

THE INTERRUPTION OF TASKS: METHODOLOGICAL, FACTUAL, AND THEORETICAL ISSUES¹

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After describing the criterion scores which have been used to assess behavior in the interrupted task paradigm (ITP), a summary of the research literature is presented. ITP as a source of data for evaluating the psychoanalytic theory of repression is found not to allow for the separation of learning and retention effects, and so is not well suited to the study of repression. Similarly, the mediation-avoidance hypothesis makes predictions only concerning interrupted task recall and while it is partially consistent with indirect data, it has yet to receive direct experimental test. The need-achievement conception predicts interrupted task recall satisfactorily but is inapplicable to completed task recall or relative recall scores. Finally ITP is considered as a source of data for a developmental conception of success-failure reactions. Repetition choice scores are found to be consistent with the developmental theory, but some recall results are not.

In the interrupted task paradigm (ITP) the subject (*S*) is engaged in a number of tasks some of which he is allowed to complete and some of which are interrupted before he completes them. Zeigarnik (1927) first introduced ITP as a test of the prediction from the gestalt theory of motivation that interrupted tasks should be recalled more frequently than completed tasks. Her findings supported this prediction and is known to this day as the Zeigarnik effect. However, ITP encompasses more than just the Zeigarnik effect or even the recall of tasks. In the first place, the Zeigarnik effect is far from being the invariable result in ITP. Frequently, more completed than incompleting tasks are recalled (e.g., Atkinson, 1953). In the second place, measuring the relative recall of com-

pleted and incompleting activities is not the only way to assess behavior in ITP. For example, ITP may be assessed by having *S* choose which task he would like to repeat (e.g., Rosenzweig, 1933, 1945). Finally, and most important, ITP has assumed a much wider theoretical significance than just being a test of a derivation from gestalt theory. (The reader who is interested in ITP as a source of evidence for the differential utility of gestalt and stimulus-response theory should see Osgood, 1951.) It has been used to test the psychoanalytic theory of repression (Rosenzweig, 1938), a mediation-avoidance hypothesis of personality functioning (Inglis, 1961), the achievement-motive conceptions of McClelland, Atkinson, Clark, and Lowell (1953), and a developmental theory of success-failure conceptualization (Cromwell, 1963). Indeed, ITP has become one of those instances in the history of psychology when a single technique has been used to test several theoretical issues. Therefore, the methodological and theoretical issues involved and the

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factual findings with ITP deserve elucidation.

Because there has been a great deal of inconsistency and circularity in the interpretation of findings with ITP (Alper, 1952; Glixman, 1948; Osgood, 1951), this review first summarizes the functional relationships found with ITP and then considers the theoretical issues which have grown out of these findings.

ITP CRITERION SCORES

The empirical findings from ITP can most readily be grasped by grouping them according to criterion scores. It will subsequently be seen that such a grouping also clarifies the theoretical issues. The criterion scores used in ITP studies fall naturally into three groups. This grouping excludes studies which have used as their criterion scores either the relative rate of spontaneous resumption of incompleting and completed tasks (Henle, 1942; Nowlis, 1941; Rickers-Ovsiankina, 1937) or attractiveness ratings (Cartwright, 1942; Gebhardt, 1948) because there are so few of them and because the factors which determine spontaneous resumption seem so numerous and so poorly understood.

One group of criterion scores which is concerned with recall of ITP tasks keeps the recall of incompleting (I) and completed (C) tasks separate. Thus, the measures are the number of I or C tasks recalled (IR and CR, respectively).

A second group of ITP criterion scores which is also concerned with task recall includes only those measures which reflect the relative recall of I and C tasks taken together. This group includes the various recall differences and recall ratio scores. The recall difference scores are: IR-CR, CR-IR, and CR/C-IR/I. The recall ratio scores are:

IR/CR, $\frac{IR/I}{CR/C}$, and a variety of more

complex and less interpretable ratios.

