

I. Introduction

Intrinsic attitude has a decisive effect on the performance of employees under specific environment and the type of assignment in which he is engaged. However, it is a difficult task to determine such an attitude of a person, even though face to face contact may be on a daily basis.

This paper shows in detail a simple and effective means of making an attitude evaluation with relatively high accuracy.

The postulated "Theory of Exposure Opportunity and Reinforcement" is an extension of the "Theory of Task Experience as a Source of Attitude", by Breer and Lockel. Two important dimensions have been added exposure opportunity and reinforcement.

The theory was confirmed by the result of a study conducted in 1967. The attitudes of 21 Ph. D. candidates and three faculty members at the University of Maryland were collected and analyzed.

II. Theory of Task Experience as a Source of Attitude

Men create their own conceptions of what is true and good in the world around them. But how are these beliefs, values, and preferences created? A complete explanation requires a number of references to a number of different sources. According to Breer and Locke, there is one major source of cultural themes, namely, task experience, which determines the individual differences in what one comes to believe, prefer, and value.

The term "task" is defined as a complex of stimuli upon which the individual performs certain operations to achieve certain outcomes. We limit the use of "task" here only to those operations people conscientiously put their efforts to perform.

While working on a task, one develops certain beliefs, values, and preferences specific to the task itself which over time are generalized to other areas of life. Given the nature of the task, some forms of behavior will be rewarded and thus repeated while others get punished and undergo extinction. In engaging the task, it is expected that the individual will develop positive attachments to those forms of behavior which have been rewarded while rejecting those for which he was punished and those which failed to yield the desired results. The patterns of behavior which are instrumental in achieving desired outcomes are most likely to be gratified. Because they are gratifying or rewarding, they will be cathected, and preferred to those behaviors leading to unfavorable outcomes. If in a task group, those forms of behavior which members perceive to be effective in achieving the goal of task and which they have come to enjoy or prefer are most apt to be legitimized in the group setting. The instrumental reward value of a form of behavior is thus confirmed by both task success or failure and responses from other group members.

In any task situation, some forms of behavior will be rewarded more than others. It is equally true that in any situation some individuals will be rewarded more than others. In view of the different kinds of rewards available, both intrinsic and extrinsic, the probability that everyone will be rewarded equally is very slight. The implication is that those who are most often or most highly rewarded for behaving in a certain way will develop the strongest cognitions, cathectes, and evaluations vis-a-vis that mode of behavior. The same principle at the group level says that the more successful a group is in dealing with its task, the more positive will be the beliefs, preferences, and values of its members toward those patterns of behavior which were instrumental to task success.

The above statement is based on the assumption that in any task situation certain patterns of behavior will have greater instrumental reward value than others. By virtue of the reinforcing quality of task outcomes, these particular forms of behavior will have a better chance of being emitted than any others. At the same time, individuals working on the task can be expected to respond cognitively (through apprehending the instrumental nature of these acts), cathectically (by developing a positive attachment for this kind of behavior), and evaluatively (by defining such behavior as legitimate and morally desirable).

It is these three orientations (cognitive, cathectic, and evaluative) which are considered to be of critical importance in sharpening one's attitude. These orientations developed in response to a given set of task attributes will be generalized to other task situations and, through the process of

induction, to the level of cultural beliefs, preferences, and value. This rule also states that the more similar one task is to another, the more likely it is that orientations developed in one will be generalized to the other.

In this sense, culture can best be thought of as a profile of abstract beliefs, preferences, and values. Where profile refers to the distribution of such orientations among members of society. To the extent that abstract beliefs, preferences, and values represent inductions from situationally specific task experiences, the profile of such orientations within a given society will reflect the distribution of task experiences in the same system. Such differences in the distribution of tasks will tend to show up as crosscultural differences in the distribution of beliefs, preferences, and values.

