Michelson, L., & Ascher, L. M. (1987). Anxiety and stress disorders: Cognitive-behavioral assessment and treatment. New York: The Guilford Press.

3

Cognitive Assessment of Anxiety Disorders

JEFFREY S. MARTZKE, BARBARA L. ANDERSEN, AND JOHN T. CACIOPPO

Jim, a local electrician and recipient of the Chamber of Commerce's "Businessman of the Year" award, waits anxiously to deliver the customary keynote address at the Chamber's monthly meeting. Although Jim deals skillfully with customers, he will be speaking before a group of peers for the first time since high school. As time passes, Jim's mouth becomes dry, his heart begins to race, and his palms sweat. Jim glances around the audience and imagines that each member in attendance is there to see him falter. He wonders how he ever allowed this to happen. What a fool he is to have agreed to address this gathering! Why didn't he feign an illness or arrange to be "unavailable"? Jim knows each and every member present is a more gifted speaker than he, and imagines their amusement as he envisions himself fumbling through his speech. What if, upon reaching the podium, he finds himself unable to utter a single syllable? He can already hear the snickering and muffled banter of the audience. Worst of all, many businessmen present are his customers, and Jim knows that once he has made a fool of himself he will have lost their respect, not to mention their business.

Cognitive-behavioral conceptualizations of anxiety (e.g., Ellis, 1962; Meichenbaum, 1977) have emphasized the role of dysfunctional cognitions—negative self-statements and evaluations, unrealistic expectations, irrational beliefs—in the development and maintenance of maladaptive emotional reactions. In the preceding vignette, Jim manifested many of the physiological indices of an impending panic attack (such as cardiac acceleration and palmar sweating) and also generated a series of anxiety-related cognitions. Jim maintained irrational beliefs regarding the skill level of his audience and the ramifications of failure. Moreover, he perseverated on a number of task-irrelevant, derogatory self-statements and focused on the most catastrophic outcome (total inability to speak).

The purpose of this chapter is to survey the procedures available for assessing anxiety-related cognitions. The term *cognition* is used here to refer to an individual's thoughts and ideas, in contrast to the term *cognitive process*, which is used to refer to the sequence of elementary information-processing operations and events underlying the elicitation or generation of cognitions. Cognitions, therefore, can be viewed as products and markers of cognitive processes. The assessment procedures described in this chapter focus on the acquisition and categorization of the reportable consequences of people's cognitive processes (e.g., self-statements, beliefs, appraisals, expectations), for the purpose

Jeffrey S. Martzke, Barbara L. Andersen, and John T. Cacioppo. Department of Psychology, University of Iowa, Iowa City, Iowa.

of drawing inferences about the maladaptive cognitive processes underlying anxiety disorders. Not all consequences of cognitive processes are reportable, of course, and this limits the utility of cognitive assessments. Nevertheless, research reviewed in this chapter suggests that procedures exist for monitoring ideation, and that the obtained reports and protocols provide a glimpse of the cognitive components of anxiety-related disorders.

The pervasiveness of the cognitive trend in psychotherapy is evidenced by the increasingly frequent mating of behavioral and cognitive theories—historically pitted against each other in bitter rivalry but now yielding hybrid cognitive-behavioral theories of psychotherapy. For a more detailed discussion of the cognitive trend in behavioral psychology, interested readers are referred to Mahoney (1977). The title of this book bears witness to this trend. The view that cognitive phenomena are inherent to the therapeutic process (Beck, 1970; Goldfried & Davison, 1976), however, has predated the development and validation of procedures designed to assess cognitive content and function. As argued by Kendall and Korgeski (1979), confirmation of a therapeutic process theory is limited by the validity of instruments designed to assess therapeutic change. As a case in point, these authors argue that establishing the efficacy of behavioral treatment necessitated extensive validation of behavioral assessment methodologies. Thus this chapter reviews the efforts of researchers to develop cognitive assessment measures.

Anxious individuals have been characterized by a constellation of overly negative self-statements, excessively high performance standards, selective attention to negative information about themselves, and pathological patterns of attribution for success and failure (Arkowitz, 1977; Glass & Merluzzi, 1981). Given this conceptualization, our ability to test and refine cognitive theories of etiology and process is limited by the reliability and validity of the available cognitive assessment procedures. Hence, in this chapter, we focus on the reliability and validity of cognitive assessment procedures. It is worthwhile noting that, although demonstrations of posttreatment reduction in symptomatology and/or distress are necessary to demonstrate a treatment's value, they are not sufficient to validate purported therapeutic processes. For example, in order to claim that the alteration of cognitions is necessary to reduce anxiety, one must first demonstrate that anxious patients who benefit from cognitive therapy do in fact manifest such changes in thinking from pre- to posttreatment assessments, and that control groups do not.

Second, it is emphasized that despite implied cause–effect relationships between maladaptive cognitions and anxiety, studies that select individuals on some characteristic of interest (e.g., anxiety) and demonstrate group differences on some theoretically relevant dependent measure (e.g., irrational beliefs) are correlational, and cause–effect conclusions are inappropriate. Research in which subjects are randomly assigned to experimental or control groups (e.g., therapy outcome studies) would justify cause–effect conclusions. The number of such studies in the literature is low at present, but it is anticipated that this will be an active area of research in the future.

Evaluative Criteria

Cognitive assessments of anxiety disorders are evaluated here in terms of their reliability (test–retest, interrater, and split-half or internal consistency); validity (predictive, content, and construct); and clinical utility. The criterion employed to evaluate the reliability of

the various assessment procedures reviewed depends on the characteristics of the procedures. For techniques employing judges' ratings of cognitions (protocol analysis), interrater reliability is of particular importance. For assessments based on the assumption that an individual's total score on a self-report scale is the most valid index, measures of the internal consistency of the scale are emphasized. Test–retest indices, on the other hand, are interpreted in a context that acknowledges the situational specificity of many anxiety-provoking circumstances. For instance, although one might expect an anxious individual tested repeatedly under similar conditions to report similar (i.e., reliable) sets of cognitions (e.g., a high frequency of negative self-statements), one need not expect the frequency or pattern of situation-specific cognitions (e.g., "I am terrible thinking on my feet early in the morning") to be consistent across varied testing situations. This is not to say that test–retest reliability is irrelevant or impossible to obtain; it may simply be less appropriate than other measures (e.g., interrater reliability, internal consistency) because of the situational specificity of anxiety-related cognitions.

For most of the assessment techniques discussed, predictive validity can be demonstrated through positive correlations between cognitive indices of anxiety (e.g., a high frequency of irrational beliefs or self-deprecating thoughts) in anticipation of some task or situation and subsequent performance level in the anxiety-producing situation. Content validity is ordinarily established deductively, by randomly selecting a sample of items from the population of interest or, alternatively, through consensual validation. In the latter case, judges rate whether a potential item is representative of the class of items of interest to the researchers. A problem can arise in establishing content validity when no universe of content is entirely agreed on for the factor to be measured (Cronbach & Meehl, 1955). The content validity of scales is generally high, however, if (1) the initial pool of items is derived from spontaneous thought protocols, (2) the resulting pool of items is subjected to independent "representativeness ratings" by judges, and (3) the items consistently rated as most representative are selected for inclusion in the scale.

Finally, construct validity refers to the extent to which a cognitive assessment procedure does, in fact, reflect in a relatively true sense an individual's thoughts and thought process. Construct validation can be demonstrated through a series of tests whose aim is to determine the psychological reality of the variable (i.e., construct). One common method of assessing construct validity, for instance, is the known-groups method. In this validation technique, groups of individuals known to differ on the attribute of interest (e.g., social anxiety) are administered the measure (e.g., thought-listing measure). If the measure accurately gauges the particular attribute of interest, then groups known to differ along this dimension should generate clearly discriminable responses to the measure.

A second common technique uses a multitrait–multimethod matrix (Campbell & Fiske, 1959). Several requirements must be met for this process. First, if the measure of interest is a valid indicator of the construct under study, then predictably high relationships should exist with other measures of the construct even when the other measures differ in format (e.g., the verbal protocol, multiple choice, or sentence completion method of assessing cognitions). If the predicted pattern of high intercorrelation is found, then the measure in question is said to have *convergent validity* with other measures of the same construct. Second, measures employing the same assessment method may

correlate regardless of the construct under study, since measurement error may be comparable and influential in determining the obtained score. Thus a further criterion of construct validity involves comparing the cognitive measure of interest with measures using the same format (e.g., multiple choice) but indexing discriminable psychological constructs. If the measure in question is only weakly correlated with the theoretically unrelated measures, then the critical measure is said to have *discriminant validity*. Both convergent and discriminant validity are subclasses of the more general notion of construct validity and could be investigated simultaneously using the multitrait–multimethod matrix technique.

In the literature on the cognitive assessment of anxiety disorders, convergent and discriminant validation are frequently employed to examine construct validity even though multitrait–multimethod analyses are relatively uncommon. For example, support for the convergent validity of a cognitive assessment technique (e.g., the Irrational Beliefs Test) is obtained if high correlations with content-similar alternatives (e.g., the Rational Behavior Inventory) and with theoretically related measures (e.g., measures of negative self-statements) or superordinate constructs (e.g., measured heterosocial anxiety) are found. A technique possesses discriminant validity insofar as correlations with measures assessing theoretically similar constructs (e.g., cognitive trait anxiety) exceed correlations with dissimilar psychological constructs measured using a similar assessment format (e.g., a Thurstone attitude scale).

In addition to reliability and validity, the clinical utility of each procedure is important. To be clinically useful, a measure should discriminate anxious clinical samples both from nonanxious normals and from nonanxious clinical samples. There is a paucity of pertinent research testing this model. Wolpe (1969), however, suggested that assertion and anxiety are mutually incompatible processes, such that assertion training by its nature inhibits social anxiety. In a rather stringent test of the hypothesized relationship between assertiveness and anxiety, Fiedler and Beach (1979) found that individuals' questionnaire-based assertiveness scores were significantly correlated with trait anxiety measures for two independent, nonclinical groups of subjects ($r = -.25$ and $-.28$). As expected, assertiveness scores were consistently correlated with heterosocial anxiety and social avoidance scores (e.g., Glass & Arnkoff, 1983). Finally, Schwartz and Gottman (1976) and Lange and Jakubowski (1976) have demonstrated that cognitions play a role in unassertiveness similar to their role in anxiety. Given these findings, research employing unassertive individuals as the target population is considered when assessing the potential clinical utility of various cognitive assessment techniques.

