

## Cognitive Tasks in Clinical Assessment: An Exercise in Applied Psychology<sup>1</sup>

JOHN F. KIHLMSTROM  
WILLIAM NASBY

A variety of procedures may be employed in the clinical assessment of personality and psychopathology. The clinician typically begins with an interview by which he or she develops an inventory of the individual's presenting complaints and a preliminary account of their history. This information is usually supplemented by the results of a number of formal assessments employing behavior checklists, tests of intelligence and other cognitive abilities, and objective and projective measures of personality. Since the founding of clinical psychology as a discipline, a major portion of the training of its practitioners has been devoted to developing competence in testing technique and test interpretation; and a major industry has arisen that seeks to develop improved tests and promote their use. Nevertheless, despite all this interest and activity, the repertoire of available procedures has not proved adequate to the task of clinical assessment and prediction (Mischel, 1968, 1972, 1977).

From time to time, those interested in normal and abnormal personality have attempted to employ procedures derived from the experimental laboratory for purposes of personality assessment. In part, these efforts have reflected a disenchantment with the traditional armamentarium of interview and testing procedures. However, they also represent the increasing reliance on laboratory testing that is characteristic of the evolution of scientific clinical practice in other domains such as

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medicine. The trend has a long history: the studies by Jung on word associations, Kraepelin on continuous performance, Shakow on reaction time, and Goldstein on concept-attainment exemplify the very earliest work. The classic review of studies of psychological deficit by Hunt and Cofer (1944) indicates that by midcentury a great variety of laboratory procedures had been applied in the clinic, covering such diverse topics as sensory thresholds, perception, reaction time, reflex function, eye movements, motor performance, word associations, startle response, behavior, conditioning, memory, language, and thought. Even casual inspection of recent work in the field indicates that the methods of the experimental laboratory play a central role in the investigation of disordered behavior and experience.

Laboratory procedures would appear to have a great deal of potential as far as clinical assessment is concerned, but so far their promise has remained unfulfilled. Part of the reason for this failure is that the investigators who have been most interested in them have been more concerned with understanding the nature of the various psychopathological syndromes in general, rather than with understanding a particular individual. It is common for investigators to study schizophrenia with tests of reaction time, for example, but it is considerably rarer for reaction time measures to contribute to the diagnosis itself. Except in neuropsychology, few of the techniques employed in experimental psychopathology have crossed over to clinical psychopathology, to be used in the investigation of particular cases. There are, of course, important exceptions to this rule. For example, tests of sensation, perception, and learning have been used for many years to distinguish between hysteria and organic brain syndrome or malingering. More generally, Eysenck (1955) has attempted to establish a taxonomic system in psychiatry that is firmly based on the findings of laboratory procedures. At the same time, Wishner (1955) proposed using laboratory tests to assess general psychological efficiency in psychiatric patients. Most recently, Zubin (1968) has developed a wide-ranging biometric approach to assessment that includes laboratory techniques for objectively indexing deviations on culture-fair and culture-free dimensions of behavior. Nevertheless, the conventional diagnostic categories remain firmly in place and in contemporary practice the most highly touted technique for collecting information relevant to diagnosis and assessment is the standardized interview.

To the extent that laboratory techniques have become familiar in the investigation of psychopathology at any level, they have been almost exclusively applied to those major syndromes that seem to involve gross impairments in the proper functioning of some psychological system. This trend is reflected in investigations of the deployment of attention in schizophrenia, affective arousal in psychopathy, and psychomotor slowing in depression, for example. In other words, laboratory techniques have been employed in the investigation of the cognitive-behavioral "hardware" of people carrying particular diagnoses; but they have not been used to explore "software"—what the troubled individual may do with an essentially intact cognitive apparatus to create and maintain abnormal behavior. Again, there are some exceptions to this rule. Some promising forays along these lines were begun many years ago within the behavioral tradition by Lindsley and Skinner (e.g., Skinner, 1955), who used operant conditioning techniques to study clients' re-

sponses to variations in environmental contingencies. This type of activity continues at a high level in the hands of those who practice applied behavioral analysis. Despite problems with Skinner's version of behaviorism (Chomsky, 1973; Neisser, 1976), this tradition is important to our concerns because the operant literature explicitly emphasizes single-case, within-subject designs, lending itself readily to the analysis of the individual case.

Rising in the late 1950s to dominate clinical psychology in the 1960s, the behavior therapy movement represented the most deliberate, systematic, and extensive attempt yet to bring the principles and procedures of the laboratory to bear on clinical problems (Yates, 1970, 1975). The scientific basis for these clinical practices was provided by the stimulus-response models of learning that prevailed in psychology in the 1940s and 1950s. Whether their roots were in the systematic behavior theory of Hull (Wolpe, 1958), the functional behaviorism of Skinner (Ayllon & Azrin, 1968), or some other system, all of these clinical approaches were anchored to the environment: maladaptive responses represented maladaptive learning. Thus, the principles of learning theory provided the basis for a theoretical conceptualization of personality and psychopathology while the laboratory procedures by which these principles were discovered were translated into a new set of therapeutic techniques.

Just as behavior therapy was becoming popular, however, adherence to the theoretical viewpoint that formed its base decreased dramatically. This turn of events was presaged in the 1950s—first by the introduction of the high-speed computer, which was eventually to replace the telephone switchboard as the root metaphor in scientific psychology, and later by the publication of persuasive theoretical challenges to the approaches of Hull (Gleitman, Nachmias, & Neisser, 1954) and Skinner (Chomsky, 1959). This decade of increasing disenchantment with the limits of behaviorism ended with the announcement of a "subjective behaviorism" that would inquire into the mental processes underlying behavior (Miller, Galanter, & Pribram, 1960). The new discipline was put on a firm empirical basis by the development of a number of behavioral techniques by which mental processes could be observed, and mental contents revealed. The signal event of the "cognitive revolution" in psychology was the publication of Neisser's (1967) sweeping survey of the field.

The emergence of a cognitive viewpoint within experimental psychology created something of a crisis within the behavior therapy movement, as several of its influential practitioners began to question their allegiance to the principles and procedures of learning theory. Although some refused to commit themselves to *any* theory (e.g., London, 1972), others began to develop a theory of social learning that emphasized the role of mediational constructs such as percepts, images, expectations, encoding strategies, and internal representations (Bandura & Walters, 1963; Mischel, 1968; Rotter, 1954). The flow of cognitive constructs into behavior therapy soon reached the stage where Beck felt the need to articulate a practice of *cognitive* therapy and to distinguish it from its behavioral predecessor (Beck, 1970). Although a few prominent figures continue to object to the influx of cognitive explanatory constructs (e.g., Eysenck, 1976; Goldiamond, 1976; Ledwidge, 1978;

Rachlin, 1977; Wolpe, 1978), there appears to be an irresistible trend toward a cognitive-behavioral hybrid that holds that maladaptive cognitions cause maladaptive behaviors, and that behavioral change can be produced by means of a cognitive change.

Virtually all brands of cognitive-behavioral therapy accord major etiological significance to illogical or maladaptive percepts, ideas, and memories that have become linked to a particular pattern of disordered affective and/or behavioral reactions. Mahoney and Arnkoff (1978), although acknowledging the many differences among the proponents of cognitive-behavioral therapy, have recently distilled the defining features of the approach. First is the assumption that cognitive processes mediate adaptive and maladaptive behavior and experience. These processes, in turn, can be activated by procedures that parallel those employed in the laboratory study of human cognition. The twin tasks of the therapist, accordingly, are those of a diagnostician who assesses the features of the cognitive system that underly the target problem and of an educator who arranges experiences that will alter these processes and contents, and therefore the patterns of behavior and experience with which they are causally associated.