The feature common to all relative recall scores is that changes in them may not be attributed to any particular change in either IR or CR individually (Glixman, 1948). An increase in a difference or ratio score may be due to: an increase in IR accompanied by no change in CR, a decrease in CR accompanied by no change in IR, an increase in IR accompanied by a decrease in CR, an increase in IR accompanied by a smaller increase in CR, and a decrease in CR accompanied by a smaller decrease in IR. Likewise, the opposite of these five conditions can lead to a decrease in relative recall score. Therefore, either an increase or a decrease in a recall ratio or difference score may reflect an increase, no change, or a decrease in IR or CR individually. Furthermore, a relative recall score may remain constant even when both IR and CR change. For these reasons, hypotheses concerned with change in either IR or CR alone must measure them directly rather than by relative recall scores. Also, any theoretical scheme which makes predictions about only IR or CR cannot be tested by a study which employs only relative recall scores. Only when a theory makes predictions about relative differences or ratios, or when it predicts both IR and CR separately, is a relative recall score appropriate to it. Even then the analysis of preference is one which does not use a relative recall score. The preferred procedure is to use completion-incompletion as a dimension of the analysis. When completion-incompletion is used as a dimension of the analysis no information about either CR or IR is lost. Consequently, any relative recall effects, which are mani-

festated as interactions involving the completion-incompletion dimension, are immediately interpretable. That is, CR and IR are not obscured in this procedure as they are in the calculation of relative recall scores.

A third group of ITP criterion scores is concerned with task repetition rather than task recall. Task repetition scores are secured by requiring *S* to choose to repeat one member of a pair of tasks, one of which he has previously completed and one of which he has previously begun but not completed. In all but two investigations of repetition choice (RC) to date (Butterfield, 1963; Stedman, 1962), *S*s have been given only two tasks, one of which was completed and one of which was interrupted. Consequently, the only score used to measure RC has been some indication of whether *S* repeated the I or the C task. Therefore, no relative recall scores, such as ratios and differences, have been employed.

Investigators have typically used either recall or repetition-choice scores without any consideration of the relationships between the two classes of criterion scores. This fact reflects an astonishing lack of basic methodological work with ITP. Despite the long history of research with ITP, Butterfield (1963) was apparently the first to examine the intercorrelations of the various criterion scores which it yields. Yet, knowledge of this kind is essential if the literature is to be integrated. More crucially, there has apparently been no systematic investigation of the reliability of the various ITP scores.

CORRELATES OF THE VARIOUS ITP CRITERION SCORES

IR and CR Taken Separately

A substantial portion of the experimentation with ITP has concerned the

effects of instructions administered prior to task presentation. In practically all of these investigations the instructions have varied along a dimension which Alper (1946) characterized as task versus ego orientation and which Inglis (1961) characterized as stressful versus nonstressful. Under the ego or stress instruction, *S* is told that task completion or incompleteness is a measure of his ability or intelligence. Under the task-oriented or nonstress instruction, *S* is told that task completion or incompleteness is of secondary importance and that it has nothing to do with his ability or intelligence. In the present article this instructional dimension is referred to as neither an ego versus task-orientation nor a stressful versus nonstressful continuum. It is referred to as a skill versus nonskill dimension because this latter label emphasizes the nature of the instructions rather than *S*'s hypothetical reaction to the instructions.

The most striking thing about the various findings on the effects of skill instructions is their inconsistency. Skill instructions have been shown to increase (Atkinson, 1953), to have no effect upon (Alper, 1957; Atkinson & Raphelson, 1956; Eriksen, 1952a; Kendler, 1949; Rosenzweig, 1943), and to decrease IR (Alper, 1946; Caron & Wallach, 1957; Eriksen, 1952b, 1954; Glixman, 1949; Smock, 1956). Similarly with skill instructions, CR has been shown to decrease (Alper, 1946; Caron & Wallach, 1957; Kendler, 1949), to remain the same (Alper, 1957; Atkinson, 1953, Atkinson & Raphelson, 1956; Eriksen, 1952b, 1954; Glixman, 1949; Rosenzweig, 1943; Smock, 1956), and to increase (Eriksen, 1952a).

