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**Socialization in formal organizations : the facilitation of higher order behavior patterns through individuation and the evaluation of performance.**

Bruce Michael Meglino  
*University of Massachusetts Amherst*

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SOCIALIZATION IN FORMAL ORGANIZATIONS:  
THE FACILITATION OF HIGHER ORDER BEHAVIOR PATTERNS  
THROUGH INDIVIDUATION AND THE EVALUATION OF PERFORMANCE

A Dissertation Presented

By

BRUCE MICHAEL MEGLINO

Submitted to the Graduate School of the  
University of Massachusetts in partial  
fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

December

1974

Business Administration

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SOCIALIZATION IN FORMAL ORGANIZATIONS;  
THE FACILITATION OF HIGHER ORDER BEHAVIOR PATTERNS  
THROUGH INDIVIDUATION AND THE EVALUATION OF PERFORMANCE

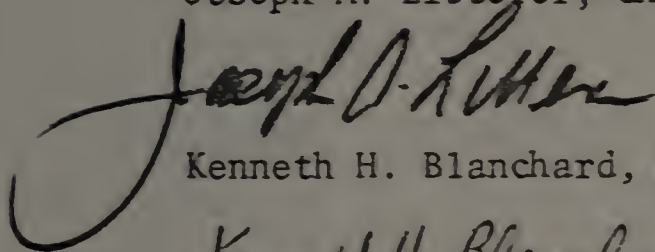
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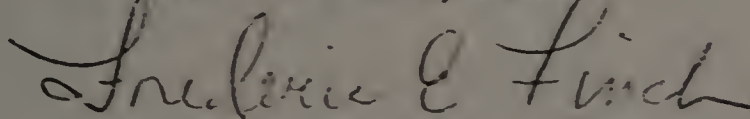
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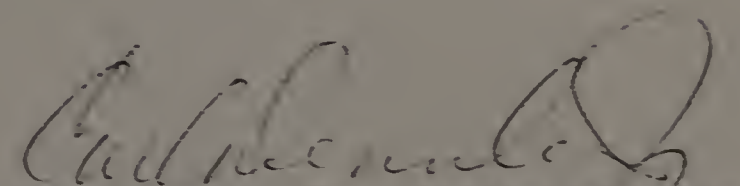
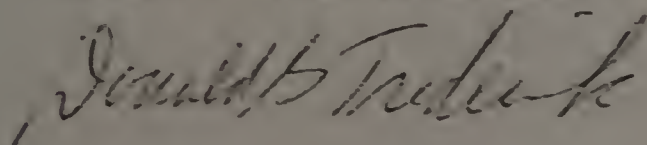
Kenneth H. Blanchard, Member



Frederic E. Finch, Member



Donald G. Frederick, Member



Carl Denmler, Jr., Acting Director  
of Graduate Studies  
School of Business Administration

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## DEDICATION

To Ellen: for her help, encouragement, and love during the most difficult and most rewarding time of our lives.

and

To Mark: for his patience and infinite understanding at a time when both were indispensable.

Socialization in Formal Organizations:  
The Facilitation of Higher Order Behavior Patterns  
Through Individuation and the Evaluation of Performance  
(August 1973)

Bruce M. Meglino, B.S., Polytechnic Institute of Brooklyn  
M.S., Polytechnic Institute of Brooklyn

Directed by: Dr. Joseph A. Litterer

Socialization in the context of formal organizations has received little research attention. There are, however, a number of well researched areas which relate to organizational socialization. One such area is social facilitation. The social facilitation paradigm states that evaluation apprehension, the feeling that one's performance will be evaluated by others, will tend to facilitate behavior which is well learned. Research in social facilitation, however, has been limited to behavior at physical, perceptual, and simple mental tasks. If the paradigm could be expanded to include more complex behavior such as personality characteristics, it would have important implications for organizational socialization. The following experiment seeks to examine the concept of social facilitation in light of more complex behavior.

Subjects were classified as high dominant or low dominant using the Dominance scale of the California Psychological Inventory and were paired in the joint operation of a cooperative task. The task involved the simultaneous operation of two model railroad trains around a six



foot diameter oval track with two bypass sidings. Each situation involved two subjects; one was designated as the leader and the other was designated as the follower. Task achievement was measured by the number of mutually complete trips recorded by each team during eight, three minute trials. Authoritarian behavior was measured by the number of direct commands which the leader gave to the follower.

The California Psychological Inventory views high dominant subjects as aggressive, persuasive and verbally fluent while low dominant subjects are viewed as inhibited, silent and unassuming. Results show that when evaluated, high dominant subjects behaved significantly ( $p$  less than .01) more authoritarian (gave more direct orders) than those that were not evaluated. Low dominant subjects behaved in a less authoritarian manner when evaluated. These results appear to indicate that when they were evaluated, high dominant subjects became more dominant and low dominant subjects became less dominant. Task achievement was less ( $p$  less than .05 in one case) in situations where subjects were evaluated.

Regression lines (learning curves), plotted for achievement scores on successive operations of the same task, showed no significant difference in rates of learning for each case. The effect of evaluation, however, tended to displace the learning curve parallel and downward. Also, the degree of dispersion about each curve was much less in cases where individuals were evaluated. That the effect of evaluation was in addition to the effect of learning and the observation of greater uniformity of learning in the evaluated case both tend to be consistent with earlier research in the field.

Results of this experiment indicate that evaluation apprehension can affect basic behavioral responses and these responses can, in turn, affect job performance. This conclusion has important implications in the area of organizational climate. Many times an aspect of an organization's climate is measured along a dimension which corresponds to evaluation apprehension. A climate described as "evaluative" or "competitive" can easily cause an individual to experience evaluation apprehension. On the other hand, climates described as "cooperative", "supportive", or "considerate" can be characterized as low in evaluation apprehension.

Since an organization's climate can induce evaluation apprehension, one must know if behavioral responses have been well learned before a prediction can be made regarding job performance. Fortunately, a number of organizational situations can indicate the degree to which behavior is learned. Cases where the individual is disadvantaged or has just completed a training program usually indicate that the desired behavior is poorly learned. Here an evaluative climate will be dysfunctional. In cases where the employee is experienced or highly trained, an evaluative climate can aid job performance.

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## CHAPTER I

### INTRODUCTION

The following experiment seeks to examine one effect that organizations have upon their members. Specifically, it investigates certain aspects of the socialization phenomenon. While much has been written in the area of socialization little of this effort has been directed to socialization in the context of formal organizations. In short, little is known about how an individual comes to perform his role in a formal organization. There are, however, other areas which are well researched and might readily be related to the field of socialization. One particular area is that of social facilitation. Social facilitation, as a field of research, deals with the impact of a social context upon an individual's task performance.

On first examination, socialization and social facilitation appear to have some important points in common. The two fields relate to a social situation and both deal with performance. Both, however, deal with different aspects of performance. Socialization, particularly that portion which relates to formal organizations, deals with the wide range of complex behaviors that one needs in order to perform his role adequately. These "higher order behaviors" can include leadership, cooperative and problem solving abilities. Social facilitation, on the other hand, deals with performance at the level of relatively simple mental, perceptual or motor tasks. If the theories of social facilitation could be extended to include higher order behavior,

both fields would become directly related. This would provide a methodology for influencing behavior and thereby aiding socialization. Such knowledge would be of tremendous value particularly in the fields of business and education. Success in both fields can be aided if the incumbent possesses an appropriate series of complex behavioral responses. In education these may include such responses as proper study habits and self discipline while in business they may include problem solving ability and leadership. If it were possible to increase the rate at which an individual can acquire these appropriate responses his effectiveness would be increased. This could increase the overall efficiency of institutions as well as reducing the cost of socialization in terms of dollars, time and turnover. Finally, increasing the rate of socialization can affect an individual's satisfaction and ultimate success in an organization.

Before an attempt can be made to relate these two fields, a review must be made of the literature contained in each. This is done in Chapter II. In the case of social facilitation this review is fairly extensive since the field extends back approximately seventy-five years. It also appears more orderly since many researchers have attempted to build upon and, on some occasions, challenge the work done by others. The socialization literature, on the other hand, is relatively recent and tends to fall into less than an organized pattern. In both cases, however, attempts are made to integrate concepts whenever possible.

Chapter III deals with the development of the experimental hypotheses. Here the relevant points of the literature are brought together to formulate an experimental question. The general framework for the experiment is also presented. The more specific points regarding experimental procedure are set out in Chapter IV which explains all steps taken in the experiment. Chapter V looks at the data gathered in the experiment and examines the significance of the original hypotheses. An attempt is also made to bring out other significant aspects of the data. Chapter VI discusses the conclusions to be drawn from the experiment and Chapter VII presents a summary and discusses implications for future research.



## C H A P T E R II

### LITERATURE SEARCH

#### Social Facilitation

The term social facilitation describes both a branch of social psychology as well as a specific psychological effect. Referring to co-actors, Allport defined social facilitation as an increase in response due to "... the sight and sound of others making the same movements."<sup>1</sup> Through the progress of experimentation and the inevitable modifications of theories, social facilitation is still measured in terms of an increase in response. More recently, however, social facilitation has come to denote that area of social psychology which deals with the effect upon an individual of the actual or implied presence of other individuals. While the term "social context" is occasionally substituted for the latter meaning, confusion rarely results when an individual is aware of this duality of meaning.

Social facilitation as a field has an early history. The first experiments were conducted by Triplett (1898)<sup>2</sup> and published in 1898. Due to its obvious applicability to a classroom situation, much of the early work in the field was conducted by educators. F. H. Allport (1924) was one of the first psychologists to examine the field and his work was followed by increased activity in the area. This early work in social facilitation is important aside from its contribution to the field. Historically, social facilitation signaled a change in research

orientation away from individual behavior and toward an emphasis on group or collective behavior. This transition, then, illustrates the continuity between psychology and social psychology. Also, as Davis (1969) points out, since social facilitation deals with the explanation of a social phenomenon by looking at the behavior of the individual, it "... serves to illustrate the futility of the old argument that phenomena at one level (social) of abstraction should not be explained by concepts at the next lower (individual) level."<sup>3</sup>

In reviewing the literature of social facilitation one is confronted with studies involving numerous variables. For the purposes of examination and analysis, these studies tend to fall into certain broad areas or classifications. Perhaps the most popular typology used in the literature is to divide studies into those conducted using a passive audience to observe the subject (audience effect) and those conducted with other individuals engaging in similar activity with the subject (co-action effect). Another scheme, used by Allport, divides groups into two classes: face-to-face (interacting) groups and co-acting groups.<sup>4</sup> Here, no consideration is given to the effect of a passive audience. In this analysis face-to-face groups involve "direct" social stimuli while co-acting groups provide their members with "contributory" stimuli. While these typologies are valuable from the point of analysis, they tend to be less than adequate for representing all the various aspects of an often complex subject. A more valuable scheme for examining the entire phenomenon of social facilitation is that suggested by Dashiell (1930).<sup>5</sup> His analysis takes

the form of examining the effect upon the individual of: 1) the presence of co-actors where rivalry or competition is explicitly present, 2) the presence of co-actors with no rivalry, 3) the presence of a quiet audience or spectators and 4) overt vocal attitudes on the part of other persons. This scheme will be used for examining most of the earlier literature of social facilitation.

Co-action with rivalry. As previously mentioned, the original studies involving individual behavior in a social context were conducted in the 1890's by Triplett. A cycling enthusiast, Triplett sought to explain the differences in average speed in three different types of cycle races. One race involved a cyclist racing alone, against the clock, attempting to achieve a fast time. The second type of race again involved only one competitor, however, this time he was "paced" by a "swift multicycle." Pacing means that another individual, in a faster cycle, was allowed to ride near the competitor to set the pace. The final type of race was again paced but involved more than one competitor on the track at the same time. In examining records of performance Triplett noticed that in an unpaced race the average time was 2.29 min/mile. In a paced race, the average time dropped to 1.55 min/mile and for a paced race with competition the average was still lower at 1.50 min/mile. There were numerous theories put forth at that time to explain this difference in performance. Among them were: 1) the suction theory which stated that the pacing cycle tends to draw the competitor along by a vacuum left behind, 2) the encouragement theory which explained that the encouragement of a friend keeps up the

spirits of the rider, 3) the brain worry theory which assigned a much higher degree of brain worry to the person setting the pace than to the person waiting (following), and 4) the automatic theory which attributed less brain work to a paced rider who followed "automatically" with less fatigue. Triplett did not refute any of the above effects he simply postulated two additional or "dynamogenic factors". These dynamogenic factors explained the increase in performance by pointing out that the presence of another person is a stimulus in arousing the competitive instinct and freeing nervous energy. He also stated that the sight of movement of another is an inspiration to greater effort.

Triplett then devised an experiment of his own in order to test his dynamogenic effect. The task involved winding fishing reels which then caused a small flag to move along a table. Children were matched against each other in competition as well as observed performing the task alone. In all cases, the learning factor was controlled. His results, using forty students, showed that subjects markedly increased production in competitive trials while making small gains or even losses in succeeding trials alone. Twenty children showed increases in competitive trials, ten showed decreases and ten were about equal. The ten that showed poorer performance during competition, however, appeared to suffer from interference with coordination due to overstimulation. These subjects, who tended to be younger than others, exhibited gross fluctuations in performance as well as frequent evidence of hypertension - arm and hand cramps. These results tend to

assert the presence of an arousal force and subsequent nervous energy predicted by the dynamogenic effect. Triplett also noted that girls seemed to show greater performance under competition than boys. In his conclusions, he felt that both of the dynamogenic factors seem to possess equal power as a stimulus. Murphy and Murphy (1931)<sup>6</sup> tend to doubt whether the second dynamogenic factor (the sight of movement of another causing inspiration) has great emphasis in this case. They point out that the children had their eyes on the flags and not on each other during the trial. Here Murphy and Murphy obviously interpret "the sight of movement of another" very literally. One could argue that movement of the flags in the Triplett experiment was enough to mentally represent the movements of other individuals. In an auto race one need not observe the movements of another driver; the position of his car is often enough to cause inspiration.

Following the experiments conducted by Triplett, additional work in the field of competition was done by Moede (1920).<sup>7</sup> He was aware of the dynamogenic factor and tested it using performance measures for individual as well as group rivalry. In one experiment, Moede required two people to make pencil dots on a piece of paper each at his own rhythm. In most cases, he noticed that each person ended up with the same rhythm. This was a demonstration of the dynamogenic factor described by Triplett. The remainder of Moede's experiments can be classified as those involving speed only, quality only and both speed and quality.

In the experiments involving speed, seventeen boys were asked to make dots on a piece of paper as rapidly as possible. Through the course of three thousand trials the subjects worked either alone or in a group. On the whole, subjects worked 8.5 percent faster in a group than when performing the same task with no co-actors present. Of the seventeen subjects all but three worked more rapidly in a group than alone. In another experiment subjects were asked to write down all the words they could think of in a five minute period. Here again, the individuals working in the group context produced more words than those subjects working alone. Moede emphasized that the work of individuals in a group is far less variable than that of those working alone. The better workers are held back while the poorer workers are stimulated to greater output. However, since poorer workers are more profoundly influenced than good workers, general productivity rises.

Of the experiments which measured quality alone one involved presenting subjects with a group of three logically connected words, e.g., "friction, warmth, expansion." Thirteen subjects were given the opportunity to learn eight such groups of words before they were tested. The test consisted of presenting the first word in each group to a subject and asking him to supply the remaining two words. In this test speed was of no consequence only accuracy or quality was important. The results indicate an improvement in quality for those subjects who participated in the group portion of the experiment. When analyzing the results of each individual's performance Moede

discovered that his seven best workers improved 3.9 percent while the six worst improved 37.3 percent. A second experiment concerned with quality only used the method of paired associates. Pairs of nonsense syllables were presented to each subject, some in a group context and some alone. The subjects also read each pair aloud. The experimenter then supplied the first syllable of the pair and required the subjects to write down the second syllable. In this experiment the work done by the group showed a 33 percent improvement over work done alone. When tested ten minutes later subjects who learned their syllables in a group were able to recall twice as much as those who learned their syllables in isolation. Again, examining the performance of each individual, Moede discovered a striking difference between the best and the worst performers. The best performers improved only about seven percent in the group condition while the worst performers improved 82 percent. The results of these two experiments indicate a similar pattern with respect to quality. In both cases a "uniform" or "leveling" tendency is evident in the case of group performance.

An interesting examination of the group effect on both speed and quality occurred in additional experiments conducted by Moede. In one experiment, subjects were required to cross out particular letters from a printed passage. When subjects were working in a group, five percent more letters were crossed out than when working alone, however, eleven percent more mistakes were made in the group situation. Every subject tested made more mistakes in a group. Of the subjects who worked well alone, some increased and some decreased their output

while working in a group. Of those who did poor work alone, all were speeded up by the group at the cost of considerable mistakes. In another experiment involving speed and accuracy, subjects were asked to give a word response to a word stimulus. For the response, however, the subjects were told to avoid words containing: the letter "e" during the first experiment, the letters "a" and "e" during the second and the letters "a", "e" and "n" during the third. Here again, the group condition yielded more words but more mistakes.

A clear pattern emerges from all of Moede's experiments summarized above. In the case of speed only, the group acts as a stimulus to people to produce more. In the case of quality, the group again stimulates an increase. In both of these cases a "leveling" effect occurs whereby poorer workers are more highly stimulated than better workers. When both speed and quality are involved, the group effect serves both to increase speed and decrease quality. Summarizing the "leveling" effect of Moede's experiments, Allport states:

The slower workers' reactions are facilitated because they are stimulated by movements made at a faster rate than their own. The more rapid lack such incitement. Rivalry also cooperates in the leveling tendency. The more rapid workers, realizing the ease with which they excel, lose interest in the competition and slacken their efforts; whereas the slower subjects, provided they are not hopelessly outclassed, are aroused to greater effort through their zeal to rival the others.<sup>8</sup>

Up to this point, the experiments which have been discussed have contrasted the work of an individual alone with that of an individual in a group rivalry situation. In essence, both the effect of the



group and the effect of rivalry together have been examined. Some researchers have attempted to isolate the effect of rivalry or competition. This has been done by recording the performance of individuals in a group where no rivalry was present and comparing it with that of a group situation where rivalry was a factor. Whittemore (1924) created rivalry by varying the instructions to his group participants <sup>9</sup> while Hurlock (1927) induced rivalry by having her groups compete with each other. <sup>10</sup>

Whittemore's subjects, eight Harvard men and four Radcliffe women, participated in a task which required them to print paragraphs from newspaper articles. This had to be done using rubber stamps and printing only one letter at a time. According to Whittemore, the task was a measure of both "... mental and of a semi-automatic mechanical performance." During the experiment the effects of practice were eliminated by alternating conditions and the paragraphs were sufficiently old and unfamiliar to the workers to preclude any effect due to familiarity. The effect of rivalry was established by varying the instructions given to each group. The instructions to each group were as follows:

Non competitive group Try to get as much work done as you can, remembering that both the quantity and the quality of the work you do count in your final score. Don't attempt to beat your fellow workers.

Competitive group Try to beat your fellow workers, remembering that both quality and quantity count in your final score. You may use any method you see fit to employ in keeping track of the progress of your competitors.  
Compete! <sub>11</sub>

The subjects recognized throughout the experiment that both quantity and quality would count in the final score. Quantity was judged by the total number of letters printed while quality was rated on a scale of 1 to 10 by the experimenter.

The results obtained by Whittemore lend direct support to those obtained by Moede. The effect of rivalry tended to increase the quantity of the output but to decrease its quality. Every subject tested showed an increase in output in the competitive situation and a corresponding decrease in quality. Also, poorer workers showed larger increases in output thereby confirming the group "leveling" effect observed by Moede.

In his experiments, however, Whittemore did not notice the decrease in the variability of output in the competitive situation as did Moede. He did notice a decrease in the variability of the quality when the group was in competition. He explained this decrease in fluctuations during competition as due to "... the difficulty of assuming a uniform attitude of non-competition after one has experienced the excitement of competitive effort, together with the greater tendency for individual differences of temperament to crop out under the lesser pressure of a non-competitive environment." <sup>12</sup>

Aside from creating rivalry between individuals, Whittemore also attempted to create rivalry between groups. He did this by encouraging one group to beat out another and by making the scores of each group available to all. In this experiment he examined the difference between individual and group rivalry. He discovered that

individuals work slightly faster "... when cooperating in groups which, in turn, are in competition with other groups not present but recognized, than when competing against one another." In other words, competition between groups caused a slightly greater increase in performance than competition between individuals. Aside from this fact, he discovered little or no difference in quality or homogeneity between individual or group rivalry.

Slightly different results were obtained by Hurlock. Her experiments were conducted using IV and VI grade grammar school boys and girls. She required subjects to perform addition problems, a task requiring both speed and accuracy. The experiment was conducted on successive days using an isolated control group and two groups in competition with each other. Her procedure was aimed at producing the maximum amount of competitive spirit. Results were discussed at the beginning of the next class and members of the winning group stood up and had their name called in front of both groups.

With regard to achievement scores, her results confirm the work done by other experimenters. The average score of the rivalry groups exceeded that of the control group. On the third and fifth day, the percentage increase was 37 and 41 percent respectively. When comparing sex and achievement scores, she discovered that girls were slightly more responsive to rivalry than boys. This tends to confirm the results obtained by Triplett in this area. The results also indicate that younger children respond more to rivalry than do older ones. This is interesting when examined in the light of Triplett's

findings. Recall, he discovered that younger children were more prone to over-stimulation and erratic results. Perhaps with a well learned task such as addition, excess stimulation can be channeled into productive effort. Examining the results for children of different abilities, Hurlock discovered, as did Moede, that rivalry was a more effective incentive for children of inferior ability than for children of average or superior ability. One difference which she noted in her subjects, however, was that an increase in accuracy came only with rivalry. This appears to be at variance with the results of other researchers. Looking at the task, however, this result may be explained by noting that students are highly conditioned to being accurate in arithmetic problems. This is much different than tasks such as printing words or crossing out letters where the conditioning process may not be quite as complete.

The articles examined thus far have, for the most part, dealt with a combination of two separate effects; the presence of co-actors and the existence of rivalry. These studies have given strong support for Triplett's "dynamogenic" or arousal force theory. Similar results have been obtained over a variety of tasks. When quality is the only measure of performance (learning pairs of nonsense syllables and logically connected words), this force tends to increase quality; when speed is the only measure (cycling, winding reels, writing pencil dots or random words) it serves to increase speed. When performance stresses both quality and speed (crossing out letters, giving word responses, printing by hand and solving arithmetic problems) the force

tends to favor speed at the expense of quality. This result, however, appears to be linked to the characteristics of the specific task and perhaps the conditioning process of the individual. The force also tends to favor the less able individuals thereby producing a leveling effect of productivity in a group. Also, there appears to be some evidence that the arousal force has a greater effect on girls and younger children. Finally, in an attempt to isolate only the factor of rivalry, one experimenter observed results very similar to those for both co-action and rivalry described above.

Co-action without rivalry. Much of the research which occurred directly after Triplett's experiments tended to look for the pure effect of co-actors and thereby attempted to control for rivalry as well as other factors. This period tended to be dominated by the work of German educators (Mayer (1903)<sup>13</sup>, Schmidt (1904)<sup>14</sup> and Meumann (1914)<sup>15</sup>) and, to a greater extent, the work of F. H. Allport (1920), (1924).<sup>16</sup> The work of these German educators, as one might expect, involved the use of children as subjects. The group or co-action setting in this case was an actual classroom. While it would be impossible to eliminate all rivalry from a classroom situation, the experimenters did not encourage competition between students. Because explicit rivalry was absent, these studies are discussed in this section.

Mayer's subjects consisted of boys with an average age of fourteen. His study was aimed at investigating the effect, upon mental function, of an individual working alone as opposed to working in a group. The

tasks, all of which were chosen to be familiar to the students, consisted of dictation, mental arithmetic, written arithmetic, learning nonsense syllables and supplying the missing verb in a sentence. The students were allowed to work on these tasks in a classroom where others were doing the same thing and in isolation with no co-actors present. Mayer also varied the instructors during the course of experimentation. In one set of tests, students were told "You are to finish as quickly and yet do your work as well as you possibly can." In the other tests students were told to "Go slowly but very carefully" and to "Be as quick as you can - quality does not count."

The results show that under the instructors which urged the participants to "finish quickly - work well" individuals working in the presence of co-actors increased their output from 30 to 50 percent over individuals working alone. This situation also caused increases in accuracy or quality of the work performed. Note the similarity of task, instruction and result to that of Hurlock previously described. Mayer also confirms the "uniform tendency" of group work by pointing out that there is less deviation among individual scores when working in a group than when working alone. More interesting aspects of this experiment emerge when the results of performance under different instructions are examined. When students were asked to "go slowly but carefully" the groups showed a decrease in speed but an increase in accuracy. When urged to work "as quickly as possible without regard for quality" there was neither an increase in speed nor quality.

What appears to be common to all the results of Mayer's experiment is the fact that the social influence or social facilitation effect of the group operates in the direction of what is legitimate or what the subject feels will elicit a favorable reaction. In other words, the instructions given to the subjects appear to provide the legitimate direction for social facilitation to act. In the case of the first result, the legitimate behavior was "quickly but well" and the social forces of the group tended to operate in that direction. In the case of Triplett's bicycle racers, the legitimate behavior was increased speed. Even though specific instructions were not given to each participant by an experimenter, the paced cyclist knows that increased speed will elicit a favorable reaction. Therefore, it is easy to understand why instructions such as "go slowly but carefully" would cause a decrease in output but an increase in quality. Finally, when students were told "go quickly as possible without regard for quality" a case of overstimulation may have occurred similar to that described by Triplett earlier. This effect was referred to by Burnham (1910) when he stated "A certain degree of affective stimulus undoubtedly increases the ability to work, but if the stimulus is extreme the work is checked or inhibited altogether."<sup>17</sup> This overstimulation resulted in no increase in quality or speed.

Schmidt (1904) compared the work done by children in the classroom with work done at home. The tasks included writing exercises, written arithmetic and German composition. The assumption here was that homework is conducted in a relatively isolated environment while

classwork is conducted in the presence of other people. In this case, measures of speed were impossible but the work could be compared for quality. A significant increase in quality was noted for work done in the classroom. Here, students recognize that quality and not speed elicits a favorable response. Upon examining the types of errors made in each condition, Schmidt noticed a particular pattern of mistakes. Those made at home tended to involve missing letters or words while classroom mistakes were characterized by excess letters or words. This result appears to lend support to the theory that the presence of others acts as a stimulus in arousing the individual.

