

are instructed how to categorize their responses (e.g., "Place a plus next to the thoughts that are favorable to yourself, a minus next to the thoughts that are unfavorable to yourself, and a zero next to the thoughts that are neutral or irrelevant to yourself"—Cacioppo, Glass, & Merluzzi, 1979; Calder *et al.*, 1974; Cialdini, Levin, Herman, Kozlowski, & Petty, 1976; Greenwald, 1968).

3. "Judge and subject ratings." Both subjects and judges rate the responses. If there is disagreement between the independent judges' ratings, there are various reasonable means of resolution, including employing the subject's rating if it breaks the tie (e.g., Petty & Cacioppo, 1977; Petty *et al.*, 1976), averaging the judges' ratings (e.g., Petty, Cacioppo, & Heesacker, 1981), obtaining a third judge's opinion to break the tie (e.g., Cacioppo & Petty, 1980a), or resolving any discrepancies in discussions between the judges (e.g., Cacioppo, Petty, & Snyder, 1979).

Independent judges have demonstrated a high degree of agreement in their classification of responses along the polarity dimension (e.g., Insko *et al.*, 1974) but not along the origin dimension (e.g., Greenwald, 1968). Though ratings by subjects and judges are correlated highly (Petty *et al.*, 1976), subjects rating their own responses circumvents both the problem of low interrater reliability and the problem of judges' misinterpreting the meaning of responses. Subjects, of course, are not always willing and/or able to comply with the request to classify their thoughts (cf. Cacioppo, Petty, & Snyder, 1979), a problem that is exacerbated by the selection of several dimensions along which subjects must classify their thoughts. The procedure of using both judges' ratings and subjects' ratings represents a compromise method.

Some of the listed cognitive responses are more extreme than others (e.g., more favorable or unfavorable, more assuredly distorted or objective-reality thoughts). What are the effects of weighting the responses in accordance with their extremity? What happens if, instead of just counting the number of favorable thoughts generated, the thoughts were weighted such that "1" indicated slightly favorable, "2" indicated moderately favorable, and "3" indicated very favorable? The research results indicate that weighting the responses along the polarity dimension neither alters nor strengthens the effects found by using the simpler frequency counts. This null effect has been obtained when using subjects' ratings (Calder *et al.*, 1974; Cullen, 1968; Greenwald, 1968) and when using judges' ratings (Roberts & Maccoby, 1973).

Alternatively, weighting inferential beliefs (responses) on the basis of the subjects' certainty that the responses were applicable and on the basis of their extremity appears to be an effective method of increasing the predictability of the attitude toward a person in an impression formation task (Jacard & Fishbein, 1975). Similarly, Petty (1977) determined that subject

weightings of the "certainty" of belief in cognitive responses scored along the polarity dimension strengthened their covariation with attitude change. This latter procedure may prove especially useful in future research of cognitive responses, emotions, and behavior.

Finally, neither simple counts nor weightings of the responses by their extremity and certainty reduces individual differences in the total number of thoughts reported. One method of controlling for these differences in total thought production is to calculate a ratio score, with the difference score serving as the numerator and the total number of responses from the two categories as the denominator—for example, (favorable - unfavorable thoughts)/(favorable + unfavorable thoughts) (Cullen, 1968; Petty & Brock, 1979).

The Stream of Cognitive Responses

Development of techniques for assessing the sequence in which cognitive responses are generated has begun only recently (see Notarius, Chapter 11, this volume). Meichenbaum *et al.* (1980) investigated the probabilistic and temporal sequence of cognitive responses during the performance of creativity tests; the think-aloud procedure was employed to obtain the cognitive responses, which were unitized differently for each of the sequential analyses performed. For the probabilistic analysis, unitization of the verbal protocols was accomplished by having judges determine what constituted a cognitive response on the basis of content and paralinguistic cues (e.g., pauses). Comments by Meichenbaum *et al.* (1980) are informative regarding the use of stream analysis:

The results thus far have indicated that high versus low creative subjects differed significantly in the frequencies with which they emitted various categories of verbal behavior. These results, however, leave open the question of how high and low creative subjects might differ in their patterns of verbal behavior. One way of addressing this question is to compare high versus low creative subjects on the frequencies of the various categories of response which follow each specific category. This provides an opportunity to examine the patterning of thoughts over time.