Several studies suggest that the inconsistent findings concerning the effects of skill instructions upon IR and CR, particularly upon IR, may be due to differences in *S* variables between the

studies. Atkinson (1953) found that high need achievement (*n Ach*) Ss increased their recall of incompleting tasks while low *n Ach* Ss decreased their recall of incompleting tasks when instructions were more skill oriented. Atkinson and Raphelson (1956) found no differences between high and low *n Ach* Ss under nonskill instructions. However, under skill instructions high *n Ach* Ss recalled more I tasks than low *n Ach* Ss. Atkinson and Raphelson also found that while there were no differences in high and low need affiliation Ss under skill instructions, high need affiliation Ss recalled more I tasks under nonskill instructions than did low need affiliation Ss. In these nonskill instructions, S was told that he was helping the experimenter participating in ITP. Neither Atkinson nor Atkinson and Raphelson found any instruction—or personality—related differences in the recall of completed tasks. Caron and Wallach (1959) replicated Atkinson and Raphelson's findings concerning IR and *n Ach*, even though they used a substantially different measure of *n Ach*. In addition, however, Caron and Wallach found that while high *n Ach* Ss' recall of completed tasks was unaffected by skill instructions, low *n Ach* Ss recalled fewer completed tasks under skill than nonskill instructions. Eriksen (1954) found that Ss who were high on the MMPI psychasthenia recalled more I tasks under skill instructions than Ss who were low on that scale, and that Ss who were high on the MMPI hysteria scale recalled fewer I tasks under skill instructions than Ss low on that scale. Eriksen found no personality-related differences in the recall of C tasks. Eriksen also found that Ss with ego strength, as inferred from high *F+* on the Rorschach, recalled more I tasks under skill instructions than low ego-strength Ss. Using

a different Rorschach measure of ego strength, Jourard (1954) found no relationship with IR or CR. Apparently high *n Ach* and strong-ego Ss respond to skill instructions by recalling more I tasks while *n Ach* and weak-ego Ss respond to skill instructions by recalling fewer I tasks. The trend for CR is less clear. The degree of overlap in the *n Ach* and ego-strength constructs remains in question.

Marrow (1938) investigated instructions which did not vary along the typical skill versus nonskill dimension. Some Ss were told task completion indicated success; others were told task incompleting indicated failure. His results clearly indicated that S's interpretation of C and I, rather than C and I per se, determined recall. Findings by McKinney (1935) support this interpretation. Subsequent analysis of Marrow's data also indicated that IR and CR were both unaffected by telling S during the course of ITP that he was doing very poorly on ITP as a whole.

The relationships of IR and CR to variables other than instructional differences have also been investigated. For example, IR and CR are differently affected by the passage of time. Martin (1940) found an increase in the recall of C tasks 2 days after task presentation which was not present for I tasks. Pachuri (1935) found a similar increase 1 day after task presentation. After 2 weeks, however, Martin (1940) found that the reminiscence of C tasks had dissipated and that both IR and CR had decreased. Sanford and Risser (1948) found after both 2 weeks and 4 months that CR had decreased significantly while IR had not changed.

Pachuri (1935) found that fatigue at the time of task administration reduced IR but did not affect CR and that fatigue at the time of recall affected neither IR nor CR.

Caron and Wallach (1957) found that the verbal cancellation or relief of skill instructions subsequent to task recall did not affect IR. Subjects who had and Ss who had not had their skill instructions relieved recalled the same number of I tasks, this being fewer than that of nonskill-instruction Ss.

Recall of I Relative to C Tasks

The experimental findings concerning the relative recall of I and C tasks can best be summarized under the following four headings: effects of instructions, effects of S variables, interaction of instructions and S variables, and other variables.

Effects of Instructions. The experimental literature unequivocally indicates that skill instructions increase the ratio of C task recalled to I task recall (Alper, 1946; Eriksen, 1952a, 1952b; Hays, 1952; Kendler, 1949; Lewis, 1944; Lewis & Franklin, 1944; Rosenzweig, 1941, 1943; Smock, 1956).

Effects of S Variables. Rosenzweig and Sarason (1942) found that Ss who were more suggestible and/or hypnotizable recalled relatively more C than I tasks while the opposite was true of Ss who were less suggestible and hypnotizable. In a related study Sarason and Rosenzweig (1942) found, by means of ratings derived from Thematic Apperception Test protocols, that those Ss who recalled more C than I tasks were relatively high on need affiliation and need deference while those Ss who recalled more I than C tasks were relatively high on need autonomy and on anxiety.