Classification of Assessment Procedures

Procedures for studying anxiety-related cognitions fall into three broad categories: (1) behavioral (performance) measures, (2) measures employing protocol analysis, and (3) structured questionnaires. Briefly, behavioral measures are currently defined as those measures incorporating self or other (e.g., trained judge or confederate) ratings of overt behavior from which deductions may be drawn regarding superordinate cognitive processes. Typically, these measures are employed to assess the individual's skill level or affective state under clearly defined conditions. Behavioral measures can be distin-

guished from cognitive assessments in that the former rely on overt behavior or self-reports of overt behavior rather than on self-reported thoughts or feelings.

A major set of cognitive assessment techniques—particularly useful when investigators either have no predetermined ideas about what cognitive dimensions are relevant or have only a few untested hunches—is protocol analysis. A protocol analysis can be viewed as a content analysis of self-reported cognitions, with variations occurring in when and how the cognitions are obtained, categorized, and analyzed. The recording of a person's thoughts may, for instance, occur in anticipation of some situation or task, as they occur, or retrospectively (following performance). Some procedures (e.g., think-aloud procedures) are designed to obtain nearly complete thought protocols, whereas others obtain random samples. Finally, some procedures (e.g., videotape reconstruction) provide retrieval cues for retrospective reporting of cognitions, whereas others (e.g., thought listing) do not. Typically, protocol analyses rely on judges' and/or subjects' ratings of content, frequency, and valence factors. There are advantages and disadvantages to each procedure, and we will attempt to identify the type of research question for which each is best suited below.

A second major type of cognitive assessment, the structured questionnaire, relies on an individual's endorsement of thoughts and/or feelings presented by the investigator (e.g., "If I fail this exam, my friends will laugh at me"). Subjects check off (from a predetermined list) those thoughts they had had during some explicit period of time. In addition to noting whether a thought occurred, individuals are often requested to estimate the frequency with which the thought occurred (e.g., "Indicate whether the thought occurred (1) not at all, (2) infrequently, (3) frequently, or (4) almost continuously"). Structured questionnaires simplify the quantification of predetermined dimensions of thought samples, but investigators risk overlooking unspecified yet important and recurrent themes present in a person's thoughts.

We have organized our discussion of cognitive assessment procedures from the broadly applicable protocol analysis methods to the more situation- and content-specific structured questionnaires. Because the items from structured questionnaires are most content-valid when generated from genuine thought samples (i.e., protocols), we first consider protocol analysis. Next we survey structured questionnaires designed to assess the cognitive components of anxiety in specific contexts. Discussion of behavioral measures of skill level and affective state are beyond the scope of this chapter. Interested readers are referred to Eisler (1976), Kent and Foster (1977), Lick and Katkin (1976), or Nay (1977).

Protocol Analyses

Protocol analyses share the assumption that the psychological significance of a person's thoughts and feelings can be examined by content-analyzing a person's reported thoughts, ideas, images, and feelings. Instead of observing people's behavior directly, or asking them to respond to questionnaires, or interviewing them, the investigator obtains protocols from anxious individuals (or from individuals in anxiety-provoking situations) and systematically asks questions of the protocols. As noted earlier, models of underlying

processes are then formulated or tested by examining the content of the verbal protocols. In this section we survey five separate procedures for securing and quantifying protocols relevant to the study of anxiety.

The Thought-Listing Technique

Brock (1967) and Greenwald (1968) pioneered a procedure for securing protocols in which individuals list their thoughts and ideas. The majority of studies employing thought-listing techniques score protocols along valence, frequency, and content dimensions, although recent developments in this area include alternative scoring objectives and approaches (e.g., pattern assessment). A detailed discussion of the procedures for administering the thought-listing technique and of the issues surrounding the analysis and interpretation of thought-listing data can be found in Cacioppo and Petty (1981). The current discussion is limited to the utility of the thought-listing technique in studies of the cognitive components of anxiety disorders.

In an illustrative study, men who were either high or low in social anxiety were told they were to engage in a discussion with an unfamiliar woman (Cacioppo, Glass, & Merluzzi, 1979). Subjects were left alone in a room for several minutes and then were asked to list everything about which they had been thinking. Specifically, individuals read the following:

> We are now interested in everything that went through your mind about the upcoming discussion. Please list these thoughts, whether they were about yourself, the situation, and/or others; whether they were positive, neutral, and/or negative. Any case is fine. Ignore spelling, grammar, and punctuation. You will have 2.5 minutes to write. We have deliberately provided more space than we think people will need, to ensure that everyone would have plenty of room. Please be completely honest. Your responses will be anonymous. The next page contains the form we have prepared for your use to record your thoughts and ideas. Simply write down the first thought you had in the first box, the second in the second box, etc. Please put only one idea or thought in a box.

After 2.5 minutes, individuals were instructed to go back and rate their thoughts as favorable toward themselves, unfavorable toward themselves, or neutral (personally irrelevant). Subsequently, subjects rated themselves on semantic differential scales (e.g., good–bad, active–passive).

Subjects were able to follow the thought-listing instructions. Two judges scored the protocols according to the favorableness/unfavorableness of each listed thought relative to the "self," with high interrater reliability ($r = +.95$). Interestingly, analyses revealed that high and low socially anxious men rated their listed thoughts similarly, even though independent judges, who were unaware of the experimental conditions, rated the thoughts listed by high and low socially anxious individuals as being distinctive. Men high in social anxiety were found to generate significantly more negative self-statements and to express more negative self-regard prior to engaging in a discussion with an unfamiliar woman than did men low in social anxiety. The finding that high and low socially anxious individuals rated their self-statements as equally favorable suggests that each group has a unique frame of reference for what constitutes a normal or favorable

self-statement. Consistent with this reasoning, previous research has shown that high socially anxious individuals possess more negative expectations regarding social interactions and more negative generalizations about themselves than do low socially anxious individuals (e.g., Clark & Arkowitz, 1975; Smith & Sarason, 1975).

With regard to the cognitive assessment of anxiety, this research highlights the importance of considering the frames of reference employed by the subjects versus those of the judges who are charged with categorizing verbal protocols. When individuals have been randomly assigned to conditions, previous research has revealed few significant differences between subject- and judge-rated thought listings (see Cacioppo & Petty, 1981). When individuals are not randomly assigned to groups, however, as is often the case in studies of anxiety, only the ratings of judges who are blind to the experimental conditions can be assumed to be based on comparable frames of reference across conditions. Whether judge or subject ratings are preferred depends, of course, on the particular research question of interest. As a general rule, however, ratings by independent judges should be included in the analyses of verbal protocols if individuals are not randomly assigned to groups, since these render subject-rated protocols more interpretable.

Although additional empirical work is necessary, the thought-listing procedure has proved informative in research on individuals known to differ in terms of their snake phobia (Huber & Altmaier, 1983), social anxiety (Cacioppo et al., 1979), and in cognitively based outcome studies of social (Malkiewich & Merluzzi, 1980) and test anxiety (Arnkoff, 1980; Bruch, 1978). Most research to date has used simple frequency counts (e.g., the number of negative self-statements), but the organization of thought listings (e.g., profiles, sequence, weightings) is beginning to attract increased attention. For instance, Huber and Altmaier (1983) found weighting the listed thoughts provided a more sensitive measure of differences in the cognitive organization of phobics and nonphobics than did simple frequency counts. Huber and Altmaier obtained thought listings from phobics and nonphobics following behavioral avoidance tasks. Subsequently, individuals were instructed to list the thought they perceived to be the exact opposite of each listed thought. Each bipolar pair of thoughts (thought dimension) was then rated by judges on a 5-point degree-of-threat scale. Subject ratings of salience or intensity of thoughts (from 1 to 3) were multiplied by judged threat ratings to obtain the total threat rating for each thought dimension. Analyses of thought dimensions indicated that phobics and nonphobics did not differ in the type or frequency of original thoughts listed, but that the groups differed in terms of the average total threat rating of the thought dimensions. More specifically, the cognitive systems of phobic individuals tended to be highly restrictive, such that both poles of the thought dimensions possessed high threat salience (an example of such a dimension being, "Snake will bite me" versus "Snake will not bite me")—a finding that may have important implications in the design of cognitive restructuring therapies for phobic individuals.

In sum, the thought-listing technique is useful but limited in several respects. Skepticism has been expressed regarding the ability of individuals to identify the stimuli that elicit cognitive or behavioral responses (cf. Nisbett & Bellows, 1977; Nisbett & Wilson, 1977), and one cannot assume that listed thoughts about causes and processes provide accurate depictions of "real" thoughts. Nevertheless, analyses of an anxious

person's thoughts about the source of his or her anxiety may provide useful insights into the actual source, whether or not the person is able to identify it accurately. A second limitation is that the thought-listing technique can be expected to be insensitive to cognitions that are not salient or temporally proximal to the collection of the thought listings. The inability of subjects to recall all of their thoughts may not be problematic if it is the salient cognitions that also are the most important guides for their behavior (cf. Fazio & Zanna, 1981), but this is a difficult hypothesis to test unless more comprehensive cognitive assessment procedures are available. Several protocol procedures have been developed to combat the problem of incomplete recall. One such procedure—termed videotape reconstruction—is discussed next.

Videotape Reconstruction

In the videotape reconstruction procedure, individuals are videotaped while engaged in some target behavior. Subsequently they attempt to reconstruct their thoughts and feelings while reviewing the videotaped behavior. The thoughts and feelings individuals report having experienced are transcribed and content-analyzed in the same manner as described for thought listings. Interrater reliabilities are consistently high in this procedure.