Meichenbaum *et al.* (1980) compared the effects of the grouping variable (i.e., high- versus low-creative individuals) on the various conditional probabilities. The potential of this procedure manifested in identifying differing sequences of cognitive response attributable to the grouping variable. For instance, Meichenbaum *et al.* reported that low-creative individuals were more likely than high-creative individuals to follow an unfavorable thought with another unfavorable thought. High-creative individuals tended to generate task-relevant or favorable thoughts after they expressed an unfavorable thought. The exact method by which these comparisons are conducted

depends upon whether the grouping variable(s) affected the frequency and types of thoughts produced. Gottman and Notarius (1978) provide a cogent presentation of the statistical procedures for conducting these probabilistic analyses; the interested reader may wish to consult their work.

Meichenbaum *et al.* (1980) also conducted an analysis of the temporal sequence of cognitive response. Unitization of the verbal protocols for the temporal analysis was achieved by dividing each protocol at every 5-second interval; one 5-second interval constituted a unit of cognitive response. The number of cognitive responses within each category generated within various (equal-length) time intervals (e.g., the first half versus the last half of the protocol) was analyzed to obtain the temporal sequence of cognitive response. This temporal analysis has the following potential merits: (1) the cognitive responses elicited by components of the stimulus presentation (e.g., particular informational items) can be identified, (2) differences in the general sequence of cognitive response are discernible (e.g., by counterbalancing the ordering of the informational items composing a stimulus presentation), and (3) the effects of grouping variables on either of the preceding can be determined. For instance, Beaber (1975) used a similar procedure and found that individuals initially responded emotionally, but that in time responded rationally, to the contents of a discrepant message.

We recently have studied the sequence of cognitive and affective responses to repeated, rather than single, exposures to a stimulus (Cacioppo & Petty, 1979*b*, 1980*a*). Individuals heard a personally relevant, counterattitudinal communication either one, three, or five times. They then rated their agreement with the message, and listed their thoughts (unitizing them as they did so by placing one idea or thought in a box). Classification of the cognitive responses was done both by subjects and by judges, and analyses were performed using the frequency counts of each type of response along the polarity dimension. We found that only topic-relevant thoughts were related to attitude change. More important, the production of unfavorable thoughts decreased and then increased, whereas agreement and favorable-thought production increased and then decreased as the subjects heard the communicative stimulus again and again.

This example underscores the major benefit of this type of sequence analysis: The pattern of cognitive response can be examined as the information in (or motor response to) a stimulus becomes overlearned, more familiar, or the object of more thought. It is theoretically possible to employ a probabilistic or a temporal analysis in combination with a repeated-exposure analysis (e.g., by examining changes in conditional probabilities as a function of exposure frequency) to provide yet more specific temporal information about the person's stream of thought. The selection of the method of assessing cognitive-response sequence depends, of course, upon the purpose of the research.

In sum, cognitive responses can be assessed using mechanical, observational, or instructional techniques. Instructional techniques, used most frequently, involve either the spoken or written report of thoughts and feelings. The classification of the cognitive responses can be done by judges, subjects, or both. Frequency counts of the items within each category of cognitive response provide a satisfactory measure of the relative prominence or profile of the different cognitive response categories. Recent research suggests that the associations between cognitive responses and the outcome variable are strengthened by including ratings of certainty (saliency) and extremity for cognitive responses.