Tamkin (1957) found that under skill instructions more adult schizophrenics than adult normals recalled more I than C tasks. Winder (1952) found that under skill instructions more paranoid schizophrenics than nonpara-

noid schizophrenics recalled more I than C tasks.

Sanford (1946) and Rosenzweig and Mason (1934) have investigated the effects of mental age (MA) and chronological age (CA) upon relative recall. Using skill instructions, crippled institutionalized Ss, and different numbers of tasks for different Ss, Rosenzweig and Mason failed to find any clear relationship between either MA or CA and relative recall. Nevertheless, they reported an impression that as both MA and CA increased the recall of C tasks increased to the recall of I tasks. Stanford, on the other hand, used nonskill instructions with slightly older, intellectually and physically average children from the public schools. He found a clear increase in the recall of I relative to C tasks as a function of CA. Stanford's findings are probably more general and reliable than Rosenzweig and Mason's. Butterfield's (1963) findings are consistent with this conclusion.

Interaction of Instruction and S Variables. Instructions and S variables interact when relative recall scores are used as the criterion. Persons with strong egos as measured by a composite Rorschach score (Eriksen, 1954) and a questionnaire (Alper, 1957) recall relatively more I tasks under nonskill instructions and relatively more C tasks under skill instructions. Alper's strong-ego Ss have higher need recognition and need dominance and react to failure with more increased effort than do her weak-ego Ss (Alper, 1948). People with low n Ach recall relatively more I tasks under nonskill instructions and relatively more C tasks under skill instructions (Atkinson, 1953; Atkinson & Raphelson, 1956; Caron & Wallach 1957, 1959). People with weak egos and high n Ach recall relatively more C tasks under nonskill instructions and

relatively more I tasks under skill instructions.

Other Variables. Abel (1938) investigated the relationship of relative recall to the Schneider index of neurocirculatory efficiency. The Schneider index is supposedly a measure of response to physiological stress. Abel found that Ss who recalled more I tasks relative to C tasks had significantly greater neurocirculatory efficiency. Strother and Cook (1953) have shown that Ss with low neurocirculatory efficiency respond to stress with a decrement in performance. Therefore, it may be that Ss who recall more I than C tasks respond with less decrement in performance under stress than do Ss who recall more C than I tasks. Bialer and Cromwell (1960) found evidence which seems to support the suggestion that Ss who recall more I than C tasks respond with less performance decrement to stress than Ss who recall more C than I tasks. They found that mentally retarded Ss who return to incompleting tasks respond with a greater increase in rate of card sorting after induced failure than do Ss who return to completed tasks in ITP procedure.

Hays (1952) found that the interpolation of an interesting task between the ITP and recall caused Ss to recall relatively fewer C tasks than when he interpolated a boring task.

RC

The RC has been studied exclusively with children and has been most extensively related to MA and CA. Bialer (1957), Bialer and Cromwell (1960), Butterfield (1963), Rosenzweig (1933, 1945), and Spradlin (1955-60) have shown that as both MA and CA increase more Ss choose to repeat I tasks. Crandall and Rabson (1960) have made similar findings for boys but not for

girls. Bialer (1960) has found by using average and mentally retarded Ss that this increasing tendency to choose I instead of C tasks under skill instructions is due solely to increase in MA. It is unrelated to increases in CA when MA is partialled out. Miller (1961) found that RC of the I task varies with MA and not with CA when ITP is administered under skill instructions but not under nonskill instructions. Bialer (1957, 1960), Bialer and Cromwell (1960), Butterfield (1963), Rosenzweig (1933, 1945), Spradlin (1955-66), and Crandall and Rabson (1960) all used skill instructions so that Miller's (1961) findings are consistent with theirs. Miller's failure to find a relationship between RC and MA under nonskill conditions may be due to the fact that practically all of his Ss chose the I task under nonskill conditions. Consequently, there was no possibility of his finding any differential relationship between the choice of I and C tasks.