Similar results were found by Meumann (1904) in a memory test of pupils working alone and together. Subjects were exposed to a series of two syllable words both in written and verbal form. After the words were presented, subjects wrote down all the words they could remember. Meumann originally expected that the classroom noises and disturbances would have a negative effect on students' memory. The results indicated the opposite effect. In the case of older children (thirteen and fourteen years old) there was essentially no difference in memory between the alone and the classroom condition. In younger children (eight and nine years old) the difference was significant. These children showed a far greater retention rate for classroom learning than for learning accomplished alone. From this, Meumann concluded that the disturbing influences to which children are normally exposed in a classroom have no special influence on performance. This result



takes on more significant implications when the presence of distracting stimuli is analyzed. This discussion will be taken up later.

As mentioned earlier, Allport<sup>18</sup> classified groups as either face-to-face or co-acting. Examining co-acting groups, he explained the accelerating effect of the group as due to social facilitation or the increase in response from the sight and sound of others doing the same thing, and rivalry or the emotional reinforcement of movement accompanied by the consciousness of a desire to win. Allport's orientation toward social facilitation, as opposed to that of Triplett, concerned abstract or mental processes. He also took a rather broad view of group influence, examining such topics as the group influence on attention, mental work, association, thought, and judgements of comparison. In this latter case he demonstrated that group opinion tends toward conformity and the avoidance of judgemental extremes.

In his work on the influence of groups upon attention and mental work, Allport used male and female graduate students in both together (T) and alone (A) conditions which were alternated to eliminate the effects of fatigue, learning and adaption. He attempted to extract the pure social facilitation effect and eliminate the rivalry effect through a combination of mechanisms. These included emphasizing the non-competitive nature of the task and prohibiting the comparison of achievement and the discussion of results. The tasks used for this experiment were the following: 1) Vowel Cancellation Test. This test required the subject to cross out all vowels in columns of newspaper material. 2) Reversible Perspective Test. This was basically a

test of attention, containing a line drawing of a three dimensional cube. The drawing had the properties of an "optical illusion" and could be viewed in two different perspectives. The subjects were required to alternate these perspectives as many times as possible in a two minute trial. 3) Multiplication Test. Here, the subjects were presented with a series of problems requiring the multiplication of two digit numbers.

In the above series of experiments Allport took measures of both speed and quality. His results showed that the co-action (without rivalry) or social facilitation effect tends to increase the quantity of the work done. This result was later confirmed by Sengupta and Sinha (1926)<sup>19</sup> using an improved method of conducting the vowel cancellation test. The quality, judged by the number of subjects who increased or decreased quality, remained practically unaffected. This increase, he concluded, is more pronounced for work involving overt physical movements than in purely intellectual tasks. Upon interviewing his subjects, Allport determined that there was an urge toward greater quality and quantity but also a distraction brought about by noise and emotional factors. For some individuals this urge outweighed the distraction which they suffered, for others the distraction was predominant. On average, the decreases in quality among the latter group were much greater than the increases in quality of the former. This led Allport to conclude that a quality advantage tends to be with the performance of the task in isolation, a conclusion which is at variance with other researchers. He also concluded that the social

facilitation effect is subject to differences due to age, ability and personality traits, showing its greatest effect on the least able worker and having its least effect on the most able worker. It is interesting to note that these results are strikingly similar to those obtained for both the rivalry effect and the rivalry and social facilitation effects combined.

In the above experiment, Allport recognized that there was a group of individuals whose quantity of work was retarded by social influence. These individuals, according to Allport, tended to "... form a distinct type." He explains this reduction in output using the factor of rivalry. While he took pains to eliminate all rivalry from his experimental design he later concludes that "... a certain degree of rivalry seems natural to all co-activity." He goes on to explain that:

Apart from ability, rivalry seems to be more a part of some personalities than of others. There are ascendant individuals who love a contest of any sort, and whose attitude is persistently to win, and stand at the head of the list. Others find strenuous contests too exciting. They are of the despairing, less self-confident type. Their desire is merely to 'make a respectable showing', and not stand at the foot of the list. Continual defeat will usually break down the attitude to win, and reduce it to the less ambitious desire to make a good record.

Additional experiments conducted by Allport involved the influence of the group upon association and upon thought processes. In his association experiments, Allport required subjects to write down successive words as quickly as they came to mind (free association). In variations of this experiment, he required subjects to list only every third or every fourth word which came to mind. In experiments on thought processes, Allport asked subjects to write down as many possible

arguments refuting specific passages of two ancient philosophers. Both experiments involved subjects in the alone (A) and together (T) conditions. The results of each experiment indicate, again, that group work tends to increase the amount of work performed. In the case where subjects were required to give arguments, two thirds of the subjects produced their best arguments while working alone and two thirds produced their poorest arguments while working in a group. This supports previous findings which show a decrease in quality when subjects work in a group. Where subjects were asked to write down every third word, more subjects worked faster in a group than when they were required to write down every fourth word. Allport therefore concluded that the social facilitation effect was directly proportional to the amount of overt action through which co-workers stimulate each other.

Other researchers attempted to extend Allport's studies relating to the group influence on mental processes. Weston and English (1926)<sup>20</sup> constructed equivalent forms of a series of intelligence tests in an effort to examine the effect of the group on a task requiring "considerable intelligence." The experiments made "... every effort to eliminate the effect of rivalry" and the possibility of unequal forms of the test was controlled by alternating each form among teams of subjects. Of the ten individuals involved, eight performed significantly better when working in the company of others. The results obtained by Weston and English were later challenged by Farnsworth (1928).<sup>21</sup> Farnsworth improved upon the technique used by

Weston and English particularly in the area of the number of subjects used, the method of pairing subjects and the test forms used. Farnsworth used more subjects (twenty six to thirty six), paired his subjects into different groups on the basis of intelligence and used only one form of an intelligence test, using alternating groups to erase any learning effects. His results indicate no increase in mean test scores for individuals taking the test in a group atmosphere. These results appear to be a direct contradiction of each other. Since there is little detail offered in the reports of each experiment, it must be assumed that variations in the tests and the conditions of administration accounted for the difference in results. Perhaps one must recall Allport's conclusion that the social facilitation effect is more pronounced for overt physical tasks than for purely intellectual tasks.<sup>22</sup>

Finally, an interesting variation of one of Allport's experiments was conducted by Travis (1928).<sup>23</sup> He employed the same task as Allport; requiring his subjects to write down words as quickly as they came to mind. In the Travis study, however, the subjects consisted of ten stutterers. The author had previously determined that stutterers have little trouble speaking alone. He, therefore, felt that it would be interesting to learn whether a social situation would interfere with or slow down the stutterer's mental processes. While Allport's results show that "... the presence of co-working group is distinctly favorable to the speed and the process of free association", Travis discovered the exact opposite occurs using

stutterers. Eight out of ten stutterers displayed greater facility with free association alone than when in the presence of co-workers. This result is interesting in that it tends to establish an emotional dimension to the social facilitation effect.

The experiments described above have established that the social facilitation effect, or the effect due to the presence of co-workers without rivalry, has basically the same behavioral manifestations as the effect due to rivalry and to both rivalry and social facilitation in combination. Specifically, this effect tends to increase either speed or quality when either one is the only measure of performance. When both are measured, the effect appears to favor speed at the expense of quality. It also produces a leveling of group output whereby there is less variation of output when individuals are performing in a group than when performing alone. A more specific case of this leveling effect, as stated by Allport, shows its greatest effect for the least able worker and its least effect for the most able worker. In addition to verifying previously established effects, these experiments have pointed out some interesting aspects of social facilitation. Specifically, Allport indicated that this effect is subject to differences of age, ability and personality traits. Travis has given evidence which tends to support the fact that an emotional demension exists for social facilitation while Mayer's experiments show that social influence operates in the direction of what is legitimate or what the subject feels will elicit a favorable reaction. Finally, Allport's conclusion that social facilitation is greater for overt

physical rather than purely intellectual tasks has received weak support. Of the studies which have examined purely intellectual tasks, one showed a significant group effect while the other showed none at all.

Passive audience. The effect of a passive audience or spectators has drawn considerable attention in the literature. This is probably due to the numerous practical applications to an audience-performer situation. Prior to this, the effect of rivalry and of co-action has been examined. Since, as Allport observed, a certain degree of rivalry is present in all co-activity, the study of an individual before a passive audience brings one to a point, conceptually, where rivalry has an insignificant effect.

One of the earliest investigations involving the use of a passive audience was conducted by Travis (1925).<sup>24</sup> The task, involving a pursuit rotor apparatus, required the subject to hold a flexible pointer in contact with a rotating target. The target was located on a disc which turned at the rate of one revolution per second. For a perfect score, an individual had to hold the pointer on the target continuously for twenty revolutions. If contact was broken at any time during a revolution, that revolution would not count in the total score. The task, which requires neuromuscular coordination, was chosen because it relates to a range of tasks in society.

Travis allowed his subjects, mostly freshman students, to practice with the apparatus over a series of days until their learning curves no longer showed an increase. When an individual had reached a

maximum, the audience was permitted to observe him participating in the task. The audience, consisting of from four to eight upper classmen and graduate students, remained quiet and produced no distracting stimuli during the experiment. The results show a clear trend in favor of increased performance in front of an audience. Eighteen of the twenty-two subjects in the experiment had a higher average for the ten scores recorded in front of an audience than for the highest ten consecutive scores while working alone.

Similar results were obtained in an experiment conducted by Ichheiser (1930).<sup>25</sup> Ichheiser measured subjects' scores on specific performance tests; tests which measured speed of multiplication and rates of association. Subjects were tested both alone and under scrutiny by an observer. The results indicate that both speed and accuracy were greatly improved when the observer was present.

Results of experiments conducted with a passive audience do not always appear as conclusive as those above. One such experiment was conducted by Gates (1924).<sup>26</sup> She used three separate groups: a control group, a "small audience" group and a "large audience" group. The experiment was aimed at determining the difference in performance between individuals taking a series of tests alone, in the presence of 4 to 6 observers and in the presence of an audience of 27 to 37 spectators. The subjects were initially given a series of tests consisting of: the Coordination Test, the Woodworth-Wells Color-Naming Test, the Woodworth-Wells Analogies Test and a vocabulary test. After the tests were administered (in the case of the audience groups) a group of



individuals were allowed to observe the subject. During the time they were being observed, the subjects were given different forms of the tests previously taken. In all cases the observers were passive and fixed their attention on the subject. While in many cases the differences in performance were not statistically significant, an interesting trend emerged when the uniformity of the results was examined. In three out of the four cases, the control group showed a larger improvement than both the "small audience" group and the "large audience" group. The only case where the small audience exceeded the control group was in the coordination test; a test which according to the author was the simplest. The author concluded that it is evident "... when we consider either the amount of improvement, or the percentage of subjects improving in all or any one test (but the word-building) that the performance of the groups which were subjected to the stimulus of the audience was in general made less efficient by this condition."

A later attempt to examine the effects of a passive audience was made by Pessin (1933).<sup>27</sup> His research was aimed at examining the relative effects of social and mechanical stimulation on learning and retention. It is the first part of this study, the social effects on learning, which is of concern now. Pessin measured learning by asking his subjects to memorize lists of nonsense syllables. Each list contained seven three-letter syllables with each syllable presented to the subject for 1.5 seconds using an exposure machine. The list was continuously repeated while the subject attempted to anticipate the next syllable. The trial was terminated when all seven syllables could be correctly anticipated. In the

control condition, subjects memorized the list of syllables alone in a partitioned booth, unobserved by anyone and relatively free from extraneous stimulation. In the social condition a spectator was permitted to closely observe the subject during the memory trials. In all cases, performance was measured in terms of trials and repetitions; errors being the number of incorrect anticipations made and repetitions being the number of times the list had to be repeated before one perfect reproduction was reached. The results indicate that fewer errors were made and fewer repetitions needed when learning the list in the control condition. The author, therefore, concludes that learning nonsense syllables was more efficient when subjects worked alone than when they were in the presence of a spectator.

A more recent study examining the effect of a passive audience was conducted by Wapner and Alper (1952).<sup>28</sup> This study employed a four variable factorial design varying the type of audience, the type of instructions, the sex of the subjects and the role of the experimenter. The present concern is with that portion of the experiment which studies the effect of an audience. Wapner and Alper designed three audience conditions: no audience, an unseen audience and a seen audience. Where no audience was present, subjects worked in a one-way vision observation room with curtains drawn across the one-way mirror. In the case of an unseen audience, the one-way mirror was exposed and the subjects informed that they were being heard and observed by an audience behind the mirror. For the case of the seen audience, the illumination was adjusted such that the subject could see the audience

behind the mirror. The task presented the subject with a phrase followed by two words and required him to choose the one word which most closely fit the phrase. Forty phrases were given to each subject; 10 of the phrases contained very easy discriminations while the remaining 30 were difficult. These phrases were difficult because they were followed by two words which were synonyms and both were appropriate to the phrase. These phrases, therefore, placed the subject in a conflict of choice situation. The apparatus for the experiment was set up such that only the time taken to make each choice was recorded and later totaled for all 40 items. With respect to the time taken for all 40 items, the results show that the presence of an audience tends to increase the time required to make a choice. The time was longest in the case of an unseen audience, shorter in the presence of a seen audience and shortest when there was no audience other than the experimenter. In other words, decision making was found to be more efficient when an individual is working alone than when he is working in the presence of an audience.

In this section a number of studies have been discussed, all of which examined the performance of a subject both alone and before a passive audience. This represents a departure from previous studies discussed since the presence of only a passive audience eliminates the effect of rivalry. The pattern which has emerged has been one of contradiction. In the case of Travis and the Ichheiser studies and a portion of the Gates study, performance before an audience was enhanced. In other portions of the Gates study and in studies conducted

by both Pessin and by Wapner and Alper, the performance of a subject was retarded by the presence of an audience. It is difficult at this point to account for these differences. The only thing which appears to vary significantly among the experiments discussed has been the task used. Generally speaking the more physical tasks (pursuit rotor and coordination) seem to be aided by the presence of an audience. The more mental types of tasks (learning and decision making) appear to have been retarded by the presence of an audience.

Vocal audience. The final dimension of the social facilitation problem which will be examined relates the effects of a vocal, non-co-acting audience on a subject. While the study of a vocal or distracting stimulus on a subject has some relation to the area of social facilitation, it does appear to be somewhat removed from the audience and co-action effects discussed earlier. It is included in the analysis for two more important reasons: it lends support to studies that will be discussed later and it will help to clarify the difference between pure rivalry, co-action and social facilitation.

A study by Gates and Rissland (1923)<sup>29</sup> examined the effect of vocal comments by examining the performance of a subject under different conditions of evaluation by an experimenter. The researchers were interested in testing the theory that encouragement has a favorable effect on performance while discouragement has an unfavorable effect on performance. The performance measures used in the experiment were very simple: the Motor Coordination Test and the Color-Naming Test. The subjects, 74 college students, were given both

tests. Following this initial testing, the students were broken down into three separate groups. The first group was given a positive evaluation of their first tests and then asked to repeat the tests. The second group was given a negative evaluation before the retest while the third group was only asked to repeat the tests. The analysis of the initial tests showed that there was no significant difference in ability among the groups. The second group of tests, however, showed a slight difference in improvement rate. The groups that were either encouraged or discouraged showed a greater rate of improvement than the group which received no evaluation. In addition, the experimenters found that persons with relatively poor performance are more likely to be unfavorably affected by negative evaluations than are relatively proficient individuals.

A different type of study involving vocal comments was conducted by Laird (1923).<sup>30</sup> He attempted to relate an experimental situation to that which regularly occurs in the sports arena. Specifically, Laird noticed that some baseball players go to pieces when subjected to critical remarks by the fans while others appear to benefit from the same discouraging comments. To test this effect of 'razzing' he used a group of fraternity pledges and a series of motor tests. The tests consisted of: a measure of how fast a subject could tap a stylus on a board, a test of coordination and a measure of how steady a subject could hold his arm while sitting and while standing. In one condition, the subjects were asked to perform the tests in front of active members of the chapter and other pledges all of whom displayed

a quiet, sincere interest in the performance of each individual. Two days later, however, the same group performed the same tests; this time the active members 'razzed' each pledge as it became his turn to run through the tests. Some of the 'razzing' consisted of discouraging remarks while other parts were "intensely personal". A review of each subject's performance showed that 'razzing' caused a decrease in performance in the steadiness tests. This was particularly true in the case where subjects were standing, which requires the steadiness of both trunk and arm muscles. The remainder of the results showed an interesting effect. Some subjects did better on both the tapping and the coordination test when being 'razzed' while others displayed the opposite effect. The author attributes this result to individual differences among the subjects.

The two studies reviewed above are similar in that they both examine the effect of vocal comments or evaluations on the performance of a task requiring motor coordination. The studies are different in that each exposes its subjects to a different number of effects. In the Gates and Rissland study subjects were exposed to the effect of evaluation only. In the Laird study, subjects were exposed to both the effect of evaluation (discouraging remarks) and the effect of distracting stimuli. The case of distracting stimuli is an area touched on before. Recall that Meumann<sup>31</sup> discovered that some of his subjects showed a higher rate of retention when memorizing words in a relatively noisy classroom. That discussion is now resumed by looking briefly at other studies involving distracting stimuli.

The first study to be considered was conducted by Cassel and Dallenbach (1918).<sup>32</sup> The authors examined the effect of distractors upon reaction time by using a series of hammer sounds. These sounds were presented to subjects in three patterns: a continuous rhythmic pattern of sounds, an intermittent pattern of irregular sounds and a continuous pattern of irregular sounds. The measure of performance in the experiment was the subjects' reaction times. The effect of the distractors upon reaction time showed an interesting pattern; some served to lengthen it while some served to shorten it or leave it unaffected. Most distractors which served to increase reaction time were intermittent and irregular while all distractors showing a decrease or no change in reaction time were regular and continuous. The authors concluded that the effect of distractions depends primarily upon the temporal relations of the distractor. A similar type of study by Tinker (1925)<sup>33</sup> examined the effect of a distractor on intelligence. Tinker measured the performance of a group of undergraduates taking the Otis Intelligence Test. In one condition the students took the test alone and without distraction while in the second condition they took it alone with two bells ringing intermittently. The results showed a non-significant gain. Distraction neither aided nor hindered a student's performance on an intelligence test.

Quite a different result was obtained in an experiment by Pessin (1933)<sup>34</sup> described earlier. His task involved learning nonsense syllables under three conditions: alone, in front of passive spectators and in the presence of mechanical stimuli. In this case the mechanical stimuli consisted of the simultaneous flashing of a 150-watt light and

the sounding of a buzzer at the constant rate of 54 times per minute. His results not only showed that the alone condition was most favorable for learning (discussed earlier) but that the most mistakes were made when the mechanical stimuli or distractors were introduced.

Looking back at the studies just discussed they appear to exhibit some rather conflicting results. In one case, distraction seems to improve performance while in another, it has the opposite effect. An interesting explanation to part of this conflict was advanced by Burnham.<sup>35</sup> He pointed out that distraction itself can be a stimulus to greater attention. The individual attempts to resist distraction and over-compensates thereby improving his attention. Burnham goes on to explain:

Not merely is it true that the performance of an individual often increases when there are disturbing stimuli, because the increased concentration to overcome the distractions increases the work: but more than this, the compensation, which in this case becomes an over-compensation, shows that the disturbing stimulus has the effect of increasing rather than decreasing the energy, that is; it has a dynamogenic effect, although this effect does not occur in case of all individuals.

Perhaps now an explanation can be offered for the conflicting results described earlier. A distracting stimulus, as the name implies, is a force which tends to divert the individual's attention from the task at hand. A compensating force, in the form of increased concentration generated by the individual, acts to oppose the distraction. In the case of a relatively routine or familiar task and/or a situation where the distractor assumes a regular pattern (e.g. back-



ground noise), an individual is free to develop a compensating force sufficiently large to cancel out the distracting stimulus and perhaps cause an increase in total concentration. This force is free to develop because the type of situations just described do not require intense concentration. However, where the task involves learning and/or an intermittent type of distraction, attention is more difficult to maintain. Learning requires a high degree of concentration and most individuals do not have the capacity to increase it in a learning task. In the case of an irregular or intermittent stimulus, concentration is drawn to the anticipation of the next distraction. In both of these cases, a small force or no force at all acts to oppose the distraction thereby impeding performance.

Looking back on the studies just examined it is possible to understand the reasons for the apparently conflicting results. In the Pessin study, poor performance in the presence of a distractor was observed because the task involved learning nonsense syllables. Cassel and Dallenbach noted a decrease in performance when the distractor was irregular and intermittent and an increase when the distractor was regular and continuous. In the studies by Tinker and by Meumann, the tasks were relatively familiar to the students. The tasks in both of these studies involved memory and in the case of Tinker, common problems which did not require learning. The results obtained by Laird are more difficult to explain because the experiment involved both distraction and evaluation. With regard to distraction, however, it is reasonable to assume that a task which

involves coordination or tapping is more common or familiar to subjects than a task which involves steadiness only. One might also be safe in assuming that steadiness involves more concentration than either coordination or tapping. In the case of the Gates and Rissland study, the authors were concerned only with the effect of evaluation. Since no distraction effect was involved, the results of this experiment will have to be considered later when our knowledge of social facilitation is more complete.

Summary of earlier studies. Up until now various studies have been examined, all of which relate to social facilitation. It now remains to pull these studies together into a coherent picture depicting the effect of a group upon the performance of an individual. In a summary of social facilitation studies, involving work within a social context as compared with working alone, Kelly and Thibaut (1954) concluded that the social context was characterized by:

- a) Greater quantity of work where physical output is involved, suggesting increased motivation to perform the task.
- b) Lesser quantity or quality of work where intellectual processes or concentration are involved, suggesting that social stimuli are able to compete successfully with task stimuli.
- c) Inhibitions of responses and qualitative changes in the work, which suggest that the person somehow "takes account" of the others as he goes about his work, e.g., he has fewer idiosyncratic thoughts, exercises moderation in judgement and gives more "popular" or common associations.
- d) Greater variations through time in his output, indicating the presence of periodic distractions and/or the effects of working under greater tension.<sup>36</sup>

It is possible to go further than the statement above. Instead of summarizing results, an attempt will be made to isolate the more fundamental factors of the social context and combine them so as to

more fully explain the results obtained in each of the previous sections.

Recall that earlier social facilitation studies were divided into four groups: the presence of co-actors with rivalry, the presence of co-actors without rivalry, the presence of a quiet audience and the presence of overt, vocal attitudes. An experiment which has related most of the above aspects of the problem was conducted by Dashiell (1930)<sup>37</sup>, one of Allport's students. Dashiell's objective was to test all four situations using the same human subjects in the same program so that direct comparisons could be made. To do this he chose tasks which could be varied in form and assigned to the same subjects a number of times. These tasks were multiplication of numbers, mixed relations or analogies and free serial word-associations. The subjects, a group of 93 college students, were instructed to work "... as accurately and as fast as you can." There were four conditions for the experiment: together, rivalry, alone and under-observation. In both the together and rivalry situations, students were seated around two large tables. In the together portion they were urged not to compete as the results would never be compared; in the rivalry portion they were told to compete since scores would be compared later. In the alone condition the individuals worked in separate rooms and were given time signals by means of a buzzer controlled by the experimenter. Subjects in the under-observation condition were seated 3 to a table. One person worked on the problems while the other two watched him closely and attentively. Perhaps the most important re-

sult of this experiment is the conclusion by the author that the important phase of the social situation, which causes subjects to increase speed, is the attitude on the part of the subject that he is either in competition or being observed. The author goes on to say that competition or rivalry has an effect distinct from that of the presence of others. In effect, Dashiell has confirmed, using the same subjects and tasks, what appeared to be emerging from the literature; namely, that one is dealing with a series of separate factors. This becomes clearer as one looks back on the literature.

Recall, when studies involving co-action without rivalry were examined it was concluded that the effect on performance was almost exactly the same as that seen in studies involving co-action with rivalry. Specifically, it was noted that speed or quality was increased when either was the only measure of performance. When both were measures of performance, speed was increased at the expense of quality. While the co-action and rivalry effects have similar behavioral manifestations, they each have different degrees of potency. In all areas examined, whenever rivalry was compared with co-action, the rivalry effect emerged as the stronger. In the study by Whittemore, groups of individuals turned out more work in competition than when they were not competing.<sup>38</sup> In the experiment by Hurlock, results showed the same effect; more output during competition.<sup>39</sup> This same effect was again observed in the experiment by Dashiell just discussed.<sup>40</sup> In studies involving the mere presence of an audience, it was shown that when subjects were not able to observe and

perhaps learn from others, a more variable and perhaps weaker effect than for either rivalry or co-action was observed. In general, it was concluded that physical tasks are aided by an audience while mental tasks appear to be retarded by an audience. The investigation of studies involving a distracting stimulus showed that distraction aided performance where the task did not require a high degree of concentration. In the case where intense concentration was required, distraction tended to decrease performance. What appears to emerge from the literature, therefore, are four distinct factors. To avoid confusion, the factors will be referred to as follows: 1) the competition factor, which is primarily due to the existence of a conscious desire to win; 2) the action factor, which refers to the presence, with the subject, of other individuals engaged in the same or a similar type of activity; 3) the presence factor, which refers to the mere presence of other individuals as observers only; and 4) the distraction factor, which is caused by the existence of other stimuli which tend to divert attention.

Now that the factors have been isolated, one must recognize that each is somewhat independent and capable of having a positive or negative effect upon performance. While the positive effect has been stressed, the negative effect has also appeared in many of the studies examined thus far. In the case of the competition factor, recall that Allport pointed to a loss in performance due to overstimulation caused by competition.<sup>41</sup> Negative effects of the action factor can be seen in the work done by Moede. His experiments in-

licated a leveling of both rhythm and output; the faster workers showing little improvement or even a decrease in output while the slower workers showed a marked improvement.<sup>42</sup> Again, with regard to the presence factor, it was shown that an audience tends to retard performance on the more mental types of tasks (learning and decision making); the distraction factor showed a negative effect on performance when the task required intense concentration. Taking these four factors into account it can therefore be predicted that the least improvement would occur in the case where there was severe competition (over-stimulation), where the worker was initially better or faster, where the task was heavily mental requiring intense concentration and where there was a distracting stimulus. The most improvement, according to the analysis, would then be shown in the case of moderate competition, where the subject is poorer or slower, where the task was mostly physical requiring little concentration and where a distraction was present.