Assessing the Structural Bases of Cognitive Responses

Cognitive organizations or schemas provide the means by which persons organize objects and events in their environment. Obviously, then, cognitive organization affects the way people respond to their environment. One of the first social psychologists to measure cognitive structure was Zajonc (1960). He had subjects describe a stimulus person "by freely listing the qualities and attributes that characterized" a person about whom they had read a letter (Zajonc, 1960, p. 160). In other words, Zajonc obtained the cognitive responses (one per index card) elicited by a description of a fictitious person. He then calculated four measures of cognitive structure:

1. "Differentiation" is a measure of the extent to which a person is capable of identifying the discriminating objects and events. The simple total of characteristics listed is the measure of differentiation. For example, if one were interested in studying the structure of cognitive responses to a stimulus, the total number of stimulus-relevant thoughts listed could serve as the measure.
2. The extent to which different categories are used determines "complexity." The cognitive responses that subjects list can come from a single category or multiple categories. Complexity is measured by asking the subjects to arrange the reported cognitive responses into their categories and subcategories and by counting the number of categories utilized.
3. "Unity" is a measure of the interdependence of the cognitive responses. It is assessed by having the subjects indicate which cognitive responses would change if one were changed or untrue. The greater the number of changes resulting from a change in each of the cognitive responses, the greater the unity.
4. "Organization" is the degree to which one cognitive response or a set of cognitive responses is central or dominates the relationship among all the cognitive responses. To the extent that changes in one cognitive response result in changes in other related cognitive responses, the initial cognitive response would be central.

Zajonc (1960) provides procedures for calculating each of these aspects of cognitive structure.

An alternate structural analysis has been suggested recently in research on personality. Some have argued that past experience and categorizations form structures (schemata) that affect perceptions and recollections of events and that function to process information efficiently (with a concomitant loss of actual detail; e.g., Abelson, 1976; Bartlett, 1932; Neisser, 1976). Markus (1977) provided evidence that self-schemata facilitate the processing of information about the self and that they contain behavioral examples and self-predictions. Cantor and Mischel (1977) demonstrated the prototypical character of schemata, which they found biased recognition of self-related, but unrepresented, items.

Recently, we have explored the question of how self-schemata influence attitudinal processing (Cacioppo, Petty, & Sidera, Note 2). Sixty introductory psychology students were shown 30 slides of trait adjectives, 15 of which were pre-rated as indicating a "religious" person, and 15 of which were pre-rated as indicating a "legal" person. Classification of subjects to group (religious or legal) was done using their "me" (self-descriptive) and "not-me" (not-self-descriptive) decisions and response times to the 30 words (cf. Markus, 1977). One week later, subjects heard one of four counterattitudinal messages, which had been developed in pilot tests to represent either a legal or a religious perspective on the topics of capital punishment or abortion. These messages were equated across perspectives for persuasiveness and familiarity. After hearing one of the four messages, subjects rated its persuasiveness, listed their thoughts in the manner described, and completed a surprise recognition test.

We found that a persuasive message that was in accord with the subject's self-schema was rated as more persuasive than one that was not. In addition, a schema-consistent message elicited more total thoughts, more externally originated thoughts (e.g., quotes), and more thoughts with the message as target. These results suggest that a developed self-schema facilitates total thought production and, more specifically, increases topic-relevant thinking. In other words, the person's cognitive structure affected the attitudinal processing of a related issue. The study of the influence on affect and behavior of self-schemata seems to portend a fuller understanding of why individuals respond cognitively as they do.

Cognitive Response Stereotypy

Finally, neuropsychological studies of human information processing suggest the utility of one additional measure of cognitive response: the degree to which one particular type of cognitive response (e.g., favorable or unfavorable thoughts) dominates the entire profile of cognitive responses (cf. Cacioppo, Petty, & Quinatar, Note 3). Specifically, research on functional cerebral asymmetry indicates that the right (minor) compared to the left (ma-

lor) hemisphere processes information in a prosodic, thematic manner (Cacioppo & Petty, in press-*b*; Tucker, 1981). This suggests that the thoughts, associations, and elaborations that are produced when, for instance, listening to a communication, are especially likely to adhere to a common theme when the right hemisphere is relatively utilized. Conversely, relative utilization of the left, rather than the right, hemisphere should be associated with more divergent (piecemeal) analyses of the communication and hence less stereotypy in the cognitive responses.