The cognitive approach to therapy raises, once more, the promise of a rapprochement between the clinic and the laboratory. In this chapter, we seek to develop a rationale for a new technology of personality assessment in which procedures derived from the laboratory study of cognition, and particularly social cognition, may be employed in the investigation of the individual's behavior and experience in the world at large. We begin by discussing the relationship between cognitive therapy and cognitive psychology, continue by proposing some specific laboratory procedures that may be serviceable in the clinic, and end with some comments about clinical assessment in general.

## COGNITIVE THEORY AND COGNITIVE THERAPY

Wilson (1978) has recently traced the development of cognitive-behavioral therapy, noting the difficulty encountered in categorizing the potpourri of "diverse and often inchoate principles [p. 13]" that the term encompasses. His choice of adjectives appears particularly apropos. Cognitive-behavioral therapy, unlike its behavioristic predecessor, has not yet fully incorporated the principles and procedures of experimental cognitive psychology. This failure, represented by a number of unresolved conceptual ambiguities, has important implications for the enterprise of cognitive-behavioral assessment. In the subsections that follow, we review three of these problems.

### "Hardware" versus "Software" in Cognition

Consider first the assumption that dysfunctional or maladaptive cognitive processes contribute significantly to the development and maintenance of the various clinical disorders. Such an assertion is certainly correct in general terms, because

cognition mediates all of the individual's interactions with the world, but one wants to know the details. It is unlikely that the entire cognitive system has run amuck. *Which* aspects of cognition are involved—the deployment of attention, the encoding and construction of percepts, the retrieval and reconstruction of memories, categorization, inference, problem-solving, language, or what? In cognitive-behavioral assessment, the investigator must employ particular techniques designed to tap each of these aspects of the human cognitive system. Otherwise, "cognition," like the "motive" and "instinct" constructs that dismayed earlier generations of psychologists, becomes just another catchall label, frequently bandied about by those who keep up with new trends, but actually void of any specific meaning.

As soon as one or more domains within the cognitive system have been selected for investigation, the assessor must confront a further problem of level of analysis. Experimental psychopathologists working on the problem of schizophrenia, for example, often make use of the constructs of cognitive psychology (e.g., Matthysse, Spring, & Sugarman, 1979). Although there is great diversity in these points of view, all of them agree that schizophrenia involves a breakdown in one or more components of the information-processing system: attention cannot be deployed effectively, sensory memory decays too quickly, transformational grammar is disrupted, information is processed too slowly, etc. The content of the information being processed plays a very minor role, if any at all, in these arguments. Accordingly, the experimental procedures developed for studying schizophrenia sample quite arbitrarily from the universe of content: geometric shapes, strings of letters and digits, and narrative prose do equally well. When these procedures are translated into techniques for clinical assessment of the functioning of the "hardware" of the cognitive system—as they already have in the case of brain disease, insult, and injury—we may expect to see a continuation of this de-emphasis on content.

Most of those individuals who come to the attention of clinicians, however, do not suffer an across-the-board deficit in some storage structure or control process within the cognitive system. Rather, their troubles can be traced to cognitions pertaining to some specific domain of content: they misconstrue particular people or events, remember certain experiences in a distorted fashion, adopt inappropriate strategies in particular interpersonal encounters, and the like. Following the computer analogy suggested earlier (and with which we are not happy; Neisser, 1963), the problem seems to lie not in the mechanics of the information-processing system, but rather with its "software": The information which it contains and the rules by which it operates. The cognitive system itself functions perfectly well, but its contents, the products of a history of social learning, are such as to lead the individual to behave in an inappropriate and maladaptive way.

Given the fundamental assumption of cognitive-behavioral therapy—that behavior change is mediated by cognitive change—considerations of content come to the fore. It may well be possible to specify the particular kinds of ideas and inferential rules that are associated with each of the "neuroses" and "personality disorders" (e.g., Beck, 1976). The research supporting this enterprise certainly will involve the same sorts of paradigms employed by experimental psychopathologists (as in the research on learned helplessness and depression), with the exception that

the content of the material will be chosen with care. Whatever the success of this nomothetic research enterprise, it is clear that proper analysis of the individual case requires the idiographic assessment of such variables as the individual's personal schemata guiding encoding, categorization, and retrieval, expectations, goals, plans, and the like (Mischel, 1973). In developing assessment procedures appropriate to the enterprise of cognitive-behavioral therapy, we must be careful to distinguish among the wide variety of cognitive processes that mediate behavior, and also to consider the distinction between the "hardware" and "software" of the cognitive system.

### Schematic Principles in Cognition

Early in the development of cognitive therapy, Beck (1967) invoked the construct of *schema* (plural *schemata*) to characterize the various cognitions implicated in maladjustment. Beck's application of the schema concept to clinical problems was very advanced for its time—Neisser (1967) had just revived it in experimental psychology—and it has found many adherents over the past dozen years (for an early anticipation of Beck's notion, see McClelland, 1951). However, the clinical conceptualization has not shared the subsequent theoretical development experienced by its experimental cousin. It seems likely that the schema concept will continue to be a powerful construct in cognitive-behavioral therapy only if clinicians recognize that there is a fair amount of controversy among experimentalists concerning how the construct is to be defined, how its structure is to be conceptualized, and how the structure actually operates to influence perception, memory, and behavior.

In fact, this has always been the case. Bartlett (1932) defined a schema as "an active organization of past reactions, or of experiences . . . operating in any well-adapted organic response [p. 201]." Northway (1940) noted, however, that Bartlett's usage of the schema concept actually varied a great deal, so that it was alternately considered to be the force guiding reconstruction, the form in which information is preserved, the storehouse for retained information, and the global representation of previous experience. Later, Oldfield and Zangwill (1943) further criticized some of the conceptual ambiguities surrounding Bartlett's application of the schema construct to problems in perception and memory. Particularly troubling, from their point of view, was the problem of determining precisely under what circumstances available schemata determine a response, and under what circumstances the schemata will themselves be modified.

Recent events recapitulate this earlier history. Neisser (1976), the prime mover of the schema construct in contemporary psychology, has defined it broadly as

that portion of the entire perceptual cycle which is internal to the perceiver, modifiable by experience, and somehow specific to what is being perceived. The schema accepts information as it becomes available at sensory surfaces and is changed by that information; it directs movements and exploratory activities that make more information available, by which it is further modified [p. 54].

Schemata guide the individual's cognitive construction and reconstruction of specific percepts and memories, thereby influencing his or her behavior in that domain. Hastie (1980b) has pointed out, however, that there are actually several competing technical definitions of the schema construct in current usage. Some theorists, for example, define a schema as a prototype representing the *statistical average* of all the dimensions constituting the category (e.g., Posner, 1969; Reed, 1972). On the other hand, others have adopted a *cue-validity* notion of schemata that holds that the prototype is that member of a category that shares the most features with other instances of the same category, and the fewest with members of contrasting categories (e.g., Rosch, 1978; Tversky, 1977). Still other theorists favor *template* notions to prototype ones, according to which a schema contains "slots" that accommodate certain kinds of information, and "default values" for information that is anticipated by the schema but not available in the cognitive environment (e.g., Minsky, 1975; Norman & Bobrow, 1975). Finally, some definitions emphasize the *procedural* aspects of schemata, noting that they do not merely contain abstract representations of categories, but also strategies for obtaining perceptual information and rules for making inferences about what is missing (e.g., Miller *et al.*, 1960; Neisser, 1967, 1976).