What has been done in the example of most and least improvement given above was to combine each one of the four factors. An interesting facet of this analysis is revealed when one recognizes that the "effects" dealt with in the literature thus far are really combinations of the above four factors. For example, the rivalry effect (or situation) is really the resultant of the competition, action, presence and distraction factors. All of these factors are directly involved in the rivalry situations examined earlier. The co-action situations, for the most part, involved the action, presence and distraction factors. The exceptions to this were cases where some competition was

implied due to the presence of co-actors. Finally the social facilitation situation involved the presence factor and in some cases the distraction factor. Keeping this in mind, it is easy to recognize why rivalry situations showed much stronger effects than co-action situations. The same is true for co-action vs. social facilitation situations. In the co-action situations an increase in performance was observed over a wide range of tasks while in the social facilitation situation the tasks were more restricted and the effect on performance appeared to be more delicate. Therefore, to get a more accurate picture of the effect of others on an individual one should first consider the number of factors that are present and the direction in which they are operating. This direction can be approximately determined by noting whether: a) competition is moderate or excessive, b) individuals are high or low performers, c) the task is mental or physical, and d) slight or intense concentration is required.

Recent studies. While the field of social facilitation produced many studies prior to the late 1930's, the field became inactive during World War II. This inactivity continued until the 1960's when an article by Zajonc (1965)<sup>43</sup> revived interest in the area. Coincident with this increased activity was a limiting of research to the presence factor only. The article by Zajonc presented a new way of viewing results obtained by previous researchers. In his analysis of these conflicting results Zajonc noted that if a response is well learned it is facilitated by the presence of other individuals (either observers or co-actors). On the other hand, the acquisition of a new response

(learning) tends not to be improved by the presence of others. This occurs because during learning a person tends to emit more incorrect responses than correct ones. These incorrect responses are more dominant in the individual's task-relevant behavioral repertoire and therefore have a higher probability of occurrence. When learning is complete, however, the correct responses are more dominant and they now have the highest probability of occurrence. Zajonc generalized his conclusions by stating that an audience (observers or co-actors) enhances the emission of dominant responses.

One should keep in mind that while Zajonc specifically mentions co-actors, he is only dealing with them to the extent that they are an audience. In other words, he is only dealing with what has been previously called the presence factor and not with the action factor. In this sense Zajonc only tells half the story. His results do not explain why, in co-acting groups, the better individuals improve least while the worst improve most. In fact, if one were to strictly apply Zajonc's generalization to the co-action situation above, it would result in an incorrect prediction. Specifically, under Zajonc's conclusion one would have to assume that better performers had mastered the task to a greater extent and, in their case, the correct responses were more dominant. If this were so, Zajonc's generalization would predict that these people would benefit most from the presence of others. This result, as has already been noted, does not occur with co-acting groups.



Nevertheless, in looking back on previous studies, the generalization by Zajonc appears to be extremely compatible with the results obtained. In the studies involving a passive audience it was observed that the more mental tasks such as learning and decision making appeared to be retarded by the presence of an audience. It is evident now that these tasks are such that the incorrect response is dominant most of the time. The results obtained by Travis using 10 stutterers appear to be more understandable in terms of Zajonc's statement. Recall that Travis discovered that an audience tends to retard a stutterer's speed in chain-word association.<sup>44</sup> Since a stutterer must wait for a response to reach full ascendancy before it can be spoken, it is easy to see how an audience can cause incorrect responses to be elicited. Finally, as previously discussed, results obtained by Pessin showed that learning nonsense syllables was retarded by the presence of an audience.<sup>45</sup> In a later portion of that same experiment Pessin attempted to test the effect of an audience on an individual's rate of retention; here a reversal was found. Those individuals who found it difficult to learn in the presence of an audience now showed a higher rate of retention before an audience.<sup>46</sup> When these subjects were learning, the incorrect responses were dominant. When learning was complete, however, the correct responses were dominant and were therefore enhanced by the presence of an audience.

Zajonc also presented some evidence which tends to suggest that the presence of others acts as a source of arousal. In support of this statement he recounted the results of animal researchers which

show that increased adrenocortical activity, a reliable symptom of arousal, is associated with the presence of others of the same species. In a further study by Zajonc and Sales (1966),<sup>47</sup> the authors concluded that if the presence of others does serve as an arousal force then this presence should manifest the same effects as those obtained by increasing the generalized drive (D) state as discussed by Hull and Spence.<sup>48</sup> The authors attempted to prove this connection using a design previously employed in experiments involving drive (Zajonc and Nieuwenhuyse (1964)).<sup>49</sup> The procedure involved exposing a subject to a series of ten nonsense words. Two of the words were presented to the subject sixteen times, the next two words were presented eight times and each subsequent two words were presented four times, two times and one time. Therefore, while all ten words were presented to each subject, some were more dominant since they were initially presented a greater number of times. The subjects, in a series of trials, were then asked which of the ten nonsense words was being quickly flashed upon a screen. In actuality, a projector flashed something which only looked like a word and flashed it so quickly as to make it impossible to recognize. The subjects were led to believe that a word had actually been flashed and were encouraged to guess at which word it was. In the previous experiment by Zajonc and Nieuwenhuyse subjects under increased drive tended to respond by giving the more dominant words or those words to which they had been exposed a greater number of times. In effect, the increased drive tended to enhance the dominant responses and attenuate the sub-

ordinate responses. Zajonc and Sales used the same procedure but divided their subjects into two conditions: the control condition, where the subject performed the recognition trials alone and the facilitated condition, where the subjects were observed by two other individuals. The results were as predicted; the more dominant responses were enhanced and the subordinate responses were impeded by the presence of an audience. These results, similar to those obtained by Zajonc and Nieuwenhuyse, support the idea that the mere presence of others serves as an arousal force.

This procedure was later modified in a similar experiment conducted by Cottrell, Wack, Sekerak and Rittle (1968).<sup>50</sup> They used the same design as Zajonc and Sales with a slightly different pattern of initial exposures. The authors also varied the conditions for administration, creating three separate groups: the alone condition, where no one was present during testing; the audience condition, where two interested spectators observed the subject during the testing; and the mere presence condition, where two blindfolded individuals were present during testing. The authors found that the pattern of responses for the mere presence condition closely resembled the pattern for the alone condition. In other words the mere presence of individuals is not sufficient for enhancement of dominant responses. The individuals must function as an audience and be able to view the subject before dominant responses can be enhanced.

This paradigm was further modified by Henchy and Glass (1968).<sup>51</sup> Their experiment, again, employed the same design used by Zajonc and

Sales with a variation in conditions of administration. Here, the subjects were divided into four groups: the alone condition, where no one was present during the word recognition tasks; the expert condition, where two "experts" were introduced to the subject and observed his performance; the non-expert condition, where the observers were not presented as experts; and the recorded condition, where the subjects were led to believe that the trials were being filmed and tape recorded for later evaluation by a group of experts. The results show that dominant responses were emitted more in the expert and recorded conditions than the non-expert and alone conditions. This led the authors to conclude that a necessary condition for social facilitation to occur is the evaluative aspect of an audience. In other words, in order for dominant responses to be enhanced, a subject must feel that he is being evaluated by individuals who are competent to judge his performance. These individuals need not be physically present; much of the social facilitation effect remains if the subject feels that his performance will be evaluated at a later time.

The concept of evaluation enhancing the dominant response tends to explain some of the inconsistent results of earlier studies. The Gates and Rissland study is one example. In that study it was noted that, on a coordination test and a color naming test, groups that were initially encouraged or discouraged showed a greater rate of improvement than the group receiving no feedback.<sup>52</sup> This encouragement and discouragement was based on previous performance and therefore amounted to an evaluation. It is easy to see, therefore, why such an evaluation could cause increases in performance. In the study by

Laird a case was examined where 'razzing' caused specific individuals to improve their performance.<sup>53</sup> This study can be analyzed by recognizing that the personal remarks made during 'razzing' constitute an evaluation. Although Laird provides no data in this respect, one might predict that those individuals who improved were those for whom the correct responses were most dominant. This would seem to be correct since the individuals showing an improvement tended to improve on more than one measure of physical performance.

Another portion of the Henchy and Glass experiment involved the measurement of autonomic activity. Recall that Zajonc gave evidence indicating that animals show increased adrenocortical activity in the presence of others of the same species. Also, Zajonc and Sales suggested that spectators may be a source of increased generalized drive (D). Henchy and Glass attempted to directly test these theories by measuring the subjects' skin conductance and heart rate during the recognition trials. Other researchers, particularly those in the field of Biology, have obtained similar data on human subjects. Shapiro, Leiderman and Morningstar (1964),<sup>54</sup> in a color guessing task, determined that individuals performing the task in a group had significantly higher Galvanic Skin Potential (G.S.P.) readings and no significant difference in heart rate. In another similar experiment Shapiro and Leiderman (1967)<sup>55</sup> discovered, in a 45 minute trial, that G.S.P. readings were initially higher and declined more slowly for individuals in a group than for those alone. In the Henchy and Glass study experimenters checked the heart rate and skin conductance of subjects

in all four conditions of the experiment. Contrary to expectations, there was no significant difference in either measure between conditions.

Summary of recent studies. The more recent studies in social facilitation specifically address themselves to what has previously been called the presence factor or the effect upon a subject of the mere presence of others. These studies explain the phenomenon of social facilitation in terms of an individual's task-relevant behavioral repertoire. The conclusion which appears to emerge from the literature is that the more dominant responses in an individual's repertoire appear to be facilitated if the individual feels that his performance, at a specific task, will be evaluated by others and that these persons are competent to judge his performance at that task. An audience need not be present for this evaluation to take place, enhancement of dominant responses has been shown to occur if the subject feels that his performance will be evaluated at some later time.

Some indirect evidence has been given which lends support to the idea that the presence of others increases the generalized drive state (D) or acts as an arousal force. This evidence, however, has been inconsistent. In some cases higher G.S.P. readings have been associated with group activity while in other cases no significant variation could be found in autonomic responses between alone and audience conditions. While no direct evidence exists, this does not mean that the measurement of arousal indicators is fruitless. The measurement of human arousal is subject to many problems. Lacey and Lacey (1958)<sup>56</sup>

have pointed out that subjects can be relatively over-active in some physiological measures, underactive in others and average in others. Measurement of human arousal will probably have to wait until more questions in the field are answered.

### Evaluation Apprehension

Evaluation apprehension is a term used by some recent authors to refer to the arousal which an individual experiences when placed in a position where his performance can be evaluated. While the arousal force is essentially the same as others described in connection with social facilitation or the presence factor, it is introduced to be consistent with the authors described below.

Steiner (1972), in his work on group productivity, points out that evaluation apprehension is not necessarily restricted to the case where others are performing the same task. People regularly evaluate the performance of others in a wide range of fields in which the evaluator has little or no experience. Steiner concludes that, "Unless an activity is extremely esoteric, an observer is a potential evaluator". Steiner also points out that evaluation apprehension not only has the effect of energizing behavior but also acts to steer behavior.<sup>57</sup> In its energizing aspect, it encourages people to elicit behaviors that are located in the dominant positions of their response hierarchy. As discussed earlier, this tends to facilitate performance on well learned tasks while inhibiting performance on poorly learned tasks. The steering aspect involves what Steiner has called the motivation "... to do those acts which are likely to elicit favorable evaluations

and to neglect those which will not be evaluated".<sup>58</sup> A similar observation was made by Jones and Gerard (1967) in discussing the desire on the part of the individual to obtain a positive reaction from others. They point out that this prompts the individual to respond in a manner which will please others.<sup>59</sup>

The previous review of the social facilitation literature illustrated many examples of the above. Frequent cases were observed where the effect of a group served to increase output on a task but also to reduce the quality of that output. Specifically, Allport's subjects produced more word associations and developed more arguments when working in a group than when working alone. The quality of their arguments and the imagination reflected in their associations decreased, however, when the subjects worked together. Steiner attributes this to the fact that the subjects viewed the other members of the group as potential evaluators. Since the subjects were instructed to produce as much as possible, high production would obviously elicit a favorable evaluation. Subjects, therefore, produced more and sacrificed quality since quality did not enter the evaluation. This phenomenon was also encountered when the results of Mayer's experiments were discussed. Recall that when Mayer's subjects were urged to work slowly and carefully they produced less output but more accurate work than when told to finish quickly and work well. Here was a very obvious case where subjects (young boys) felt that their instructions dictated the behavior which would elicit a favorable reaction from their evaluators.



Taking both the arousal and steering aspects into account, Steiner summarizes the effect of evaluation apprehension as follows:

Evaluation apprehension is a powerful motive which may either facilitate or inhibit task performance. It is likely to have a facilitating effect when task behaviors have been well learned and are expected to evoke favorable appraisals. Inhibiting effects may be anticipated when task behaviors have been poorly learned or are likely to elicit adverse appraisals.<sup>60</sup>

### Socialization

The major portion of research in the field of socialization has been concerned with the adjustment of the child into his cultural environment. Presthus (1962), however, points out that formal organizations are miniature social systems and are similar to society in inculcating their values.<sup>61</sup> Therefore, the concept of socialization can be extended to include "adult socialization" which recognizes the fact that adults must change and accommodate themselves into various roles during the course of a lifetime. A special case of adult socialization has received some small attention in the literature. This case relates to the socialization of the individual into professional or occupational roles as well as other roles in formal social organizations.

Before the current literature is examined, there are some questions which should be discussed. To begin with, there appears to be a controversy regarding the definition of socialization. Tannenbaum and McLeod (1961) point out that "This is partly due to the ambiguous nature of the concept itself - there are almost as many

definitions as there are definers, and few are specific enough for operational purposes."<sup>62</sup> While most researchers agree that socialization involves a change in some aspect of the individual, the main point of disagreement appears to lie in defining exactly what is changed. Tannenbaum and McLeod discuss socialization as a change in a person's cognitions or behavior.<sup>63</sup> Brim (1968) defines socialization as the process by which one learns to perform his various roles adequately. He also states that it involves a change in, or addition to a person's beliefs, attitudes, behavior motives or values.<sup>64</sup> Both of these definitions agree that an appropriate change in behavior may constitute socialization. On the other hand, Jones and Gerard describe socialization as referring to "... the adoption and internalization by individuals of values, beliefs and ways of perceiving the world that are shared by a group."<sup>65</sup> Here, the authors stress internalization and speak of the more internal characteristics of an individual's personality; behavior is not mentioned. In order to understand why this difference exists it should be noted that the authors quoted have different orientations on the subject of socialization. Jones and Gerard concern themselves with child socialization while both Brim and Tannenbaum and McLeod, focus on adult socialization. Perhaps a review of the differences in the two types of socialization may be beneficial in understanding the differences in the definitions.

One important way in which child socialization differs from adult socialization is in the reward structure. With respect to the child,

parents have abundant resources (food, warmth) which the child learns quickly to value.<sup>66</sup> Because of these resources and the advantage of immediate gratification, parents have a tremendous lever in shaping a child's personality. The mechanism of dissonance reduction or what Raven has called secondary influence operates to cause what is basically coercion to be internalized thereby resulting in enduring attitudes and beliefs.<sup>67</sup> Formal organizations do not have a mechanism to offer immediate rewards and must therefore depend upon the individual's ability to symbolize future rewards. In addition to the reward structure, parents have the advantage of being in contact with a child at a time when he is most highly susceptible to social influence.<sup>68</sup> During this time, the parent presents many mannerisms, behavior patterns and values which are assimilated at more or less full strength by the child.<sup>69</sup> By the time the child is old enough to leave the parents he has values and beliefs which take the place of the parents; he has, to a large extent, been socialized into society by his parents. Formal organizations, because they encounter individuals at a later stage, have more difficulty in changing values and beliefs.

As illustrated in the previous paragraph, organizations tend to be at a substantial disadvantage in socializing the individual as compared to the parents. It is, therefore, reasonable to expect that an individual whose orientation is toward child socialization would define socialization more in terms of the internal characteristics of personality. On the other hand, someone concerned with adult socialization would most likely define the concept in terms of behavior or

the more external characteristics of personality. It is also interesting to note that when attempts are made to measure socialization they are, of necessity, concerned with the more external aspects of personality such as speech patterns<sup>70</sup> and selected attributes of a particular role.<sup>71</sup> Since organizations are concerned with what is basically adult socialization, the concept will be defined, for the purposes of this study, as an appropriate change in, or addition to, an individual's feelings, values, attitudes, perceptions or behavior.

While the above definition includes those aspects of an individual's personality which must change in order for socialization to occur, it does not describe the direction of appropriate change. Another way of saying the same thing is to ask how the ultimate role of the individual is prescribed. This can occur in two basic ways. A role may be prescribed by the expectations that someone has regarding the role aspirant. In other words, another agent can specify a role which involves a change in the aspirant's feelings, values, attitudes, perceptions or behavior. Such a person can be a parent, employer or society in general. Secondly, a role may be prescribed by the individual himself. The aspirant may have self initiated conceptions and prescriptions regarding his own personality and behavior change. These conceptions can play an important part in the socialization of an individual. Self conception can either aid (self socialization) or confound the socialization process.

It is now appropriate to begin a summary of current articles relating to socialization. These articles are divided into three

groups. The first group considers the overall process of socialization, the second examines the actions of the socializing agent and the third looks at the effect of socialization on the individual.

Socialization process. In the first of two articles Schein describes the process of socialization.<sup>72</sup> The process begins with a destructive or unfreezing phase. This phase serves the function of detaching the person from his former values, and proving to him that his present self is worthless from the point of view of the organization and that he must redefine himself in terms of the new role which he is to be granted. Graphic evidence of this can be seen in the initiation rites of novitiates for religious orders which symbolically destroy the "old individual" by the loss of clothing, name, sometimes hair and other equipment which defined the previous person. Similar forms of initiation rites occur in formal organizations and are termed "upending experiences". Common forms of upending experiences include giving the novice trivial assignments or, on the other hand, assigning him to tasks which are nearly impossible to complete. All such experiences dramatically and unequivocally upset or disconfirm some of the major assumptions which the new employee holds about himself, his company or his job. The success of this phase depends on the initial motivation of the individual and the degree to which the organization can hold the person captive. Obviously, the organization does not want the new employee to leave during the first phase.

The second phase involves learning the organizational role. This can come from official literature, examples by key members of the organization, direct instruction or rewards and punishments. Dys-

functional aspects of learning occur when the values of the immediate group into which the person is hired are partially out of line with the value system of the organization as a whole. Here, the person will learn the group's values faster than those of the organization.

The next phase in the socialization process involves building commitment and loyalty to the organization. This can be accomplished in two ways. First is to invest much time and effort in the new member and thereby build up expectations of being repaid by loyalty, hard work and rapid learning. The second is to have the new member make a series of small behavioral commitments which he can only justify through the acceptance and incorporation of company values. The first technique uses the individual's guilt to gain a commitment while the second places him under strong pressure to justify his initial commitment.

The final mechanism in the socialization process is the transition of a novice to a full fledged member. This transition is usually signaled by an event of some sort which has meaning for the individual. It may involve a responsible assignment, status, extra rights or the sharing of confidential information. These events serve to show the member that he has been accepted and is now identified with the organization.

In a second article, Schein (1961) presents a "model of influence and change".<sup>73</sup> Here he considers influence as a process which occurs over time and involves three phases. The unfreezing phase involves motivating the individual; making him ready to change by altering the forces acting on him so as to disturb his equilibrium. The changing

phase involves presenting a direction for change and the learning of new attitudes. Finally, the refreezing phase is concerned with the integration of the changed attitudes into the personality.

More specifically, the unfreezing phase consists of three essential elements: 1) the removal of supports for the old attitudes, 2) the saturation of the environment with the new attitudes to be acquired and, 3) minimizing the threat and maximizing the support for any change in the right direction. Examples of such unfreezing are management development programs which remove the individual for some length of time from his normal role and social relationships. Such programs, in effect, reduce threats inherent in change by emphasizing the value of experimentation. Also, the material presented facilitates self-examination and self-diagnosis based on feedback from other participants. Additional methods of unfreezing include rotating a manager from one assignment to another and providing a training program before a manager assumes a new position.

The changing phase, as previously mentioned, involves the learning of new attitudes. This process can occur in either of the two following ways. Identification is the process of learning new attitudes by identifying with and emulating another person who holds those attitudes. Internalization involves learning new attitudes by being placed in a situation where new attitudes are demanded as a way of solving problems. It is important to recognize that each of these two methods of attitude learning arise in different ways and have different characteristics. Identification occurs when a psychological relation-

ship exists between the influence target and a member of the organization. Because the target is dealing with one member of the organization the alternative attitudes available to him are limited. If, however, the target is placed in an attitude learning situation we can expect internalization to occur. The difficulty here is that the attitudes learned may be incompatible with the value system in other parts of the organization.

The final or unfreezing phase is concerned with causing the change to be permanent. Important in this phase is the idea of providing social support for attitudes learned. The lack of social support effectively acts as an unfreezing force producing a new influence which could very well be in the direction of the old attitudes. The obvious conclusion to be drawn is that attitude change cannot occur in isolation. In order to effect permanent attitude change the program should include not only target persons but significant other individuals in their environment.

Actions of the agent. The first of two articles is by Berlew and Hall (1966) and deals with the effect of the company's initial expectations on the individual's performance and success.<sup>74</sup> The part that the expectations of others plays in the socialization process was previously discussed. For a manager new to the company, the expectations of individuals within the company constitute an important class of role forces. Therefore, his behavior will be strongly affected by the expectations of his associates.



Consider now what happens when an individual successfully meets performance expectations which are set reasonably high i.e. close to the person's own level of aspiration. In this case, the individual will feel personal satisfaction at having achieved his goal. These positive outcomes will generally lead to a higher level of aspiration or internalization of higher personal standards of performance. In addition, meeting high performance standards is usually rewarded in some way. On the other hand, failure to meet performance expectations is not rewarded and leads to lower personal performance goals and negative attitudes toward the task activity.

Routine performance is not generally rewarded and will not bring about internalization of high performance standards unless the task requirements lie near the person's upper limit of achievement. Meeting low performance expectations will usually result in modest external rewards. Failure to meet low expectations generally leads to projecting blame outward to preserve a measure of self esteem.

It is fairly obvious from the previous discussion that the only situation which tends to foster high standards on the part of the individual is the case where he has met high performance expectations. In this case high standards tend to be retained and form a pattern for future behavior in the company. The conclusion reached by Serlew and Hall, and supported by experimentation, is that new managers, given initial jobs that are demanding (and therefore challenging), will in the next several years perform better and be more successful than new managers given less demanding assignments.

A second article which falls in the classification of actions that are within the realm of the agent is one by Mulford et. al. (1968)<sup>75</sup> and deals with the effect of selectivity upon socialization. Basically, Mulford conducts an empirical test of a hypothesis by Etzioni which states: "All other things being equal, socialization and selectivity can frequently substitute for each other, on the simple ground that the organization can recruit participants who have the characteristics through training or education. On the other hand, if the organization has to accept every member who wishes to join, or every member of a specific but larger and unselected group, it has to turn to socialization to produce the desired results". Mulford selected a normative organization (Civil Defense Agency) for his test. Socialization is usually carried out formally in normative organizations. Economic organizations, unlike normative types, tend to rely on comparatively autonomous external social units for socialization.

Mulford's results confirmed the hypothesis that selectivity and socialization are both positively related to performance. Socialization had significant effects on performance when selectivity was at a low or medium level with the greatest effect occurring at the medium level. When selectivity was high, there was almost no association between socialization and role performance. The clear implication of the study is that an organization may waste its resources by devoting them to socialization and at the same time being selective.

The individual. The final section deals with the effects of socialization on the individual. More specifically, it deals with the

relationship between an individual's self identity and his ultimate socialization into a group.

Ziller (1964) points out that a conflict exists within individuals.<sup>76</sup> This conflict can be traced back to childhood when a person emerges from a period of dependent development and begins to distinguish himself from other group members. Basically, then, this is a conflict between dependence and independence. Erickson points out that people are able to resolve such conflicts by delineating ego identity and group identity. If this delineation does not occur a person suffers from "ego diffusion" or difficulty in distinguishing his uniqueness.<sup>77</sup> Because of this, the individual fails to perceive contrasts and similarities between himself and others thus resulting in an obscured self-portrayal. The importance of a clear self-portrayal may have cultural derivatives. In the United States the individual is emphasized, there is concern for the "dignity of man" and abundance permits people to dress differently. Children are taught individual achievement from early development and ultimately, career choice is made from a wide range of alternatives. In short, American culture creates an expectation on the part of its members that they be individuated.

While culture may create pressures toward individuation, environmental factors may create pressures toward anonymity. This condition may arise, for example, in the case of a hostile environment. Here an individual can become "submerged in the group" and thereby escape identification. Also, as Hoffer points out, people join

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mass movements to escape from themselves. They look upon their lives as spoiled and reject individuation because it reminds them of their personal failures.<sup>78</sup> Therefore, in the above cases voluntary anonymity may aide the socialization process.

Ziller defines individuation as a person's subjective mapping of the social world in which the self is differentiated to a greater or lesser degree from the other social objects in the field. He then proposes that a person's reactions with respect to individuation vary inversely with the number of bits of information necessary to locate him unequivocally within a group of persons. Therefore, the greater the number of bits of information required to locate the person, the greater the degree of deindividuation. Similarly, the individual about whom the most information is known is the most individualized or personalized. Ziller uses this concept to explore why individuals seek both group membership and self identification at the same time. He shows that ego identity is facilitated through group identity. When an individual becomes a member of a group his position can be mapped using a smaller number of information bits. To distinguish one person from a population of one hundred requires more information than the case where the population consists of ten groups of ten people each. Therefore, when an individual becomes a group member he becomes, in one sense, more individuated. In another sense, groups tend to run counter to the development of a more singular self-concept. There is the possibility that the individual will become identified with the group and thereby lose his self-identity.

The problem, then, is to develop individuality within the group. Development of a self-concept is fundamental to the socialization process. Socialization can be impeded if the individual feels that he will lose his self-identity as a result of membership in the group. Some organizations can facilitate self-realization by the assignment of employees to easily distinguishable positions. Other organizations are limited due to a large number of positions and relatively undifferentiated roles. Here much of the burden falls upon the supervisor to differentiate among the members of the group. Results obtained by Fiedler suggest that leaders who evaluate people as individuals rather than as similar parts of a group, have more highly productive groups.<sup>79</sup> Barron shows that individuals with more well defined and more stable self-concepts find a bureaucratic organization less threatening.<sup>80</sup> The negative side of the self-concept issue is proposed based upon Erickson's concept of negative identity. Erickson's proposition states that a loss of self-identity may lead an individual to adopt a role that has been pointed out in one of the developmental stages as clearly the most undesirable and dangerous.<sup>81</sup> In actuality, the individual distinguishes himself from the mass of similar people through negative behavior. In this case, the search for identity through compliance with the rules of the organization is viewed as unattainable.