In a technologically advancing world, the distribution of task opportunities undergoes change. As a result some individuals are compelled to take jobs which are not entirely in keeping with what they believe, prefer, or value. Whether we talk about a specific individual vis-a-vis a specific task or a whole aggregate of people vis-a-vis a distribution of tasks, it is this asymmetry between already formed beliefs, preferences, and values on the one hand and the nature of the task demands on the other that provides the impetus to change.

For those individuals involved, their situational specific orientations are apt to change first as a response to the particular environment in which he is operating. His abstract orientations dealing with more general classes of human beliefs, preferences, and values will be less sensitive to innovation at task level.

III. Theory of Exposure Opportunity and Reinforcement

From the Theory of Task Experience as a Source of Attitude, the Theory of Exposure Opportunity and Reinforcement is constructed. This theory is based on the assumptions that the availability of certain task experience depends on the Exposure Opportunity to such task experience. And the outcomes of the task experience will have reinforcement effect on the individual's beliefs, values, and preferences, which in turn sharpen his attitude.

In this theory, the personality of the individual plays a virtue role. Personality is believed to be conditioned by one's attitude and satisfaction. Before further discussion on this point, some review of personality must be made.

Kretschmer and Sheldon² see personality as determined almost entirely by inherited body constitution. Allport^{4 5} argued that it is entirely social. Here we believe that personality is the dynamic organization within the individual of those psycho-physical systems which determine his unique adjustments to his environment. It is believed that personality differences are due to four factors of determinates, namely constitutional, group membership, role, and situational. And these are interrelated and interact with one another.² The last three factors are all included in the term of "task experience" used in this paper.

But personality is not a simple phenomenon within which an individual operates.³ Within an individual, there can exist multiple entities which are "psychical complexes" as McDougall termed personalities/characters⁷ with the characteristics which are attached to the operation of one's ego. And the attitudes and the behaviors of an individual is the reflection of, at that particular moment, the multiplicity of egos in posse.

Similarly, when an individual has multiple-potential, his behavior pattern will be the reflection of, at that particular moment, the multiplicity of potentiality in posse. Because the kind of activities which are in line with the individual's high potential usually will yield results more desirable than those in his low potential field. Hence the behavior to participate in such activities will be considered instrumental, as well as satisfying. Therefore, it is concluded that when the individual has potentials high in certain areas, he is most likely to engage in those activities closely related to his potential areas, either consciously or subconsciously.

The "multiple-potentiality" of individual sharpens his tendency of behavior pattern regarding to different task seeking activities. These activities in turn control the opportunity of the individual to be exposed to certain task experiences. In this Theory of Exposure Opportunity and Reinforcement, we argue that the potential of the individual is the major factor, which is the starting point of the whole cyclic reinforcement process, followed, in determining his attitudes.

There are two more exposure opportunity determining factors. One is the environment in which the individual is operating. Since the environment determines the task distribution and availability, it also controls the exposure opportunity of certain tasks to the individual of concern. Another one is the task searching and screening process. But this is different from that derived from the individual's potentiality, because this is derived from one's preferences rather than potential one possesses. Since preferences are formulated on the feedback of task experience, this process is actually a part of the reinforcement cyclic process rather than that of the starting one

which is based on one's potential.

It is argued that once the individual has been exposed to a certain kind of task experience, either by his potentiality or by the environmental factor, he will then have the outcome of that task experience as a feedback. This feedback will be evaluated based on its reward value, both extrinsic and intrinsic, through the step of evaluation.

If the reward value of the feedback is considered high and desirable, and which is consistent with the beliefs, values, and preferences the individual already has, then this task experience will have reinforcement effect on the individual's attitude and satisfaction. From the Theory of Task experience as a Source of Attitude, it is obvious then the individual will develop certain attitude favorable to that kind of task experience, which will then make him consider the behavior to participate in such task activities as instrumental and morally desirable. This will lead to his task search and screening process favorable to such task activities, and make more such task experiences available to him. By doing so, his potential in this area will also be better developed through the application and repeated practice. This cyclic process reinforces both his potential, his attitude and satisfaction, and his task exposure opportunities.