In an illustrative study, Hollandsworth, Glazeski, Kirkland, Jones, and van Norman (1979) employed the videotape reconstruction procedure to compare reported self-statements of low- and high-test-anxious individuals. Women with extreme Test Anxiety Scale scores and average General Anxiety Scale scores (Sarason, 1972) were videotaped while completing a forty-minute mental abilities test. While the women completed the items, physiological measures of skin resistance response rate, heart rate, and respiration rate were obtained. Immediately following task completion, subjects were led to a viewing room where they observed a videotape of their task performance. While watching the videotape, the women were requested to reconstruct the flow of thoughts that had occurred during the testing session. Their self-statements were audiotaped, and the videotape was stopped by the experimenter as each cognition was verbalized. Following the thought reconstruction session, subjects filled out a series of self-report anxiety and arousal questionnaires.

The women's verbalizations were transcribed and subjected to content analysis by two independent judges blind to the research hypotheses. Thoughts and feelings were assigned to one of five classes:

1. On-task (e.g., self-statements focused on test items)
2. Off-task (e.g., self-statements focused on activities occurring prior to or following the task)
3. Positive-evaluation (e.g., self-referent labeling as good, smart, or fast; and task-referent labeling as easy or fun)
4. Negative-evaluation (e.g., self-referent labeling as stupid, slow, or dumb, and task-referent labeling as hard or difficult)
5. Miscellaneous (self-statements not classified within any of these categories and excluded from subsequent analyses).

On-task and positive-evaluation self-statements were considered task-facilitating: off-task and negative-evaluation self-statements were considered task-debilitating.

Results indicated that low- and high-test-anxious women did not differ on physiological or self-report measures of arousal during the testing session. However, low-test-anxious women labeled their arousal as task-facilitating, whereas high-test-anxious women labeled their arousal as task-debilitating. Moreover, the number of reconstructed task-facilitating self-statements was double that of task-debilitating self-statements for the low-test-anxious women, whereas the number of self-statements classified within these categories did not differ for high-test-anxious women. Given these findings, Hollandsworth et al. (1979) argued that treatment of test anxiety should emphasize relabeling of arousal as facilitative and strive to increase and maintain the number of task-facilitating self-statements within test situations rather than instructing subjects in progressive relaxation techniques.

The videotape reconstruction procedure has also proved informative in studies of the cognitive components of social competence (Smye, 1977, cited in Meichenbaum & Butler, 1979; Smye & Wine, 1980). Research by Burgio, Glass, and Merluzzi (1981) and by Chiauzzi and Heimberg (1983), however, raises questions about the sensitivity of this procedure. Burgio et al., for instance, identified women who differed in terms of their level of social anxiety and videotaped the individuals while they engaged in a conversation with a male confederate. Thoughts reported by women after viewing a videotape of their interaction failed to discriminate between the high and low socially anxious groups, even though their responses to a situation-specific self-statement questionnaire (the Social Interaction Self-Statement Test, SISST, to be discussed) did differentiate the groups.

Providing individuals with the retrieval cues inherent to a videotape of their own behavior may lead to more accurate and complete thought recall. Meichenbaum and Butler (1979) have noted, however, that (as with retrospective thought listing) it is impossible to determine the degree to which individuals are recalling rather than constructing the flow of thoughts and feelings reported while they observe themselves on the videotape. Presented with their own oftentimes maladaptive behavior (typically in the presence of an experimenter), individuals may engage in post hoc rationalizations of their behavior. Second, as noted by Burgio et al. (1981), this procedure appears to vary in its sensitivity to group differences across situations. These authors argue that the videotape reconstruction procedure taps many thoughts and ideas that are not specific to important features of anxiety-inducing situations. Nevertheless, the results of Hollandsworth et al. (1979) suggest the videotape reconstruction procedure can be sensitive in assessing the influence of anxiety on problem solving.

In trying to resolve these disparate conclusions, it is interesting to note, that the procedure adopted by Burgio et al. (1981) differs from that adopted by Hollandsworth et al. (1979). Hollandsworth et al. encouraged subjects to verbalize reconstructed thoughts as they were recalled (i.e., concurrent with videotape viewing), whereas Burgio et al. asked subjects to verbalize their thoughts following their viewing of the videotape (i.e., retrospectively). Chiauzzi and Heimberg (1983), who adopted an approach similar to that of Burgio et al., also found the obtained protocols to be similar for high- and low-anxious groups. Differences in the sensitivity of the obtained protocols, therefore, may be

attributable to differences in the timing of thought reconstruction relative to videotape presentation. Research comparing retrospective thought-listing to concurrent think-aloud protocols suggests that these procedures do elicit quantitatively and qualitatively different protocols (e.g., Blackwell, Galassi, Galassi, & Watson, 1985). It is still uncertain, therefore, whether it is possible that the lack of sensitivity suggested by the null findings of Burgio et al. and Chiauzzi and Heimberg is attributable to the retrospective nature of their thought reconstruction or to differences in the sensitivity of the videotape reconstruction procedure across situations.

The Think-Aloud Technique

The think-aloud technique is designed for concurrent cognitive assessment. Ericsson and Simon's (1978) review of this technique provides a detailed description of the procedure. Briefly, the subject is asked to verbalize all thoughts and feelings experienced while completing a task, or during a defined time period. In most cases, the individual is performing a task relevant to the researcher's hypothesis (e.g., completing a set of math problems). Reported thoughts and feelings are transcribed and content-analyzed in the same manner as described for thought listing. This procedure is inapropriate for some research topics (e.g., cognitions occurring during heterosocial interactions) and may be further limited in application by its disruptive effects on task performance (Fulkerson, Galassi, & Galassi, 1984). Nonetheless, the think-aloud technique has been used successfully in a number of situations.

Fulkerson et al. (1984) asked college students in the top and bottom third of a classwide distribution of math anxiety scores to think aloud while solving Scholastic Aptitude Test (SAT) math problems. Math anxiety level was unrelated to performance or to the frequency of thoughts, as rated by judges, within 11 categories of cognition. When similar analyses were conducted on the subset of problems for which subjects did not think aloud, cognitive categories concerned with task facilitation (i.e., attention-controlling and self-facilitating cognitions) and inhibition (i.e., irrelevant and self-inhibiting cognitions) were significantly related to performance. These results suggest that think-aloud procedures may impair performance (cf. Ericsson & Simon, 1980). The fact that performance on the subset of "think-aloud questions" correlated only +.44 with performance on non-think-aloud questions further supports this conclusion.

The reactivity of the think-aloud technique may be much less of a problem when used with children who have not yet completely internalized their private speech (Luria, 1961). For example, Fox, Houston, and Pittner (1983) found that high-trait-anxious children reported more thoughts of preoccupation, justification of positive test-taking attitude, and derogation of others during a preexam think-aloud session. Fox et al. argued that the think-aloud technique is particularly useful with children, as their private speech has not been internalized long and they are, therefore, easily trained in the procedure.

One final caveat is warranted regarding the interpretation of think-aloud protocols. It is inappropriate to assume the think-aloud technique elicits verbalizations that are literal expressions of thought. As Meichenbaum and Butler (1979) note, thoughts occur more rapidly than speech, implying that editing is inherent even to the think-aloud

approach. Think-aloud protocols are, therefore, best conceived as selective (i.e., nonrandom) samples of thoughts and feelings. Given that cognitive assessment procedures involve obtaining samples of cognitions (as opposed to literal expressions of thought content), concurrent randomized thought-sampling procedures are of interest because they purportedly provide the benefits of concurrent cognitive assessment while minimizing the risk of reactivity.

Other Methods Employing Protocol Analysis

Two alternative approaches for obtaining thought protocols are Hurlburt's (1976) thought-sampling approach and the articulated thoughts during simulated situations (ATSS) technique of Davison, Robins, and Johnson (1983). Briefly, during thought sampling individuals are asked to record what they were thinking just prior to a randomly timed recall cue. The thoughts are rated either immediately or retrospectively (and, in the latter case, by either a judge or the subject) on a series of 5- or 7-point Likert-type scales, 25 of which assess the cognitive, and 17 the affective, nature of the thought. Hurlburt (1980) and Hurlburt, Lech, and Saltman (1984) employed a random tone generator to cue thought recording in both naturalistic and laboratory settings. Preliminary evidence suggested that factor loadings for the cognitive and affective variables were consistent across settings and reliable across time ($p < .01$). Although this method lacks extensive validation and has not been used with anxious subjects, it has potential as an alternative to retrospective thought-listing and think-aloud procedures. The primary advantage of this procedure (in comparison to think-aloud techniques) appears to lie in its ability to provide thought samples across an extended period of time while potentially reducing reactivity. To date, however, the reactivity of this procedure has not been systematically assessed. As with think-aloud techniques, this technique is limited in its situational applicability. Moreover, compared to think-aloud protocols, inferences regarding thought pattern and sequence (Notarius, 1981) drawn from thought sample protocols are limited.

ATSS is a similar procedure developed recently by Davison et al. (1983). In this procedure, the subject pretends that he or she is a participant in a role-played interaction. Subjects verbalize their thoughts during pauses inserted at predetermined intervals throughout the audiotaped session. Judges analyze these recorded verbalizations, allowing for comparisons across role-playing situations and subject groups. Data regarding the validity of the ATSS procedure are mixed. Thoughts reported by college students presented with stressful situations were rated as less rational than thoughts in nonstressful situations. In addition, for highly fearful subjects who also received high scores on the Irrational Beliefs Test (IBT—a self-report measure of beliefs, to be discussed), self-reported anxiety following exposure to personally derogatory conversations was significantly correlated with irrationality scores obtained from ATSS protocols ($r = +.49$, $p < .01$) (Davison, Feldman, & Osborn, 1984). However, irrationality scores based on articulated thoughts were not significantly correlated with IBT or Assertion Inventory scores. This lack of convergence between alternative measures of irrational beliefs raises questions about the validity of the ATSS and underscores the importance of multi-

method research. We turn now to a study that compares the thought protocols obtained employing the two most widely used protocol generation techniques, think-aloud and thought-listing.