Summary. In the previous section some important aspects of the socialization process were discussed. Also, socialization was defined as an appropriate change in feelings, values, attitudes, perceptions

or behavior. This definition is important because the ultimate experimental design will describe socialization in terms of changes in behavior. The role of the expectations of others in the socialization process was also discussed. Expectations are one way in which a role is prescribed for an individual. The establishment of expectations is necessary to determine the degree of socialization. This is carried out by comparing actual performance with expectations. It was also determined that meeting high performance expectations can have a long range effect on the relationship between the individual and the organization. This will be discussed later in relation to the importance of the hypothesis.

In the description of the socialization process three basic phases emerged. Initially, the individual must recognize that some portion of his personality or behavior is not adequate for his new role. This leads to a learning or changing phase where the proper behavior is rewarded. In the final phase an attempt is made to make the change permanent.

Finally, the effect that individuation has upon socialization was discussed. Here it was discovered that, under specific conditions, individuation can aid socialization. This discussion will be resumed later during the development of the hypotheses.

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## C H A P T E R I I I

### HYPOTHESES

#### Statement of Non-Operational Hypothesis

Having reviewed the literature of social facilitation, evaluation apprehension and socialization it is now possible to develop a hypothesis. This begins by looking back at the work done by Zajonc. Recall that Zajonc explained much of the previous work in social facilitation by observing that the presence of an audience enhances the individual's dominant response. The types of behavior involved in the experiments he discussed were physical (eating, nest building, simple motor responses) as well as perceptual or simple mental type behavior (judging lights, multiplication, word association, vowel cancellation). In effect, he established the fact that social facilitation exists for a wide range of fairly simple tasks. The work of Cottrell, et.al., Henchy and Glass and the account provided by Steiner modify the Zajonc proposal by pointing out that the enhancement of a response which lies in the dominant position of the individual's response hierarchy can be accomplished through evaluation apprehension. Based on the present state of research, therefore, one can say that evaluation apprehension can cause enhancement of an individual's dominant response when that response involves a wide range of fairly simple physical, perceptual or non-motor type behavior.

While the above effect has not been examined for cases involving more complicated or higher order behavior, there is some indication

that such an investigation would yield similar results. For example, when Spence discusses the habit family hierarchy he does not restrict responses to simple physical or perceptual behavior. He states that "... each such response typically consists of a series or chain of movements or skills involving sensory-motor integrations of varying complexity."<sup>1</sup> Also, Steiner does not restrict the type of behavior which can be elicited; he states that evaluation apprehension "... is likely to have a facilitating effect when task behaviors have been well learned ...".<sup>2</sup> Here, "task behaviors" are not restricted to a narrow range of activity. Finally, a study by Berkowitz (1956) shows that higher order behaviors can be described in terms of their position in an individual's response hierarchy.<sup>3</sup> He points to the fact that people who are initially different exhibit strikingly similar behavior after they are assigned to common positions in on-going social structures. This similarity of behavior frequently results from pressure generated by similar role expectations. In effect an individual is placed under pressure to emit a specific type of behavior. His response to this pressure will vary depending on the position of the desired behavior in the individual's response hierarchy. If the behavior is in a dominant position it will be emitted quickly; if not, other behavior will be emitted and the individual will behave in an undesirable way. Assuming, however, that the required behavior is located somewhere in the individual's response hierarchy and that there are no response inhibiting factors, it is likely that the required behavior will eventually occur.

Berkowitz tested the response hierarchy concept using individuals with a high characteristic level of ascendance and other individuals with low ascendance. He arranged these individuals in an "autocratic" or "wheel" type of communication pattern with one central position that could communicate directly with each member of the group and three peripheral positions which could communicate only with the central position. Since the central position of this network requires ascendant type behavior, subjects with high ascendance could be expected to be more successful in this position than subjects with low ascendance. Berkowitz did find such differences in the behavior of each type of subject. These behavioral differences, however, existed only during the first trial. In subsequent trials, behavioral differences were negligible. Under the high pressure of situational requirements, both high and low ascendant subjects behaved in a somewhat similar manner by the third trial. In effect, behavior patterns were extracted from the individuals' response hierarchies due to the heavy press of situational requirements. Situational pressure was found to be more effective in determining behavior than the person's initial behavioral predisposition.

Combining ideas from the previous paragraphs two concepts emerge:

- a) evaluation apprehension can facilitate dominant responses over a wide range of simple behaviors and higher order behavior (or behavior patterns) can be shown to exist in different locations of an individual's response hierarchy. Since social facilitation has been shown to occur over a wide range of simple behaviors, it would appear logical to assume that it could also be extended to include higher

order behavior. This statement is given further support by the second concept, the fact that such behavior patterns can be viewed as located in relative positions of an individual's response hierarchy. From these concepts it is possible to formulate a hypothesis. It can be stated that evaluation apprehension will tend to facilitate relatively complex behavior patterns which are located in the dominant position of an individual's response hierarchy.

As discussed in the previous chapter, socialization can be defined as an appropriate change in behavior. Since the hypothesis stated above also involves a change in behavior, it can have an effect upon socialization. If one assumes that an individual has a particular behavior pattern located in a dominant position of his response hierarchy, the emission of that behavior pattern can be encouraged by causing the individual to feel that his performance is being evaluated. If that behavior was desirable, the socialization process could be aided by creating evaluation apprehension. If, on the other hand, the dominant behavior is undesirable for socialization purposes, one should not cause the individual to feel evaluated. Evaluation, in this case, would facilitate undesirable behavior. The absence of evaluation, on the other hand, would increase the probability that a desirable non-dominant response will occur. This happens because the failure to evaluate performance decreases the chances that a dominant response will be emitted. Since the individual must respond in some manner, he will be more likely to emit a non-dominant response. In effect, by manipulating the evaluation of the individual, it is possible to alter behavior patterns and thereby effect socialization.



Now that manipulating the evaluation of individuals for the purpose of aiding socialization has been proposed, it might be well to consider the social implications of altering evaluation. Specifically, if it is determined that socialization would be better achieved if an individual were not evaluated, what would be the effect of placing that individual in a group of others who were being evaluated? The reverse of this question is also of interest, namely the effect of evaluating the performance of an individual in a group of others whose performance is not being evaluated. In effect, the concern is for what happens when evaluation of the individual runs counter to that of the group.

Two factors appear to be important in examining the above question. The work done by Ziller would lead one to believe that when an individual is "singled out" because he is evaluated differently, this amounts to individuation. Since Ziller showed that performance can be aided by individuation it can be assumed that this "singling out" will enhance the emission of the desired behavior.<sup>4</sup> Therefore, according to Ziller, one can conclude that when an individual is evaluated differently than other members of a group, this will serve to aid the socialization process. Consideration should also be given a different view, namely that being singled out is an arousal producing circumstance and amounts to increasing an individual's evaluation apprehension. In this case, if one were interested in enhancing an individual's dominant behavior for the purpose of socialization, the process of singling him out would serve to aid socialization. However,

this effect would be reversed if dominant behavior was undesirable from a socialization point of view. Here the effect would serve to retard socialization.

In determining which of the above two cases accurately represents the situation where evaluation of the individual runs counter to that of the group, Ziller's reasoning should be re-examined. Since he points out that individuals wish to differentiate themselves from others, one can conclude that exhibiting the desired organizational behavior does not serve this end. If, however, the individual were somehow individuated or looked upon as unique, he could safely exhibit the desired organizational behavior without fear of losing individuality. Implied in this line of reasoning is the idea that the individual is fully capable of emitting the desired behavior if he wishes. In the case of sub-dominant responses that is not true; the individual must learn the appropriate behavior or response. For this reason individuation will not be thought of as increasing performance, and thereby fostering socialization, in the cases to be examined. Individuation will be looked upon as increasing an individual's evaluation apprehension and thereby facilitating dominant behavior patterns.

The hypothesis formulated in the previous paragraphs can therefore be stated as follows: evaluation apprehension has the tendency to facilitate behavior patterns which are located in the more dominant positions of the individual's response hierarchy. In cases where the presence or absence of evaluation is different for the individual than for others, the effect will be to increase evaluation apprehension.

### Selection of a Task

In order to examine the hypothesis just developed, a task with particular specifications is needed. The most important of these specifications is that the task must show a difference in performance for individuals with different degrees of a specific measurable behavior pattern. In other words, people with a particular behavior pattern located in a more dominant position should perform differently at this task than individuals who have that behavior pattern located in a sub-dominant position. The appropriate task will permit the effect of evaluation on performance to be examined for each individual. If evaluation causes facilitation of dominant response, a change in task performance should then be noted. Another important specification of the task is that it involve more than one person. Since an attempt is being made to measure the effect of individuation, a subject must see himself as being treated differently from at least one other person. Finally, the task should be such that evaluation apprehension can be easily created. Recall, Henchy and Glass found that the evaluative aspect of an audience could be created by recording a subject's performance for later evaluation by a group of experts.<sup>5</sup> In this case, since more than one subject is being considered, the subject must feel that only his task performance and not some other aspect of his behavior is being recorded.

A task which meets the above specifications and is suitable for laboratory use is that employed by Ghiselli and Lodahl (1958)<sup>6</sup> and later modified by Smelser (1961).<sup>7</sup> It involves running model rail-

road trains around a circular track with two bypass sidings. There were two subjects and each ran one train around the tracks by means of duplicate control panels. These panels were arranged such that each subject could impede the other through careless operation of his switches. Performance at this task was judged by the number of mutually complete trips made around the track by the group in 6, three minute trials.

In the above task one person was appointed a dispatcher and was charged with ordering the solution to the problem. The person in this position, called the dominant position, gave orders to the other participant so as to maximize the number of trips. To remove some confusion this position will be referred to as the "dominant or dispatcher" position. The individual occupying the second position, called the submissive position, carried out the orders of the dispatcher and was permitted only to make suggestions. Using this task Smelser found that the maximum achievement occurred in case A where a dominant person was placed in the dominant or dispatcher position and a submissive person placed in the submissive position. The terms "dominant person" and "submissive person" refer to the individuals' score on the Dominance scale of the California Psychological Inventory to be discussed later. In case G, where the submissive person was placed in the dominant or dispatcher position and the dominant person in the submissive role, the performance level was below that of A. On the last of the six trials, however, there was no significant difference between group A and G. The results

of the six trials are shown in Table 1:<sup>8</sup>

TABLE 1

PERFORMANCE DATA, GROUPS A AND G  
FOR SMELSER'S EXPERIMENT  
(Mutually Complete Trips)

Group		1	2	3	4	5	6	Sums
A	Mean	18.9	23.9	26.8	29.8	30.3	30.8	160.4
	S.D.	7.0	5.3	5.4	2.1	2.8	2.0	19.0
G	Mean	7.3	14.8	15.9	22.4	27.6	28.4	116.4
	S.D.	5.7	4.9	7.0	5.1	2.4	4.9	13.5

What appears to have occurred was that the submissive person in the dominant or dispatcher role (group G) eventually became socialized into the dominant role. Basically, behavior patterns (order giving etc.) changed to enable the subjects in group G to increase output significantly.

The above task lends itself to the hypothesis because one has the option of placing a dominant or submissive person in the dominant or dispatcher position and then observing the effect of evaluation or non-evaluation on performance. Also, the performance of different pairings of subjects increases at a modest rate. This will permit examination of the rates of learning under each condition.

The problem of creating evaluative apprehension, while at the same time causing the subject to feel that it is his performance, and not his behavior, that is being evaluated can be solved using a digital device along with a video tape recorder. If a camera records the subject's actions during the trial for later evaluation by "experts", the subject will experience evaluation

apprehension. Recall that this was determined by Henchy and Glass in an experiment (previously discussed) where the behavior of the subjects was filmed and recorded for later evaluation by a group of "experts".<sup>9</sup> This, however, can cause facilitation of any number of dominant behavior patterns. For example, the subject may give commands more frequently, change his style etc.; one cannot be sure exactly what will change. Steiner refers to this problem by pointing out that the subject will behave in a way which he feels will elicit a favorable reaction from others.<sup>10</sup> Since the subject has no evidence (except for verbal directions) of what the experimenter or the "experts" are looking for, his behavior can take many forms. However, if in addition to his actions the camera also records his score or progress on the task, he is much more likely to believe that the experimenter and the "experts" are truly interested in performance. Increased performance then becomes the way to elicit a favorable reaction. Recording progress can be accomplished by locating a digital display in the camera's field of vision. When a complete trip is recorded the visual display could then register this fact. The overall result would be a greater awareness on the part of the subject that he is being evaluated on the basis of performance.

A consideration one should have during the development of a task is how that task relates to a real-life situation. Laboratory experiments need not map directly onto a real-life situation to be valid; however, the more comparable the two situations are the greater the probability that the results can be generalized. The task developed above creates evaluation apprehension through observation of the

individual as well as the results of his actions. This appears to be closely correlated to the way in which evaluation is accomplished in an organizational situation. The objective evaluation of performance, characteristic of a pure bureaucracy, tends not to occur in most situations. The task also involves the cooperation of two individuals. This, again, tends to duplicate a real situation since faulty process can substantially reduce the productivity of a group. With respect to individual characteristics, the task requires the ability to comprehend instructions, give orders and engage in mental processes necessary to order the solution to a task. It rewards imaginative approaches as well as penalizing conventional thinking. In short, it requires many of the characteristics of effective management.

#### Operational Hypothesis

Since a suitable task has been arrived at for testing the previously stated hypothesis, it is now possible to express that hypothesis in operational terms. It is already known that a dominant person performs better in the dispatcher position than a submissive person.<sup>11</sup> It is also known, from the work done by Berkowitz, that dominant subjects have dominant type responses located at a higher or more available position in their response hierarchies than do submissive subjects.<sup>12</sup> Since evaluation apprehension enhances these more available responses or behaviors, one can expect that a high-dominant subject will perform better at the task when he is evaluated than when he is not evaluated. On the other hand, submissive subjects have dominant type responses located in a lower or less available position

in their response hierarchies than do dominant subjects.<sup>13</sup> Therefore, when a submissive subject is evaluated he will be less inclined to emit the dominant type responses which are characteristic of high performance at the task. His performance should therefore be better in the case where he is not evaluated.

The difference in performance at the task are best illustrated in Figure 1 below where the content of each cell is the mean performance (mutual trips) of the groups and treatments indicated. If the dominant or dispatcher position contains a dominant person, one

FIGURE 1

EXPERIMENTAL SITUATIONS 1 THROUGH 4

Dispatcher Position is:

		Evaluated	Not Evaluated
Dispatcher Position Contains	High Dominant Person	Situation 1	Situation 2
	Low Dominant Person	Situation 4	Situation 3

can expect that he will perform better when evaluated (Situation 1) than when not evaluated (Situation 2). Therefore, with reference to the diagram, the first hypothesis can be stated as follows:

Hypothesis 1 Performance shown in Situation 1 should be significantly greater than that shown for Situation 2.



If the dispatcher position contains a submissive person one can expect that he will perform better when not evaluated (Situation 3) than when evaluated (Situation 4). Therefore, the second hypothesis can be stated as follows:

Hypothesis 2 Performance shown for Situation 3 should be significantly greater than that shown for Situation 4.

In the above diagram only individuals in the dominant or dispatcher position of the task are evaluated. These individuals will therefore experience a sense of individuation greater than for the case where both parties to the task are evaluated. Since the hypothesis proposes that individuation increases evaluation apprehension we should notice differences in task performance when one person is evaluated as compared with the case where both people are evaluated. We can therefore propose the situations shown in Figure 2.

FIGURE 2  
EXPERIMENTAL SITUATIONS 5 AND 6

		Both Positions Evaluated
		Dominant Position Contains
	Low Dominant Person	6

Comparing Situation 5 above with Situation 1 of the previous figure one can see a difference in individuation. The person in the dominant position in Situation 1 is more individuated since he is the only one in that group being evaluated; he should therefore perform better than the person in Situation 5. However, since Situation 5 involves evaluation while Situation 2 involves no evaluation one should also expect the individual in Situation 5 to perform better than the individual in Situation 2. The hypothesis can therefore be stated in the following way:

Hypothesis 3    Performance shown in Situation 5 should be significantly less than that in Situation 1 but greater than that in Situation 2.

Comparing Situation 6 with Situation 4 it can be seen that the individual in the dominant position in Situation 4 is more individuated since he is the only one in that group being evaluated. Since individuation increases evaluation apprehension and since a submissive person exhibits decreased performance at the task when being evaluated, individuals in Situation 4 will perform worse than those in Situation 6. However, since Situation 6 does involve evaluation one can expect people in this situation to perform worse than those in Situation 3. The final hypothesis can therefore be expressed as follows:

Hypothesis 4    Performance in Situation 6 should be significantly greater than that in Situation 4 but less than that in Situation 3.

#### The Instrument

Up to this point the words dominant and submissive have been used without describing how these categories are established. Dominance

refers to the subject's score on the Dominance (Do) scale of the California Psychological Inventory (C.P.I.). The C.P.I. consists of a series of eighteen different scales each of which measures a separate dimension of an individual's personality. The Do scale was designed to "... Assess factors of leadership ability, dominance, persistence and social initiative."<sup>14</sup> According to Gough, high scorers tend to be seen as:

Aggressive, confident, persistent, and planful; as being persuasive and verbally fluent; as self-reliant and independent; and as having leadership potential and initiative.

On the other hand, low scorers are viewed as:

Retiring, inhibited, commonplace, indifferent, silent and unassuming; as being slow in thought and action; as avoiding of situations of tension and decision; and as lacking in self confidence.<sup>15</sup>

Reliability for the Do scale has been established using the test-retest method with groups of high school students and prison inmates. The results of these studies show correlation coefficients of +.72 for high school females (n = 125), +.64 for high school males (n = 101) and +.80 for male prison inmates (n = 200).<sup>16</sup> The period between test administrations varied from 7 to 21 days for the prison inmates while in the case of high school students it was held constant at one year. Reliability in the case of prison inmates is as high as those generally found in personality measurement. The lower values shown for high school students reflect the differing rates of maturation during the year between testings.<sup>17</sup>

The validity information available for the Do scale falls into two categories: criterion-oriented or predictive validity and con-

struct validity. Assessments of predictive validity were made using medical students ( $n = 70$ ) and military officers ( $n = 100$ ). The students, applicants to the University of California Medical School, were given ratings of "dominance" by staff individuals. These ratings correlated  $+0.48$  with scores on the Do scale. The military officers were rated for "dominance" in a similar manner; these ratings correlated  $+0.40$  with scores on the Do scale. Construct validity was established using groups of high school students that were previously designated as "most" or "least" dominant by their principals. The "most dominant" group of males attained significantly higher scores on the Do scale ( $p < .01$ ) than the "least dominant" group ( $\bar{x} = 28.00$  vs  $\bar{x} = 21.58$ ).<sup>18</sup> In another study by Gough (1969), Do scores were obtained for high school students nominated as "leaders" ( $n = 90$ ). These scores were found to be significantly higher ( $p = .01$ ) than those obtained for a total sample of high school students ( $n = 1,532$ ).<sup>19</sup> Finally, a study by Megargee, Bogart and Anderson (1966) obtained direct behavioral validation of the Do scale. The authors had pairs of subjects participate in a simulated industrial task under two sets of instructions. When instructions stressed a task solution to the problem, leadership (the assumption of initiative) was uncorrelated with dominance scores of the participants. When the evaluation of leadership was stressed in the instructions, initiative was assumed by subjects scoring higher in dominance in 18 of the 20 pairings.<sup>20</sup>

Aside from the fact that extensive reliability and validity information has been gathered for the Do scale, the greatest reason for its use in this experiment is the fact that it has been success-

fully employed in a similar experiment utilizing the same task. Recall, Smelser discovered that when dominant subjects were assigned to the dispatcher position of the task they performed better than when submissive subjects were assigned to the same position.<sup>21</sup> Smelser distinguished dominant from submissive subjects using scores on the Do scale of the C.P.I. His group mean was 28.5 (S.D. = 6.5) and he defined a subject as dominant if he scored 34 or above and as submissive if he scored 23 or below.<sup>22</sup> In effect, Smelser defined the ranges of dominance and submissiveness as  $\bar{x} \pm .85\sigma$ . This same criterion will be retained for determining the difference between dominant and submissive subjects.

In addition to the Dominance (Do) scale subjects will also be given the Sociability (Sy) scale of the C.P.I. Although the administration of this scale is not necessary for the conduct of the experiment there are other reasons for its use. It would be "bad form" to administer only one scale of an inventory; this might enable a subject to see the pattern of questions. For this reason, Sy statements will be used to separate Do statements in the questionnaire. Also, Gough expects that Do and Sy scales would relate to supervisory effectiveness.<sup>23</sup> If this is true it would be interesting to compare the performance of subjects with both their Do and Sy scores.

The purpose for the development of the Sy scale was "... to identify persons of outgoing, sociable, participative temperament".<sup>24</sup> Individuals scoring high tend to be seen as:

Outgoing, enterprising and ingenious; as being competitive and forward; and as original and fluent in thought.

Individuals scoring low tend to be viewed as:

Awkward, conventional, quiet, submissive and unassuming; as being detached and passive in attitude; and as being suggestible and overly influenced by others' reactions and opinions.<sup>25</sup>

Reliability information for the Sy scale is similar to that for the Do scale. Test-retest reliability data was obtained from high school students and prison inmates. Results show correlation coefficients of +.71 for high school females (n = 125), +.68 for high school males (n = 101) and +.84 for prison inmates (n = 200). Again, the retest period was one year for the students and between 7 and 21 days for the prison inmates. Higher scores for the inmates are attributed to the fact that their level of maturity was higher than that of the high school students.<sup>26</sup>

Available validity information for the Sy scale is of the construct type. High school principals were asked to nominate students who were "most" and "least" participative. The socially active students scored significantly higher ( $p < .01$ ) on the Sy scale than the socially inactive students ( $\bar{x} = 25.40$  vs  $\bar{x} = 20.96$  in the case of the males). In another comparison principals nominated students they believed to be "most popular". These students scored significantly higher ( $p < .01$ ) than a group of unselected students ( $\bar{x} = 24.00$  vs  $\bar{x} = 21.45$  in the case of males).<sup>27</sup>

In order to assure the fact that two Do scale items do not appear together in the questionnaire, 16 additional statements are needed. These 16 statements can be selected at random from the 40 item Good

Impression (Gi) scale. Aside from filling space, Gi items might provide a clue in determining if someone is attempting to lie on the questionnaire. Since very high scores on the Gi raise the possibility of test "faking", these items can be examined when faking is suspected.<sup>28</sup>

### Importance of the Hypothesis

The hypotheses developed earlier refer to the effect of evaluation upon the socialization of an individual into a formal role. Since evaluation is something which can be controlled, what is really being investigated is a method of improving the socialization process, specifically, the presence or absence of evaluation. The ability to influence the socialization process can have an important impact in many fields particularly those of business and education.

In most organizations the socialization process, whether formal or informal, involves a cost. Obviously, speeding the process would have the effect of reducing such cost. This cost can be viewed in many ways; actual cash expenditures, time, efficiency and turnover. If socialization can be brought about more quickly the cost of training programs as well as the time spent by individuals in such programs could be reduced. In addition, since the individual can be socialized more quickly, the probability that he will commit errors of judgement will be appropriately and perhaps significantly reduced. Finally increasing the speed of socialization will cause individuals to be less inclined to leave the organization due to dissatisfaction with their progress.

Aside from the more immediate cost savings, increasing the rate of socialization may have far reaching effects. In the previous chapter Berlew and Hall showed a positive correlation between meeting high initial performance expectations and ultimate success in an organization.<sup>29</sup> Speeding the socialization process can increase the probability of meeting these high expectations and thereby effect the ultimate success of an individual in an organization.

The advantages of examining the effect of evaluation on behavior patterns are more obvious in specific applications. One such application involves the relationship of evaluation apprehension to current college grading systems. There is good reason to suspect that the conventional grading system (A, B, C, D and F) tends to result in higher evaluation apprehension than a pass-fail grading system. Performance under a conventional system can be evaluated to a much greater degree because there are more possible categories. Steiner points out that "... instructions to outproduce rivals and the prospect of receiving an attractive reward for their proficiency or a noxious punishment for their inefficiency ..." are arousal producing circumstances for the individual.<sup>30</sup> Since grades can qualify as rewards and punishments and are used to compare the performance of individual students, the evaluative aspect of a conventional grading system can be viewed as much higher than that of a pass-fail system.

If the above is the case, perhaps the students who come from strong academic backgrounds and have learned appropriate academic behavior should be graded using a conventional system. Here, the proper behavior patterns (good learning and study habits) are in the



more dominant positions and greater evaluation apprehension will cause them to be enhanced. If, on the other hand, students come from poor academic backgrounds or give indications that they have not learned the appropriate behavior for an academic environment, perhaps their initial grading should be on a pass-fail basis. In this case, reduced evaluation apprehension would decrease the probability that dominant or inappropriate response patterns will be exhibited.

A similar case arises when one considers the employment of disadvantaged workers or individuals who have never learned suitable behavior patterns for a work situation. If these individuals are initially subjected to strong performance evaluation, previous inappropriate behavior patterns can result. If, however, evaluation is minimized or even eliminated for a period of time, it will increase the probability that the desired behavior will result.

An interesting study relating to behavior patterns and socialization was conducted by Denhardt (1968).<sup>31</sup> He points out that various subcultures may possess a firmly entrenched system of values which are largely antithetical to those required for functioning in a bureaucratic organization. His results indicate that socialization can be better accomplished if an organization operates in a nonbureaucratic mode during a specific transition period. This nonbureaucratic mode involves abandoning the supervisor-subordinate relationship for one of bargaining among relative equals. Here, therefore, is a case where socialization was better accomplished by reducing evaluation apprehension for disadvantaged workers.

A similar pattern emerges in a study by Friedlander and Greenberg.<sup>32</sup> The authors surveyed 478 hard-core unemployed individuals who had completed a training and orientation program. The only item they found which correlated with job effectiveness was the degree to which the organizational climate was viewed by the employee as supportive. Employees who saw their climate as supportive tended to be rated more favorably by their supervisors in terms of effectiveness and work behavior. Again, it is possible to show that disadvantaged employees can be more effectively socialized when the environment is low in evaluation apprehension.