All of these varying conceptualizations of schema have been employed in social-cognitive domains relevant to the problems encountered in clinical assessment. For example, Cantor (1980a, 1980b; Cantor & Mischel, 1979) has applied cue-validity notions of prototypes to the analysis of schemata pertaining to categories of people and social situations. In a series of studies, she has shown that social categorization involves matching the attributes of people and situations to prototypical exemplars of available categories; some features are more important to the prototype than others, and not even all of the most prototypical must be present before the category is assigned. Once the categorization is made, the presence of other prototypical features, not actually observed in the instance at hand, may be inferred. In this way the prototype guides the construction of a percept so that the mental representation of a person or situation may be quite different from its "objective" character. Similarly, Schank and Abelson (1977) have extended the template notion to social interactions with the concept of the *script*. Scripts represent the sequence of events (themselves represented by primitive actions), linked causally in a canonical order, that makes up an episode. A script is accessed when certain events in a social encounter match the events contained in an available script. The script guides the person's expectations concerning subsequent events, and permits him or her to infer the occurrence of scripted events that have not actually been observed. Finally, with respect to procedural schemata influencing social judgment, Anderson's (1974) cognitive algebra describes the way in which items of information are combined to yield an overall global impression of a person. In his view, such an impression is the product of an integration process that averages values on relevant dimensions, taking into account the degree of importance of each dimension to the impression category, and giving emphasis to whatever initial bias may be present.

One of the functions of schemata is to anticipate environmental events, facilitating the pickup of relevant information. Schema theory is less clear, however, on the fate of information that is irrelevant to, and even incongruent with, active schemata. Hastie (1980b) has reviewed a vast literature on schematic processing in several domains including visual perception, verbal learning and memory, and social cognition. In one such experiment (Hastie & Kumar, 1979), subjects read a list of traits describing a stimulus person, followed by a list of behavioral episodes involving the person. The trait ensemble was constructed to convey a unitary impression of the person as intelligent, friendly, honest, etc.; the behaviors presented were selected to be congruent, irrelevant, or incongruent with respect to these trait impressions. The results clearly showed a disadvantage in recall for behaviors irrelevant to the initial impressions. However, impression-incongruent behaviors were typically recalled *better* than impression-congruent ones, with the magnitude of the difference depending on the relative numbers of congruent and incongruent behaviors presented. Similar findings were obtained in other, related experiments (reviewed in Hastie, 1980a). Finally, Hastie (1980b) proposes that schematic principles operate to favor the encoding of schema-incongruent, and the retrieval of schema-congruent, material. He argues that information perceived as incongruent with expectations receives more attention, in terms of processing time or effort, as the individual attempts to comprehend the information and its relation to the abstract schema and other concrete information. This elaborate processing will result in a rich, highly memorable, trace. At retrieval, the schema provides cues that facilitate contact with congruent information.

Whereas most treatments of the schema concept emphasize its function of anticipating information, some radical constructivists, following in the tradition of Procrustes and the White Queen, have seemed to argue that schemata dominate cognition to such an extent that people can perceive and remember events in any way that they desire. Neisser (1967, 1976), however, has discussed some of the boundary conditions of "constructive alternativism" (Kelly, 1955) in perception and memory. In ordinary perceptual activity, stimulus information is relatively rich and explicit. The operation of schemata is therefore strongly constrained by the "information in the light," so that the individual is not able to see *just anything*. There are other domains, however, that provide more possibilities for this assimilative aspect of schemata to have an impact. In memory, for example, trace information appears to be extremely fragmentary, so that schemata active at the moment can influence the manner in which the event is reconstructed. Bartlett (1932), in his classic studies, argued that schematic processes were responsible for the lawful omissions, transformations, reorganizations, and other distortions observed in his subjects' recall of narrative prose (see also Bower, 1978; Jenkins, 1974; Paul, 1959). In social cognition, information is often ambiguous even if it is not fragmentary, so there is wide latitude for schemata to influence what information will be sampled and how it will be interpreted. Taylor and Crocker (1980) have shown that the schematic processing that guides the encoding and interpretation of information can have powerful distorting effects in social cognition—as when the wrong



schemata are applied to the cognitive task. Other liabilities created by schematic information processing result from the possibility that schemata may provide an illusory data base for evaluation and decision making, lead the individual to accept as schema-consistent information that is grossly inconsistent with prevailing expectations, and alter the perceived magnitude of empirical covariations.

These basic problems having to do with the nature of schemata and their effects on social cognition are highly relevant to the problems encountered by cognitive-behavioral therapists, given the assumption that behavior is mediated cognitively by schematic principles. It becomes a matter of some importance, therefore, for both clinician and client to develop an understanding of the schemata employed by the latter in his or her social intercourse. It is unlikely, however, that these schemata are fully represented in the client's phenomenal awareness—hence the need for special assessment techniques capable of revealing both the declarative schemata containing his or her knowledge and inferences about the social world, and the procedural schemata that guide the way in which relevant information is combined to yield an impression or behavioral response. Beck (1967) believes that the clinician can infer the content and process characteristics of a client's schemata from indirect sources of data—from analyzing how the person structures his or her experiences, from thematic analysis of free associations and fantasy material, and from direct questioning. Elsewhere, Kovacs and Beck (1978) advise that the clinician can infer the contents of a schema from the client's "habitual thinking errors" and "stereotypical preoccupations [p. 531]." Drawing attention to such surface manifestations of a schema does not, however, solve the problems of assessment, but serves instead to create and to pose additional problems. A great many of the concrete suggestions offered in this chapter have to do with procedures for the assessment of schemata.

### Affect in Cognition

Another theoretical problem relevant to the concerns of cognitive-behavioral therapists is the role of affect in cognition, particularly memory. Historically, the most active interest in emotional effects on cognition and memory has been shown by experimentalists and clinicians allied with the psychoanalytic movement, as exemplified by the construct of repression (Erdelyi & Goldberg, 1979). An independent line of inquiry developed from early hedonic theories of learning: As noted by Dutta and Kanugo (1975), Thorndike's law of effect led to research on selective memory for pleasant and unpleasant material. A third source of interest owes to the influence of Gestalt psychologists, particularly Lewin, and their interest in the problem of memory for completed and uncompleted tasks (e.g., Zeigarnik, 1927). There is also a related body of research on memory for interrupted tasks emerging from other theoretical perspectives (e.g., Butterfield, 1964; Weiner, 1966), some of which examined the complex interactions between such individual difference variables as achievement motivation and ego-strength. Although there are significant exceptions, and nontrivial individual differences and situational effects, the general finding in this research, enshrined in the "Pollyanna Principle" (Boucher & Os-

good, 1969; Matlin & Stang, 1978), is that the cognitive system is organized to facilitate the processing of pleasant information in every aspect of its operation.

The finding of selective thought, perception, and memory favoring pleasant material has often been held to be consistent with an intrapsychic mechanism such as repression that directs attention away from unpleasant material. However, there have been significant demurrals on both sides of the question of repression. Sears (1936) argued that the psychoanalytic notion of repression should be applied exclusively to material that is truly ego-threatening, as opposed to the merely unpleasant; Rapaport (1942) took this argument one step further and limited repression to material associated with primitive sexual and aggressive urges. Holmes (1970, 1974) argued that the presence of affect, positive *or* negative, made a memory salient and thus more accessible to recall; because negative affect decreased at a faster rate than positive affect, there was a differential forgetting of unpleasant material as an instance of a more general principle of contrast in memory (Von Restorff, 1933).

Despite the clear role of salience and figure-ground contrast effects in perception and memory, it would be a mistake to downplay the importance of affect *per se*. Perceptual constructions, and their residual memory traces, possess a number of attributes, including affective valence as well as other aspects of connotative meaning (e.g., Bower, 1967; Tulving & Watkins, 1975; Underwood, 1969; Wickens, 1972). Developmental studies (Cermak, Sagotsky, & Moshier, 1972; Kail & Siegel, 1977; Kail & Schroll, 1974) show that even very young children are aware of the positive and negative connotations of familiar words, and that by age 10 they routinely encode them along with denotative features such as taxonomic class. Given the availability of evaluative and affective features in memory, there is no reason to suppose that the selectivity that pervades the human cognitive system cannot bias the processing of emotionally-colored material (Erdelyi, 1974; Erdelyi & Goldberg, 1979; Mandler, 1975).