Multimethod Assessment

We have suggested that multimethod research is necessary to determine the method variance inherent to various cognitive assessment procedures. Recently, Blackwell et al. (1985) compared the thought protocols elicited through think-aloud and thought-listing procedures. Employing a mixed design, Blackwell et al. required math-anxious college students to complete two sets of math problems. For one set, they were asked to think aloud (having received brief training prior to actual data collection); for the other they were asked to list their thoughts, in order of occurrence, immediately following each item. The order of problem set and cognitive assessment procedure was counterbalanced across subjects. Data were obtained on the number of problems solved correctly, the amount of self-reported anxiety, the duration of the data acquisition period for each method, and the frequency of thought protocol cognitions within each of eleven cognitive content categories.

Analysis of the frequency data indicated that think-aloud yielded twice as many thoughts as thought-listing and that the two thought protocols differed on 6 of the 11 content variables. Specifically, thought-listing protocols contained a significantly greater number of thoughts scored as positive problem-solving evaluations and positive self-evaluations. Think-aloud protocols contained a significantly greater number of thoughts scored as review of information, strategic calculations, conclusions, and attention control. Employing proportional cognitive content data (frequency data corrected for total number of responses), significant differences were obtained between procedures for each of the 11 variables. These proportional data mirrored the frequency data, but thought-listing also yielded proportionally more statements categorized as strategic planning, irrelevant, negative self-evaluation, negative problem-solving evaluation, and neutral content. The two procedures differed marginally on the number of problems solved correctly, with fewer questions being answered correctly during the think-aloud phase of the study. Subjects took significantly longer to complete each problem in the thought-listing phase, and they reported a higher level of anxiety following thought-listing than they did following think-aloud—suggesting that thought-listing may have reactive effects as well. Although this research does not resolve the issue of which procedure is "better," it does suggest that the ability of each procedure to assess cognitions may vary according to the type of cognition being assessed.

Blackwell et al. argue that think-aloud techniques may best assess problem-solving cognitions, whereas the thought-listing technique taps proportionally more self-relevant, evaluative cognitions. Moreover, the think-aloud technique appears to provide more of an ongoing record of thoughts than does thought-listing, to be less vulnerable to post hoc rationalization or reconstruction, and to be less dependent on memory. In contrast, they propose, the thought-listing technique is less likely to interfere with task performance and is more easily administered in groups.

Throughout our discussion of protocol analysis procedures, we have noted that various techniques may differ in the cognitive content they best assess, and in the contexts in which they have been demonstrated to be sensitive and nonreactive. Structured questionnaires have been developed to assess anxiety-related cognitions of a specific nature (e.g., beliefs) and, more recently, within unique contexts (e.g., social interaction). We turn now to a consideration of the more content- and situation-specific structured questionnaires.

Structured Questionnaires

Self-report structured questionnaires have been applied primarily in the assessment of anxious individuals' belief systems, self-statements, and expectations (including the assessment of self-efficacy). We have organized our discussion of the development and application of structured questionnaires for research on the process and treatment of anxiety disorders according to the content of the questionnaire's target cognitions.

Assessment of Beliefs

Ellis (1962) proposed that anxiety stems from a set of conscious beliefs that predispose a person to engage in irrational reasoning processes. Although protocol analysis may be employed to assess the frequency of thoughts and feelings indicative of irrational beliefs, several self-report questionnaires have been developed specifically to assess the frequency of maladaptive, irrational beliefs. In contrast to protocol analysis procedures (in which subjects' beliefs are inferred from reported self-statements), belief questionnaires require individuals to estimate the frequency with which previously selected beliefs occurred while they were completing a theoretically relevant task or during a defined period of time. The first scale developed for this purpose was the Irrational Beliefs Test (Jones, 1969).

IRRATIONAL BELIEFS TEST

The Irrational Beliefs Test (IBT) (Jones, 1969) was based on the irrational beliefs identified by Ellis (1962). This self-report inventory requests individuals to estimate on a 5-point scale the degree to which they maintain each of 100 specific beliefs. Ten subscales are used to gauge the irrational beliefs reflecting need for approval, perfectionism, blaming of others, catastrophizing, external attribution of emotions, anxious overconcern, dependency, helplessness, and beliefs that there are perfect solutions to problems. Jones (1969) reported high test–retest reliability (full-scale IBT $r = +.92$, subscale r's ranging from +.67 to +.87) and internal consistency of subscales (item-to-subscale score coefficients ranging from +.66 to +.80) for the IBT. Convergent validation was determined by correlating IBT full-scale and subscale scores with summed anxiety symptom checklist scores and anxiety-related Sixteen Personality Factor Questionnaire (16PF) (Cattell, Eber, & Tatsuoka, 1970) subscale scores. The total score on the IBT correlated +.61 with the symptom score and had an average correlation of +.42 with the six anxiety-related 16PF subscale scores (all correlations reaching significance). Eight IBT

subscales were significantly correlated with summed anxiety scores (multiple-$R = .72$) and anxiety-related 16PF subscales (multiple-R's ranging from .43 to .63).

Additional convergent validity for the IBT was documented by Gormally and colleagues (Gormally, Sipps, Raphael, Edwin, & Varvil-Weld, 1981a) who found IBT scores (combined and subscale) not only predicted heterosocial comfort scores (IBT worry and past influences subscales' $r = -.40$ and $-.42$, respectively), but were also moderately correlated with the Situational Expectancies Inventory (SEI), a measure of subjective risk estimate, to be discussed. (Correlation coefficients were not reported). Smith and Zurawski (1983) administered the IBT and a variety of anxiety measures to a nonclinical sample of college students. The measures employed included the trait form of the State–Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970); the Fear of Negative Evaluation Scale (Watson & Friend, 1969); the Test Anxiety Inventory (Spielberger, 1980); and a measure of cognitive and somatic trait anxiety (Schwartz, Davidson, & Coleman, 1978). IBT total scores were correlated with all anxiety scores ($+.38 < r < +.68, p < .001$). However, IBT total scores were also more highly correlated with trait anxiety scores (State–Trait Anxiety Index, or STAI) than with Rational Behavior Inventory scores (an alternative measure of irrational beliefs, to be discussed). On the basis of their results, these investigators postulated that the IBT may be a redundant measure of cognitive anxiety rather than a measure of purported mediating constructs. Alternatively, these results may reflect that the IBT is more sensitive to beliefs related specifically to anxiety than it is to irrational beliefs generally.

The validity of the IBT has been further substantiated through its use as a measure of cognitively based therapy outcome with unassertive (Craighead, 1979); socially anxious (Goldfried & Sobocinski, 1975; Kanter & Goldfried, 1979); and speech-anxious (Trexler & Karst, 1972) individuals, and as a means of identifying group differences with socially anxious clients (Davison et al., 1984; Gormally et al., 1981a; Sutton-Simon & Goldfried, 1979). However, several other outcome studies have failed to obtain posttreatment differences between groups of test-anxious (Casas, 1976) or unassertive (Derry & Stone, 1979) groups, or to differentiate groups of high versus low socially anxious individuals (Burgio et al., 1981).

Finally, the most extensive validation research on the IBT has been conducted by Lohr and associates (Lohr & Bonge, 1981, 1982a, 1982b; Lohr, Bonge, & Jones, 1983; Lohr, Nix, Dunbar, & Mosesso, 1984; Lohr & Rea, 1981). Lohr & Rea (1981) compared test anxiety scores (Personal Report of Public Speaking Anxiety, McCroskey, 1970) of students enrolled in an introductory speech course with concurrently obtained IBT scores. They found that, although in past research therapy designed to change irrational beliefs effectively mediated fear of public speaking (Fremouw & Harmatz, 1975; Fremouw & Zitter, 1978), only one IBT subscale, "demand for approval," was positively correlated with speech anxiety ($r = +.23$), and even this subscale did not differentiate groups of individuals who differed in their level of speech anxiety. Research assessing the relationship between irrational beliefs and assertiveness has obtained inconsistent results (Lohr & Bonge, 1982b; Lohr et al., 1984). In summary, the findings suggest that IBT scores are related to assertiveness, but the percentage of common variance is low.

The data to date indicate that IBT scores are clearly related to social anxiety,

whereas their relationship to test anxiety and assertiveness is less clear. The data warrant continued examination of the IBT for anxiety-related research purposes and application with socially anxious clinical populations. Further validation with test-anxious and unassertive individuals is necessary before employing this scale with these clinical populations.

RATIONAL BEHAVIOR INVENTORY

The Rational Behavior Inventory (RBI), developed by Shorkey and Whiteman (1977), is composed of items previously used by Hartman (1971) and Fox and Davies (1971). Two factor analyses yielded a final scale of 37 items that loaded on 11 factors, some consistent with the categories of irrational beliefs identified by Ellis (1962), others reflecting common substrates of several beliefs. Examples of the latter include irrational beliefs that the world should be completely altruistic, that guilt should be assigned for deviance, and that difficult problems should be avoided. Reliabilities (based on college student samples) are +.82 and +.71 for test–retest reliability, and +.73 for split-half reliability. Among college student groups, evidence of the validity of the RBI is provided by significant correlations with 13 of the 14 Personal Orientation Inventory subscales ($.23 < |r| < .53$) (Shorkey & Reyes, 1978). Rosenberg's Self-Esteem Scale ($r = +.45$), Schulze's dogmatism scale ($r = -.35$), the Srole Anomic Scale ($r = -.35$), and Lane's Authoritarianism Scale ($r = -.16$) (Whiteman, 1979; Whiteman & Shorkey, 1978). Moreover, mental health service providers undergoing brief training in rational–emotive therapy demonstrated a change in RBI scores indicating greater rationality following training (Shorkey & Whiteman, 1977). Finally, Himle, Thyer, and Papsdorf (1982) provided evidence for the convergent validity of the RBI by obtaining significant correlations for a college student sample between RBI scores and measures of state, trait, and test anxiety ($-.31 < r < -.50$, p's $< .001$).