## References

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- <sup>9</sup>Henchy and Glass, "Evaluation Apprehension," p. 452.
- <sup>10</sup>Steiner, Group Productivity, p. 134.
- <sup>11</sup>Smelser, "Dominance in Achievement," p. 539.
- <sup>12</sup>Berkowitz, "Personality and Group Position," p. 211.
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- <sup>14</sup>H. G. Gough, Manual for the California Psychological Inventory (Palo Alto, Calif.: Consulting Psychologists Press, 1957), p. 5.
- <sup>15</sup>Ibid.
- <sup>16</sup>Ibid., 19.
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<sup>19</sup>H. G. Gough, "A Leadership Index on the California Psychological Inventory," Journal of Consulting Psychology, 16, No. 4 (1969), 286.

<sup>20</sup>E. I. Megargee, P. Bogart, and B. J. Anderson, "Prediction of Leadership in a Simulated Industrial Task," Journal of Applied Psychology, 50 (1966), 292.

<sup>21</sup>Smelser, "Dominance in Achievement," p. 539.

<sup>22</sup>Ibid., 538.

<sup>23</sup>Gough, Manual, p. 26.

<sup>24</sup>Ibid., 10.

<sup>25</sup>Ibid.

<sup>26</sup>Ibid., 19.

<sup>27</sup>Ibid., 20.

<sup>28</sup>Ibid., 16.

<sup>29</sup>David E. Berlew and Douglas T. Hall, "The Socialization of Managers: Effects of Expectations on Performance," Administrative Science Quarterly, 11 (Sept., 1966), 215.

<sup>30</sup>Steiner, Group Productivity, p. 133.

<sup>31</sup>Robert B. Denhardt, "Bureaucratic Socialization and Organizational Accommodation," Administrative Science Quarterly, 13 (1968), 449.

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## C H A P T E R   I V

### METHODOLOGY

#### Experimental Materials

In order to screen potential subjects for the experiment an instrument or test was developed. The test is shown in Appendix I and was taken from the California Psychological Inventory (C.P.I.) as described in the previous chapter. The even numbered items in the instrument are the Dominance or Do scale of the C.P.I. Question numbers 7, 13, 19, 22, 25, 31, 37, 43, 49, 55, 61, 67, 73, 79, 85, and 91 are sixteen scale items taken from the Good Impression or Gi scale. The remaining odd numbered items belong to the Sociability or Sy scale of the C.P.I. In addition, item numbers 8, 18, 28, and 36 are common to both the Do and the Sy scales and item number 22 is common to both the Do and the Gi scales. The test consists of ninety three items and was designed to be completed in ten minutes or less. It is of the expendable type; that is, subjects are requested to answer each item directly on the question sheet itself. While this makes the test more difficult to score than those with a separate answer sheet, administration is quicker and less complicated.

The model railroad task used for the experiment was fabricated from Atlas H. O. model equipment. The actual arrangement of tracks and controls is shown in the Appendix II diagram. The main track was six feet in diameter and had two bypass sidings which enabled the train to enter and leave the main track. The track was composed

of six electrically distinct sections (1-6) which were wired separately. Power to these sections came from switches on the left hand side of each control panel. Both the track sections and the switches were plainly numbered. If a subject wished to deliver power to a specific section of track he pushed the switch corresponding to that section of track. Power could be delivered to any section of track from either control panel; however, the switches were wired such that if the same switch was "on" in both panels, no power was delivered to that section of track.

The center portion of each control panel contained an Ampack model 402 H. O. train control pack. Contained in the pack was a rheostat for controlling the speed of the train, a reverse switch for changing the direction of the train and an on-off power switch. The output of each pack was either direct current for the operation of the trains or alternating current for the operation of the accessories including the track switches or turnouts. There were four such turnouts which controlled access to the two bypass sidings. The turnouts were marked with letters (a-d) corresponding to four switches located on the right hand side of each panel. These were slide switches and required the operator to move a slide and then push it down before the turnout would change its direction. Either subject could change the position of any turnout at any time. In addition, the turnouts were wired such that, regardless of the position of either of the corresponding slide switches or the position of the turnout, when the slide was moved to the left the turnout assumed a position to allow the train to move along the outer sections of track (main track).

Each train used in the experiment consisted of an engine only. Indicators on the top of each engine designated it as either the yellow or the red train. The appropriate path of each train was marked next to each unit of track with either a red or yellow line. The path for the yellow train was along sections 2, 4, 6, and 1; the path for the red train was along sections 3, 4, 5, and 1. Both trains could properly use sections 4 and 1, therefore, these sections were marked with both a yellow and a red line.

Points were scored when the subjects made complete trips with each train around its prescribed path. If either the red or yellow train made a complete trip, one point was scored; however to score more points, the number of trips by the red train had to equal the number of trips by the yellow train. For example, if the red train made 5 trips and the yellow made only 3 trips, the subjects would receive 3 points for the yellow train but only 3 points for the red, for a total of 6 points for that trial. In effect, only mutual trips counted for points. A wreck or derailment was penalized by deducting 5 points for each occurrence.

Both trains were run in a clockwise direction around the track which represents a slight change from the way the task was run by Smelser as discussed in the previous chapter. This was necessary due to changes in model railroad equipment which have occurred since this task was last used some fifteen years ago. If the trains were run in opposite directions, as Smelser did,<sup>1</sup> it would have been possible to run them correctly without having to switch the turnouts. Since

switching was an important part of the task it was decided to make the necessary procedural modifications.

In situations where the subject or subjects were evaluated, their performance was recorded using a video tape machine. The machine was a console type equipped with a camera and tripod, recorder unit, microphone and video monitor. The camera contained a wide angle lens which enabled it to be placed within five feet of the subject to be evaluated. When the machine was turned "on" the monitor displayed a picture regardless of whether the recorder was "on" or "off". Two digital display devices were placed within the camera's field of view such that both the subject(s) and the display devices were shown on the monitor and recorded. The devices were each capable of displaying three single digit numbers. When the subjects scored a complete trip on the yellow train it was recorded on the upper display; a complete trip on the red was shown on the lower display. Therefore, when one viewed the monitor it was possible to examine the actions of the subject(s) as well as the progress that had been made in terms of completed trips. The display devices were operated by the experimenter by means of remote controls from his position about five feet away from the subjects.

During the conduct of the experiment the time was kept by means of a stopwatch. The watch was attached to the experimenter's clipboard so that it was visible to the subjects; however, they were not able to read the watch during the experiment. Throughout the experiment the experimenter recorded the number of trips and made additional notes. He also kept track of the number of commands given



by the dispatcher using a small silent hand counter. When a subject or subjects were evaluated, the experimenter was located within their field of vision. In the case where no evaluation occurred he assumed a low profile, located himself behind the subjects and attempted to project a non-evaluative role. In all cases the experimenter signaled the beginning of each trial with "ready...begin" and three minutes later told subjects to "stop".

### Procedure

Subjects were recruited from classes during the Spring and Summer semesters, 1973 at the School of Business Administration of the University of Massachusetts at Amherst. Subjects used in situations 1 and 2 were drawn from students enrolled in S.B.A. 751, Organization Theory; those used in situations 3 and 4 were drawn from students enrolled in Management 201, Principles of Management. Subjects used in situations 5 and 6 were drawn from students enrolled in undergraduate summer courses. In the case of S.B.A. 751 students, participants were permitted to write journal papers describing their experiences during the experiment. These papers were then accepted by the instructor as one method of fulfilling a portion of the course requirement. All other subjects were paid \$3.00 for their participation in the experiment.

The typical method of recruiting subjects was for the experimenter to arrange with an instructor to be present at the beginning of his class session. After the experimenter was introduced to the class, he instructed the students using a memorized version of the

"Instructions to Potential Subjects" which appears in Appendix III. The test was then distributed and the experimenter waited in the classroom until everyone had an opportunity to complete the test. Individuals were encouraged to take the test even though they did not wish to participate in the experiment. The experimenter explained that he would score all tests and discuss the results with anyone regardless of their participation in the experiment. The entire process took between ten and fifteen minutes and approximately 90% of all students completed the test.

When all classes were surveyed the tests were scored. While the test instructions stated that it was not necessary to answer all questions, those tests with more than 15% of the questions unanswered were eliminated from the sample. These cases usually exhibited extremely low scores on all three scales. In addition, all female participants were eliminated from the sample. This was done because only male subjects were sought for the experiment in an attempt to reduce within group variance. The results of all samples which remained are shown in Table 2.

Of the students who completed the questionnaire, 42% indicated that they did not wish to participate in the experiment. The scores of these individuals were included in the calculation of means and standard deviations shown in Table 2 and Table 3. Aside from this, these subjects were not contacted for any further participation in the experiment. Five of these subjects contacted the experimenter to obtain their scores on the scales. They were given their results and a brief explanation of the meaning of the scores.

TABLE 2

MEAN AND STANDARD DEVIATION OF DOMINANCE,  
SOCIABILITY AND GOOD IMPRESSION SCORES FOR  
ALL MALES SURVEYED

	<u>Situations 1.2</u>	<u>Situations 3.4</u>	<u>Situations 5.6</u>
Sample Size	72	148	83
Dominance (mean)	28.55	27.55	29.00
S.D.	6.83	5.67	5.58
Sociability (mean)	25.21	24.70	24.30
S.D.	5.10	4.70	4.65
Good Impression (mean)	6.54	6.41	6.05
S.D.	2.47	2.98	2.78

Statistical tests were performed on the above data testing the hypothesis that the means for each scale were equal ( $H_0: U_{1,2} = U_{3,4} = U_{5,6}$ ). The F values were as follows: Dominance  $F = 1.74$ , Sociability  $F = 1.68$ , and Good Impression  $F = 0.70$ . The critical value for  $F_{3,300}^2 = 3.00$  at  $p = .05$ . Since  $F_c > F$  for the three previous cases we accept  $H_0$  and state that the means are equal for each scale. Therefore, the data can be combined as shown below:

TABLE 3

MEAN AND STANDARD DEVIATION OF  
COMBINED DOMINANCE, SOCIABILITY  
AND GOOD IMPRESSION SCORES FOR  
ALL MALES SURVEYED

	<u>Dominance</u>	<u>Sociability</u>	<u>Good Impression</u>
Mean	28.18	24.71	6.34
S.D.	5.96	4.78	2.81
Sample Size = 303			

After the tests were scored subjects were divided into dominant and submissive categories. As mentioned in the previous chapter, these categories were defined using the same criterion used by Smelser; that is  $\bar{x} \pm .85\sigma$ .<sup>2</sup> Since, in the case of Dominance scales  $\bar{x} = 28.18$  and  $\sigma = 5.96$  then  $\pm .85\sigma = 23.12$  and  $33.24$ . Therefore, a person scoring 23 or below was designated as submissive and someone scoring 33 or above was designated as dominant. In Smelser's case subjects scoring 23 or below were defined as submissive and those scoring 34 or above were defined as dominant.<sup>3</sup> Individuals scoring between 23 and 33 were excluded as subjects from the experiment.

After subjects were divided into categories an attempt was made to schedule their appearance in the laboratory. Subjects scoring above 11 on the modified Good Impression scale were not contacted for participation. This criterion was arbitrarily set in an effort to eliminate individuals who were attempting to appear as ideal subjects. It was felt that this type of attitude might distort the experimental results. Individuals were contacted by telephone in the evening to determine the times during the week when they were available to come to the laboratory. When a common time was found for both a dominant and a submissive individual, which also corresponded to the available laboratory hours, an appointment was made. Subjects were also contacted the evening before their scheduled appointment to remind them of the experiment the following day.

During the scheduling process an effort was made to pair subjects who were approximately the same age and who were unacquainted with each other. The ages used were those given by the subjects themselves on

the test. To determine if the subjects knew each other, they were given the name of their partner in advance and then asked if they were acquainted. If there was any possibility of friendship the pairing was changed.

The following day the experimenter set up all equipment in the laboratory before the subjects arrived. The laboratory was a medium sized classroom with moveable chairs and tables. The experimental material was set up in one corner of the room so that the subjects, with the trains in front of them, faced toward an empty wall. The subjects sat in two chairs arranged side by side; it was necessary for the dispatcher to sit in the chair on the left. When the first subject arrived the experimenter introduced himself in order to determine the subject's name. Having determined his name the experimenter, in an unobvious way, caused the subject to be seated in the proper chair. When the second subject arrived the individuals were introduced in order to verify the fact that they were unacquainted. The second subject then occupied the remaining chair.

When both subjects were seated the experimenter handed each one an envelope containing three dollars. This was payment for their participation in the experiment. It was understood that the money was now the property of the subjects and was to be kept regardless of the outcome of the experiment, even if it became necessary to cancel the experiment. The experimenter then explained the purpose of the experiment and gave the subjects instructions on how to operate the trains. The actual instructions appear in Appendix IV "Instructions to Subjects". In the case where individuals were to be evaluated the

experimenter explained the presence of the video tape equipment by using "Instructions to Subjects Being Evaluated" which appears in Appendix V. They were then asked to face the camera and give their name, class and major field. This was then played back on the television monitor to demonstrate to the subjects that the recording device was working. The experimenter then answered all questions posed by the subjects and allowed the participants three minutes to discuss the operation of the trains among themselves; the experiment was then started.

The experiment consisted of 8 trials of three minutes duration. During each trial the experimenter monitored the time remaining and recorded the number of trips completed as well as the number of direct commands given. For the purposes of the experiment, a direct command was considered as any expressed direction given by the subject occupying the dispatcher position to the other subject. The word "direct" should be emphasized because any implied direction was not counted as a command. For example, a phrase such as "move the yellow train" would constitute a command while one such as "maybe the yellow train should be moved" would not count as a command. Also, any expressed direction given to the person occupying the dispatcher position by the other subject was not counted as a command. In effect, only the number of direct orders given by the dispatcher was counted.

In the case of an equipment failure the experimenter took time out, repaired the difficulty and resumed the experiment as though the failure never occurred. During all trials conducted this became necessary eleven times. In all cases except one the difficulty was

repaired within one minute. In the remaining case it was necessary to cancel the experiment; the subjects were excused and not used again. The data collected up until that point was discarded. In another case an experiment had to be terminated when the threat of a bomb necessitated the evacuation of the building. Again the data was discarded and the subjects not used again. In a situation where trains were either wrecked or derailed a time out was also taken. In this case the trains were replaced and the experiment resumed; however, five points were deducted from the subjects' score as a penalty for the wreck.

With the exception of the time outs described above, each series of trials continued from start to finish without a delay. Subjects were free to discuss the operation of the trains among themselves both during the trials and during the one minute break between trials. The experimenter, however, would not answer any questions pertaining to the operation of the trains once the trials had begun. When all 8 trials had ended the subjects were asked to complete a short questionnaire relating to the experiment. When subjects were not evaluated the questionnaire was as follows:

- 1) Do you have any complaints about the experiment?
- 2) Do you feel that the time factor caused you to rush?
- 3) Do you feel that you did the best you could on the task?
- 4) Did conditions of the experiment cause you to feel uneasy?

In the case of evaluated subjects the questionnaire was as follows:

- 1) Do you have any complaints about the experiment?
- 2) Do you feel that the time factor caused you to rush?
- 3) Do you feel that you did the best you could in the task?
- 4) Did the presence of the camera bother you or make you feel uneasy?
- 5) Would you rather that nobody else see this tape?

At the conclusion of each experiment the experimenter held a discussion with both subjects. During that time he gave the subjects feedback of how well they scored compared to other groups. He also discussed at some length the positive as well as negative aspects of the way the subjects organized themselves during the operation of the trains. The purpose of the discussion was to make the experiment a learning experience for the subjects. During this discussion the experimenter cautioned the subjects not to discuss the experiment with others in any way but very general terms as this would invalidate the data and destroy the experiment as a learning experience for future subjects.

The above experimental procedure was repeated thirty times during the study; five times for each one of the "situations" discussed earlier in the section describing the operational hypotheses. Specifically, ten groups of subjects (where the dominant person occupied the dominant or dispatcher position and the submissive person occupied the remaining position) were randomly assigned to treatments; five were evaluated and five were not. In addition, ten groups of subjects (where the submissive person occupied the dominant or dispatcher position and the dominant person occupied the remaining position) were randomly assigned to treatments; five were evaluated and five were not. Finally, ten groups of subjects (where both individuals were evaluated) were randomly assigned to treatments. In five of these treatments the dominant person occupied the dominant or dispatcher position and the submissive person occupied the remaining



position, and in the remaining five the submissive person occupied the dominant or dispatcher position and the dominant person occupied the remaining position.

The sample size of five for each case was determined through an estimate of the experimental effects. Since the sample sizes are equal and equal variances are assumed the test statistic becomes:

$$Z = \frac{(\bar{x}_1 - \bar{x}_2) - (u_1 - u_2)}{\sqrt{\frac{2}{n}}}$$

In the case of an  $\alpha$  error  $(u_1 - u_2) = 0$  and for a  $\beta$  error  $(u_1 - u_2) > 0$ . The experimental effects were estimated as follows:  $(u_1 - u_2) = 20$  and  $\sigma^2 = 400$ . For the case where  $\alpha = .05$  and  $\beta = .15$  two simultaneous equations were solved for  $n$ . The value for  $n$  was determined to be 5.38 and rounded off to 5.

## References

<sup>1</sup>William T. Smelser, "Dominance as a Factor in Achievement and Perception in Cooperative Problem Solving Interactions," Journal of Abnormal and Social Psychology, 62, (1961), 539.

<sup>2</sup>Ibid.

<sup>3</sup>Ibid.

C H A P T E R V  
ANALYSIS AND RESULTS

Experimental Measures

There are basically four types of measures used in this experiment: scores on personality scales of the California Psychological Inventory (C.P.I.), performance on the task in terms of mutually complete trips, the number of verbal commands given by the dispatcher in each trial and the ages of the individuals participating in the experiment. With regard to the C.P.I. scales, they will be treated as interval scales. In doing this an assumption is being made that the distance between any two numbers on the scale is of known size.<sup>1</sup> While this has become common practice in the behavioral sciences, little has been offered to warrant making the assumption. Some justification has been given by pointing to the fact that any positively scored answer in the scale is exactly equivalent to any other positively scored answer. Since this has not been proven, however, this amounts to exchanging one assumption for another untested assumption.<sup>2</sup> With respect to the other measures used (complete trips, number of commands and ages of subjects) these are clearly ratio scale items. The distances between any two numbers on the scale are of known size and, in addition, each scale has a true zero point at its origin.<sup>3</sup>

The analysis of data for this experiment will require that groups of measures be compared and tested for significance. Since

parametric tests will be used in this analysis, an examination of the assumption underlying these tests should be made. In order to use the "t" test, observations must be independent. According to Siegel, if observations are independent "... the selection of any one case from the population for inclusion in the sample must not bias the chances of any other case for inclusion, and the score which is assigned to any case must not bias the score which is assigned to any other case."<sup>4</sup> Since a comparison is being made between the performance of dominant individuals under two separate conditions (situations 1, 2, and 5) and of submissive individuals under two separate conditions, (situations 3, 4, and 6) there is no reason to believe that measures will involve dependence; therefore, it will be assumed that the data meet the conditions of independence.

A second requirement for the use of a "t" test is that data must be drawn from a population which is normally distributed. This requirement, however, is not a strict one. Mendenhall states that "... it can be shown that the distribution of the "t" statistic is relatively stable for populations which are non-normal but possess a mound-shaped probability distribution."<sup>5</sup> For the case of C.P.I. scales it can be shown that scores are nearly normally distributed. The standard scores for each C.P.I. scale show heavy concentrations about the mean with significant reductions as the extreme scores are approached.<sup>6</sup> Other measures used in the experiment would appear to also exhibit at least a mound-shaped if not normal distribution. While no data are available to confirm this assumption one would expect, based on experience, that these performance measures would

be highly grouped about the mean with decreasing frequency as extreme values are approached.

The final requirement for the use of the "t" test is that populations must have the same variance. Again, it does not appear to be vital that populations have absolute equal variances. Hays and Winkler point out that:

... it is often suggested that a separate test for homogeneity of variance to be carried out before the "t" test itself, in order to see if this assumption were at all reasonable. However, the most modern authorities suggest that this is not really worth the trouble involved. In circumstances where they are needed most (small samples), the tests for homogeneity are poorest. Furthermore, for samples of equal size relatively big differences in the population variances seem to have relatively small consequences for the conclusions derived from a "t" test.<sup>7</sup>

When tests for the equality of variance were conducted using the data described above, all but two comparisons showed no significant difference in variance at the  $p = .05$  level.

#### Examination of Hypotheses

A summary of the data collected in relation to performance (mutually complete trips) and commands appears in Appendix VI. A summary of the mean values for each situation is shown below;  $\bar{x}_t =$  the mean number of mutually complete trips for each case and  $\bar{x}_c =$  the mean number of commands for each case.

FIGURE 3  
 MEAN NUMBER OF COMMANDS AND TRIPS  
 FOR SITUATIONS 1 THROUGH 4

Dispatcher Position is

		Evaluated	Not Evaluated
		Situation 1	Situation 2
High Dominant Person		$\bar{x}_t = 86.2$	$\bar{x}_t = 150.8$
		$\bar{x}_c = 48.8$	$\bar{x}_c = 17.0$
Dispatcher Position Contains		Situation 4	Situation 3
	Low Dominant Person	$\bar{x}_t = 92.0$	$\bar{x}_t = 94.8$
		$\bar{x}_c = 17.8$	$\bar{x}_c = 26.2$

FIGURE 4  
 MEAN NUMBER OF COMMANDS AND TRIPS  
 FOR SITUATIONS 5 AND 6

Both  
Positions  
Evaluated

High Dominant Person	Situation 5	$\bar{x}_t = 108.4$
		$\bar{x}_c = 37.4$
Dispatcher Position Contains	Situation 6	$\bar{x}_t = 99.6$
		$\bar{x}_c = 24.8$

Low  
Dominant  
Person

Hypothesis 1 stated that performance in situation 1 should be significantly greater than for situation 2. Referring to the summary above one can see that the exact opposite is the case, therefore hypothesis 1 must be rejected. Hypothesis 2 predicted that performance in situation 3 would be significantly greater than that for situation 4. While it is greater ( $94.8 > 92.0$ ) there is no significant difference in the means at the  $p = .05$  level ( $t = .08 < t_c = 1.65$ ). Therefore, hypothesis 2 must be rejected. Hypothesis 3 stated that performance in situation 5 should be significantly less than that of situation 1 but significantly greater than that of situation 2. Again, the exact opposite has occurred therefore, hypothesis 3 must be rejected. Finally, hypothesis 4 predicted that performance in situation 6 would be significantly greater than that for situation 4 but significantly less than that for situation 3. While performance in situation 6 is greater than that for situation 4 ( $99.6 > 92.0$ ) there is, again, no significant difference in the means at the  $p = .05$  level ( $t = .21 < t_c = 1.65$ ). In addition, performance in situation 6 is greater than that for situation 3 therefore hypothesis 4 must be rejected.

It is interesting to note that in nearly all cases shown above the direction of prediction was completely reversed. In the two instances where this was not true the means were extremely close and no significance could be found. On the other hand, there does appear to be significant differences in the means shown above. The mean number of trips in situation 2 ( $\bar{x}_t = 150.8$ ) is significantly greater

than the mean number of trips for situation 1 ( $\bar{x}_t = 86.2$ ) at the  $p = .05$  level ( $t = 2.09 > t_c = 1.65$ ). In addition, the mean number of commands in situation 1 ( $\bar{x}_c = 48.8$ ) is significantly greater than the mean number of commands for situation 2 ( $\bar{x}_c = 17.0$ ) at the  $p = .01$  level ( $t = 2.39 > t_c = 2.33$ ). It appears that when a dominant individual occupies the dispatcher position, the presence of evaluation causes a significantly greater ( $p < .01$ ) amount of commands to be given. Also, in this situation, evaluation appears to cause a significant decrease in performance ( $p < .05$ ) as measured by the number of mutual trips completed.

In the situation where the submissive person occupies the dispatcher position (situations 3 and 4) there appears to be a reversal of the above effect. For example, when a submissive person is evaluated there appears to be less commands given than when there is no evaluation ( $17.8 < 26.2$ ). While this difference is not significant at the  $p = .05$  level ( $t = .62 < t_c = 1.65$ ) it is interesting to note that the trends have reversed themselves from those observed in situations 1 and 2. In an analysis of the number of trips, the mean performance for situation 4 ( $\bar{x} = 92.0$ ) is slightly less than that of situation 3 ( $\bar{x} = 94.8$ ). As mentioned earlier, this difference is not significant at the  $p = .05$  level. It appears, however, that in the cases where performance was evaluated (situations 1 and 4) a decrease in the mean number of trips was observed.



Finally, situation 5, where both subjects were evaluated appears to exhibit less of an evaluation effect than when only the dominant individual is evaluated. Performance ( $\bar{x}_t = 108.4$ ) falls between the values for situation 1 ( $\bar{x}_t = 86.2$ ) and situation 2 ( $\bar{x}_t = 150.8$ ). The same is true for commands; the number of commands given for situation 5 ( $\bar{x}_c = 37.4$ ) falls between the values for situation 1 ( $\bar{x}_c = 48.8$ ) and situation 2 ( $\bar{x}_c = 17.0$ ).

The effect of evaluating both individuals demonstrated above in situation 5 is strikingly similar in situation 6. In situation 6, where both subjects are evaluated, the number of commands given ( $\bar{x}_c = 24.8$ ) falls between situation 4 ( $\bar{x}_c = 17.8$ ) and situation 3 ( $\bar{x}_c = 26.2$ ). Apparently, less of an evaluation effect occurs when both subjects are evaluated than when only the submissive subject is evaluated. This is not true for the performance measure in situation 6. However, the mean number of trips ( $\bar{x}_t = 99.6$ ) is so close to those for situation 4 ( $\bar{x}_t = 92.0$ ) and situation 3 ( $\bar{x}_t = 94.8$ ) that the trends might have been the same as the above if the number of trials were increased.

It would appear from the results described in the above paragraphs that in the case of a dominant individual, the effect of evaluating the individual is to increase the number of commands given and to decrease performance. In the case of a submissive individual, the effect of evaluating the individual is to decrease the number of commands (although not significantly so) and to also decrease the level of performance. Finally, the effect of evaluating both

individuals appears to diminish but not eliminate the effect of evaluation observed in other cases.

It might be argued that the above effect could be due to differences in the ages of the subjects. In order to investigate this point the ages of the dominant subjects were compared to those of the submissive subjects. The comparisons, shown in Appendix VII, indicate no significant differences at the  $p = .05$  level for any of the experimental cases.

