.75	2	2	2	2	1	1	L	H	3	19	18	2
31	1.10	1.00	1.00	1.29	1	0	2	2	-2	4	L	H	5	9	27	2
33	1.79	2.13	1.00	.67	2	1	2	0	13	16	H	L	0	15	22	2
34	1.05	2.00	1.00	.66	2	2	2	0	7	3	H	H	3	11	19	10
35	1.55	1.83	1.80	1.12	3	1	2	0	8	15	H	L	0	20	28	5
37	.90	1.33	1.12	.38	2	0	3	0	11	8	H	H	5	15	16	6
38	1.16	1.43	1.00	.43	1	2	2	0	-3	0	L	H	3	13	16	2
39	.60	.63	.00	.00	2	1	2	0	3	8	H	L	0	29	21	2
40	1.10	1.30	2.00	.63	3	1	2	1	5	4	-	H	5	-	-	2
41	1.25	--	1.45	.38	2	2	2	1	3	2	L	H	2	13	22	11
42	1.05	1.50	1.33	.38	2	2	2	1	2	7	-	L	0	11	20	9
45	1.65	2.50	2.00	.75	1	3	2	3	5	10	H	H	9	-	-	6
47	.70	1.28	1.00	.00	2	0	2	1	-1	3	L	L	0	10	11	5
48	1.25	1.12	1.67	.86	2	1	1	0	-	-	-	-	-	26	15	3