Smith, Boaz, and Denny (1984) found that irrational beliefs, based on full-scale RBI scores, were correlated with measures of psychological and physical distress ($r = +.49$ and $+.27$, respectively; $p < .01$). These findings were consistent with previous research employing alternative means of assessing irrational beliefs (Knapp, 1979). Smith and Zurawski (1983) assessed the discriminant validity of the RBI, along with the IBT, employing the trait and state anxiety measures described earlier. Unlike the IBT, the RBI was found to have good discriminant validity, correlating higher with the IBT (an alternative measure of irrational beliefs) than any anxiety measure administered to the sample of participating college students. No replication using a clinical sample or measures of other components of emotional distress are yet available, nor has the validity of the RBI been established for specific classes of anxiety disorders (e.g., test anxiety, speech phobia, social anxiety).

As previously discussed, irrational beliefs are the major component of the irrational cognitive philosophies adopted by anxious individuals (Ellis, 1962). Coinciding with this belief system, individuals engage in an internal dialogue, a series of self-statements, regarding recent or impending events and the consequences of alternative (primarily negative) outcomes. It is through this internal dialogue that individuals experience their irrational beliefs (Kendall & Hollon, 1981). Next we consider questionnaires designed to assess these self-statements in anxiety-inducing situations.

Assessment of Self-Statements

Self-statement questionnaires are less specific with respect to the nature of the cognitions they assess (e.g., beliefs, expectations, evaluations) than are irrational belief questionnaires. In lieu of assessing a well-circumscribed set of cognitions, questionnaires may increase their sensitivity by narrowing their context of application (as opposed to their cognitive content of interest). With the exception of the Anxious Self-Statement Inventory, investigators have attempted to increase the sensitivity of their self-statement questionnaires by limiting their context of application.

ASSERTION SELF-STATEMENT TEST

The Assertion Self-Statement Test (ASST), developed by Schwartz and Gottman (1976), has received the greatest research attention among self-statement inventories. This scale was designed to assess the role of self-statements in individuals' ability to complete assertive tasks. Items for the instrument were selected on the basis of consensual validation by college students. Items include "I was concerned that the person would think I was selfish if I refused" (a negative-assertion self-statement) and "I was thinking I am too busy now to say yes" (a positive-assertion self-statement). In Schwartz and Gottman's original study, college students completed the 34-item ASST following participation in a series of role-playing situations. The students were asked to respond to 17 positive and 17 negative self-statements on a 5-point scale indicating how frequently the thought had occurred (from "hardly ever" to "very often").

Schwartz and Gottman found that low-assertive subjects did not differ from their high-assertive peers in knowledge of assertive responses or in ability to behave assertively in a low-threat situation (such as showing a friend how to handle assertive situations). Deficient assertive behavior was manifested by the low-assertive subjects in assertiveness situations in which subjects were personally confronted with an unreasonable request. Analyses of subjects' self-reported self-statements showed that high- and moderate-assertive subjects reported significantly more positive than negative self-statements in these situations, whereas low-assertive subjects did not differ in the number of positive and negative self-statements. In contrast to the "positive cognitive set" characterizing moderate- and high-assertive subjects, low-assertive subjects were "characterized by an 'internal dialogue of conflict' in which positive and negative self-statements compete against each other" (Schwartz & Gottman, 1976, p. 919). These results were replicated by Bruch (1981).

Further research by Bruch, Haase, and Purcell (1984) demonstrated that the ASST has acceptable internal consistency (Cronbach's $\alpha = .78$), but may be best conceptualized as having two independent negative thought factors. Factor analysis suggested that negative self-statements may reflect apprehension over negative interpersonal consequences (e.g., "I was thinking that people will dislike me if I always refuse") or preoccupation with moral standards involving responsibility to others (e.g., "I was thinking that it was better to help others than to be self-centered"). Regression analysis demonstrated, however, that the second negative factor score (reflecting a preoccupation with moral standards) did not contribute significantly to the ability of the ASST to predict assertiveness scores.

Pitcher and Meikle (1980) used a revised form of the ASST to assess differences between high- and low-assertive individuals in positive as well as negative assertion situations. They found that in positive-assertion situations, reported self-statements did not differ between assertiveness groups. In the negative-assertion situation, however, Schwartz and Gottman's findings for assertive refusal situations were replicated.

Heimberg, Chiauzzi, Becker, and Madrazo-Pederson (1983) extended this area of research by administering the ASST to high- and low-assertive college students, psychiatric patients, and normal adults. Although a sample effect was obtained, their results demonstrated that the ASST distinguished low-assertive subjects independent of subject type in a manner consistent with Schwartz and Gottman (1976). This serves as a valuable extension of the "internal dialogue of conflict" hypothesis to socially anxious clinical populations.

Finally, two therapy outcome studies (Craighead, 1979; Derry & Stone, 1979) employed the ASST as a measure of cognitive change. Craighead (1979) reported that instructional self-training resulted in a significant decrease in negative self-statements relative to no treatment and expectancy controls. A similar pattern of results was obtained on Craighead's assertion-specific measure of irrational beliefs, providing evidence for the convergent validity of the ASST. Derry & Stone (1979) also reported posttreatment and follow-up differences between treatment conditions in the number of negative self-statements. Compared with individuals in a behavioral rehearsal alone or behavioral rehearsal and attribution training condition, individuals in the behavioral rehearsal plus cognitive self-statement condition endorsed fewer negative self-statements.

SOCIAL INTERACTION SELF-STATEMENT TEST

Developed by Glass and Merluzzi (Glass, Merluzzi, Biever, & Larsen, 1982), the Social Interaction Self-Statement Test (SISST) is a 30 item scale, presented in a format comparable to the ASST, targeted for the assessment of the cognitive correlates of heterosocial anxiety. The self-statements included were among those generated by a group of pilot subjects in response to ten heterosocial vignettes via the thought-listing procedure. Items generated were first classified as positive, negative, or neutral in valence and subsequently rated by eight judges on an 11-point scale from negative to positive. Based on these judges' ratings, the authors selected the 15 positive (e.g., "What the heck, the worst that can happen is that she won't go for me"; "What do I have to lose? It's worth a try") and 15 negative (e.g., "I hope I don't make a fool of myself"; "I'll probably bomb out, anyway") items with the most extreme ratings. Glass et al. (1982) found that the item-to-total scale correlations ranged from +.45 to +.77 ($p < .001$), and odd versus even item split-half reliabilities were +.73 and +.86 for the positive and negative self-statements, respectively. SISST scores correlated with self-report measures of social anxiety and heterosocial skill (correlations ranging from +.44 to +.77, $p < .001$), and SISST negative self-statement scores were correlated with judge and confederate ratings of skill and anxiety ($.23 < |r| < .32$). Finally, Glass et al. (1982) found that SISST scores discriminated high from low heterosocially anxious men and women. Given these encouraging initial data, research extending validation to clinical samples, employing naturalistic observation of heterosocial interaction to establish predictive validity, and generating and analyzing additional items to yield a more general measure of social anxiety appears justified.

OTHER SELF-STATEMENT QUESTIONNAIRES

Two other self-report questionnaires warrant discussion. The Cognitive Interference Questionnaire (CIQ), a questionnaire designed for use with test-anxious subjects, was developed by Sarason (1978). The CIQ contains 11 self-statements rated on a 5-point frequency-of-occurrence scale, and a 7-point scale on which the degree of "mind wandering" is assessed. The validity of the CIQ has been substantiated through its use as a therapy outcome measure (Kirkland & Hollandsworth, 1980) and as a means of identifying group differences with test-anxious subjects (Hollandsworth et al., 1979; Sarason, 1984; Sarason & Stoops, 1978).

Kendall and Hollon (1980; cited in Kendall & Hollon, 1981) approached the construction of their Anxious Self-Statement Inventory (ASSI) somewhat differently. Employing a known-groups approach, these researchers selected 33 self-statements endorsed significantly more often by subjects in a highly anxious group (based on STAI and Minnesota Multiphasic Personality Inventory [MMPI] anxiety scale scores) than subjects in a moderately anxious group. The 33 items received cross-validation with a second sample of similarly defined criterion groups. Kendall and Hollon (1981) report preliminary findings suggesting that, independent of trait stress level, change scores (from nonstress to preexamination administrations) on the ASSI correlated significantly with changes in state anxiety ($r = +.34$), but not in depression ($r = +.09$). Although this measure has not received widespread use, preliminary results suggest that it may be a useful measure of general rather than situation-specific cognitive concomitants of anxiety.

Although self-statement questionnaires show high potential, most inventories require additional validation. With the exception of the ASST, the measures lack validation with clinical samples. Moreover, suprisingly few attempts have been made to compare the self-statement scores obtained employing structured questionnaires to protocol analyses, and few attempts have been made to establish the discriminant validity of many self-statement questionnaires. Finally, performance on self-statement questionnaires may be subject to individuals' post hoc reappraisals of their thoughts. Particularly for cognitively based therapy outcome studies, the potential for demand characteristics appears great. Demonstrations that the number and nature of reported self-statements is independent of social desirability scores, prior to and following cognitively oriented therapy, would further validate the role of self-statement modification in the therapeutic process.

Self-Efficacy Measures

Bandura (1977) argues that behavior change is mediated by a single underlying process—namely, changes in efficacy expectations. Efficacy expectations reflect an individual's expectation that he or she can perform a particular task. Outcome expectations, in contrast, refer to an individual's expectation that specific outcomes will result from a given situation or action. Scales developed to assess efficacy expecations have reflected Bandura's concern that the assessment of efficacy expectations be situation-specific. The instruments are organized in a fashion similar to behavioral avoidance tests such that statements that describe less threatening behaviors ("Look at snake in glass case from a distance") are followed by statements placing an individual in closer proximity to, and

ultimately in contact with, the anxiety-inducing situation ("Tolerate snake in lap"). For a brief description of behavioral avoidance tests, see Lang and Lazovik (1963). For each item, subjects indicate whether they feel they could perform the task (an index of efficacy level) and, if so, indicate on a separate scale their confidence (an index of efficacy strength). Confidence scores may range from 0 to 100 (in 10-point increments). Efficacy scales of this nature have been validated through therapy outcome studies with speech-anxious subjects (Jaremko & Walker, 1978, cited in Glass & Merluzzi, 1981) and snake phobics (Bandura & Adams, 1977). Correlational studies have found that scores on efficacy scales are significantly correlated with assertiveness (Lee, 1984a) and snake-approaching behavior in nonphobics (Lee, 1984; $+.66 < r < +.82$, $p < .001$).