In addition to the data on ages, an analysis was made of both the Sociability and the modified Good Impression scores of those individuals selected as dominant and those selected as submissive. The results are shown in Appendix VIII. In all groups of cases, subjects who were classified as dominant had significantly ( $p < .01$ ) higher scores on the Sociability scale ( $4.75, 6.32, 8.71 > t_c = 2.33$ ). On the other hand, there was no significant difference ( $p = .05$ ) in Good Impression scores for the same group ( $0.19, 0.17, 0.40 < t_c = 1.65$ ). In effect, individuals classified as dominant also had significantly higher Sociability scores than those classified as submissive while there was no difference in Good Impression scores.

#### Examination of Learning Curves

Since this experiment called for subjects to engage in a series of eight trials at the same task, it is possible to investigate the degree to which their performance improved during the experiment. This was done by constructing learning curves (perhaps socialization

curves would be a more accurate description) for each situation. Each curve shows the trial number (1-8) on the horizontal or X axis and the total achievement (mutual trips) by all subjects in a particular situation on the vertical or Y axis. A computer constructed representation of these curves for each situation appears in Figures 5 through 10.

Some interesting features emerge from these diagrams. Recall that situations 1, 4, 5 and 6 involved evaluation of subjects while no evaluation was performed in situations 2 and 3. Examining the diagrams one can notice a greater uniformity of points in the cases where evaluation occurred. If a least squares fit is drawn through the points on each curve the results are clearer. The data for least squares fit are summarized in Table 4 below:

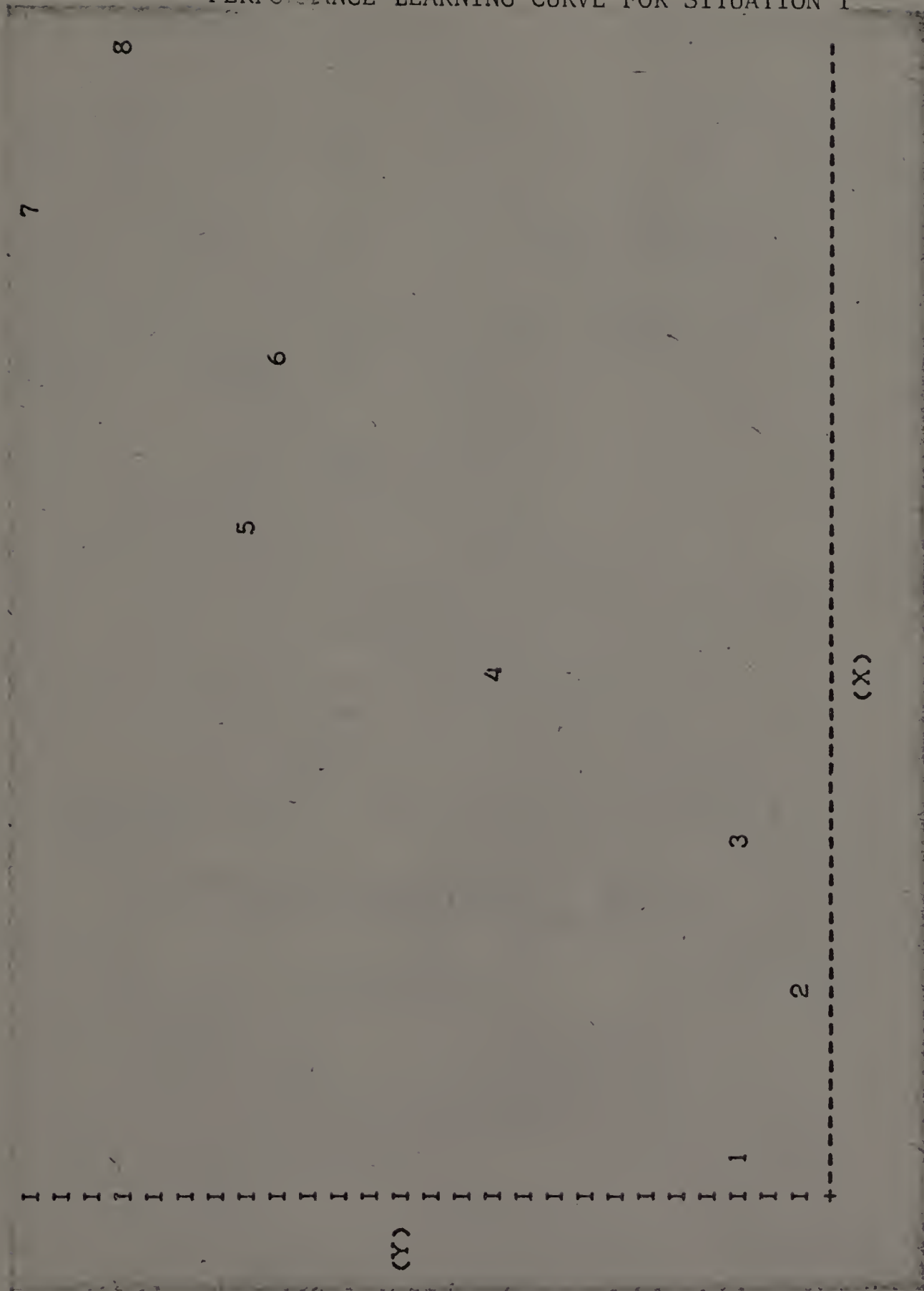
TABLE 4  
REGRESSION DATA FOR ALL SITUATIONS

	<u>Y Intercept</u>	<u>Slope</u>	<u>R<sup>2</sup></u>	<u>Order of Decreasing x<sub>t</sub></u>
Situation 1	-3.6	12.7	.88	6
Situation 2	38.0	12.3	.67	1
Situation 3	17.6	9.3	.58	4
Situation 4	3.0	12.0	.92	5
Situation 5	12.6	12.3	.83	2
Situation 6	10.7	11.5	.86	3

Note that the values for R<sup>2</sup>, a measure of the closeness-of-fit of the regression line, are much higher in situations 1, 4, 5 and 6 where

FIGURE 5

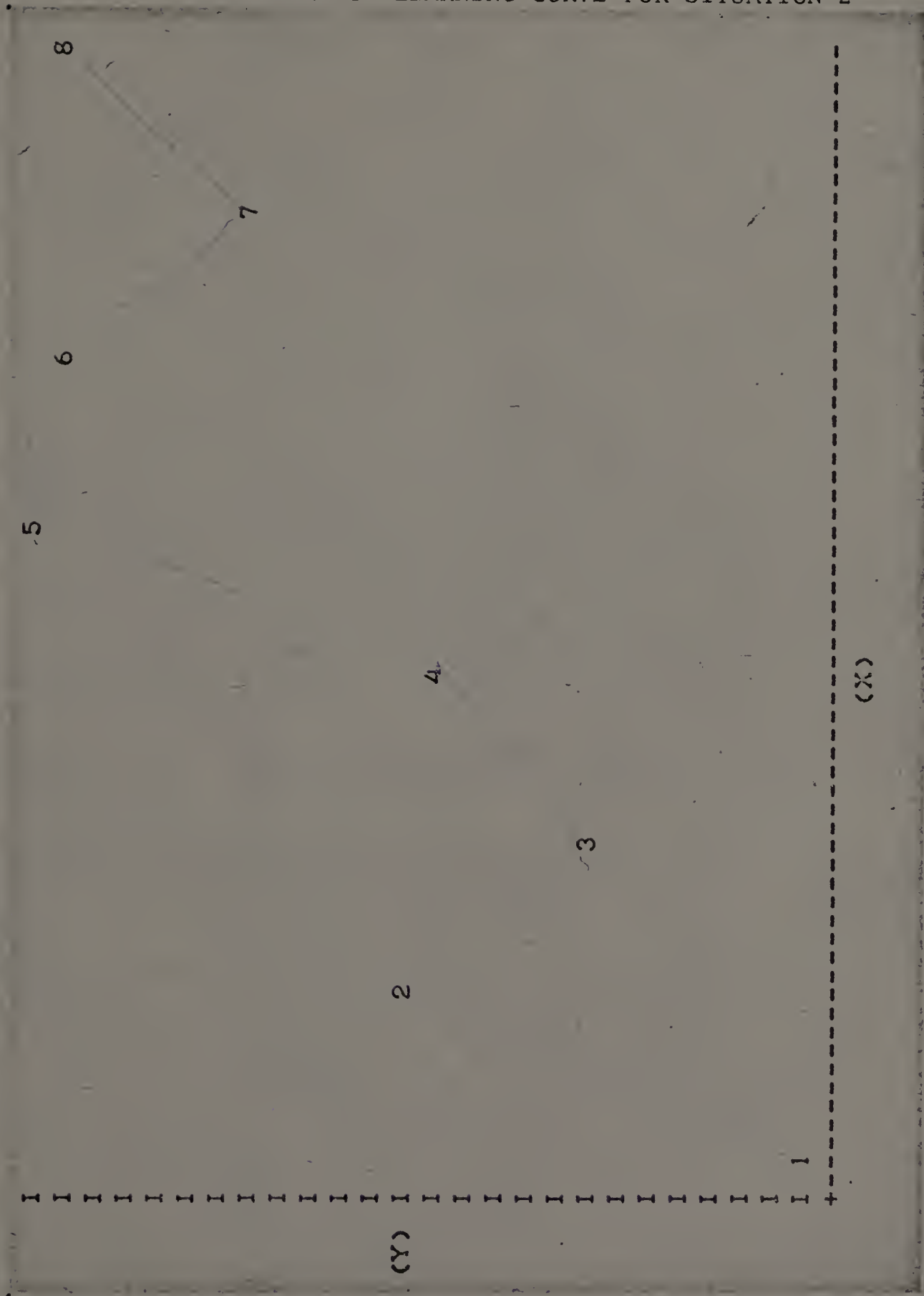
PERFORMANCE LEARNING CURVE FOR SITUATION 1



Mutually  
Complete  
Trips

Trial Number

FIGURE 6  
PERFORMANCE LEARNING CURVE FOR SITUATION 2

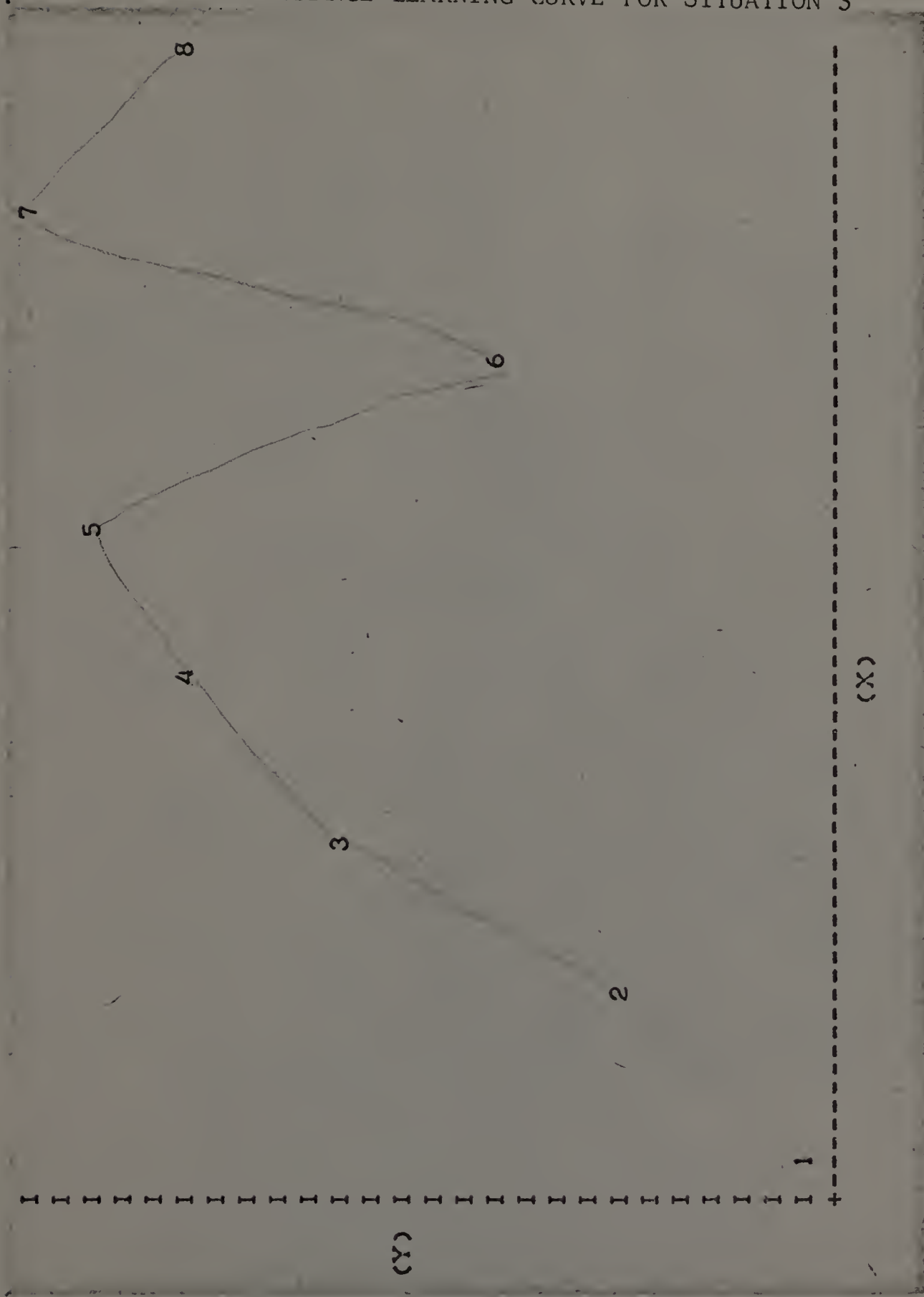


Mutually  
Complete  
Trips

Trial Number

FIGURE 7

PERFORMANCE LEARNING CURVE FOR SITUATION 3

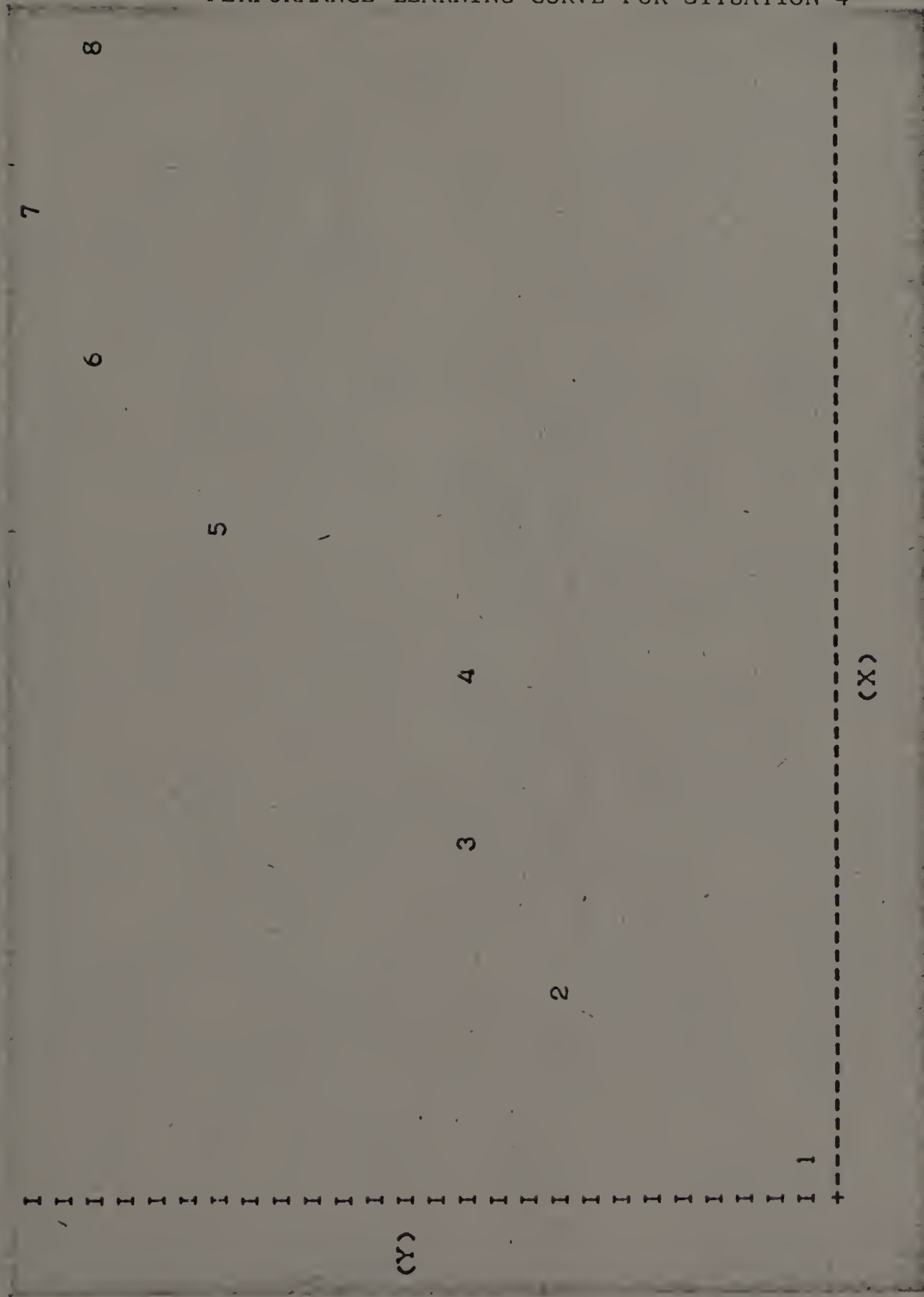


Mutually Complete Trips

Trial Number

FIGURE 8

PERFORMANCE LEARNING CURVE FOR SITUATION 4

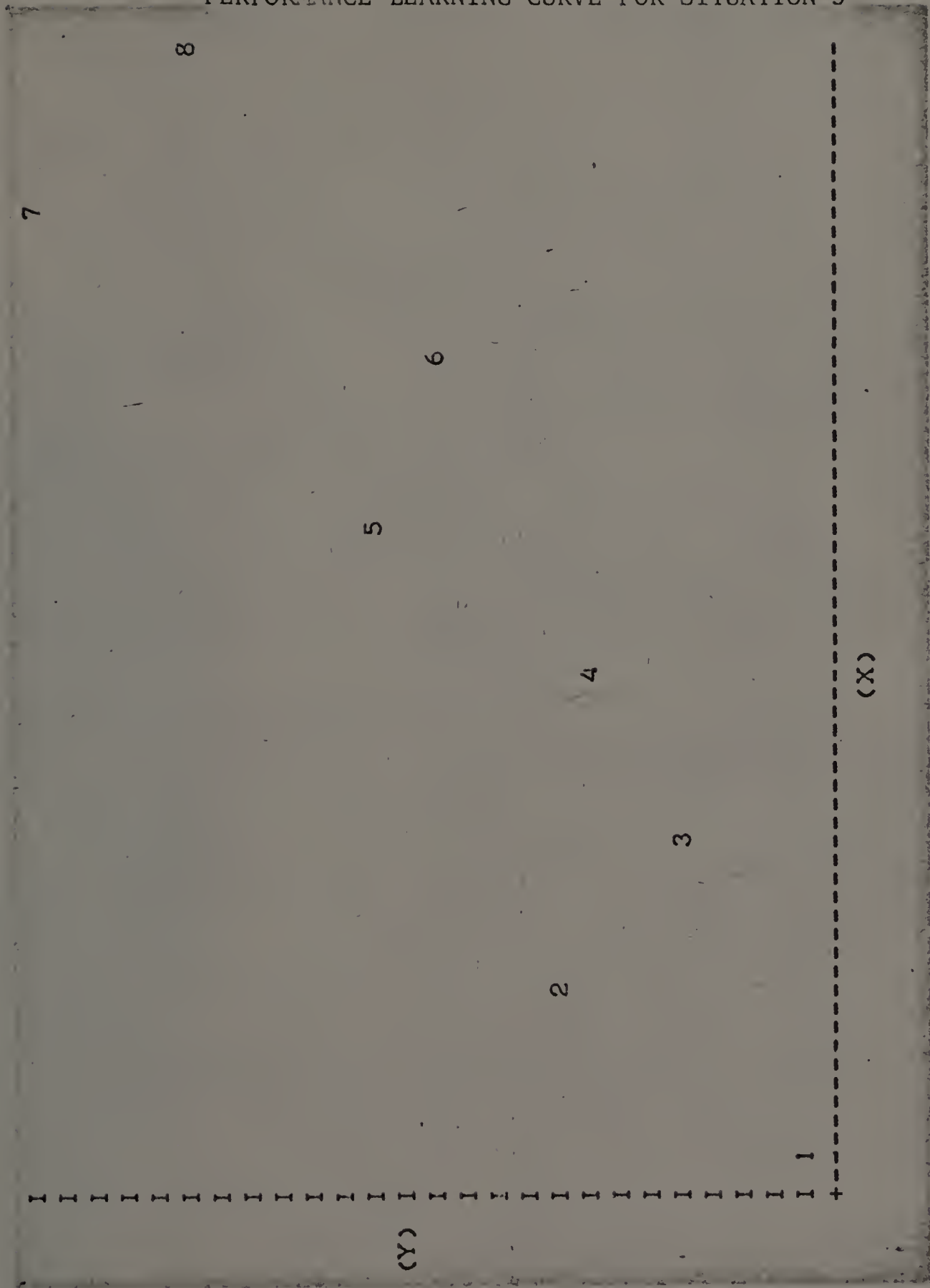


Mutually Complete Trips

Trial Number

FIGURE 9

PERFORMANCE LEARNING CURVE FOR SITUATION 5



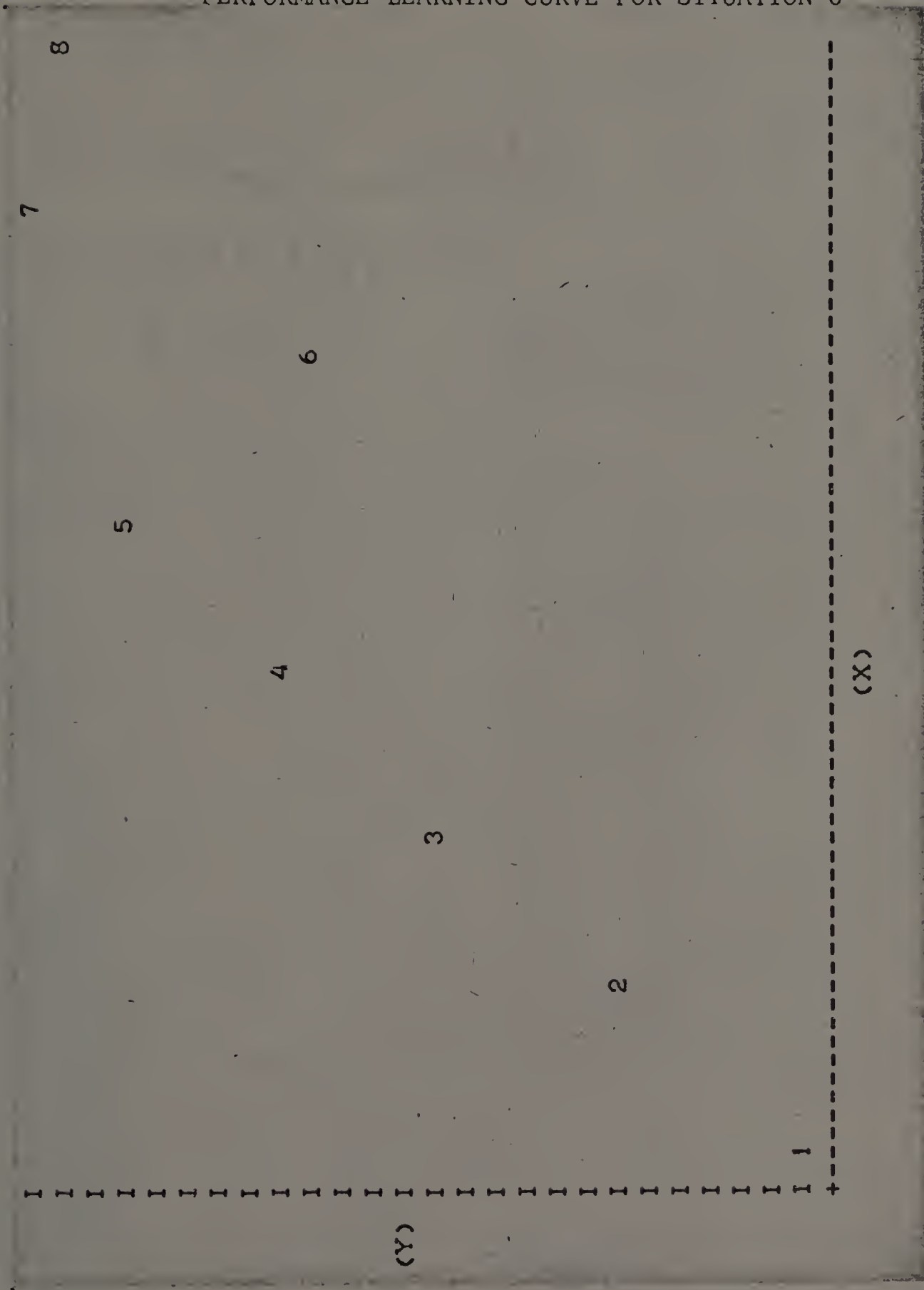
Mutually Complete Trips

Trial Number



FIGURE 10

PERFORMANCE LEARNING CURVE FOR SITUATION 6



Mutually  
Complete  
Trips

Trial Number

evaluation occurred. A greater dispersion about the regression line is shown in situations 2 and 3 where no evaluation occurred. It would appear that the presence of evaluation tends to cause more uniform and therefore more predictable learning on the task.

Another interesting fact is visible in Table 4 above; namely, there does not appear to be a large difference in the slope of the regression line for each situation. Tests were conducted to examine the equality of slope between situations 1 and 2, situations 3 and 4 and situations 5 and 6. The results are shown below:

TABLE 5

## F VALUES FOR EQUALITY OF SLOPE TEST

	<u>Between</u> <u>Situations 1 and 2</u>	<u>Between</u> <u>Situations 3 and 4</u>	<u>Between</u> <u>Situations 5 and 6</u>
Calculated F Value	0.42	1.95	3.44

Since all calculated F values are less than  $F_c = 4.60$ , the null hypothesis at  $p = .05$  must be accepted; that is, the slopes are equal between situations 1 and 2, situations 3 and 4 and situations 5 and 6. Since the major difference between situations 1 and 2 and situations 3 and 4 is the presence and absence of evaluation one can conclude that evaluation does not appear to change the slope or rate of learning on this task. Furthermore, since the major difference between situations 5 and 6 is the exchange of a dominant and submissive individual in the dispatcher role, one may also conclude that such an exchange does not appear to change the rate of learning.