On the other hand, if the reward value of the feedback is considered as low and undesirable, usually when he engaged in the activities in the area where his potential is low, then due to the inconsistency with the beliefs, values, and preferences he already possessed, he may reject the behavior to participate in such activities again next time. Thus there will be less possible for the reinforcement process to occur and his potential in this area, which is already low, to be developed.

This cyclic process will then eventually lead to the full development of that potential which is relatively higher than other potentials he has. From the above discussion, it is obvious that the higher the potential is in one area, the higher the probability that this potential will be better developed, and the higher the probability that his attitude will be favorable to that sort of tasks which will give fuller utilization of that potential.

We must recognize that the potentials one possesses is largely inherited. The development process, or the reinforcement process, can only help to develop that potential. And whether that potential will be developed or not is conditioned by the availability of task experience, which is controlled by the exposure opportunity.

It should be pointed out that the evaluation step is highly interrelated, as well as highly interacting with the individual's attitude and satisfaction. The latter two are in the boundary of his personality. When the feedback of the task outcome reaches this step, the reward value of the task outcome is determined against the beliefs, values, and preferences of the individual. And the standards used to determine the reward value are generated from the individual's attitude and satisfaction. The attitude and satisfaction undergo frequent changes based on the feedback of task outcome, through the evaluation step. But it is believed that the reinforcement phenomenon is stronger and more readily than that of modification phenomena. These phenomena eventually led to more concrete attitude toward those behavior pattern as well as activities be considered as instrumental and morally desirable. This has been shown by the Theory of Task Experience as a Source of Attitude.

The functional relationships between those steps has been pictured on Figure 1, following.

In evaluating the feedback of outcomes, there are two forms of rewarding values to be determined. One is that of intrinsic, and the other is extrinsic. If the intrinsic rewarding values of two sets of task outcomes are the same, then the determining one for the value evaluation will be that of the extrinsic. Similarly, if extrinsic rewarding values are the same, then the intrinsic