A number of apparently similar personality variables have been related to RC behavior. Subjects who return to I rather than C tasks have been rated by teachers as more rebellious (Miller, 1961) and as having more pride (Rosenzweig, 1933) and by observers of their free-play activity as being more assertive and independent (Crandall & Rabson, 1960). Bialer (1960) found that Ss who reported in questionnaire items that they feel personal control over what happens to them more often repeat I tasks than Ss who report feelings of more external control. It is possible that none of these relationships would have been found if MA had been controlled. For example, Bialer's (1960) finding was eliminated when MA was controlled statistically.

In the only study to investigate the effects of different instructions upon RC, Miller (1961) found that skill

instructions increased the tendency to return to C rather than I tasks.

THEORETICAL ISSUES

The ITP has been considered to provide validity measures for the psychoanalytic theory of repression, the mediation-avoidance hypothesis of personality functioning, the McClelland and his associates' (1953) conception of achievement motivation, and a developmental theory of success-failure conceptualization. Its role in each of these four theoretical realms is considered in turn.

Repression

Rosenzweig (1938) originated the rationale for deriving a measure of repression from ITP. He reasoned that skill instructions would make I tasks seem like failure to the Ss, thereby causing them to repress the I tasks. Therefore, Ss would recall fewer I tasks under skill instructions than under non-skill instructions. Rosenzweig derived no predictions from psychoanalytic theory about the effects of skill instructions upon C tasks and no such derivation seems possible.

Rosenzweig found that the ratio of I tasks to C tasks was less under skill than under nonskill conditions. However, Rosenzweig suggested, and Glixman (1948) subsequently established by reanalyzing Rosenzweig's data, that this relative change was due to an increase in CR rather than to the predicted decrease in IR. Other investigators have also failed to find any consistent effects of skilled instructions upon IR when Ss were unselected for personality variables (Alper, 1946, 1957; Atkinson, 1953; Atkinson & Raphelson, 1956; Caron & Wallach, 1957; Eriksen, 1952a, 1952b, 1954; Glixman, 1949; Kendler, 1949). When Ss were selected for personality variables, skill instructions increased the IR

of Ss high in n Ach and MMPI psych-asthenia and decreased the IR of Ss low in n Ach and high in MMPI hysteria. Therefore, if a decrease in IR due to skill instructions is indeed repression, repression occurs markedly more often in some personalities than in others. This is as might be expected. Furthermore, other personalities actually show the opposite of repression—call it obsession (Caron & Wallach, 1959)—to task interruption under skill conditions.

While it is conceivable that some Ss should react to interruption under skill instructions by repressing the I task and others by becoming obsessed with the I task, there is a good reason to doubt that changes in IR due to skill instructions have demonstrated either repression or obsession. While the present argument is made solely for the phenomenon of repression, it also applies to obsession. It is said to occur when some experience has been registered, that is, learned but because of some painful association has been warded off from recall. In order to demonstrate repression, it is first necessary to demonstrate that two groups have learned some response equally well and then to show that some painful experience leads one group to recall that response significantly less well. That is, it is necessary to be able to separate the effects of learning from the effects of retention upon recall. In ITP, it is impossible to show that the groups to be compared on retention are equal on original learning. For an example of a study which separates the effects of learning and retention by placing the repression-inducing stimulus after a test for initial learning see Zeller (1952). This inability to show that I and C tasks are equally well learned is a crucial shortcoming of ITP as a measure of retention since the original learning opportunity is frequently shorter

for I than for C tasks. Since ITP does not allow for the separation of learning from retention it is not well suited to the study of repression. Nevertheless, indirect attempts have been made to determine whether differential recall of I tasks was a phenomenon of learning or of retention.

Theoretically, repressed material should not be subject to the same laws of retention as unrepressed material as long as the reason for the repression exists. In ITP, the ostensible reason for repression is *S*'s reaction to his belief that task incompleteness is due to his lack of skill. Therefore, until the skill instructions are somehow countermanded and *S* "realizes" that task incompleteness is unrelated to his skillfulness, IR should not change over time the way CR does. However, there should be no differences in changes over time between IR and CR when the tasks are presented under nonskill instructions. As was reported earlier, Martin (1940), Pachuri (1935), and Sanford and Risser (1946) found differences between changes in IR and changes in CR, but these differences occurred under both skill and nonskill instructions. Therefore, these differences establish neither that decreases in IR are due to retention, that is, repression, nor that they are due to original learning.