Some of the most provocative demonstrations of the effect of affect on cognition come in the form of studies of human state-dependent retention (SDR). Generally, SDR is said to occur when the performance of a response is contingent upon the presence of the same organismic state as that in which the acquisition of the response originally took place. Although most studies of human SDR have manipulated organismic state by means of drugs such as alcohol and marijuana (Eich, 1977; Weingartner, 1978), there are a few demonstrations of SDR that are attributable to emotional states. The first attempt at such a demonstration failed: Macht, Spear, and Levis (1977) employed the threat of electric shock to induce fear, but observed no effect on the retention of nonsense syllables. Later, Isen and her colleagues (Isen, Shaker, Clark, & Karp, 1978) manipulated positive and negative moods by means of experimenter-induced success and failure on tasks performed before a word list was presented for study, and before the subjects were asked to recall the items. There was some suggestion of an influence of affect on memory, in that the subjects in a positive mood during the retention test recalled more positive than neutral or negative words, compared to subjects who were in a negative mood. There was not

a similar retrieval effect for negative mood, however, and there was no effect of congruence between encoding and retrieval states. One problem with this study is that it is by no means clear that success and failure can be depended upon to induce positive and negative moods; another is that it does not make any further distinctions between qualities of mood within the positive and negative categories.

A few studies have attempted to investigate the effects of specific moods, with varying success. Weingartner, Miller, and Murphy (1977) relied on naturally occurring mood shifts associated with bipolar affective disorder (manic-depressive illness). The clients were required to generate 20 free associations to each of two nouns; 4 days later they were asked to recall the associates given previously, and then generated 20 associations to a new set of nouns. These generate-recall cycles continued every 4 days for periods of 8–20 weeks. The results indicated that more associates were successfully reproduced when the subjects were in the same mood state, normal or manic, as had been present when the words were generated. It is not clear that this result reflects the effect of mood on the encoding and retrieval of episodic memories: The same effect could be produced if mood influenced the direction of associations within the network of semantic memories. In any case, the Weingartner *et al.* results indicate that mood *may* influence the way in which information is encoded, stored, and retrieved by the cognitive system.

Other studies have attempted to manipulate mood directly by means of various techniques. Bower and his colleagues, for example, have employed hypnotic suggestions to induce emotional states. In one study (Bower, Monteiro, & Gilligan, 1978, Experiment 3)—a variant on the familiar retroactive inhibition paradigm—two lists of words were learned successively in one of two mood states, euphoria or grief. Memory of the first list was then tested in one of these moods. Retention of the original list was best when the mood of recall was congruent with the mood of learning (happy or sad), and different from the mood present during study of the interpolated list. In a subsequent study (Monteiro & Bower, 1979), subjects read a short narrative while in a state of hypnotically induced happiness or sadness; one of the characters in the story was portrayed as happy, the other sad. One day later, the subjects returned to the laboratory and attempted to remember the story in the normal waking state. Those who read the story while happy remembered more about the happy character, and those who read the story while sad remembered more about the one who was sad. Because mood was not manipulated at the time of retrieval, this is not strictly a study of SDR. However, it does clearly show the interaction effect of mood at encoding and properties of the target material on retrieval. A study by Nasby and Yando (1980), conducted entirely in the normal waking state, induced moods by asking children to recall happy or sad experiences. After the mood induction, the subjects studied or recalled a list of familiar words. The results showed a clear interaction of mood with the evaluative valence of the words (positive or negative) at both encoding and retrieval. There was no evidence of state-dependency, and the effects of mood seemed strongest when the subjects were encoding and retrieving positive items.

The results of these studies, tentative as they are, begin to reveal the potential

effects of mood on cognitive processes, especially those associated with memory. While moods themselves are created cognitively (Mandler, 1975; Marshall & Zimbardo, 1979; Maslach, 1979; Schachter & Singer, 1962), moods affect cognitive processes—thus leaving open the possibility for a vicious cycle that can be highly maladaptive. Consider the case of a clinician who attempts to alter the “depressive triad” of negative cognitions (Beck, 1967)—about one’s self, one’s past, and one’s future—by leading the client to focus on positive rather than negative features of percepts and memories. This will be difficult to do if the client’s mood is having just the opposite effect. The clinician must find some way to break the vicious cycle of affect and cognition before treatment can hope to be successful—either by means of a physiological manipulation (drugs or ECT) or, better, by teaching the client a self-regulatory strategy by which he or she can learn to modulate the effect of mood. Later we suggest some procedures that may be used to assess the degree to which the subject selectively encodes and retrieves material associated with pleasant and unpleasant moods. In addition, however, it is clear that cognitive-behavioral clinicians must have available some techniques for the assessment of affect as well as cognition—a task of instrument development that we leave to others.

## REPRESENTATIVE ASSESSMENT PROCEDURES

In this section, we wish to draw attention to a number of procedures employed in the laboratory study of cognition that may find a place in clinical assessment. We want to be quite clear at the outset on two points: we have not ourselves attempted to use these procedures in clinical assessment, so we have no idea how feasible some of these ideas really are (as reasonable as they seem to us); and we have not done the necessary leg work to get these procedures ready for clinical application—standardization and such—because we lack the facilities to do so. What follows is not by any means an exhaustive list. Comprehensive assessment for cognitive-behavioral therapy must include the client’s self-concept, the declarative schemata that he or she uses to guide social perception and memory, the client’s expectations and plans for coping with them, goals and plans for achieving them, and the self-control strategies and other cognitive competencies that he or she has available for use. In the sections that follow, we focus on the assessment of declarative and procedural schemata pertaining to oneself, others, and social situations.

### Features of Social Categories

Since Kelly (1955), cognitively oriented clinicians have been concerned with the personal constructs by which their clients encode and organize information about themselves, other people, and social situations. The most popular technique for the assessment of personal constructs, of course, has been the Role Construct Repertory Test—Rep Test (Bonarius, 1965). However, the Rep Test is extremely cumbersome, difficult for clients to complete and for investigators to analyze, and the

analytic techniques that have been developed are geared more toward the quantitative relations among the constructs than the content of the constructs themselves. An easy way to assess the content of personal constructs is some form of the adjective checklist, but this involves the assumption that personal constructs are organized around trait and mood descriptions, and also does not allow the client to speak for him- or herself.

Recently, Cantor (1980a, 1980b, Cantor & Mischel, 1979) has employed a technique that reveals the content of the individual's social categorization schemata in a relatively simple, straightforward manner. The technique is based on Rosch's studies of "family resemblances" among categories in the object domain (e.g., furniture, vehicles, tools). Rosch asks her subjects to list the features or attributes of common objects: those features that a panel of subjects agree characterize a category are considered to represent the consensual prototype of that category. Cantor has applied a similar strategy to study categorization in the social domain. Her findings suggest a taxonomy of persons and situations defined by the number and content of features comprising the prototypical exemplars of the categories, the extent of overlap within a taxonomy, and contrast with members of different taxonomies. Like those found in the object domain, social categories are well-ordered in a hierarchical structure. They are also richly informative: Basic-level person categories supply expectations concerning the physical appearance and material possessions of various types of people, their socioeconomic status and social roles, personality traits and dominant moods, characteristic behaviors, and the types of situations in which they are likely to be found. Similarly, basic-level situation categories indicate the locations associated with the situation, its physical aspects and characteristic events, typical atmosphere, and the physical, dispositional, and emotional characteristics of people likely to be found there.