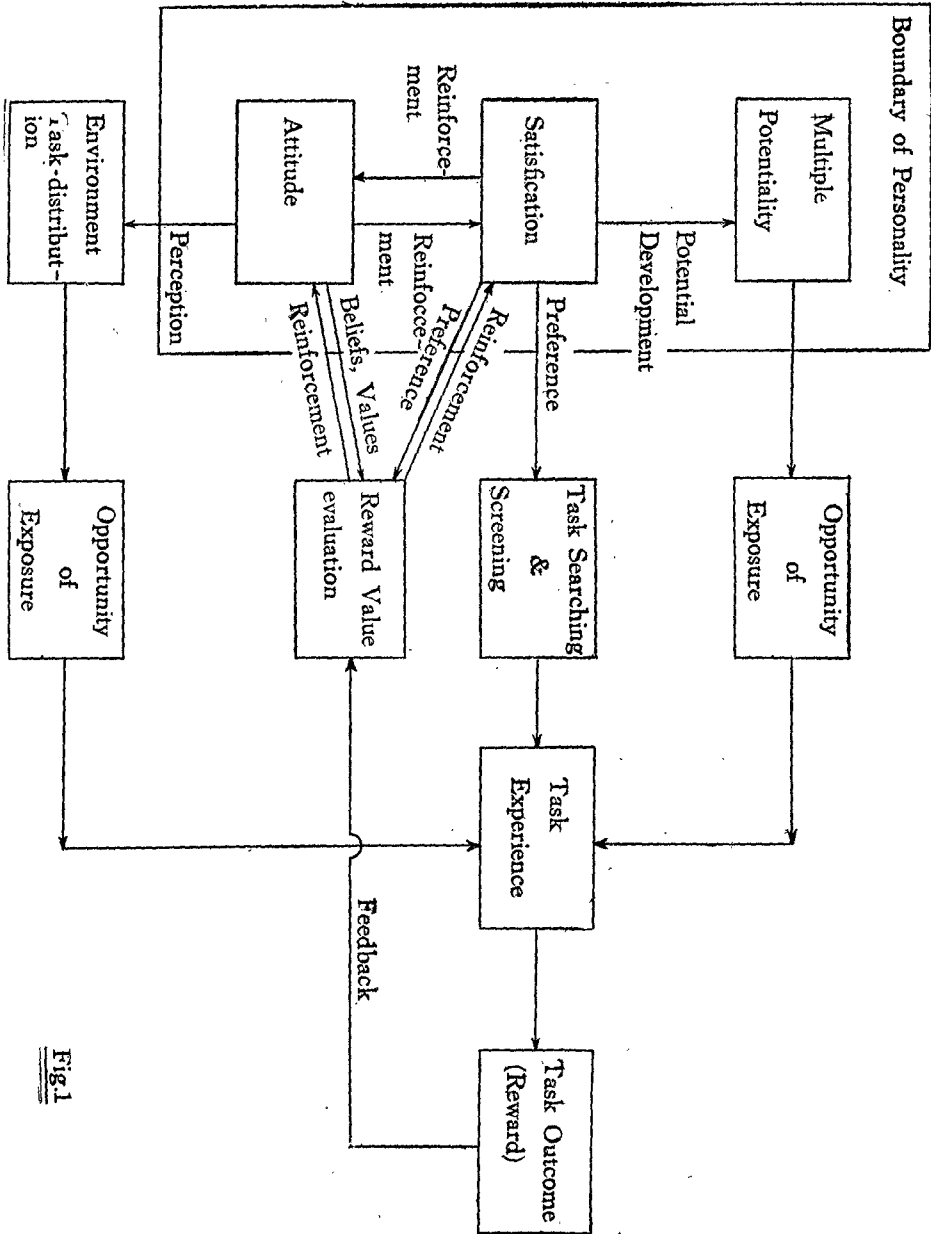


Fig.1

rewarding values will be of determinative.

The individual's attitude toward his environment may seem insignificant in shaping the task distribution, but when the majority of people's perception is formulated its effect on environment will be obvious. This effect will change the distribution of task opportunity hence task experience available to individual. This in turn will exert influence on individual's attitude, as predicted by the Theory of Task Experience as a Source of Attitude.

Another environmental effect is based on the potentiality the individual possessed. Because if one has potential in one area and has been exposed to that sort of activities, he will then receive the feedback and his attitude will be formulated in favor of that activities. Hence he will try, through the task searching and screening process, get himself into the environment which will give him a better chance to utilize his potential in that area. By the argument stated above, the environmental task-distribution effect is obviously also a function of the individual's potential.

IV. Attitude Research Design

This attitude research is designed to study the differences exist between highly educated scientists and engineers, and correlate these differences to the task experiences they had. The sample group chosen for this study are all Ph. D. level chemical engineers and chemists. This particular group is chosen because they have the following similarities:

1. They all have good capacity of learning.
2. They all have had similar task experience in academic work. And they all have experienced tough competition and passed tough requirements, and gone through a significant long period of hard work, on their way to this level of education.
3. They all have been exposed to the beauty of scientific knowledge. Virtually they are all at the boundary of human knowledge of their particular field.
4. Since the more education one has, the more rational one will be, therefore, it is believed that their attitudes, beliefs, values, and preferences are all formulated in a pretty rational way.

And they have the following differences:

1. Even though they all have pretty good capacity of learning, some of them have much higher creative research capability than others.
2. As the capacity of feeling is concerned, significant differences exist among them. Some have demonstrated distinguished social and leadership capability. While some others merely responded to their social environment very inactively.

Given a set of questionnaires to all the respondents, they are to indicate their closest preferences by circling one or more answers provided. The questionnaires are designed to test:

1. What kind of task they prefer most. (task searching and screening).
2. What kind of task they feel most satisfying to perform. (Evaluation of task intrinsic reward value).
3. Which of the potential he most heavily rely on for future success. (Potential instrumental value determination).

The reason why the task extrinsic reward value is not tested is because it is assumed, since they are all highly qualified professional people, little difference will be made between different task assignments. Therefore, the evaluation process is most heavily determined by the intrinsic reward value of the task.