Caron and Wallach (1959) theorized that, since the ostensible reason for repression in ITP is *S*'s reaction to his belief that task incompleteness is due to his lack of skill, they could determine whether differential recall was due to learning or retention by comparing the recall of three groups: nonskill instructions, skill instructions, and skill instructions which were countermanded between the time of task presentation and task recall. If the countermanded skill-instruction group was similar to the

nonskill group, then the effect would be one of retention. If the countermanded skill group was similar to the skill group and different from the nonskill group, then the effect would be one of original learning. Their results suggested that differences were probably due to differences in original learning.

Pachuri's (1935) finding that fatigue at the time of task administration affects IR while fatigue at the time of task recall does not, also suggests that depressed recall is due to differences in learning rather than differences in retention.

In summary, both logical consideration and research findings with ITP suggest that, as it has been used in the past, it is not well suited to the study of repression.

Mediation-Avoidance Hypothesis

Inglis (1961) attempted to integrate the results of ITP studies by means of the mediation-avoidance hypothesis. According to this hypothesis, *Ss* react to moderate amounts of "socialized anxiety" by avoiding the mediator or instigator of that anxiety. Small amounts of anxiety are said to have no influence upon avoidance behavior and large amounts are said to be disruptive of avoidance behavior. In other words, the mediation-avoidance hypothesis postulates a curvilinear relationship between anxiety and avoidance. Furthermore, there are said to be two sources of socialized anxiety: *S*'s immediate environment and his personality. The environment ranges from nonstressful to stressful situations in such a way that task interruption under skill instructions is more stressful than task interruption under nonskill instructions. The personality factors which are said to be related to socialized anxiety are the dimensions of stability to neuroticism and introversion to extraversion.

Neurotic extraverts are least susceptible, neurotic introverts are most susceptible, and stable introverts and stable extraverts are intermediately susceptible to stress. Since, according to the mediation-avoidance hypothesis, there is a curvilinear relationship between anxiety and avoidance, and since anxiety is contributed to by both the environment and *S*'s personality, the mediation-avoidance hypothesis predicts an interaction in the production of avoidance reactions between personality and situational stress (see Figure 1).

From these premises of the mediation-avoidance theory the present author has derived the following predictions.

1. Under conditions of low stress, introverts recall fewer I tasks than extraverts.

2. Under conditions of high stress, introverts recall more I tasks than extraverts.

3. If both the introverts and extraverts are neurotic the differences predicted in Hypotheses 1 and 2 above are greater than if the groups are unselected for neuroticism.

4. Under similar instructional conditions, there are no mean differences between neurotic and stable groups which are equal on or unselected for introversion-extraversion.

5. Under similar instructional conditions, the variance is greater and the distribution of avoidance scores is more bimodal for neurotic than for stable groups when the groups are equal on extraversion-introversion.

6. The effects of stress instructions upon IR are unpredictable without knowledge of *S*'s personality.

These predictions refer only to the recall of interrupted tasks because according to Inglis (1961, p. 280) I tasks are the only "anxiety-producing mediators" in ITP. Therefore, since

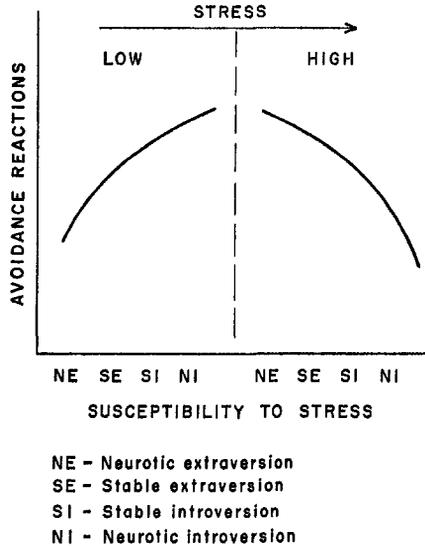


FIG. 1. Hypothetical relationship between susceptibility to stress and avoidance reactions (adapted from Inglis, 1961).

changes in relative recall scores depend upon changes in both IR and CR, relative recall scores do not provide a definitive test of the validity of the mediation-avoidance hypothesis. Consequently, Inglis' (1961) discussion of ITP in which he relied entirely upon relative recall scores is inconclusive with regard to the mediation-avoidance hypothesis and his conclusion that ITP studies confirm the mediation-avoidance hypothesis is questionable if not erroneous.