While Cantor (1980a, 1980b) has primarily been concerned with establishing the general principles of social categorization and their functional significance for social interaction, her procedures can easily be adapted to the idiographic assessment of the categorization schemes employed by individual clients. For example, clients might be asked to describe the features and attributes of specific people and situations relevant to their presenting problems. Alternatively, they might be asked to describe the features of exemplars of a standard list of broader social roles and situations such as those listed by Kelly (1955, pp. 220-222 and 313-315). The feature lists provided by the clients could, in principle, be compared with consensual prototypes developed by the nomothetic procedures of Rosch (1978) and Cantor—assuming, of course, that appropriate normative information were available. However, they are probably better employed idiographically, for the perspective gained on the social world as viewed through the eyes of the individual client. Given a list of features of individuals, roles or situations, the material could be examined in a variety of ways. Features listed repetitively would certainly qualify as "personal constructs" applied to a broad range of categories in the social world. The overlap in features ascribed to different objects and categories would also reveal the relationships among them in the mind of the individual client. And, of course,

therapeutic attempts to change the world view or self-concept of the client would be confirmed by appropriate shifts in the features ascribed to social categories after treatment has concluded.

### Category Judgments

Feature lists, like adjective checklists, provide an extremely efficient means of assessing personal constructs. However, under conditions of clinical assessment, the validity of the information so extracted may be constrained by problems relating to social desirability and other aspects of self-disclosure and impression management, as well as the possibility that some important constructs may be unconscious or (at least) not well articulated. What is needed is a technique for confirming this information that is less susceptible to this kind of ambiguity and contamination. Recently, Rogers, Kuiper, and their colleagues (e.g., Kuiper & Derry, 1980; Rogers, 1980) have employed a set of techniques for studying cognitive structures pertaining to the self, based on experimental studies of categorical decision making, which may be adaptable for clinical use.

Rarely, if ever, does category membership follow the classical "all or nothing" rule, with each instance possessing the same set of singly necessary and jointly sufficient features. Rather, natural categories appear to be defined by principles of "family resemblance," with individual members possessing nonidentical but overlapping subsets of attributes (Cantor, 1980a; Rosch, 1978; Tversky, 1977). According to this alternative view of categorization, the members of a category do not enjoy equal status; rather, some are better or more "prototypical" instances than others. All the members of natural categories can be ordered along a dimension of prototypicality, with highly prototypical instances being those that share the most features in common with other category members, and the fewest with members of contrasting or alternative categories. Interestingly, the length of time required to verify category membership varies with the prototypicality of the instance: Decisions about extremely good and poor instances are made much more quickly than corresponding decisions concerning moderately prototypical members. Moreover, the category prototypes abstracted or applied during perceptual encoding and categorization will introduce reliable biases in memory for the material studied. Specifically, subjects tend to falsely recognize highly prototypical distractor items, compared to less prototypical lures.

Although these effects have been most intensively studied in the domain of common objects, both the inverted-U relation between prototypicality and categorization latency and the false recognition of highly prototypical exemplars have been obtained with social categories pertaining to the self and others. For example, Rogers and Kuiper (Note 1) found that when subjects made decisions about whether trait terms applied to themselves or familiar others, those that were highly descriptive or nondescriptive were associated with faster response times than moderately descriptive terms. Cantor and Mischel (1977) asked subjects to study items describ-

ing extraverted and introverted characters, and found a strong tendency for subjects to falsely recognize distractor items describing the characteristics of prototypically extraverted or introverted personality types (see also Tsujimoto, 1978). Finally, Rogers, Rogers, and Kuiper (1979), presenting trait adjectives for study in a conventional verbal-learning procedure, found more false recognition of highly self-descriptive terms, as opposed to less descriptive ones.

A similar laboratory procedure can be developed for clinical investigation of the client's conceptualizations of self. A standard list of words describing moods, personality traits, and interpersonal acts (for example) could be presented for inspection by means of a desk-top microcomputer. The client would be required to make, for each item, a dichotomous yes-no decision as to whether each item was self-descriptive, registering his or her decision at the keyboard. Those items associated with extremely fast or slow response times may be considered to be most strongly associated, positively or negatively, with the prototype representing the individual's generalized self-concept. If further confirmation of prototypicality is needed, a stratified sample of items drawn from four levels of response (fast negative, slow negative, slow positive, and fast positive) could be selected and presented for study under conditions of intentional learning. When the entire list is presented for recognition testing, those lures that are falsely recognized may also be considered to be associated with the self-prototype. It should be noted that the extra step of recognition testing involves an inferential leap of some distance. For that reason, the time devoted to confirmatory recognition testing might better be devoted to additional trials with the category-decision procedure with relevant others as targets, or with self and others in more specific situations.

### Mapping Psychological Space

Beginning with the work of Asch, cognitively oriented personality and social psychologists have been increasingly interested in the study of implicit personality theory (Schneider, 1973), and particularly the relations among various features of the personality as they are understood by the naive observer. Major research efforts along these lines have focused on the study of trait implications, the accuracy of perceived covariation among traits, and the general structure of the semantic space defined by personality descriptors. For example, Rosenberg and Sedlak (1972) asked people to sort a set of trait adjectives into categories representing personal acquaintances. Multidimensional scaling of the co-occurrence data revealed two major bipolar dimensions of intellectual and social evaluation; other studies reviewed by these authors have revealed major activity and potency dimensions. There have also been some attempts to study individual differences in the structure of perceived trait relationships perceived by the individual. Most of this work, however, has focused on strictly structural aspects such as the number of dimensions underlying the individual's psychological space, as an index of cognitive complexity or some other aspect of cognitive style (e.g., Crockett, 1965). Aside

from occasional investigations of the salience of particular trait dimensions in impression-formation, however, there has been little interest in the content of these dimensions.

Recently, Rosenberg (1977) has developed a technique for mapping the relations among personality descriptors as perceived by individuals. In his procedure, subjects are required to generate the names of 100 or more people known personally or by reputation, along with the traits displayed by each and the feelings each arouses in the subject. By means of a computer-driven display, the subject then rates each stimulus person on each trait and feeling. Using either multidimensional scaling or hierarchical clustering techniques, Rosenberg has been able to develop graphic representations of the relations among features of the personality, as they are perceived by each individual subject. In a demonstration study employing character sketches found in the fiction of Theodore Dreiser, for example, Rosenberg and Jones (1972) extracted three major dimensions, hard-soft, male-female, and conformity-nonconformity, that seemed to reflect major issues in Dreiser's own life. Later, Rosenberg (1977) continued these explorations of individual psychological space with a number of student subjects. Statistical analysis reveals the number of dimensions underlying the structure of the psychological space, and also permits these dimensions to be identified by inspection of the clusters of traits and feelings lying at the endpoints of the dimensions. An interesting feature of this type of analysis is that it does not require the subjects to specify contrasting poles for their personal constructs, as the Repertory Grid does, but reveals these contrasts if they exist empirically in the data. Because the dimensions are defined by clusters of descriptors, with each trait or feeling item interpreted in the context of others associated with it, the precise meaning of the dimensions emerges rather clearly with little interpretive effort needed on the part of the investigator. Preliminary analyses of the 16 subjects reported by Rosenberg indicates that there are substantial differences in the nature of the dimensions employed by individuals in organizing their psychological space. The technique has been extended to the study of the self-concept by Pervin (1976).