Finally, the last column in Table 4 shows the order of decreasing size for the actual number of trips completed in each case (e.g. less total trips were scored in situation 5 than in situation 1). Note how this order closely parallels the order of decreasing Y intercept values. What appears to have happened is that in situations where subjects had high achievement (more trips), that achievement was not due to a higher rate of learning but rather to a parallel shift upward in the learning curve. In a similar manner, lower achievement was not due to a decreased rate of learning but to a parallel shift downward in the learning curve.

Additional observations. During the course of experimentation, data of a subjective nature were noted which bears mention. While subjects chose different methods of operation, those groups that decided upon simultaneous operation of the trains were characterized by greater enthusiasm for the task which persisted until the end of the experiment. Of the seven groups who operated the trains simultaneously during the last few trials of the experiment, three asked permission to remain after the experiment in an attempt to better their score. Groups which chose not to operate the trains simultaneously never asked to remain and were characterized by greater apparent boredom and a tendency toward decreased performance in the final trials. The reason for this may be due to the fact that simultaneous operation was more difficult and also more rewarding in terms of points. If trains were not operated simultaneously subjects could easily predict the maximum number of trips possible;

when this number was approached, enthusiasm declined. Predicting the maximum number of trips was not possible in the case of simultaneous operation and subjects tended toward exceeding their previous score.

In addition, subjects in the evaluated situations appeared to experience greater apprehension than those who were not evaluated. While this is a subjective observation, evaluated subjects tended to relax more when the camera was off between trials and also tended to express greater relief at the end of the experiment.

## References

<sup>1</sup>Sidney Siegel, Nonparametric Statistics: for the Behavioral Sciences (New York: McGraw Hill, 1956), p. 26.

<sup>2</sup>Ibid., 27.

<sup>3</sup>Ibid., 28.

<sup>4</sup>Ibid., 19.

<sup>5</sup>William Mendenhall, Introduction to Probability and Statistics (Belmont, Calif.: Wadsworth Publishing Company, 1967), p. 192.

<sup>6</sup>H. G. Gough, Manual for the California Psychological Inventory (Palo Alto, Calif.: Consulting Psychologists Press, 1957), p. 38.

<sup>7</sup>William L. Hays and Robert L. Winkler, Statistics: Probability, Inference and Decision (New York: Holt, Rinehart and Winston, 1971), p. 346.

## C H A P T E R VI

### CONCLUSIONS

The preceding experiment was undertaken to investigate the degree to which the social facilitation phenomenon could be generalized, and to attempt to link it to the socialization process. The mechanism of social facilitation causes an individual who experiences evaluation apprehension to tend toward the emission of behavior which is located in a higher or more available position of his response hierarchy. It was felt that if the theory could be extended to include more complicated or higher order types of behavior, this would have implications for the socialization of individuals in organizations. Since dominant individuals perform better at the laboratory task used, it was predicted that the effect of evaluation would be to increase achievement at that task. It was also predicted that since submissive individuals perform poorly at the task, evaluation would tend to retard their performance. Finally, it was predicted that the evaluation of more than one individual would diminish the evaluation effect as compared with the case where one individual was evaluated.

As discussed earlier, the effect of evaluation was the opposite of that predicted; dominant individuals performed significantly poorer when evaluated. On the other hand, dominant subjects gave significantly more direct commands when evaluated. When submissive subjects were evaluated they gave less (though not significantly so) commands and exhibited slightly decreased productivity. Since in

order for a statement to qualify as a command it had to be specifically directed at the other individual, the number of commands may be thought of as an index of the degree of aggressive or authoritarian behavior engaged in by an individual. Viewed in this light the above facts become extremely interesting. Recall that dominant individuals tend to be seen as aggressive, persistent and verbally fluent while submissive individuals are viewed as inhibited, silent and avoiding of situations of decision.<sup>1</sup> In addition, since subjects chosen as dominant were also significantly higher on the Sociability scale, dominant subjects can possess some characteristics of individuals who score high in sociability. Persons who score high on the Sociability scale are seen as outgoing, competitive and forward while low scores are viewed as quiet and submissive.<sup>2</sup> In effect, the evaluation experienced by the subjects appears to have caused dominant individuals to behave in a more dominant manner. In the case of submissive individuals, evaluation appears to have caused them to behave in a less dominant (more submissive) manner. This reversal is characteristic of the social facilitation effect. Since dominant individuals have aggressive or authoritarian type behavior located in a higher or more available position of their response hierarchy, evaluation tended to increase the emission of this behavior. Submissive individuals, on the other hand, have inhibited or quiet type behavioral characteristics located in a higher or more available position of their response hierarchy. As in the case of the dominant individual, evaluation tended to increase the emission of this behavior.

In order to understand why dominant individuals did not perform better when evaluated one must recognize that the task was relatively complex. It was also unfamiliar and therefore involved the acquisition of new responses. In other words, the responses required for high achievement on the task were not the dominant responses of the subjects. Recall that the conclusion reached in the more recent studies of social facilitation is that evaluation apprehension enhances the dominant response. With that in mind it is easy to understand why achievement was reduced in both cases where the dispatcher was evaluated. In these situations (situations 1 and 4) evaluation enhanced the dominant responses; however, these were the wrong responses for achievement on the task. The result was reduced performance. It was originally thought that dominant individuals would show increased achievement when evaluated since their initial performance on the task was better. This effect, if it exists, was completely overpowered by the fact that evaluation apprehension impeded learning and thereby reduced performance.

An interesting effect emerges when one examines the performance data in Figure 3. The differences in values between situations 1 and 2 are large;  $\bar{x}_t$  is significant at ( $p < .05$ ) and  $\bar{x}_c$  is significant at ( $p < .01$ ). The differences in values between situations 3 and 4 are not as great. It appears that evaluation apprehension had a greater impact on dominant subjects than on submissive subjects. This is quite consistent with the descriptions of dominant and submissive individuals presented earlier. Submissive individuals tend to be seen as "... avoiding of situations of tension ...".<sup>3</sup> Because of this



characteristic it appears that submissive subjects were able to avoid some of the effects of evaluation apprehension.

Other results of the experiment appear to lend support for the conclusion that a social facilitation effect exists for higher order behavior. Recall that early researchers noticed a "uniform" or "leveling" tendency in cases where evaluation was present. Specific references to this effect are made in the work of Moede,<sup>4</sup> Mayer,<sup>5</sup> and Allport.<sup>6</sup> This same effect was also noted in this experiment. Specifically, the  $R^2$  values for cases where evaluation was present were higher than for cases where evaluation was not present. In effect, evaluation caused greater uniformity of learning. Note that this effect is quite apart from the actual level of achievement which should not enter into the  $R^2$  calculations since no significant difference was found in the slopes of the learning curves. Apart from the fact that it lends support for the existence of a social facilitation effect, the above result is an interesting conclusion in itself. While earlier researchers discovered a "leveling" or "uniform" effect, none of their descriptions included the factor of learning. The above result appears to indicate the presence of a tendency for individuals to learn in a more uniform manner when being evaluated.

The fact that there were no significant differences in the slopes of the learning curves is, again, an interesting observation. Increases or decreases in achievement appear not to be due to differences in the rates of learning but rather to a parallel upward or downward shift in the learning curve. This conclusion appears somewhat similar to the results obtained by Travis. Recall that Travis allowed students

to practice with an apparatus until they no longer showed an increase in their learning curve. When this maximum was reached the task was performed before an audience with a resultant increase in performance for eighteen of the twenty-two subjects.<sup>7</sup> The effect of the evaluation was in addition to the effect of learning. The same appears true for the case of a parallel shift in the learning curve. Evaluation tends to shift the curve downward without affecting the slope or learning rate.

Finally, the effect of evaluation appeared to be diminished for the case where both individuals were evaluated as opposed to the case where only one person was evaluated. This result was in the predicted direction although not significantly so. What appeared to happen when both were evaluated was that an individual experienced less evaluation apprehension due to the fact that the implied responsibility for the task was shared between him and another person. In essence, the establishment of group responsibility reduced the effect of evaluation on the individual.

In conclusion, the experiment appeared to give a strong measure of support for the existence of a social facilitation effect for higher order behavior. Support was given to this conclusion by the fact that the data tended to exhibit effects noted by other researchers; namely the "uniform" or "leveling" tendency and the fact that evaluation tended to produce an effect in addition to learning. Also, learning was shown to occur at a more uniform rate in the case where the subject was evaluated. Finally, evaluation was shown to have less of an effect when both individuals were evaluated than when only one was evaluated.

## References

<sup>1</sup>H. G. Gough, Manual for the California Psychological Inventory (Palo Alto, Calif.: Consulting Psychologists Press, 1957), p. 5.

<sup>2</sup>Ibid., 10.

<sup>3</sup>Ibid.

<sup>4</sup>W. Moede, "Einzel-und Gruppenarbeit," (Alone and Group Work,) Prakt. Psychol., 2 (1920-21), 71-81, 108-115. in G. Murphy and L. B. Murphy, Experimental Social Psychology (New York: Harper & Brothers, 1931), p. 460. and in F. H. Allport, Social Psychology (Cambridge, Mass.: The Riverside Press, 1924), p. 280.

<sup>5</sup>August Mayer, "Uber Einzel-und Gesamtleistung des Schulkindes," (On the Schoolchild's Work Alone and in the Group,) Arch. ges Psychol., 1 (1903). 276-416, in G. Murphy and L. B. Murphy, Experimental Social Psychology (New York: Harper & Brothers, 1931), p. 458. and in F. H. Allport, Social Psychology (Cambridge, Mass.: The Riverside Press, 1924), p. 262.

<sup>6</sup>Floyd Henry Allport, Social Psychology (Cambridge, Mass.: The Riverside Press, 1924), p. 262.

<sup>7</sup>Lee Edward Travis, "The Influence of the Group upon the Stutterer's Speed in Free Association," Journal of Abnormal and Social Psychology, 20 (1925), 143.

## C H A P T E R VII

### SUMMARY AND IMPLICATIONS

Research in the area of social facilitation has examined performance at relatively simple perceptual or motor tasks. The conclusion which appears to emerge from the literature is that the process of performance evaluation can serve to enhance behavior which has been well learned. If this conclusion could be expanded to include more complex or higher order behavior, such as leadership ability, valuable insight would be gained into the effect of the evaluation process on organizational socialization.

#### The Experiment

Method. In order to examine the above issue an experiment was devised which could yield information on complex behavior. Selection for participation in the experiment was based upon scores on a modified form of the California Psychological Inventory (C.P.I.). The form contained the Dominance (Do) and Sociability (Sy) scales and a shortened form of the Good Impression (Gi) scale. Subjects scoring 23 or below on the Do scale were designated as submissive while those scoring 33 or above were designated as dominant. This criterion ( $\bar{x} + .85\sigma$ ) resulted in the top 20 percent of the Do scores being classified as dominant while the bottom 20 percent were classified as submissive. Prior to selection, subjects scoring in the top 10 percent of the sample on the modified Gi scale were eliminated to reduce the possibility of test faking.

Of the actual participants, those designated as dominant scored significantly higher ( $p < .01$ ) on the sociability scale than those designated as submissive. There were no significant differences ( $p = .05$ ) in either age or score on the modified Good Impression scale.

The task was similar to that used by other researchers. It required a pair of subjects to jointly operate two model railroad trains on a six foot diameter oval track with two bypass sidings. The sidings were arranged so that trains could enter and leave the main track and thereby pass each other at these locations. The track was segmented into six separate power sections such that power could be delivered to each section independently of the others. Each subject operated the trains from his own control panel. The control panels were exact duplicates of each other and contained power switches for each section of track, remote switches to control access to the bypass sidings and a speed control. The panels were interconnected such that careless operation of either would subvert the group's progress.

The experiment consisted of eight 3-minute trials separated by a 1-minute rest period. The task required subjects to maximize the amount of trips around the oval track by each train during each trial. A complete trip by one train counted as one point; however achievement was based on mutually complete trips. Therefore, if one train completed 3 trips while the other train completed 10 trips, the achievement score was 6 for that trial. In the event that subjects caused a "wreck" a time-out was taken, the trains replaced

and 5 points deducted from the achievement score for each occurrence. The prescribed path for each train was clearly marked and arranged so that subjects were required to use all the controls on their panels.

Procedure. Based on their scores on the Dominance scale a dominant and submissive subject were paired for each experiment. In all cases, participants were unacquainted with each other prior to the experiment. Subjects were told that they would be participating in a group learning experiment which required them to cooperate with each other. Instructions for the operation of the trains and details of the scoring system were given to the subjects during the first 25 minutes of the experiment. Subjects were encouraged to ask questions but were told that no questions could be answered once the trials had begun. During this time the experimenter demonstrated the operation of the trains using both control panels. Subjects, however, were not permitted to operate the control panels until the actual trials had begun. After the instruction period the subjects were given 3 minutes to discuss their strategy for the operation of the trains before the first trial. Communication was permitted at any time during the experiment.

Prior to the first trial, roles were assigned to each of the participants. One subject was designated the "dispatcher" and was responsible for arranging and ordering the solution to the problem. The dispatcher was to plan and organize as well as make final decisions regarding the operation of the trains. The remaining participant was able to make suggestions, but was to carry out the directions of the

dispatcher. In one half of the cases the dominant subject was designated as the dispatcher while the submissive subject occupied the follower role. In the remaining one half of the cases the roles were reversed; the submissive subject occupied the dispatcher role.

In one half of the experimental situations evaluation apprehension was induced in the subject occupying the dispatcher position. This was accomplished using a method previously used in the literature. Subjects were told that a number of behavioral experts from different departments had expressed a desire to see some of the experiments. Since they were not able to be present in the laboratory the sessions were being video taped for later evaluation. These experts were described as being interested in individual behavior therefore only one subject was being recorded. The video camera was then aimed directly at the subject being evaluated and a microphone attached around his neck. The video recorder was demonstrated to the subjects so they could see that the device was working. Before the trials began the subject being evaluated was asked to give his name and major field while the machine was recording. To insure that the subjects realized that the evaluators were concerned with achievement (number of trips), and not some other form of behavior, digital displays were placed in the camera's field of vision. These devices kept a running total of the number of trips made by each train during each trial. It was pointed out to the subjects that anyone looking at the tape could instantly see when a complete trip had been recorded. Subjects, how-

ever, were not allowed to see the tape and therefore could not use it as a source of feedback to modify their own behavior.

Results. The results of the experiment indicate that the evaluation process can have an important impact on complex behavior. Dominant individuals gave significantly more direct commands ( $p < .01$ ) when they were evaluated while submissive individuals gave less direct commands in the same situation. In effect, the evaluation process caused dominant individuals to become more dominant and submissive individuals to become more submissive. This observation offers support for the idea that certain types of complex behavior can be either facilitated or inhibited through the evaluation process. The evaluation process also had the effect of retarding task achievement. Dominant subjects had significantly ( $p < .05$ ) lower output when their behavior was evaluated. Submissive subjects also had lower output but not significantly so. Since the task was complex and unfamiliar to the subjects, reduced achievement during evaluation appears consistent with social facilitation theory.

In the case of both direct commands and achievement, the effect of evaluation was more pronounced for dominant subjects than for submissive subjects. This observation is in agreement with the characteristics of submissive individuals. Gough states that submissive persons tend to be seen as "... avoiding of situations of tension ...".<sup>1</sup> Apparently this characteristic enabled the submissive subjects to avoid some of the effects of evaluation.



With regard to the rate at which subjects learned to perform the task, evaluation apprehension was associated with more uniform learning. The  $R^2$  value of the learning curve for each experimental situation showed a reduction in variability for situations where evaluation apprehension was present. This observation is consistent with previous research which noted a "uniform" or "leveling" effect with the presence of spectators. In addition to the uniformity effect, the learning curves showed no significant difference in slope across experimental situations. It appears that evaluation apprehension causes a parallel, downward shift in the learning curve without changing its slope.

Finally, the evaluation effect appears to be reduced for situations where both individuals are evaluated instead of one. This may be due to the fact that shared responsibility reduces the evaluation apprehension experienced by each individual.

#### Implications

The conclusion that the evaluation process can affect complex behavior has important implications in the area of organizational climate. Many times an aspect of an organization's climate is measured along a dimension which corresponds to evaluation apprehension. A climate described as "evaluative" or "competitive" can easily cause an individual to experience evaluation apprehension. On the other hand, climates described as "cooperative", "supportive" or "considerate" can be characterized as low in evaluation apprehen-

sion. Therefore, if one had guidelines which would indicate whether or not a particular behavior was well learned, he could predict an individual's performance by examining the climate of the organization. One might also alter the climate to improve job performance. Performance, therefore, can to some extent be viewed as the interaction of an individual variable (degree behavior is learned) and a climate variable (degree of evaluation).

There are a number of organizational situations where relatively accurate predictions can be made about the degrees to which a particular behavior is learned. Some of the situations are described below.

Post-training. In most instances the object of a training program is to change the individual in some way rather than to provide information relative to an area to which the trainee has had no prior exposure. The change could involve information which the trainee possesses as well as attitudes or behavior. In any case, programs of this type are usually characterized by the fact that individuals have not fully assimilated the information, attitudes or behavior when the program is completed. These new responses are in competition with others which might have been learned over an entire lifetime. Because of this, individuals that encounter an evaluative environment immediately after training will tend to exhibit their older, well learned responses.

In one study Golembiewski, et. al. were successful in changing attitudes and behavior.<sup>2</sup> When the training design was replicated

in another organization, the researchers experienced little success. The authors cite the harsh work environment in the second organization as a major factor in the diminished training effect. While the first organization faced a bright, expanding future the second faced a dismal future and a climate characterized by significant personnel reductions. In this case one can see a significantly decreased training effect associated with a climate which might easily be characterized as high in evaluation apprehension.

In a study by Fleishman, foremen increased their scores on consideration and decreased their scores on initiating structure immediately following a training program.<sup>3</sup> When scores were measured 39 months after training, those individuals that returned to environments high in consideration retained more of the training effect than those who returned to environments high in initiating structure. In another study by Hand, Richards and Slocum, the authors observed little change in attitudes and behavior after a training program.<sup>4</sup> The 18 month period following the program was characterized by salary increases and promotions. After the 18 month period, however, significant changes were noted in attitudes and behavior. In this case, an environmental change in the supportive direction appears to have allowed the training effect to exhibit itself.

Disadvantaged hiring. It is reasonable to assume that when individuals are termed disadvantaged from an employment point, they probably do not possess the values, attitudes or behavior appropriate for a normal work situation. If these individuals experience a

climate high in evaluation apprehension, they will tend to exhibit characteristics which are inappropriate from an employment point of view. On the other hand, a climate low in evaluation will aid in the acquisition of new responses. In one study Denhardt surveyed southern Appalachia residents employed in bureaucratic organizations.<sup>5</sup> He concluded that in order for these new employees to accept the values of bureaucratic participation they should first experience a transitional employment period. During this time the organization should suspend its normal authority relationships with respect to the new employees. In effect, Denhardt advocates an environment lower in evaluation apprehension in order to permit the acquisition of bureaucratic values.

In another study Friedlander and Greenberg surveyed 478 hard-core unemployed individuals who had completed a training and orientation program.<sup>6</sup> The only item they found which correlated with job effectiveness was the degree to which the organizational climate was viewed by the employee as supportive. Employees who saw their climate as supportive tended to be rated more favorably by their supervisor in terms of effectiveness and work behavior. Again this is a case where poorly learned behavior appears to be aided by an environment low in evaluation apprehension.

Work experience - training. A reliable indicator of whether an individual has learned a particular response is the amount of training and work experience he possesses. Obviously a highly trained and experienced individual will most likely have learned the responses

appropriate to his particular field. In such a case the effect of evaluation apprehension would be to facilitate the appropriate responses. A study of this type of individual was conducted by Hall and Lawler.<sup>7</sup> The authors surveyed professional employees of research and development companies. These were highly trained individuals with an average of 7.2 years in their organizations. The authors show that high performing organizations tend to be seen as dominant rather than submissive, hard rather than soft and competitive rather than cooperative. In this case it becomes clear that individuals who have learned the appropriate behavior can be aided by the presence of evaluation apprehension.

Type of work. Allport concluded that the social facilitation effect was more pronounced for tasks involving overt physical movement.<sup>8</sup> It appears that most physical tasks are relatively easy to learn particularly if they require an individual to do something he has done previously. For this type of task one could expect evaluation apprehension to enhance an individual's performance. In a study reported by Litwin the author simulated the operation of three companies.<sup>9</sup> The individuals in each company were engaged in a predominantly manual task under three different climate conditions. The highest performance was achieved by the company whose climate could be termed evaluative. Participants in this organization were frequently given competitive feedback as well as rewards and promotions for excellent performance. This evidence tends to support the con-

tention that physical tasks are more likely to be well learned and therefore more likely to be enhanced through the evaluation process.

## References

<sup>1</sup>H. G. Gough, Manual for the California Psychological Inventory (Palo Alto, Calif.: Consulting Psychologists Press, 1957), p. 10.

<sup>2</sup>R. Golembiewski, R. Munzenrider, A. Blumberg, S. Carrigan, and W. Mead, "Changing Climate in a Complex Organization: Interactions Between a Learning Design and an Environment," Academy of Management Journal, 14 (1971), 465.

<sup>3</sup>E. A. Fleishman, "Leadership Climate, Human Relations Training, and Supervisory Behavior," Personnel Psychology, 6 (1953), 205.

<sup>4</sup>H. Hand, M. Richards, and J. Slocum, "Organizational Climate and the Effectiveness of a Human Relations Training Program," Academy of Management Journal, 16 (1973), 185.

<sup>5</sup>R. B. Denhardt, "Bureaucratic Socialization and Organizational Accommodation," Administrative Science Quarterly, 13 (1968), 441.

<sup>6</sup>F. Friedlander and S. Greenberg, "Effect of Job Attitudes, Training and Organizational Climates on Performance of the Hard-Core Unemployed," Journal of Applied Psychology, 55 (1971), 287.

<sup>7</sup>D. Hall and E. Lawler, "Unused Potential in Research and Development Organizations," Research Management, 12 (1969), 339.

<sup>8</sup>F. H. Allport, Social Psychology (Cambridge, Mass.: The Riverside Press, 1924), p. 262.

<sup>9</sup>G. H. Litwin, "Climate and Motivation: An Experimental Study," in R. Tagiuri and G. H. Litwin, (eds.), Organizational Climate: Explorations of a Concept (Boston: Harvard University, 1968).

APPENDIXES



A P P E N D I X I

THE INSTRUMENT

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Age \_\_\_\_\_

Sex \_\_\_\_\_

Present or Intended Major \_\_\_\_\_

Name \_\_\_\_\_

Campus Address \_\_\_\_\_

Campus Phone \_\_\_\_\_

This booklet contains a series of statements. Read each one, decide how you feel about it, and then mark your answers after each statement. If you agree with a statement, or feel that it is true about you, answer TRUE by marking the left box as shown.