There are no studies in the literature which test directly the predictions made from the mediation-avoidance hypothesis. However, some indirect tests have been made. For example, if it is assumed, as Inglis does, that high *n* Ach is an index of neurotic extraversion, then the findings of Atkinson (1953), Atkinson and Raphelson (1956), and Caron and Wallach (1959) support Hypotheses 1 and 2 above. Since Hypotheses 1 and 2 taken together constitute the prediction of an

interaction between instructional and *S* variables, the mediation-avoidance hypothesis predicts some of the most complex ITP phenomena. Hypothesis 3 has not been tested even indirectly. If it is assumed, as Inglis does, that Eriksen's (1954) measure of ego strength is a valid index of neuroticism, then Hypothesis 4 has been contradicted and Hypothesis 5 has received no support. The author's conclusion that Hypothesis 4 has been contradicted differs from Inglis' interpretation of the evidence. Inglis concluded that a study by Eriksen (1954) supported the mediation-avoidance hypothesis when it would not have done so even if a relative recall score was an appropriate criterion score with which to test the hypothesis. Inglis noted that Eriksen measured ego strength "partly by a Rorschach conformity score not unlike that found by Eysenck to be a fairly good measure of neuroticism." He concluded from the fact that Eriksen's ego-strength measure was positively related to relative recall scores under nonstress conditions and negatively related to relative recall scores under stress conditions that the mediation-avoidance hypothesis was upheld. It is clear from Inglis' diagrams (see Figure 1), however, that neuroticism independent of extraversion-introversion is predicted to be unrelated to directional differences in avoidance. That is, Eriksen's finding of a directional relationship between neuroticism and relative recall is contrary to rather than supportive of the derivation from the mediation-avoidance hypothesis. Hypothesis 6 has been supported by the lack of consistency in the results of studies examining the effects of skill instructions upon IR.

It is apparent that while the mediation-avoidance hypothesis is relevant to the recall of I tasks, much more

research is needed before it can be asserted that it adequately summarizes or predicts even the existing findings with ITP.

Achievement Motivation

In order to predict ITP findings from *n* Ach scores it has been assumed that differences in *n* Ach indicate qualitative differences in motive structure rather than, or in addition to, differences in intensity of motivation (McClelland, 1951; McClelland et al., 1953). Specifically, it has been assumed that persons with high *n* Ach scores are motivated primarily by a need to approach success while persons with moderate or low *n* Ach scores are motivated primarily by a fear of, or a need to, avoid failure. Furthermore, skill instructions are assumed to enhance the motivations which the person possesses. That is, for low or moderate need achievers, skill instructions are said to be threatening and to lead to increased avoidance of failures, that is, I tasks "since recall of failures would serve to reintegrate the pain of failure [McClelland et al., 1953]." On the other hand, for high need achievers, skill instructions are said to be an incentive or challenge which leads to increased approach to, or recall of, I tasks. It is as if the high need achiever "wanted to continue to strive to complete them [McClelland, et al., 1953]." These predictions about the interactive effects of instructions and *n* Ach on IR are supported by the experimental literature.

As it was developed by McClelland and his associates (1951, 1953), the achievement-motive conception makes no predictions about the recall of C tasks. Therefore, it cannot predict the interactive effects of instructions and *n* Ach upon relative recall scores without the addition of factually unwarranted assumptions. It would be neces-

sary to assume that neither *n Ach* nor skill instructions affect CR. While it is true that *n Ach* is unrelated to CR, instructions do affect it. Consequently, without the addition of some specification of conditions under which instructions affect CR, achievement-motive theory is concerned with only the relationship between IR and *n Ach*.