Although Rosenberg (1977, p. 193) believes that a set of 100 stimulus persons is preferable to insure a stable scaling or clustering solution, he has also noted that as few as 35 stimuli will serve adequately. This modification makes his procedure potentially tractable for clinical application. We suggest a procedure in which the client is asked to supply the names of at least 35 persons, principally personal acquaintances, and to list for each a set of applicable trait and mood descriptors. This information, collected in a booklet as part of "homework," can be presented to the subject by means of a desk-top microcomputer so that he or she can rate every stimulus person on every descriptor, following the method of Rosenberg (1977). The individual co-occurrence data can be subjected, off-line, to analysis by conventional multidimensional scaling or hierarchical clustering techniques. Depending on the form of analysis employed, the product can be either a graphic representation of the presumed implicative relations among personality descriptors, or of the perceived similarity relations among individuals in the person's environment. Determi-



nation of these clusters is likely to provide useful information concerning the structure of the client's interpersonal world. Although such an assessment technique may strike the reader as somewhat Herculean, Rosenberg has found that the task is engaging in practice, and rewards the subjects by allowing them to reflect at length on their interpersonal relationships.

### **Release from Proactive Inhibition**

In an extensive series of studies, Wickens (1972) and his associates have used "release from proactive inhibition" (RPI) in the Brown-Peterson paradigm to determine which attributes of a stimulus are routinely encoded by their subjects. In the Brown-Peterson paradigm the experimenter presents a set of three words and then a number from which the subject is to count backwards by threes. The object of the mental arithmetic is to prevent the subject from rehearsing the critical material. The classic finding, independently reported by Brown (1958) and Peterson and Peterson (1959), is that after less than 18 seconds of mental arithmetic, recall of the three words drops to very low levels. Keppel & Underwood (1962), exploring the paradigm further, discovered two further properties of this forgetting: The effect is not observed on the first few trials of the experiment, and only occurs when all the critical material comes from the same category of items. Over the course of a small number of trials with related items, proactive inhibition (PI) based on item similarity builds up so that even a short period of distraction produces a marked impairment in memory for the stimulus material. When the critical attribute shifts, proactive inhibition is released and memory for the items from the new category is comparable to that of the first trial with the old category. If the experimenter continues to present items from the new category, proactive inhibition builds up again until released by yet another shift in attribute.

Wickens (1972) argues that when a shift in attribute results in RPI, then that attribute has been encoded by the subjects; when RPI does not occur, then the subjects have not been attending to that feature of the stimulus material. RPI is especially strong when the shift is between words and numbers, or between visual and auditory mode of presentation; shifts in taxonomic category (e.g., furniture to food) produce somewhat smaller amounts of RPI, while shifts in syntactic categories (e.g., verb to noun) typically fail to produce RPI. Of particular relevance to our concerns is Wickens' finding that shifts in connotative meaning such as pleasantness, evaluation, potency, and masculinity-femininity produce moderate amounts of release, compared to other attributes that show almost total RPI or none at all. However, it should be clear that "moderate RPI" is a statistical concept. It may be the case that as PI builds-up, the subjects are only able to recall a subset of the critical items. Alternatively, the moderate RPI found by Wickens for connotational attributes may reflect individual differences in stimulus encoding. For example, there may not be complete consensus as to the connotative meanings of particular words; alternatively, there may be consensus but some subjects may not be sensitive to particular connotative meanings. In any event, intersubject differences

in RPI may reflect individual differences in personality, particularly with respect to the constructs that the person uses to encode and interpret events.

Two recent formal experiments lend credence to this possibility. In the first, Kail and Levine (1976), working with 7- and 10-year-old boys and girls, determined the subjects' degree of identification with culturally-prescribed sex-role stereotypes by means of a toy-choice task. The children were run in a version of the RPI paradigm with words carrying masculine and feminine connotations. The degree of RPI observed when there was a shift between masculine and feminine items was related to the sex-role orientation of the subjects. In research in progress at Harvard, Nasby (Note 2) has asked subjects to describe themselves in terms of a standard set of adjectives. Items rated by an individual as self-descriptive or not self-descriptive then serve as items in the RPI paradigm. Preliminary results indicate marked RPI when there is a shift in the attribute of self-descriptiveness.

The RPI paradigm can be easily adapted for use in the clinical psychology laboratory. The stimuli can be presented by means of an ordinary 35mm slide projector (preferably one with a facility for automatic control of presentation and advance times) or—better—by means of a desk-top microcomputer. Optimal stimuli for clinical purposes are likely to be adjectives drawn from the usual trait and mood categories (McNair, Lorr, & Droppleman, 1971; Rosenberg & Sedlak, 1972; Wiggins, 1979; Zuckerman & Lubin, 1965), although any set of items sharing critical attributes relevant to the presenting problem would do. Items sharing features in common would be presented for study by means of a slide projector or desk-top microcomputer, with 18 seconds of mental arithmetic (e.g., counting backwards by threes from a three-digit number) intervening between study and recall test. After presentation of three triplets from a single category, the category would be shifted for the next three trials, and so on. The extent of RPI observed with each shift should indicate the degree to which the client encodes information with respect to the attribute defining the category.

### **Organization in Free Recall**

Free recall learning is a popular paradigm in the study of secondary memory in which the experimenter presents a list of items for study and then requires the subject to reproduce them from memory. In some cases there may be only one trial; in others, study-test cycles continue until the subject has met some criterion of mastery. In any case, the order of recall is left to the discretion of the subject, and it is typically found that the order of recall differs appreciably from the order of presentation. Thus, if the subject is presented with a list that contains a number of words drawn from different taxonomic categories (e.g., animals, articles of clothing, etc.) arranged in random order, he or she is likely to group the related items together. This is known as category clustering (Bousfield, 1953). If the randomized word list contains some items that are associatively related to each other (e.g., man and woman, high and low, etc.), he or she might regroup them so that associated words are clustered together (Jenkins & Russell, 1952). Even if the experimenter goes to some trouble to construct a list of unrelated words, subjects prove quite

ingenious in finding rubrics that will organize them, by grouping them into idiosyncratic categories, or linking the items into interactive images, sentences, or stories.

Like release from proactive inhibition, clustering and subjective organization permit observation of the subject's encoding of stimulus attributes, and his or her use of them to guide the retrieval and reconstruction of memories (Bower, 1967, 1972; Underwood, 1969). Similarly, individual differences in the clustering of items belonging to particular experimenter-defined categories, or the nature of the subjective organization schemes employed by particular subjects, may be related to individual differences in personality. A study by Bousfield and Cohen (1956) indicates the possibilities. They employed a randomized list of words carrying stereotypically masculine, feminine, and sex-role-neutral connotations. Among the college students who served as subjects, women showed greater clustering of "feminine" words while men showed greater clustering of "masculine" words. The particular outcome of the Bousfield-Cohen experiment depends on there being a strong relation between biological sex and identification with traditional concepts of masculinity and femininity. If the experiment were to be repeated today, it would be more relevant to assess sex-role orientation directly. Bem (Note 3) has shown that sex-typed males, at least, show superior clustering of sex-role-relevant words than their androgynous, cross-sex-typed, or undifferentiated counterparts; apparently these individuals readily divide the world into masculine and feminine. Similar results have been obtained in ongoing research by Kihlstrom & Harackiewicz (Note 4).

These laboratory results suggest that organization in free recall would provide an alternative means of indexing the degree to which the individual attends to various attributes during encoding and retrieval. Again, standard sets of stimuli could be developed representing trait adjectives, mood adjectives, roles, and situations. These items would be presented at a standard rate, either visually or orally. Following the procedure suggested for the RPI technique above, the clinician could determine the degree to which the client clusters the items into the categories defined on an *a priori* basis, employing Bousfield's Repetition Ratio or some similar measure as an index. The real advantage to free recall, however, is that subjects are permitted to determine their own organizational scheme, and the strategies adopted by the individual client may be obscured if the clinician focuses only on his or her own categorizations. Accordingly, a better index would be the Bidirectional Pair Frequency measure of Sternberg and Tulving (1977). This would require several study-test trials in order to give the client the opportunity to establish a stable organizational structure in the recall protocols. The procedure is so easy to administer and score that we suggest four trials with each of the four lists (traits, moods, roles, and situations) as an optimum procedure.