Although efficacy scales have been widely used in research designed to examine the relationship between efficacy expectations and subsequent behavior, little emphasis has been placed on determining the psychometric merits of the scales employed. Data suggest the scales possess construct validity; yet questions remain regarding reliability, discriminant validity, and convergent validity.

Initially, Bandura (1977) argued that efficacy expectations played a more central mediating role in behavior change than outcome expectations. More recently, Bandura (1982) has suggested that, in specific situations, interactions between efficacy and outcome expectations will lead to unique affective states. Research on the relationship between efficacy and outcome expectations on subsequent task performance and affective state (Davis & Yates, 1982) supports Bandura's more recent position. In Davis and Yates's study, students manifested depressed affect and performance decrements on an anagram task only when outcome expectations were high and efficacy expectations were low. These results suggest that outcome expectations influence overall affective state.

Researchers assessing the mediating cognitive processes of anxiety have also examined the effect of outcome expectations on affective state. In the next section we examine the reliability, validity, and utility of measures designed to assess anxiety-related outcome expectations.

Outcome Expectancy Measures

In two studies examining the relationship between expectations and anxiety (Lee, 1984a, 1984b), efficacy expectations were better predictors of behavior than outcome expectations; indeed, outcome expectancy measures did not account for a significant portion of variance in behavior over that predicted by efficacy expectations. Nevertheless, greater attention has been paid to the development and validation of outcome than efficacy expectation measures.

SUBJECTIVE PROBABILITY OF CONSEQUENCES INVENTORY

Fiedler and Beach (1978) incorporated the concept of *subjective expected utility* (SEU), a measure of the subjective risk or response cost of certain behaviors, to examine the relationship between outcome expectancies and assertiveness. Bruch et al. (1984) labeled the instrument developed to assess the SEU of a given behavior the Subjective Probability of Consequences Inventory (SPCI). The SPCI is a list of potential positive and negative consequences associated with complying with or refusing a request made by

another individual. An example of a positive consequence of refusal is "I will respect myself more"; a negative consequence of refusal is "I will feel guilty." An example of a positive consequence of compliance is "We will become better friends"; a negative consequence of compliance is "I will feel angry and resentful." The SPCI was derived from an original list of potential outcomes that were subsequently subjected to consensual validation by clinical experts to ensure representativeness. SPCI scores are obtained by summing an individual's weighted rating of the cost or benefit assigned to each consequence. Weightings are determined by the probability of occurrence the individual assigns to that consequence.

Fiedler and Beach (1978) presented the SPCI to high-, medium- and low-assertive individuals following each of nine assertion vignettes. Individuals had personally rated the utility of each consequence prior to exposure to the vignettes. For each vignette, subjects were asked to rate the probability of occurrence of each consequence under conditions in which the requests were either complied with or refused. SEU scores were computed for each by multiplying the utility attributed to each consequence by its assigned probability of occurrence. In addition, individuals stated whether they would have refused or complied in each situation (behavioral intent). Results indicated that, although SEU was unrelated to anxiety or assertiveness level, it was highly predictive of behavioral intent, and discriminated high- from low-behavioral-intent groups for peer refusal vignettes.

Bruch et al. (1984) assessed the internal consistency and factor structure of SPCI responses and found the SPCI to be internally consistent (Cronbach's $\alpha = .77$). Responses to the SPCI loaded on four factors defined as negative consequences of refusal, positive consequences of refusal, negative consequences of compliance, and positive consequences of compliance. Bruch et al. (1984) also assessed the assertiveness of their subjects and found the SPCI factor scores accounted for 8% of the total variance in assertiveness scores ($p < .01$).

In summary, modest evidence exists suggesting that SPCI scores are related to assertiveness, particularly in peer refusal situations. The strength of the relationship is not great, however, and further research is necessary to justify inclusion of the SPCI in cognitive assessment batteries for anxiety. It would be particularly worthwhile to assess the predictive validity of the SPCI in light of Fiedler and Beach's (1978) findings. To this end, naturalistic observation is most desirable in assessing assertive behavior, as behavioral intent measures (à la Fiedler & Beach, 1978) may be more susceptible to response bias.

SITUATIONAL EXPECTANCIES INVENTORY

Gormally and associates (Gormally, Sipps, Raphael, Edwin, & Varvil-Weld, 1981a; Gormally, Varvil-Weld, Raphael, & Sipps, 1981b) have developed the Situational Expectancies Inventory (SEI) to assess heterosocial anxiety in males. The SEI employs four social interaction vignettes (e.g., starting a conversation with a female unknown to the respondent while in a cashier's line) described as problematic by heterosocially anxious men who seek treatment (Gormally et al., 1981a). For each vignette, men indicate how they would feel following rejection and acceptance, on a scale from −100 ("horrible") to 100 ("ecstatic"). In addition, men rate the probability of rejection (in 25% increments).

As with the SPCI, SEI risk estimates are computed by multiplying the affective value of rejection by its probability of occurrence. Gormally et al. (1981a) report a test–retest reliability of +.85 and Cronbach's α of .81.

Gormally et al. (1981a) found SEI scores discriminated competent daters from a clinical sample of men in a social skills training program. Moreover, SEI scores were better predictors of heterosocial comfort than were IBT scores ($r = -.51$, $p < .0001$). Moderate correlations between IBT subscale scores and SEI estimates provide evidence for the convergent validity of the SEI. (Correlation coefficients were not reported.) In addition, Gormally et al. (1981b) found that, although both cognitive counseling and skills training resulted in improved dating skills, cognitive counseling led to greater change in SEI scores than did skills training. The attempt to examine the psychometric merits of the SEI prior to employing it as a means of validating cognitive theories of therapeutic process is commendable. Replicability and discriminant validity remain issues, but the SEI appears to hold promise as a measure of outcome expectancies for men. Should future validation studies prove encouraging, development of a similar scale for use with heterosocially anxious women would seem warranted.

GENERALIZED EXPECTANCIES OF OTHERS QUESTIONNAIRE

The final outcome expectancy measure to be discussed is the Generalized Expectancies of Others Questionnaire (GEOQ) developed by Eisler, Frederiksen, and Peterson (1978). Briefly, the GEOQ, which assesses outcome expectancies on a somewhat broader plane, requires that subjects estimate the percentage of time they receive admiration, anger (aggression), fear, understanding, and advantage-taking reactions from others. The items are of the format "How often do you expect they will show fear of you?" ". . . be angry with you?" and so forth. Eisler et al. (1978) found that low-assertive subjects anticipated more frequent favorable reactions from others during social interaction than did high-assertives. To our knowledge, however, this measure has not been employed subsequently.

In summary, structured questionnaires hold the advantage of being (1) quick to administer to large groups; (2) easily scored, quantified, and normed; and (3) helpful in providing retrieval cues for thoughts subjects might erroneously neglect. On the other hand, structured questionnaires have their limitations. The individual must "decide" whether or not his or her unique cognition matches one of the listed cognitions. Novel cognitions (perhaps of low frequency, yet high in subjective impact) often remain unassessed. Furthermore, such questionnaires rarely allow for pattern assessment (the order in which cognitions occur). Finally, structured questionnaires share two additional limitations with measures employing protocol analysis. Specifically, they fail to assess the subjective meaning of reported thoughts, and they may be subject to response bias in reporting.

Conclusion

The recent research attention focused on cognitive assessments of anxiety is encouraging, and a number of assessment procedures with unique strengths and weaknesses now exist. Nevertheless, several general points can be noted.

1. There is a paucity of instances in which cognitive assessments were validated in naturalistic as well as analogue settings (e.g., Galassi, Frierson, & Siegel, 1984). It is difficult, for instance, to recreate all the real-life contingencies of a physics final exam in an analogue experiment employing subjects from an introductory psychology class who receive course credit for their participation in a "psychology experiment." Until naturalistic performance measures are taken, the validity of cognitive assessment procedures for clinical purposes remains uncertain.

2. The validity of self-report measures would be bolstered by demonstrations of independence from social desirability response bias and demand characteristics (Bruch, Juster, & Heisler, 1982; Lohr et al., 1983).

3. The reactivity of cognitive assessment procedures (e.g., thought sampling) has not been determined. As a case in point, evidence exists that, for certain types of tasks, think-aloud procedures may inhibit performance (Fulkerson et al., 1984; Genest & Turk, 1981; Kendall & Hollon, 1981). Research is needed examining the conditions under which specific assessment procedures might influence performance, and how these effects might be quantified or eliminated.

4. With a diversity of cognitive assessment procedures available, mutlitrait–multimethod analyses would provide valuable information regarding the method variance of alternative approaches to assessment (Cone, 1979; Norton, Dinardo, & Barlow, 1983). Few procedures have established validity that justifies exclusion from such analyses. Multitrait–multimethod research would also provide insight into which assessment procedure most effectively indexes specific cognitions under which circumscribed conditions.

In a related vein, the frequent lack of convergence between cognitive therapy outcome measures underscores the utility of multiple outcome measures. These measures, however, need not be limited to cognitive techniques. Although cognitive assessment is important in evaluating cognitive theories of therapeutic change, it is equally important that cognitive indices of improvement be compared to behavioral (e.g., Halford & Foddy, 1982; Malloy, Fairbank, & Keane, 1983) and physiological (Malloy et al., 1983; Schule & Wilsenfeld, 1983) correlates of anxiety. Such research would further validate cognitive assessments in those anxiety-inducing contexts where convergence across measures would be expected.

5. Outcome research comparing cognitively-based therapies (which incorporate thought monitoring) to non–cognitively based therapies (which do not incorporate thought monitoring) cannot discern genuine posttherapeutic changes in cognitive content (and presumably, process) from posttherapeutic changes that may reflect the practice effects of thought monitoring and reporting. Posttreatment cognitive change may, therefore, merely reflect the variable accessability of cognitions—for instance, as might result from the practice effects of therapeutic thought monitoring—rather than actual changes in cognition type or frequency. Outcome studies that compare the effects of cognitively based "therapy" designed solely to increase a subject's awareness of (and, presumably, access to) cognitions versus more traditional cognitively based therapies designed to alter maladaptive cognitions are necessary. This research could discern what portion of therapeutic gain actually reflects alterations in cognition accessibility. The number of such studies is currently low, but, given this issue's importance, we are confident that this will become an active area of research.