Success-Failure Conceptualization

While theorists who were interested in repression, the mediation-avoidance hypothesis, and achievement motivation have used task recall measures as their criterion scores, theorists who were interested in success and failure conceptualization and developmental variables have used task RC.

These latter theorists (Bialer, 1960; Cromwell, 1963) have based their predictions about RC on developmental hypotheses such as the following:

From the time of birth the child is assumed to respond to stimuli as pleasant or unpleasant and to learn to approach stimuli previously associated with pleasant events and to avoid stimuli previously associated with unpleasant events. As the child matures a second motivational and conceptual system is said to develop. This second system is called the success-approach versus failure-avoidance system. As it matures the child comes more and more to conceptualize events in terms of his own behavioral competence, that is, success and failure and less and less in terms of pleasantness and unpleasantness. In terms of the ITP situation in which the child is asked to repeat the task of his choosing, this means that the older child will more often choose to repeat the task which allows him to demonstrate behavioral competence. The younger child, on the other hand, will more often choose the task which gave him the greatest pleasure.

Since more behavioral competence can be demonstrated by doing a more difficult task, the older child will more often choose the more difficult task. Theoretically, the only clue to difficulty in the ITP situation is completion or incompleteness, the I task appearing to be more difficult. Therefore, the older child should more often return to the I task even though the C task was probably the more pleasurable to him. The evidence strongly supports this prediction.

This developmental viewpoint has difficulty predicting the relationship between ITP behavior and instructional and *S* variables. The predictions it does make all stem from a straightforward and well-documented derivation from the notion of a developmental success-striving versus failure-avoiding motivation system; namely, that as children mature they report more frequently and in a wider variety of situations that they feel control over what happens to them (Bialer, 1960; McConnell, 1963; Miller, 1961). To the extent that this tendency to report oneself in control of what happens to him is correlated with MA or CA, the increases in it are associated with increasing resumption and recall of I tasks. However, there is some evidence that the tendency to verbalize control is not solely dependent upon MA or CA and that increases in the portion of verbalized control which are independent of MA or CA are associated with increasing resumption of C tasks (Bialer, 1960). These findings have been interpreted (Butterfield, 1963) to mean that the particular part of the variance in verbalized control which is independent of MA is a measure of the degree to which an individual strives to avoid events at which he succeeded in the past. This interpretation gives the developmental position two *S* variables by which to predict ITP be-

havior: intellectual maturity and verbalized control. As intellectual maturity increases, the resumption or recall of I tasks becomes more frequent. As an individual verbalizes more control over events without concomitant growth in intellectual maturity, the resumption or recall of C tasks becomes more frequent.

The verbalized control construct also makes it possible for the developmental theory to make predictions about the effects of skill instructions. According to the developmental position, the effect of skill instructions is the same as that of S's verbalized control. That is, skill instructions simply induce S to believe that he controls task completion. Internal control independent of MA leads to reduced resumption of I and increased resumption of C tasks.

Virtually all of the data within the realm of task resumption are consistent with the developmental theory outlined above. However, it does not predict the more thoroughly studied task recall phenomena as well. Skill instructions do not always decrease the recall of I tasks and increase the recall of C tasks as the developmental theory predicts. Furthermore, the developmental theory does not include variables with known relationships to many of the S variables which have been shown to interact with the various ITP scores. For example, it can make no predictions about the effects of n Ach. Therefore, it is not applicable to some of the most reliable and orderly findings with ITP. However, the developmental position does predict the fact that skill instructions always decrease the recall of I tasks to the recall of C tasks and vice versa. This is a distinct difference between it and the other theoretical schemes considered here. The reason the developmental scheme predicts the effects of skill instructions upon relative recall

scores is that, unlike all of the other positions here considered, it makes predictions about both IR and CR. Consequently, relative recall scores are as relevant to the developmental position as are scores which keep IR and CR separate.

CONCLUSION

It is apparent that none of the systematic attempts to deal with ITP phenomena has adequately accounted for all of the known relationships. However, these theoretical efforts and the literature upon which they are based clearly indicate that any adequate explanation of ITP phenomena must take into account: instructions, personality variables, developmental level of the subject, and probably task variables.

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