### Early Recollections

Since the time of Freud, adult recollections of early childhood experiences have been of interest to clinical psychologists. Within the tradition of classic psychoanalysis, however, they have rarely served as sources of diagnostic informa-

tion. Early recollections held a much more important place in Adler's individual psychology (Adler, 1937; Ansbacher, 1947). Along with dreams and family constellations, they were considered major sources of diagnostic information concerning the client's life-style, goal direction, and adjustment. Over the past three decades or so, there have been a number of attempts to relate the surface features of early recollections to psychiatric diagnosis, individual differences in personality, and the like, with the limited success that characterizes most efforts to relate psychodynamic or trait constructs to actual behavior (see Kihlstrom, 1980; Mosak, 1969). Nevertheless, there are good reasons to suspect that early recollections, like autobiographical memory in general, would reflect general personality processes and contents of interest to the cognitive-behavioral therapist. Recall, especially of events in the real world, is a reconstructive process in which fragmentary trace information combines with information supplied by active schemata to build a mental representation of some previous experience. As both Bartlett (1932) and Neisser (1967) noted, an important aspect of the schemata brought to bear on trace (or perceptual) information is the subject's attitude. What is remembered, and the manner in which it is reconstructed, depends on his or her emotional response to the target material, interests, and goals—in short, what the individual is trying to accomplish. Within limits, then, we should expect that early recollections—the stories that individuals tell about themselves—should change when those features of personality that impact upon the reconstructive process change. If, as Murray (1938) noted, the history of the personality is the personality, then, when the personality changes, history as construed by the individual should change too. Greenwald (1980) has expended this notion with his concept of the "totalitarian ego" as a "revisionist historian."

The method of analysis employed in those studies of early recollections conducted to date has typically been extremely impressionistic and unsystematic. As such, this research has not contributed a scheme for content analysis that is widely applicable (e.g., Kramer, Ornstein, Whitman, & Baldrige, 1967; Mosak, 1958). More explicit coding schemes have been proposed by Langs (Langs, Rothenberg, Fishman, & Reiser, 1960) and by Mayman (1968), both working within the psychoanalytic tradition. The Langs scheme employs only the individual's very earliest memory of childhood, although in principle it could be extended to other memories as well, while Mayman asks for a series of early memories. The Langs system is by far the more extensive, as it is divided into four sections dealing with the characteristics of the memory itself (e.g., whether it has the properties of a screen memory), the manifest characteristics of the remembered episode (e.g., the relationships of the participants to the client, the nature of the event, and the affects involved), "surface" inferences concerning the underlying theme and the client's self-image (e.g., themes referring to body organs, damage, active versus passive role), and "depth" inferences concerning psychodynamic processes relevant to diagnosis (e.g., use of symbols, character structure, attitudes toward therapist). Mayman's method emphasizes salient interpersonal themes (e.g., oral pessimism, phallic intrusiveness, hostile competitiveness, productivity and inferiority) and

other relevant material (e.g., paradigmatic relationships, style of coping, modes of defense). Although these proposals have their merits, both give so much attention to constructs central to psychoanalytic theory as to be unpalatable to most working within the cognitive-behavioral framework. Furthermore, so much judgment is involved that reliability is certain to be low except in the hands of someone steeped in the psychoanalytic tradition—and then, as in any case of interpretation, there is the very real danger of imposing the clinician's constructs inappropriately on the client's life. The schemes would also appear to be extremely cumbersome in actual use. Nevertheless, they represent useful starting points for those who wish to develop alternatives.

We propose that assessment procedures routinely include a series of early recollections: the earliest memory, early recollections of mother, of father, and of siblings; a happy and a sad early recollection; and other early recollections that are of special significance to the client. Except for the very earliest recollection, we do not propose that the memories be confined to the earliest in each category, simply because it is possible that these are well-rehearsed and stereotyped, and leave little possibility for alteration as a function of personality change. What is relevant is what the person chooses to remember at any particular time. As far as the method of analysis is concerned, we are not in a position to propose a detailed coding scheme. We do, however, endorse a general approach that stays quite close to the manifest content of the memories, emphasizing central themes and affects. As Saul and his colleagues noted, "The depths descend indefinitely. . . . Use symbols only with great caution and only in context [Saul, Snyder, & Shepard, 1956, p. 130]." With respect to the details of content analysis, we think that objective procedures similar to those employed in coding the Thematic Apperception Test (Zubin, Eron, & Schumer, 1965; McClelland, 1980) offer a great deal of promise.

### **Autobiographical Memory**

The same considerations that are applied to early recollections of childhood may be extended to autobiographical memories from any period of life. Even casual observation indicates that what a person retains of his or her personal experiences, and the manner in which these experiences are remembered, are important aspects of personality. Indeed, this information may be more revealing of personality than the most sophisticated trait measure. Following the arguments of Bartlett (1932) and Neisser (1967), we assume that what is remembered, and how it is remembered, depends on the individual's attitude toward the material, as represented in the schemata that guide the process of reconstructing memories from fragmentary traces. Research on autobiographical memory, and clinical application of these insights, has been hampered by difficulty in devising appropriate techniques for the collection of such material.

Recently, Crovitz (Crovitz & Quina-Holland, 1976; Crovitz & Schiffman, 1974) and Robinson (1976) have introduced a method for systematically sampling autobiographical memory. The technique, based on earlier work of Galton, employs

words that serve as cues for the retrieval of related personal experiences. This task is quite involving, and typically yields memories with a wide range of ages, content, salience, detail, and emotional valence. The data, suitably analyzed, can also reveal individual differences in response to particular types of cues, the content and salience of the elicited memories, the fate of emotional valence, etc. Most recent work with the technique has involved investigations of the general processes involved in the retrieval of autobiographical memories rather than individual differences. For example, Crovitz and his colleagues have attempted to relate the frequency distribution of memories to their ages, while Robinson has explored the response latencies associated with cues drawn from different syntactic categories. Chew and Kihlstrom (Note 5) found that concrete cues elicited memories more readily than abstract ones, and pleasant cues more readily than unpleasant ones; they also obtained results indicating that the accessibility of remote and recent memories is a complex function of the properties of the cue, the particular epoch targeted, and the retrieval strategy adopted by the subject.

More directly relevant to the concerns of cognitive-behavioral clinicians are efforts to relate performance in the Crovitz-Robinson task to aspects of personality. The recent experiments were anticipated by an interesting series of studies by Washburn and her colleagues (e.g., Washburn, Giang, Ives, & Pollock, 1925; Washburn, Harding, Simmons, & Tomlinson, 1925) conducted more than 50 years ago. In some of these experiments, the subjects were presented with a stimulus word and instructed to recall either a pleasant or an unpleasant experience associated with it; in other cases, the subjects were asked to recall experiences in which particular emotional states were aroused; in others, they were asked simply to rate the pleasantness of whatever memories emerged. Individual differences in the qualities of the memories obtained, and in the latencies between presentation of the probe and recovery of memories of various types, were found to be related to self- and peer-ratings of the subjects on such dimensions as optimism-pessimism, cheerfulness, and emotionality. In a similar manner, Markus (1977, Experiment 1) found that individuals who defined independence-dependence as an important part of their self-concepts were more readily able to access memories of specific past instances where they had behaved in an independent or dependent manner more readily than subjects who were "aschematic" for this dimension. Lloyd and Lishman (1975) and Teasdale and Fogarty (1979), working with clinically and experimentally depressed subjects, respectively, found that the retrieval times associated with pleasant and unpleasant memories were related to the mood (happy or sad) experienced by the subjects at the time of the test. In ongoing research, Chew and Kihlstrom (Note 4) have found that subjects with high levels of achievement or intimacy motivation (as assessed by the research TAT) retrieved more pleasant and vivid memories to cues related to these constructs than did low-scoring individuals. Even when they were cued with neutral words, the memories of the high-scoring subjects were more likely to involve achievement or intimacy themes. The findings also tentatively reveal individual differences in the revision, over time, of the affect associated with personal recollections (Holmes, 1970).