The sample group is arbitrary classified into four subgroups, based on their past task experiences. As the investigator of this study knows all the respondents personally this classification is believed to be reasonably reliable. They are:

- Group (1). Research and academic activities dominating.
- Group (2). Research and academic activities relatively high.
- Group (3). Social activities relatively high.
- Group (4). Social activity and leadership role dominating.

It must be understood that those classified as social activity high do not imply that their research and academic activity are low. So does that of group (1) people. The classification merely indicates the relative measure of the two kinds of task experiences they had in the past.

Because they are all Ph. D. degree holders, or candidates, their academic honors are all high. 50 percent of the respondents were Dean's list students during their undergraduate studies. 40 percent are foreign students. They don't have the system of Dean's list. Actually they are all scholarship or fellowship honor students. The classification is arbitrary. The standard used for Group (1) is that of having more than 10 publications resulted from research studies, whereas that for Group (4) is that having participated in a number of social activities with more than 5 offices held. Group (2) and (3) are merely by weighing their relative measures.

V. Research Results

Out of the total sample of 24 respondents, there are 18 chemical engineers (including 3 faculty members) and 6 chemists.

After the classification according to their task experience, we have the following figure:

Group (1) 2 (all faculty members) engineers.

Group (2) 5 engineers and 4 chemists.

Group (3) 7 engineers and 2 chemists.

Group (4) 4 engineers (including 1 faculty member)

The first question is designed to test what kinds of task he prefers most (Task opportunity searching and screening). The answers provided represent a continuum from one extreme of highly ideological research studies purely for the sake of knowledge, gradually toward the practical side, and ended at Management which requires no highly specialized scientific knowledge at all. The questions are as following:

Question I.

What kind of job assignment you prefer most?

- a. Pure research. I can choose whatever the topic I like. And nobody bother me about progress and the way I handle the the problem. The purpose of the research is to advance the human knowledge.
- b. Applied research. There is a definite goal for the project. If I get it done, I can see its impact through its immediate application.
- c. Technical service. To apply whatever I learned to attack the problem at hand. There is a lot of hard work and I must learn a lot to do the job, but no original research findings are required.
- d. Management. To organize, to lead, and to coordinate the efforts and talents of others, to get the job done.

The result of this test is tabulated below:

Question (I)

Answers Group	a	b	c	d
1. 2 engineers (All faculty members)	1 engineer (faculty)	1 engineer (faculty)		
2. 5 engineers 4 chemists	2 chemists	2 chemists 3 engineers	1 engineer	1 engineer
3. 7 engineers 2 chemists	1 chemist	2 chemists 4 engineers	1 chemist 2 engineers	1 chemist 4 engineers

4.	4 engineers (including 1 faculty member)	1 engineer (faculty)	1 engineer (faculty) 2 engineers	2 engineers	3 engineers
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It must be understood that the respondents are not restricted to indicate only one answer. He may indicate all the answers if he feels that way.

Similarly the second and third questions are given. To test how to evaluate the intrinsic reward value of tasks and the instrumental value of his potentials, respectively. They are, and the results are as follows:

Question II.

If you have the following opportunities to make contribution to the human society, and their values of contribution are all the same. If you can do them all equally well, which one of them you feel will be *most satisfying for you to do*.

- a. A scientific research finding which advances human knowledge.
- b. A technical innovation which made the application of some research findings possible. Therefore, it increases the wealth of our society.
- c. Technical application and supervision. To be in a position for production plant supervision and operation.
- d. Administrative position. To plan, to organize, and to direct, hence put the human knowledge and nature resources into maximum utilization.

Question III.

Which of the following assets you think will be the most important factor for your future success?

- a. Your capacity of learning and creative research ability.
- b. Your persistence to attack the problem at hand and your hard working attitude.
- c. Your ability to analyze the problem you face and to plan your effort distribution for goal attainment.
- d. Your ability to influence the people and change the situation in which you work. In other words, your leadership capability to get the things done, no matter by your own or through others.