References

Arkowitz, H. (1977). Measurement and modification of minimal dating behavior. In M. Hersen, P. Miller, & R. Eisler (Eds.), *Progress in behavior modification* (Vol. 5). New York: Academic Press.

Arnkoff, D. B. (1980). Psychotherapy from the perspective of cognitive theory. In M. Mahoney (Ed.), *Psychotherapy process: Current issues and future directions*. New York: Plenum Press.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191–215.

Bandura, A. (1982). Self-efficacy mechanisms in human agency. *American Psychologist*, 37, 122–147.

Bandura, A., & Adams, N. E. (1977). Analysis of self-efficacy theory of behavioral change. *Cognitive Therapy and Research*, 1, 287–308.

Beck, A. T. (1970). Cognitive therapy: Nature and relation to behavior therapy. *Behavior Therapy*, 1, 184–200.

Blackwell, R. T., Galassi, J. P., Galassi, M. D., & Watson, T. E. (1985). Are all cognitive assessment methods created equal? A comparison of think aloud and thought listing. *Cognitive Therapy and Research*, 9, 399–414.

Brock, T. C. (1967). Communication discrepancy and intent to persuade as determinants of counterarguement production. *Journal of Experimental Social Psychology*, 3, 269–309.

Bruch, M. A. (1978). Type of cognitive modeling, imitation of modeled tactics, and modification of anxiety. *Cognitive Therapy and Research*, 2, 147–164.

Bruch, M. A. (1981). A task analysis of assertive behavior revisited: Replication and extension. *Behavior Therapy*, 12, 217–230.

Bruch, M. A., Haase, R. F., & Purcell, M. I. (1984). Content dimensions of self-statements in assertive situations: A factor analysis of two measures. *Cognitive Therapy and Research*, 8, 173–186.

Bruch, M. A., Juster, H. R., & Heisler, B. D. (1982). Conceptual complexity as a mediator of thought content and negative affect: Implications for cognitive restructuring interventions. *Journal of Counseling Psychology*, 29, 343–353.

Burgio, K. L., Glass, C. R., & Merluzzi, T. V. (1981). The effects of social anxiety and videotape performance feedback on cognitions and self-evaluations. *Behavioral Counseling Quarterly*, 1, 288–301.

Cacioppo, J. T., Glass, C. R., & Merluzzi, T. V. (1979). Self-statements and self-evaluations: A cognitive-response analysis of heterosocial anxiety. *Cognitive Therapy and Research*, 3, 249–262.

Cacioppo, J. T., & Petty, R. E. (1981). The thought-listing technique. In T. V. Merluzzi, C. R. Glass, & M. Genest (Eds.), *Cognitive assessment*. New York: Guilford Press.

Campbell, D., & Fiske, D. (1959). Convergent and discriminant validation by the multitrait–multimethod matrix. *Psychological Bulletin*, 56, 81–105.

Casas, J. M. (1976). A comparison of two mediational self-control techniques for the treatment of speech anxiety. *Dissertation Abstracts International*, 36, 4681B. (University Microfilms No. 76-5701).

Cattell, R. B., Eber, H. W., & Tatsuoka, M. M. (1970). *Handbook for the Sixteen Personality Factor Questionnaire*. Champaign, IL: Institute of Personality and Ability Testing.

Chiauzzi, E., & Heimberg, R. G. (1983). The effects of subjects' level of assertiveness, sex, and legitimacy of request on assertion-relevant cognitions: An analysis by postperformance videotape reconstruction. *Cognitive Therapy and Research*, 7, 555–564.

Clark, J., & Arkowitz, H. (1975). Social anxiety and the self-evaluation of interpersonal performance. *Psychological Reports*, 36, 211–221.

Cone, J. D. (1979). Confounded comparisons in the triple response mode research. *Behavioral Assessment*, 1, 85–95.

Craighead, L. W. (1979). Self-instructional training for assertive-refusal behavior. *Behavior Therapy*, 10, 529–542.

Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin*, 52, 281–302.

Davis, F. W., & Yates, B. T. (1982). Self-efficacy expectancies versus outcome expectancies as determinants of performance deficits and depressive affect. *Cognitive Therapy and Research*, 6, 23–35.

Davison, G. C., Feldman, P. M., & Osborn, C. E. (1984). Articulated thoughts, irrational beliefs and fear of negative evaluation. *Cognitive Therapy and Research*, 8, 349–362.

Davison, G. C., Robins, C., & Johnson, M. K. (1983). Articulated thoughts during simulated situations: A paradigm for studying cognition in emotion and behavior. *Cognitive Therapy and Research*, 7, 17–40.

Derry, P. A., & Stone, G. L. (1979). Effects of cognitive-adjunct treatments on assertiveness. *Cognitive Therapy and Research, 3*, 213–221.

Eisler, R. M. (1976). The behavioral assessment of social skills. In M. Hersen & A. S. Bellack (Eds.), *Behavioral assessment: A practical handbook*. New York: Pergamon Press.

Eisler, R. M., Frederiksen, L. W., & Peterson, G. L. (1978). The relationship of cognitive variables to the expression of assertiveness. *Behavior Therapy, 9*, 419–427.

Ellis, A. (1962). *Reason and emotion in psychotherapy*. New York: Lyle Stuart.

Ericsson, K, & Simon, H. (1978). *Protocols as data: Effects of verbalizations*. Unpublished manuscript, Carnegie-Mellon University.

Ericcson, K. A., & Simon, H. A. (1980). Verbal reports as data. *Psychological Review, 82*, 215–251.

Fazio, R. H., & Zanna, M. P. (1981). Direct experience and attitude behavior consistency. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 14). New York: Academic Press.

Fiedler, D., & Beach, L. R. (1978). On the decision to be assertive. *Journal of Consulting and Clinical Psychology, 46*, 537–546.

Fox, E., & Davies, R. (1971). Test your rationality. *Rational Living, 5*, 23–25.

Fox, J. E., Houston, B. K., & Pittner, M. S. (1983). Trait anxiety and children's cognitive behaviors in an evaluative situation. *Cognitive Therapy and Research, 7*, 149–154.

Fremouw, W. J., & Harmatz, M. G. (1975). A helper model for behavioral treatment of speech anxiety. *Journal of Consulting and Clinical Psychology, 43*, 562–660.

Fremouw, W. J., & Zitter, R. E. (1978). A comparison of skills training and cognitive restructuring relaxation for treatment of speech anxiety. *Behavior Therapy, 9*, 248–259.

Fulkerson, K. E., Galassi, J. P., & Galassi, M. D. (1984). Relation between cognitions and performance in math anxious students: A failure of cognitive theory? *Journal of Counseling Psychology, 34*, 376–382.

Galassi, J. P., Frierson, H. T., Jr., & Siegel, R. G. (1984). Cognitions, test anxiety, and test performance: A closer look. *Journal of Consulting and Clinical Psychology, 52*, 319–320.

Genest, M., & Turk, D. C. (1981). Think-aloud approaches to cognitive assessment. In T. V. Merluzzi, C. R. Glass, & M. Genest (Eds.), *Cognitive assessment*. New York: Guilford Press.

Glass, C. R., & Arnkoff, D. B. (1983). Cognitive set and level of anxiety: Effects on thinking processes in problematic situations. *Cognitive Therapy and Research, 6*, 529–542.

Glass, C. R., & Merluzzi, T. V. (1981). Assessment of social-evaluative anxiety. In T. V. Merluzzi, C. R. Glass, & M. Genest (Eds.), *Cognitive assessment*. New York: Guilford Press.

Glass, C. R., Merluzzi, T. V., Biever, J. L., & Larsen, K. H. (1982). Cognitive assessment of social anxiety: Development and validation of a self-statement questionnaire. *Cognitive Therapy and Research, 6*, 37–55.

Goldfried, M. R., & Davison, G. C. (1976). *Clinical behavior therapy*. New York: Holt.

Goldfried, M. R., & Sobocinski, D. (1975). Effect of irrational beliefs on emotional arousal. *Journal of Consulting and Clinical Psychology, 43*, 504–510.

Gormally, J., Sipps, G., Raphael, R., Edwin, D., & Varvil-Weld, D. (1981a). The relationship between maladaptive cognitions and social anxiety. *Journal of Consulting and Clinical Psychology, 49*, 300–301.

Gormally, J., Varvil-Weld, D., Raphael, R., & Sipps, G. (1981b). Treatment of socially anxious college men using cognitive counseling and skills training. *Journal of Counseling Psychology, 28*, 147–157.

Greenwald, A. G. (1968). Cognitive learning, cognitive response to persuasion, and attitude change. In A. G. Greenwald, T. C. Brock, & T. M. Ostrom (Eds.), *Psychological foundations of attitudes*. New York: Academic Press.

Halford, K., & Foddy, M. (1982). Cognitive and social skills correlates of social anxiety. *British Journal of Clinical Psychology, 21*, 17–28.

Hartman, B. (1971). Sixty revealing questions for 20 minutes. *Rational Living, 5*, 23–25.

Heimberg, R. G., Chiauzzi, E. J., Becker, R. E., & Madrazo-Pederson, R. (1983). Cognitive mediation of assertive behavior: An analysis of the self-statement patterns of college students, psychiatric patients, and normal adults. *Cognitive Therapy and Research, 7*, 455–464.

Himle, D. P., Thyer, B. A., & Papsdorf, J. D. (1982). Relationships between rational beliefs and anxiety. *Cognitive Therapy and Research, 6*, 219–223.

Hollandsworth, J. G., Jr., Glazeski, R. C., Kirkland, K., Jones, G. E., & Van Norman, L. R. (1979). An analysis of the nature and effects of test anxiety: Cognitive, behavioral, and physiological components. *Cognitive Therapy and Research, 3*, 165–180.