These laboratory findings suggest that a version of the Crovitz-Robinson technique may prove useful for sampling autobiographical memory within the context of cognitive-behavioral assessment. A standard set of stimuli could be drawn up, including trait and mood descriptions and exemplars of various significant social roles and situations. These could be presented by means of a slide projector or desk-top microcomputer, with response latencies recorded either automatically or by means of a silent stopwatch. The memories themselves could be coded objectively for emotional and thematic content, etc., as desired. This standard procedure could easily be modified to limit the elicited memories to particular temporal epochs, or particular problematic persons or situations, as required by the individual case.

### Procedural Schemata: A Note

In the preceding subsections, our primary concern has been with the development of laboratory techniques for the clinical assessment of declarative schemata involved in social cognition. This deliberate choice reflects our strong feeling that from the point of view of clinical assessment, content is primary. It should be clear, however, that an enterprise similar to the one suggested here can produce a set of parallel techniques for the assessment of *procedural* schemata involved in social cognition. Space does not permit us to go into detail on any of these procedures, but we do wish to indicate, in passing, some laboratory paradigms that we think can be usefully employed in assessing the *how*, as well as the *what*, of clinically relevant social cognitions. For example, it seems likely that the procedures employed by Kelley (1967) and Weiner (Weiner, Frieze, Kukla, Reed, Rest, & Rosenbaum, 1972) for studying the attribution of outcomes, especially success and failure, to environmental and dispositional causes may serve a useful purpose (see also Metalsky & Abramson, this volume). Similarly, research on the correspondent inference model of Jones and Davis (1965) and the causal schemata model of Kelley (1972) employs procedures which may provide a more detailed view of the manner in which the client makes dispositional attributions. There has also been a great deal of work on the manner in which individuals form unitary impressions of other people. Anderson (1974), for example, has developed a "cognitive algebra" that describes the way in which stimulus information is combined in social judgment tasks, while Lingle (Lingle, Geva, Ostrom, Leippe, & Bamgardner, 1979; Lingle & Ostrom, 1979) has developed corresponding models for memory-based judgments. These are not the only such possibilities: In principle, any paradigm used in the study of attribution, self-perception, and impression formation can be adapted for clinical assessment.

### CONCLUSION

Historically, the essential tension in personality assessment has been between idiographic and nomothetic approaches. The temptation in the present proposals, following the lead of the classical approach to psychological testing, is to produce

standardized test instruments and develop norms for interpretation based on the testing of a large, representative group of people. Individual performance could then be assessed in terms of deviations from the performance typical of the normative sample or some appropriate reference group. We can conceive of situations where such norm-referenced testing might be appropriate: determining whether the person can effectively modulate the impact of mood on cognition, for example, or whether he or she agrees with consensual prototypes for social roles and situations, or with consensual scripts for social encounters. For the most part, however, we think that a better approach would be to employ criterion-referenced rather than norm-referenced procedures (McClelland, 1973), in which individual performance is compared against a standard set after careful consideration of the presenting complaint and the task of therapy. In this case, performance at the outset of therapy can serve as a baseline against which therapeutic progress can be measured, following the within-subject designs familiar in applied behavior analysis. Thus, feature lists and scripts can be used to determine how the individual views certain aspects of the social world; release from proactive inhibition and category clustering can help determine the person's sensitivity to stimulus attributes relevant to social cognition and interaction; impression-formation procedures can reveal what information the person extracts in a first impression, and what inferences he or she makes about missing data; autobiographical memories can reveal how the person construes his or her past.

The stimulus materials employed in these procedures cannot be selected arbitrarily. Rather, careful attention must be paid, in constructing stimulus lists, to make sure that the stimulus items have known properties. This will require some normative work similar to Cantor's (1980a) determination of consensual prototypes, Anderson's (1968) rating of adjectives for likability, and the description of the personality-trait space provided by Rosenberg and Sedlak (1972) and Wiggins (1979). One could argue that the resources of the major test-constructing firms would be better utilized in this sort of work rather than in the construction of ever-better personality questionnaires and ability tests. We like this argument. At the same time as we advocate adapting procedures from the experimental laboratory for use in the clinic, we do not think that this can be done without modification. Few clinics have the means for careful control of stimulus presentations and detailed data analysis, for example, that most university laboratories have. The advent of the desk-top microcomputer eases one of these problems substantially, however, and we see no reason why firms currently offering computerized scoring of the MMPI and similar psychological tests should not also offer similar services geared toward cognitive assessment.

More important, the stimulus materials developed for research on normal subjects may not always be appropriate for use with clinical clients. This problem has been raised concretely by the recent experiment of Davis (1979), which attempted to compare the self-schemata of depressives and nondepressives. The experiment included groups of depressed and nondepressed subjects who completed structural, phonemic, semantic, and self-referent ratings of the same adjectives used by Rogers, Kuiper, & Kirker (1977). A test of incidental recall showed that the self-



referent encoding task enhanced the incidental recall of nondepressives, but not depressives. According to Davis, "non-schema-based responding" characterized the performance of the depressives, thereby posing a challenge to the conceptual account of depression presented by Beck and others (e.g., Beck, 1967). However, Rogers *et al.* (1977) deliberately attempted to minimize the pathological content of their adjectives. If, as Beck claims, the self-schemata of depressed individuals incorporate material with negative valence, one would not expect self-referent processing to produce any advantage in the recall of material with largely positive valence. The ongoing research project of Kuiper and Derry (1980) used adjectives rated for "depressive" connotations, finding evidence that depressives have, in fact, developed self-schemata that are tuned to encode depressively toned information more efficiently than information without such connotations. The finding alerts us once more to the fact that successful application of cognitive tasks to clinical assessment will necessitate careful and representative selection of stimulus content.

We are aware that many of our proposals have a distinct "High Tech" flavor to them. We make no apologies for this: We think that the tools employed by practitioners should reflect the sophistication of the basic science on which their work is predicated. Even so, we are sobered by the reminder of the fate of attempts to develop "sophisticated" instruments within the domain of self-report questionnaires. Here, at least, the sad fact is that the sophistication of the methods employed has not generally been matched by the results obtained (Ashton & Goldberg, 1973; Hase & Goldberg, 1967; Jackson, 1975; Mischel, 1977).

Whether the sorts of procedures proposed herein will prove to have been worth the effort in devising them is an empirical question, but we think that the effort will be fruitful. Certainly the empirical precision of cognitive-behavioral assessment would increase. Moreover, we believe that clinical application of laboratory-based cognitive tasks will help to clarify some of the conceptual ambiguities that currently mar cognitive-behavioral perspectives (Mahoney & Arnkoff, 1978; Wilson, 1978). For example, the criterion-referenced approach to clinical assessment that we have outlined would require the cognitive-behavioral therapist to go well beyond the excessively vague and essentially uninformative assumption that the presenting complaint of a particular client implicates maladaptive cognitions. Instead, the therapist would attempt to discover which of the client's cognitive processes have faltered and which content areas have become especially problematic. We suspect that such specification would not only increase treatment efficacy but would also contribute to the theoretical development and refinement of cognitive-behavioral approaches to therapy and psychopathology.

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# ASSESSMENT STRATEGIES FOR COGNITIVE-BEHAVIORAL INTERVENTIONS

*Edited by*

**PHILIP C. KENDALL**

**STEVEN D. HOLLON**

*Department of Psychology  
University of Minnesota  
Minneapolis, Minnesota*



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