Question II

Answers	a	b	c	d
Groups				
1.				
2 engineers (All faculty members)	1 engineer (faculty)	1 engineer (faculty)		
2.				
5 engineers 4 chemists	2 engineers 2 chemists	3 engineers 2 chemists		

3.	7 engineers 2 chemists	1 engineer 1 chemist	2 engineers 1 chemist	2 engineers	5 engineers
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4.	4 engineers (1 faculty member)		1 engineer	2 engineers	2 engineers 1 engineer (faculty)
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Question III

Answers Groups	a	b	c	d	
1.	2 engineers (faculty members)	2 engineers (faculty)			
2.	5 engineers 4 chemists	1 chemist	2 chemists 1 engineer	2 chemists 4 engineers	
3.	7 engineers 2 chemists	2 engineers	1 chemist 3 engineers	2 chemists 5 engineers	3 engineers
4.	4 engineers (including 1 faculty member)		1 engineer	2 engineers	4 engineers (including 1 faculty member)

VI. Data Analysis

It is obvious, from the results of this research, that those people classified as research and academic activity high, such as group (1) and (2) members, usually tend to indicate the first couple of answers as their preference. Because the first couple of questions virtually require, and hence give fuller utilization, higher creative research capabilities. It is also clear that those who has higher social activities prefer more the kind of tasks which require higher capacity of feeling. This is consistent to the proposed Theory.

If we give more attention to that particular sample of chemical engineer faculty members, all three indicated that they prefer research task, either pure or applied research. The explanation is that because they are interested in research, so they took teaching as their career. And after joining the teaching faculty, the research activity becomes critically important to their future success, i. e. promotion and salary increase. Coupled with the group (their peer teaching faculty members) norm is in favor of research activities, their attitudes toward this set of particular tasks have been reinforced. And they will perceive that activities as most rewarding, both intrinsic and extrinsic. Thus they will consider that such activities are most satisfying (evaluation). It must be emphasized that they reach this perception because they have distinguished research capabilities in the first place. This made them be exposed to the reward value of this kind of activities (Potential-exposure). These remarkable capabilities are indicated by their previous research results as shown by their publications.

As the environment-distribution effect is concerned, question (II) gives some very interesting result. Chemists all show that they evaluate research activities, either pure or applied, as most satisfying to participate. Whereas about 50% of the engineers indicated that they feel that practical aspects of assignments, such as production supervision and administration, are more satisfying. This is explained as engineering education emphasizes much more on the *application* of scientific knowledge, rather than the search for knowledge is purely for knowledge seeking as does the education for chemists. Another way to see it is that may be those chemists are interested in research activities at the first place, so they take chemistry as their major study (Task searching and screening). Both views are consistent with the theory proposed.

The last question tests how people evaluate the instrumental values of their different potentials. All the Group (1) members rely on their creative research capability. Whereas all the Group (4) members indicated that their capability to influence others is the most important. This clear cut answer gives the strongest support to this Theory of Exposure Opportunity and Reinforcement. A closer examination of the members of Group (4) shows that except one of them, who is a faculty member, all other three take Business Administration as one of their minor areas for the doctoral degree. This is obviously the proposed Task Searching and Screening process, which is the result of complicated potential exposure, evaluation, attitude reinforcement effects.

The data obtained from the survey are tested by statistical methods.⁶ The results are even more convincing. The calculations are shown below.

For the first test, we take Group (1) and Group (2) as two unrelated sample groups. We put

the capacities of creative research and that of leadership (influencing) as two independent capacities. By examining the answers of question III, we have the tabulated result and then test it by the Fisher Exact Probability Test, which is for unrelated samples and conditions.