Huber, J. W., & Altmaier, E. M. (1983). An investigation of the self-statement systems of phobic and nonphobic individuals. *Cognitive Therapy and Research, 7*, 355–362.

Hurlburt, R. T. (1976). *Self observation and self control.* Unpublished doctoral dissertation, University of South Dakota.

Hurlburt, R. T. (1980). Validation and correlation of thought sampling with retrospective measures. *Cognitive Therapy and Research, 4*, 103–111.

Hurlburt, R. T., Lech, B. C., & Saltman, S. (1984). Random sampling of thought and mood. *Cognitive Therapy and Research, 8*, 263–275.

Jaremko, M. E., & Walker, G. R. (1978). *The content of coping statements in the cognitive restructuring component of stress inoculation.* Unpublished manuscript, University of Richmond.

Jones, R. G. (1969). A factored measure of Ellis' Irrational Belief System (Doctoral dissertation, Texas Technological College, 1968). *Dissertation Abstracts International, 29*, 4379B–4350B.

Kanter, N. J., & Goldfried, M. R. (1979). Relative effectiveness of rational restructuring and self-control desensitization in the reduction of interpersonal anxiety. *Behavior Therapy, 10*, 472–490.

Kendall, P. C., & Hollon, S. D. (Eds.). (1980). *Cognitive-behavioral interventions: Assessment methods.* New York: Academic Press.

Kendall, P. C., & Hollon, S. D. (1981). Assessing self-referent speech: Methods in the measurement of self-statements. In P. C. Kendall & S. D. Hollon (Eds.), *Assessment strategies for cognitive-behavioral interventions.* New York: Academic Press.

Kendall, P. C., & Korgeski, G. P. (1979). Assessment and cognitive-behavioral interventions. *Cognitive Therapy and Research, 3*, 1–22.

Kent, R. N., & Foster, S. L. (1977). Direct observational procedures: Methodological issues in naturalistic settings. In A. R. Ciminero, K. S. Calhoun & H. E. Adams (Eds.), *Handbook of behavioral assessment.* New York: Wiley.

Kirkland, K., & Hollandsworth, J. G., Jr. (1980). Effective test-taking: Skills-acquisition versus anxiety-reduction techniques. *Journal of Consulting and Clinical Psychology, 48*, 431–439.

Knapp, S. (1979). Life events, rationality and emotional disturbance. *Psychological Reports, 45*, 510.

Lang, P. J., & Lazovik, A. D. (1963). Experimental desensitization of a phobia. *Journal of Abnormal and Social Psychology, 66*, 519–525.

Lange, A., & Jakubowski, P. (1976). *Responsible assertive behavior.* Champaign, IL: Research Press.

Lee, C. (1984a). Accuracy of efficacy and outcome expectations in predicting performance in a simulated assertive task. *Cognitive Therapy and Research, 8*, 37–48.

Lee, C. (1984b). Efficacy expectations and outcome expectations as predictors of performance in a snake handling task. *Cognitive Therapy and Research, 8*, 509–516.

Lick, J. R., & Katkin, E. S. (1976). Assessment of anxiety and fear. In M. Hersen & A. S. Bellack (Eds.), *Behavioral assessment: A practical handbook.* New York: Pergamon Press.

Lohr, J. M., & Bonge, D. (1981). On the distinction between illogical and irrational beliefs and their relationship to anxiety. *Psychological Reports, 48*, 191–194.

Lohr, J. M., & Bonge, D. (1982a). The factorial validity of the Irrational Beliefs Test: A psychometric investigation. *Cognitive Therapy and Research, 6*, 225–230.

Lohr, J. M., & Bonge, D. (1982b). Relationships between assertiveness and factorially validated measures of irrational beliefs. *Cognitive Therapy and Research, 6*, 353–356.

Lohr, J. M., Bonge, D., & Jones, C. (1983). Social desirability and endorsement of irrational beliefs. *Psychological Reports, 53*, 395–397.

Lohr, J. M., Nix, J., Dunbar, D., & Mosesso, L. (1984). The relationship of assertive behavior in women and a validated measure of irrational beliefs. *Cognitive Therapy and Research, 8*, 287–297.

Lohr, J. M., & Rea, R. G. (1981). A disconfirmation of the relationship between fear of public speaking and irrational beliefs. *Psychological Reports, 48*, 795–798.

Luria, A. R. (1961). *The role of speech in the regulation of normal and abnormal behavior.* New York: Liveright.

Mahoney, M. J. (1977). Reflections on the cognitive-learning trend in psychotherapy. *American Psychologist, 32*, 5–13.

Malkiewich, L. E., & Merluzzi, T. V. (1980). Rational restructuring vs. desensitization with clients of diverse conceptual level: A test of a client-treatment matching model. *Journal of Counseling Psychology, 27*, 453–461.

Malloy, P. F., Fairbank, J. A., & Keane, T. M. (1983). Validation of a multimethod assessment of posttraumatic stress disorders in Vietnam veterans. *Journal of Consulting and Clinical Psychology, 51*, 488–494.

McCroskey, J. C. (1970). Measures of communication-bound anxiety. *Speech Monographs, 37*, 269–277.

Meichenbaum, D. H. (1977). *Cognitive-behavior modification*. New York: Plenum Press.

Meichenbaum, D. H., & Butler, L. (1979). Cognitive ethology: Assessing the streams of cognition and emotion. In K. Blankstein, P. Pliner, & J. Polivy (Eds.), *Advances in the study of communication and affect: Assessment and modification of emotional behavior* (Vol. 6). New York: Plenum Press.

Nay, W. R. (1977). Analogue measures. In A. R. Ciminero, K. S. Calhoun & H. E. Adams (Eds.), *Handbook of behavioral assessment*. New York: Wiley.

Nisbett, R. E., & Bellows, N. (1977). Verbal reports about causal influences on social judgments: Private access versus public theories. *Journal of Personality and Social Psychology, 35*, 613–624.

Nisbett, R. E., & Wilson, T. P. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review, 84*, 231–259.

Norton, G. R., Dinardo, P. A., & Barlow, D. H. (1983). Predicting phobics' response to therapy: A consideration of subjective, physiological and behavioural measures. *Canadian Psychology, 24*, 50–58.

Notarius, C. I. (1981). Assessing sequential dependency in cognitive performance data. In T. V. Merluzzi, C. R. Glass, and M. Genest (Eds.), *Cognitive assessment*. New York: Guilford Press.

Pitcher, S. W., Meikle, S. (1980). The topography of assertive behavior in positive and negative situations. *Behavior Therapy, 11*, 532–547.

Sarason, I. G. (1972). Experimental approaches to test anxiety: Attention and the uses of information. In C. D. Spielberger (Ed.), *Anxiety: Current trends in theory and research* (Vol. 2). New York: Academic Press.

Sarason, I. G. (1978). The test anxiety scale: Concept and research. In C. D. Spielberger & I. G. Sarason (Eds.), *Stress and anxiety* (Vol. 5). Washington, DC: Hemisphere.

Sarason, I. G. (1984). Stress, anxiety and cognitive interference: Reactions to tests. *Journal of Personality and Social Psychology, 46*, 929–938.

Sarason, I. G., & Stoops, R. (1978). Test anxiety and the passage of time. *Journal of Consulting and Clinical Psychology, 46*, 102–109.

Schule, J. G., & Wiesenfeld, A. R. (1983). Automatic response to self-critical thought. *Cognitive Therapy and Research, 7*, 189–194.

Schwartz, G. E., Davidson, R. J., & Coleman, D. J. (1978). Patterning of cognitive and somatic processes in the self-regulation of anxiety: Effects of meditation versus exercise. *Psychosomatic Medicine, 40*, 321–328.

Schwartz, R. M., & Gottman, J. M. (1976). Toward a task analysis of assertive behavior. *Journal of Consulting and Clinical Psychology, 44*, 910–920.

Shorkey, C., & Reyes, E. (1978). Relationship between self-actualization and rational thinking. *Psychological Reports, 42*, 842.

Shorkey, C., & Whiteman, V. (1977). Development of the Rational Behavior Inventory: Initial validity and reliability. *Educational and Psychological Measurement, 37*, 527–534.

Smith, T. W., Boaz, T. L., & Denny, D. R. (1984). Endorsement of irrational beliefs as a moderator of the effects of stressful life events. *Cognitive Therapy and Research, 8*, 363–370.

Smith, R. E., & Sarason, I. G. (1975). Social anxiety and the evaluation of negative interpersonal feedback. *Journal of Consulting and Clinical Psychology, 43*, 429.

Smith, T. W., & Zurawski, R. M. (1983). Assessment of irrational beliefs: The question of discriminant validity. *Journal of Clinical Psychology, 39*, 976–979.

Smye, M. (1977). *Verbal, cognitive and behavioral correlates of social anxiety*. Unpublished doctoral dissertation. University of Toronto.

Smye, M. D., & Wine, J. D. (1980). A comparison of female and male adolescents' social behavior and cognitions. *Sex Roles, 6*, 213–230.

Spielberger, C. D. (1980). *The Test Anxiety Inventory*. Palo Alto, CA: Consulting Psychologists Press.

Spielberger, C. D., Gorsuch, R., & Lushene, R. (1970). *Manual for the State-Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologists Press.

Sutton-Simon, K., & Goldfried, M. R. (1979). Faulty thinking patterns in two types of anxiety. *Cognitive Therapy and Research, 3*, 193–203.

Trexler, L. D., & Karst, T. O. (1972). Rational-emotive therapy, placebo and no-treatment effects on public-speaking anxiety. *Journal of Abnormal Psychology, 79*, 60–67.

Watson, D., & Friend, R. (1969). Measurement of social-evaluative anxiety. *Journal of Consulting and Clinical Psychology, 33*, 448–457.

Whiteman, V. (1979). Development of an Australian version of the Rational Behavior Inventory. *Psychological Reports, 44*, 104–106.

Whiteman, V., & Shorkey, C. (1978). Validation testing of the Rational Behavior Inventory. *Educational and Psychological Measurement, 38*, 1143–1148.

Wolpe, J. (1969). *The practice of behavior therapy*. New York: Pergamon Press.