T	F
<input checked="" type="checkbox"/>	<input type="checkbox"/>

If you disagree with a statement or feel that it is not true about you, answer FALSE by marking the right box as shown:

T	F
<input type="checkbox"/>	<input checked="" type="checkbox"/>

If you find a few questions which you cannot or prefer not to answer, they may be omitted

- 1) I enjoy social gatherings just to be with people  T  F
- 2) I find it hard to keep my mind on a task or job.  T  F
- 3) A person needs to "show off" a little now and then.  T  F
- 4) I have sometimes stayed away from another person because I feared doing or saying something that I might regret afterwards.  T  F
- 5) As a child I used to be able to go to my parents with my problems.  T  F
- 6) I doubt whether I would make a good leader.  T  F
- 7) I always follow the rule: business before pleasure.  T  F
- 8) When in a group of people I have trouble thinking of the right things to talk about.  T  F
- 9) I seem to be about as capable and smart as most others around me.  T  F
- 10) I don't blame anyone for trying to grab all he can get in this world.  T  F
- 11) When in a group of people I usually do what the others want rather than make suggestions.  T  F
- 12) I think I would enjoy having authority over other people.  T  F
- 13) I gossip a little at times.  T  F
- 14) School teachers complain a lot about their pay, but it seems to me that they get as much as they deserve.  T  F
- 15) A windstorm terrifies me.  T  F

- 16) Every citizen should take the time to find out about national affairs, even if it means giving up some personal pleasures.  T  F
- 17) I liked school.  T  F
- 18) I should like to belong to several clubs or lodges.  T  F
- 19) I sometimes pretend to know more than I really do.  T  F
- 20) I am certainly lacking in self-confidence.  T  F
- 21) I have at one time or another in my life tried my hand at writing poetry.  T  F
- 22) Sometimes at elections I vote for men about whom I know very little.  T  F
- 23) It is very hard for me to tell anyone about myself.  T  F
- 24) When I work on a committee I like to take charge of things.  T  F
- 25) I hate to be interrupted when I am working on something.  T  F
- 26) I very much like hunting.  T  F
- 27) I usually feel nervous and ill at ease at a formal dance or party.  T  F
- 28) If given the chance I would make a good leader of people.  T  F
- 29) I can be friendly with people who do things which I consider wrong.  T  F
- 30) A person does not need to worry about other people if only he looks after himself.  T  F

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- 31) Sometimes I cross the street just to avoid meeting someone. T  F
- 32) I can honestly say that I do not really mind paying my taxes because I feel that's one of the things I can do for what I get from the community. T  F
- 33) I like to be the center of attention. T  F
- 34) When prices are high you can't blame a person for getting all he can while the getting is good. T  F
- 35) I have a tendency to give up easily when I meet difficult problems. T  F
- 36) In school I found it very hard to talk before the class. T  F
- 37) I must admit I often try to get my own way regardless of what others may want. T  F
- 38) I would be willing to give money myself in order to right a wrong, even though I was not mixed up in it in the first place. T  F
- 39) I do not dread seeing a doctor about a sickness or injury. T  F
- 40) I am a better talker than a listener. T  F
- 41) I was a slow learner in school. T  F
- 42) We should cut down on our use of oil, if necessary, so that there will be plenty left for the people fifty or a hundred years from now. T  F
- 43) Sometimes I think of things too bad to talk about. T  F

- 44) When the community makes a decision, it is up to a person to help carry it out even if he had been against it. T  F
- 45) I have no dread of going into a room by myself where other people have already gathered and are talking. T  F
- 46) I would rather have people dislike me than look down on me. T  F
- 47) I am likely not to speak to people until they speak to me. T  F
- 48) I must admit I try to see what others think before I take a stand. T  F
- 49) I do not always tell the truth. T  F
- 50) People should not have to pay taxes for the schools if they do not have children. T  F
- 51) It makes me uncomfortable to put on a stunt at a party even when others are doing the same sort of thing. T  F
- 52) In a group, I usually take the responsibility for getting people introduced. T  F
- 53) I would like to wear expensive clothes. T  F
- 54) I would be willing to describe myself as a pretty "strong" personality. T  F
- 55) If I am not feeling well I am somewhat cross and grouchy. T  F
- 56) I must admit I am a pretty fair talker. T  F

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- |  |                               |                               |  |                               |                               |
|--|-------------------------------|-------------------------------|--|-------------------------------|-------------------------------|
| 57) Once in a while I laugh at a dirty joke.                                 | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> | 73) I do not mind taking orders and being told what to do.   | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> |
| 58) There are times when I act like a coward.                                | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> | 74) It is pretty easy for people to win arguments with me.   | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> |
| 59) I like parties and socials.  | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> | 75) I like to read about history.  | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> |
| 60) I have strong political opinions.  | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> | 76) I have not lived the right kind of life.   | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> |
| 61) I must admit that I often do as little work as I can get by with.        | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> | 77) I am a good mixer.   | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> |
| 62) I think I am usually a leader in my group.                               | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> | 78) I have a natural talent for influencing people.  | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> |
| 63) At times I have worn myself out by undertaking too much.                 | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> | 79) I often act on the spur of the moment without stopping to think.   | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> |
| 64) I seem to do things that I regret more often than other people do.       | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> | 80) I am embarrassed with people I do not know well.   | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> |
| 65) I am quite often not in on the gossip and talk of the group I belong to. | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> | 81) I like science.  | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> |
| 66) Disobedience to any government is never justified.                       | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> | 82) I like to give orders and get things moving.   | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> |
| 67) I feel nervous if I have to meet a lot of people.                        | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> | 83) I am bothered by people outside, on streetcars, in stores, etc., watching me.  | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> |
| 68) I enjoy planning things, and deciding what each person should do.        | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> | 84) The one to whom I was most attached and whom I most admired as a child was a woman (mother, sister, or other woman). | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> |
| 69) I love to go to dances.  | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> | 85) I am apt to show off in some way if I get the chance.  | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> |
| 70) I usually have to stop and think before I act even in trifling matters.  | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> | 86) I'm not the type to be a political leader.   | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> |
| 71) People pretend to care more about one another than they really do.       | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> | 87) I have no fear of water.   | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> |
| 72) I would rather not have very much responsibility for other people.       | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> | 88) I have more trouble concentrating than others seem to have.  | T<br><input type="checkbox"/> | F<br><input type="checkbox"/> |

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- |   |                          |                          |
|---|--------------------------|--------------------------|
|   | T                        | F                        |
| 89) It is hard for me to act natural when I am with new people.         | <input type="checkbox"/> | <input type="checkbox"/> |
|   | T                        | F                        |
| 90) People seem naturally to turn to me when decisions have to be made. | <input type="checkbox"/> | <input type="checkbox"/> |
|   | T                        | F                        |
| 91) I have never deliberately told a lie.                               | <input type="checkbox"/> | <input type="checkbox"/> |
|   | T                        | F                        |
| 92) I dislike to have to talk in front of a group of people.            | <input type="checkbox"/> | <input type="checkbox"/> |
|   | T                        | F                        |
| 93) I like to read about science.                                       | <input type="checkbox"/> | <input type="checkbox"/> |

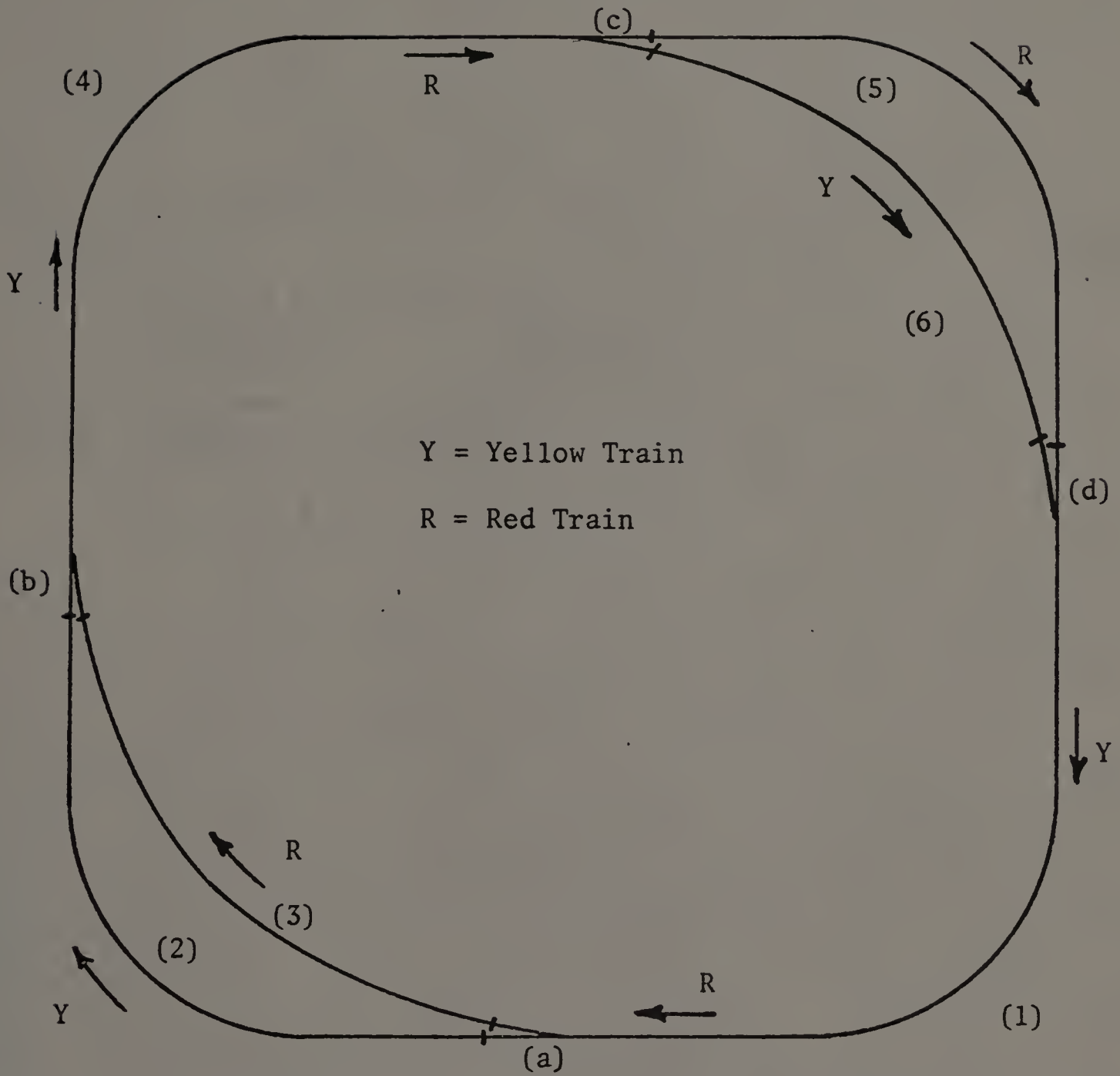
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A P P E N D I X II

DIAGRAM OF THE TASK



Panel X

1	2	3	(S)				
				a	b	c	d
4	5	6	(R)				
			(O)				

Panel Y

1	2	3	(S)				
				a	b	c	d
4	5	6	(R)				
			(O)				

S = Speed Control  
 R = Reverse  
 O = On-off Switch

1 thru 6 = Sections of Track  
 a thru d = Bypass Switches

### A P P E N D I X III

#### INSTRUCTIONS TO POTENTIAL SUBJECTS

The experimenter appears at the beginning of a class and is introduced to the class by the instructor who explains that the experimenter would like to have the class' attention for a few minutes. The experimenter then thanks the instructor.

I am attempting to recruit some people who would like to participate in a laboratory experiment we are running this semester. You may have heard something about it already because we have previously run some trials. The task involves running model railroad trains. I think you'll find it interesting; everyone who's participated so far has enjoyed it and most have felt that they have learned something about themselves. The entire experiment takes about one hour and is conducted in the behavioral laboratory, room 7A, here at the School of Business. Each person is paid \$3.00 for participating. (The last sentence was omitted in the case of S.B.A. 751 students.)

In order to be selected you must fill out this test scale (hold up test scales). It's purely voluntary and I'll wait around to collect them. It takes about ten minutes to fill out. If you are not interested in participating but would like to know your score on these psychological scales then simply fill out the scales, put your name on the front page but do not include your telephone number. If your phone number is missing I won't contact you but will score your test and hold it in my office; when you have some time you can stop

in and we'll discuss the results. (The last sentence was omitted in the case of the S.B.A. 751 students.)

If you want to participate, complete the test and fill out the first page including your phone number. I'll give you a call in the evening to find out what times you have free during the week to come into the lab for an hour. Since it takes two people to run the trains I will have to pair two individuals based on the times they have available and their test scores. I'll phone each person back to confirm the appointment time. Does anyone have any questions?

(When all questions are answered the experimenter distributes the test and waits until all tests are completed and handed in.)



## A P P E N D I X IV

### INSTRUCTIONS TO SUBJECTS

At the beginning the yellow train is set on block 2 and the red train is set on block 3. Both trains are facing the clockwise direction.

All power switches are set in the "OFF" position and all track control switches are set to the left.

Let me begin by saying that you are about to participate in a group learning experiment. While psychologists conduct many experiments examining the way an individual learns, less work is done dealing with how individuals learn as a group. So, therefore, we are interested in how well you, as a group, can perform a task which requires you to cooperate with each other. In our case the task will require you to run these trains around the track so as to get the greatest number of trips and the fewest number of wrecks. The reason that railroad trains are used is because we feel that they are more interesting to the participants.

The first thing I'll do is explain how to run the trains, then I will explain the scoring. Finally, I will give you a few minutes to discuss the task with each other before we begin. Once we have started we will run 8 three minute trials with a one minute rest period between trials. I will answer any questions you may have up until the time we actually begin running the trials. After that I will not answer any questions; therefore, be sure you understand the instructions before we begin. Also, I will ask you not to touch the

controls until we actually begin the experiment. I will operate the controls for the demonstration.

As you can see the railroad is made up of a main track along with two sidings. The railroad is also broken up into six separate sections of track numbered 1 through 6 (point to each section of track). These are called power blocks or simply "blocks" and each one has a separate power control. On the left side of each control panel is a group of switches numbered 1 through 6 (point to switches). These control the power to each block of track: push the switch up and power is delivered, down and it is cut off (turn on power to block 2 and show that the yellow train moves). Therefore, to make a train move you must know what block it's on so you can deliver power to that block.

Now, you will note that if I keep the switch "on" for block 2 the train will run and eventually stop (demonstrate this). What has happened is that the train went from block 2 onto block 4. If we want to get the train to move we must now throw the switch for block 4 (demonstrate this). Note again that the train begins to run but stops when it passes onto block 5 (repeat this process until train again rests on block 2). I can also turn "on" switches 2, 4, 5, and 1 and run the yellow train around the track without stopping (demonstrate one full trip around tracks).

Now let me show you some other controls that you will use. Note that the main power box has two slide switches and a rheostat control. One switch is the reverse control; when I throw this switch it

reverses the direction of the train (demonstrate that the train reverses direction). I'll caution you not to throw this switch when the train is running fast because it may cause the train to fall off the track which will result in you losing points. The next slide switch is the "on"- "off" switch. As the name implies, this switch cuts off all power from the controls (throw switch and note that train stops). The rheostat control in the center is the speed control. If I turn it clockwise the train will run faster: counterclockwise and the train runs slower (demonstrate that speed can be varied). Here, let me caution you to watch the speed at which each train operates. It is possible to run the trains so fast that they fall off the track which, again, will cost you points. Also, if you run the trains too fast in the beginning it may cause you to become confused with the switching.

With regard to switching, notice that there are four track switches or turnouts designated "a" through "d". On the right side of each panel are slide switches lettered "a" through "d": each controls its corresponding turnout on the tracks (point to turnouts on tracks). In order to change the direction of a turnout you must find the control switch with the same letter, move its slide to the other side and then press the slide down (demonstrate this and show that the turnout changes its direction). It's easy to remember which direction a switch should be thrown since all switches are arranged so that if the slide is moved to the left the train will run along the outer sections of track, if the slide is moved to the right the train will

run along the inner sections of track (point to outer and inner sections and run train over switch so as to show the possible different directions). Please note that you must operate switches "a" and "b" together and "c" and "d" together otherwise the train may derail causing you to lose points. For example, if you want the train to travel from section 1 through section 3 to section 4 both switches "a" and "b" must be moved to the right to allow the train to traverse switches "a" and "b" properly. The same is true for switches "c" and "d" (demonstrate the operation of "a" and "b", and "c" and "d" together). One additional note with regard to switches, in order for the switches to get any power the "on"- "off" switch on the right power pack must be "on" (demonstrate this).

Now you will notice that we have two panels which are exact duplicates of each other. I can change the direction of any switch from either panel (demonstrate this from both locations). I can also control the power blocks from either location. For example, I can move the yellow train on block 2 from the left hand panel as well as the right hand panel (demonstrate operation from each panel). I can also arrange the blocks so that one train can pass from control by the left hand panel to control by the right hand panel. To show this I will throw the switch for block 2 on the left hand panel and set the speed low. Now I will throw the switch for block 4 on the right hand panel and set the speed up high. Notice now, when the train passes from block 2 to block 4, it will increase its speed (demonstrate this by showing how train increases its speed). It is also possible

to run both trains at the same time from the same panel. If I turn on all block switches on the left panel and turn off all block switches on the right hand panel I can run both trains from the left panel (demonstrate using left hand panel).

There is one final characteristic of these duplicate panels which is important. As I mentioned before we can operate a train on any block simply by throwing the power switch to that block. This can be done from either location (demonstrate by moving train on block 2 using both panels). However, if I throw the switch for the same block from both panels at the same time, no power is delivered to that section of track and the train will not move. Therefore, in order to move a train you must not only throw the switch for the proper power block but you must be sure that your partner does not have the same switch thrown (demonstrate that block switches cancel each other when the same switches are thrown).

During the time you are running the trains you might happen to get both trains on the same section of track or block. This is not a desirable situation since you do not have independent control of each train. In order to get out of this difficulty you must either run the trains forward or backward to get them onto separate power blocks, then separate control can be restored (demonstrate this). If you get into this situation and can't get out within a reasonable time I will take time out, place the trains on separate sections of track and subtract the same number of penalty points as if it had been a wreck.

As I mentioned earlier, we will have a series of 8 trials of three minutes each, separated by a one minute rest period. Before we begin I will give you three minutes to discuss the task between yourselves; you may also talk with each other at any other time during the experiment. During the rest periods, you will not be able to move the trains; they will remain in the same position as they were when the previous trial terminated. During this time I will return all power switches to the "off" position and place all switch controls to the left. You will, therefore, begin each trial with switches in the same position while trains will be in the positions they were when the previous trial had ended.

Your task is to run the trains around their assigned path as many times as possible during three minutes. As you can see sections 2, 4, 6, and 1 are marked with a yellow stripe, this is the path for the yellow train (demonstrate by running yellow train along designated path). Sections 3, 4, 5, and 1 are marked with a red stripe, this is the path for the red train. Note that in order to run the red train around its path we must now switch all turnouts (demonstrate switching switches and running red train along designated path).

When you make a full circle with a train around its appropriate path you score 1 point. You must, however, run each train around its path the same number of times during each trial to score the most points. For example, suppose during one trial you run the red train around its proper path twice, that is two trips; and in the same

trial you run the yellow train around its proper path twice, that is also two trips. You would then get a total of 4 points for that trial. However, if you make three trips with the red train and five trips with the yellow train, you will get 3 points for the red train, of course, but you will only get 3 points for the yellow train. In effect, what we will record is the number of mutually complete trips; you would, therefore, receive 6 points for that trial. It is, therefore, to your benefit to keep the number of trips as equal as possible.

Should you manage to wreck or derail a train during a trial I will take time out and place the train back on the track. However, this will cost you 5 points which will be subtracted from your total score for each trial. At the end of each trial I will tell you how many trips you scored with each train, the number of wrecks for that trial and the total number of points scored for that trial. The points are not additive between trials; you start again from zero at the beginning of each trial.

A few final details, if you run the train around the wrong section of track you will not receive a point for that trip; however, you may, at any time, back the train up and correct a mistake and thereby receive a point. Also, if a train has completed some portion, say three quarters, of a trip during one trial you will receive one point if the final quarter of the trip is completed during the next trial. Finally, should there be an equipment failure for any reason I will take time out, correct the situation and we will continue where we left off.

I'll now give you three minutes to talk over how you wish to run the trains. You can run them anyway you wish. You can run one trip on the yellow followed by one trip on the red, you can run a number of successive trips on the red or you may choose to run them simultaneously. You can talk to each other any time you want. I will ask you, however, not to time the trains with your wristwatches during the trials.

Now (subject A's first name) your train will be the yellow train and (subject B's first name) your train will be the red train. Mr. A, you are the dispatcher and you will arrange and order the solutions to the problem, and Mr. B, your task is to carry out, on your board, Mr. A's directions. Remember Mr. A, you are to plan and organize the solutions, while both of you are to carry out the operations of the trains on your respective boards. Mr. B, you are permitted to make suggestions, but the final decisions rest with Mr. A.

As I mentioned earlier, we will have eight trials of three minutes each and a one minute rest period in between. At the start of each trial I will say "Ready----begin," and at the end of each trial I will say "Stop". During the one minute rest period I will tell you your scores and return all controls to the off or left position. Do you have any questions? Remember, I won't answer questions after we start.



## A P P E N D I X V

### INSTRUCTIONS TO SUBJECTS BEING EVALUATED

Note that instructions which are underlined are used in the case where both individuals are being evaluated.

Before we begin let me explain that your behavior on this trial will be recorded on video tape. The reason for this is that the members of the faculty who are conducting the (mention the number of the course that the student is taking) course along with other behavioral experts are interested in the scores people achieve in this experiment. Since they can't all be here to observe the trials I have agreed to tape some of the sessions and then allow them to view the tapes as a group.

Since they are interested in individual behavior/group behavior I will record only the behavior of the dispatcher/record the behavior of both of you. You can see that when I aim the camera at you we can't see the trains in the viewing monitor (aim camera at subject(s) and point out the picture on the monitor, show that trains are not visible). Since the people who will review this tape are concerned with the number of trips you attain and since they can't see the trains, we have arranged a digital readout display. (Demonstrate the display and show how numbers can be flashed on the viewing monitor.) When you make a complete trip with the yellow train, that fact will instantly be shown on the viewing screen using the upper display; the lower display will record the number of complete trips

made by the red train. I will flash the numbers on the screen using these controls (point to controls and show how they work). Therefore, when people view the tape they will immediately see when you have made a trip with either train; they will also know your final score for each trial the same way.

I want to check the machine now to be sure that it's working. (At this point the experimenter aims the camera at the individual or individuals and turns on the recording device. He also places a microphone around the neck of the individual whose behavior is being recorded. If both subjects are being recorded the microphone is placed on a table stand close to both persons.) Would you please look into the camera and say your name, class and major field. Let me play that back to be sure it's working.

(The experimenter plays back the tape and points out to the subjects that the machine is working perfectly. He allows them to see and hear themselves on the monitor. Finally, he turns the monitor so that the subjects cannot see their images on the screen but are aware that it is in operation.)

I will start the machine at the beginning of each trial and stop it at the end of each trial. I will also stop the machine during any time out periods. Do you have any questions?

A P P E N D I X VI

SUMMARY OF DATA, SITUATION 1

	Trial Number								
	1	2	3	4	5	6	7	8	Total
Commands	7	5	15	22	11	10	5	8	83
Mutual Trips	8	0	0	16	20	18	28	32	122
Commands	2	13	10	13	8	4	6	6	62
Mutual Trips	0	4	8	16	20	6	12	22	88
Commands	1	3	3	2	3	2	1	0	15
Mutual Trips	10	8	6	8	20	22	24	2	100
Commands	3	7	11	10	9	9	6	5	60
Mutual Trips	0	2	6	8	8	20	24	28	96
Commands	4	4	3	2	4	3	2	2	24
Mutual Trips	2	0	0	0	6	4	10	4	26
Total Commands	17	32	42	49	35	28	20	21	244
Total Mutual Trips	20	14	20	48	74	70	98	88	432

Group

## A P P E N D I X VI

## SUMMARY OF DATA, SITUATION 2

	Trial Number								Total
	1	2	3	4	5	6	7	8	
Commands	16	4	3	1	1	1	2	0	28
Mutual Trips	0	12	20	20	26	28	28	30	164
Commands	6	0	1	1	3	0	2	0	13
Mutual Trips	6	8	18	22	28	32	8	30	152
Commands	4	3	3	5	0	2	3	7	27
Mutual Trips	0	10	6	14	22	0	0	2	54
Commands	1	0	4	1	1	0	0	0	7
Mutual Trips	22	24	6	6	22	30	26	32	168
Commands	1	0	5	3	1	0	0	0	10
Mutual Trips	8	32	10	16	36	38	42	34	216
Total Commands	28	7	16	11	6	3	7	7	85
Total Mutual Trips	36	86	60	78	134	128	104	128	754

Group

## A P P E N D I X VI

## SUMMARY OF DATA, SITUATION 3

	Trial Number								Total
	1	2	3	4	5	6	7	8	
Commands	7	6	5	6	6	15	13	7	65
Mutual Trips	2	4	4	2	6	6	8	10	42
Commands	5	1	4	1	3	5	1	0	20
Mutual Trips	2	8	16	20	24	0	26	30	126
Commands	1	2	4	0	0	0	0	0	7
Mutual Trips	0	2	2	4	2	0	2	2	14
Commands	0	0	0	0	0	0	0	0	0
Mutual Trips	4	16	24	24	28	28	30	30	184
Commands	2	4	13	5	5	6	1	3	39
Mutual Trips	0	0	12	26	26	10	28	6	108
Total Commands	16	13	26	12	14	26	14	10	131
Total Mutual Trips	8	30	58	76	86	44	94	78	474

Group

A P P E N D I X VI

SUMMARY OF DATA, SITUATION 4

	Trial Number								Total
	1	2	3	4	5	6	7	8	
Commands	0	0	0	1	1	1	0	0	3
Mutual Trips	0	10	18	24	26	28	30	24	160
Commands	1	0	0	0	0	0	0	0	1
Mutual Trips	2	8	4	10	10	20	24	20	98
Commands	4	6	5	10	6	1	3	1	36
Mutual Trips	4	12	22	10	26	26	26	28	154
Commands	4	3	5	2	3	5	3	1	26
Mutual Trips	0	0	0	2	6	8	8	10	34
Commands	0	1	1	6	1	4	4	6	23
Mutual Trips	0	2	0	0	2	2	4	4	14
Total Commands	9	10	11	19	11	11	10	8	89
Total Mutual Trips	6	32	44	46	70	84	92	86	460

Group

A P P E N D I X VI

SUMMARY OF DATA, SITUATION 5

	Trial Number								Total
	1	2	3	4	5	6	7	8	
Commands	4	2	1	0	2	1	2	0	12
Mutual Trips	0	0	10	16	16	10	22	10	84
Commands	6	7	13	5	2	1	1	0	35
Mutual Trips	4	10	14	10	22	28	30	18	136
Commands	1	4	7	16	8	6	8	10	60
Mutual Trips	10	18	4	16	16	14	34	30	142
Commands	3	5	10	6	6	5	6	1	42
Mutual Trips	6	20	4	6	18	20	16	22	112
Commands	2	6	4	6	6	5	3	6	38
Mutual Trips	2	6	6	4	8	0	20	22	68
Total Commands	16	24	35	33	24	18	20	17	187
Total Mutual Trips	22	54	38	52	80	72	122	102	542

Group

A P P E N D I X VI

SUMMARY OF DATA, SITUATION 6

	Trial Number								Total
	1	2	3	4	5	6	7	8	
Commands	5	4	5	3	5	6	3	6	37
Mutual Trips	0	2	4	8	12	6	10	6	48
Commands	1	5	2	6	3	4	2	2	25
Mutual Trips	4	2	14	26	24	16	26	20	132
Commands	0	1	2	3	1	3	2	0	12
Mutual Trips	4	18	26	12	16	12	24	28	140
Commands	3	3	3	10	5	3	9	4	40
Mutual Trips	0	2	2	8	10	10	12	8	52
Commands	1	0	0	2	1	1	3	2	10
Mutual Trips	2	6	6	14	22	22	24	30	126
Total Commands	10	13	12	24	15	17	19	14	124
Total Mutual Trips	10	30	52	68	84	66	96	92	498

Group



## A P P E N D I X VII

## MEAN AGES FOR DOMINANT AND SUBMISSIVE SUBJECTS

	<u>Mean Age Dominant</u>	<u>Mean Age Submissive</u>	<u>t Value</u>
Situation 1	24.4	22.4	1.44
Situation 2	23.2	25.0	-1.05
Situation 1 and 2 Combined	23.8	23.7	0.87
Situation 3	20.0	19.8	0.21
Situation 4	20.8	21.6	-0.41
Situation 3 and 4 Combined	20.4	20.7	-0.28
Situation 5	20.4	20.8	-0.34
Situation 6	21.6	21.2	0.32
Situation 5 and 6 Combined	21.0	21.0	0

## A P P E N D I X VIII

MEAN SOCIABILITY AND GOOD IMPRESSION SCORES  
FOR DOMINANT AND SUBMISSIVE SUBJECTS

	<u>Situations 1 and 2 Combined</u>	<u>Situations 3 and 4 Combined</u>	<u>Situations 5 and 6 Combined</u>
Mean Sociability Scores for Dominant Subjects	30.0	28.6	28.9
Mean Sociability Scores for Submissive Subjects	20.9	20.7	20.1
t Value	4.75	6.32	8.71
Mean Good Impression Scores for Dominant Subjects	6.7	5.4	6.1
Mean Good Impression Scores for Submissive Subjects	6.5	5.6	6.5
t Value	0.19	-0.17	-0.40

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