	Research capability	Leadership capability	
Group (1)	2	0	$A+B=2$
Group (4)	0	4	$C+D=4$
	$A+C=2$	$B+D=4$	$N=6$

By applying the equation,

$$p = \frac{(A+B)! (C+D)! (A+C)! (B+D)!}{N! A! B! C! D!}$$

we have

$$p = \frac{2!4!2!4!}{6!4!2!} = \frac{1}{15} = 0.066$$

This test shows that the probability for the distribution of potential instrumental value recognition among the members of the two groups, as reported by this study, is only 0.066.

The second test takes the members of Group (1) as the respondents. And the answers Question III as conditions. From the data obtained, we have:

Answers	a	b	c	d
Respondents				
1	1	0	0	0
2	1	0	0	0

Since there are four conditions, the respondent may indicate any of them, or any combination of them, as his answer. Then, according to the probability, both of them indicate the answer (a) as their answers is,

$$p = \frac{1}{(2)^4 \cdot (2)^4} = 0.0031$$

If we assume that the respondents were implied (which is not true) but it might still be the case, to choose only one answer from the four. The possibility for both of them to take answer (a) is,

$$p = 1/4 \cdot 1/4 = 1/16 = 0.063$$

That is, the probability of such intrinsic reward value to be recognized as reported is only 0.0031, if the respondents were not implied to make only one choice to one question. And it will be 0.063 if they were implied so.

The third test took the members of Group (4) as respondents with the answers of Question III as conditions. Since both samples and conditions are related, the nonparametric Cochran Q Test was used. From the survey data, we have,

Answers:	a	b	c	d	L_i	L_i^2
Respondents						
1	0	0	1	1	2	4
2	0	1	1	1	3	9
3	0	0	0	1	1	1
4	0	0	0	1	1	1
	$G_a=0$	$G_b=1$	$G_c=2$	$G_d=4$	$\Sigma L_i=7$	$\Sigma L_i^2=15$

And $K=4$.

$$df=K-1=3$$

By applying the equation, $Q = \frac{(K-1)[K\Sigma G_i^2 - (\Sigma G_i)^2]}{K\Sigma L_i - \Sigma L_i^2}$

Therefore,

$$Q = \frac{3[4x(1+4+16) - 7^2]}{4x7 - 15} = 8.07$$

Hence, from the CHI-square table (Table C, Appendix of Reference 6), we have

$$p=0.04$$

That is, the probability of distribution for the potential instrumental value recognition among the members of Group (4) people, as reported, is only 0.04.

From the above three statistic tests, we can see clearly that those potential instrumental values and intrinsic reward values, as tested by this study, among that two paritcular group members are not distributed by chance.

The probabilities of such distributions are all so close to the region of rejection ($p=0.05$). That is, under normal donditions such distribution is not likely to occur. Therefore, it could well concluded that there must be some reasonings for the so distributed results of this survey study. This is another strong support to the Theory of Exposure Opportunity and Reinforcement, because it gives clear explanation to such phenomena.

VII. Conclusion

The Theory of Exposure Opportunity and Reinforcement is proved by the research result of this study. And certain intangible traits of an individual's attitude are made tangible, by examining his task experiences. This could be considered as the major contribution of this theory.

It is believed that this theory is of practical significance. It could be applied to improve the operating efficiency of business firms whenever personnel problem arise. In determining the task assignment to an individual, we must consider the individual's potential, attitude, and environmental factors. The same applies to the problems of recruiting, promotion, and line-staff divisions. Those important traits of the individual of concern could now well be made tangible by examining their past task activities.

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Intrinsic Attitude Made Tangible

-Theory of Exposure Opportunity and Reinforcement-

by C. K. Hsu

ABSTRACT

Modern management theories concerning personnel selection and development place heavy weight on identifying and evaluating the potentiality and intrinsic attitude of a candidate. However, it is a difficult task to determine such trait of a person even though face to face contact may be on a daily basis. This paper shows in detail a simple and effective means of making an attitude evaluation with relatively high accuracy by simply examine one's past task records.

The "Theory of Exposure Opportunity and Reinforcement" is presented. In this theory, the personality and potentiality of an individual are considered as the determining factors for the availability of task experience, rather than the environmental task-distribution effect as proposed by Breer and Locke¹.