To test this notion, we conducted several experiments in which subjects anticipated and heard either a proattitudinal or counterattitudinal message (Cacioppo & Petty, Note 4). Immediately following the message presentation, subjects listed everything they had been thinking about and, afterward, went back through their listed thoughts and scored them along the polarity dimension. Throughout the session, we monitored the electroencephalographic activity over the right and left associative (parietal) areas of the brain. Afterward, we calculated electroencephalographic ratio scores to determine which side of the brain of each subject was being relatively utilized; at the conclusion of the study, we conducted a median split between subjects, using these ratios to determine who displayed relative left versus right hemispheric involvement while anticipating and listening to the persuasive communication.

The next task was to derive the measure of cognitive response stereotypy. To do this, we used a nomothetic criterion to identify the predominant and the nonpredominant cognitive responses. In pilot testing, we had found that most people responded to our proattitudinal message by listing favorable thoughts, whereas most responded to our counterattitudinal message by listing unfavorable thoughts. Hence, by our nomothetic criterion, "favorable thoughts" was the predominant cognitive response, and "unfavorable thoughts" the nonpredominant cognitive response when the message was proattitudinal; the opposite was the case when the message was counterattitudinal. We calculated the degree of cognitive response stereotypy by subtracting the number of nonpredominant cognitive responses generated by each individual from the number of predominant cognitive responses produced by each. Thus we obtained a measure of cognitive response stereotypy for each subject in the study. We analyzed this measure in the same manner in which we analyzed the other measures obtained (e.g., attitudes).

As expected, we found that subjects who displayed relative right hemispheric involvement while anticipating and listening to the persuasive communication generated a more stereotyped profile of cognitive responses. Interestingly, median splits on the electroencephalographic ratios obtained during a prewarning basal interval did not portend this effect, which is consistent with the notion that there are predictable relationships between relative cerebral hemispheric involvement and the means by which attitudes are developed and changed. More important here, perhaps, is the utility of the

measure of cognitive response stereotypy that is illustrated in this research.³

In sum, the research concerning the measurement of cognitive responses has focused on a variety of empirical means of obtaining and analyzing cognitive reactions to a stimulus. Most of this work has been conducted on the level of analyzing and classifying single responses. The work on the stream of cognitive response and on analyses of cognitive organization offers a potentially rich area of research in which the reciprocal organismic-environmental interactions can be studied.

Some Final Considerations

How useful is the thought-listing procedure for tapping a person's self-statements? Can the procedure be employed successfully in an attempt to monitor the covert verbalizations or images that are produced as some task is anticipated or performed? Is the thought-listing procedure useful in psychological research and treatment?

Several important issues must be addressed in answering these questions, namely:

1. Is the measure reliable?
2. Is the measure sensitive to environmental interventions and individual differences?
3. Are the thoughts that are measured determinants or post hoc rationalizations of the observed outcome variable?
4. Can the thought-listing procedure serve as both an independent and a dependent variable?⁴

Reliability

A perfectly reliable measure is internally consistent (split-half reliability) and yields the same result on repeated testings (test-retest reliability). In

³Rather than using the nomothetic procedure for identifying predominant and nonpredominant cognitive responses that we have outlined, an idiographic criterion could be used. In this alternative method, the predominant cognitive response is considered to be whatever type of cognitive response is most abundant within each individual's thought listing. This can be calculated simply by taking the absolute value of the difference between the number of favorable and unfavorable thoughts generated by each subject. When we calculated this index in the study described here, we obtained essentially the same results. This idiographic criterion is especially useful, however, when the goal of the study is to examine a particular individual's thought processes and when thought listings by this individual in response to a variety of stimuli are available. The reader might recognize the parallels between our notions of nomothetic and idiographic stereotypy in cognitive response and psychophysicologists' notions of stimulus and individual response stereotypy in bodily reactions (cf. Engel, 1972).

⁴Other important issues concern the reactivity and the validity of the thought-listing measure. Because we addressed these issues previously in this chapter, we have excluded discussion of them in this section.

1968, Cullen compared the reliability of the thought-listing procedure with that of several respected attitude assessments (the Likert and Thurstone scales). Subjects responded to messages on two topics (birth control and segregation) by completing attitude and thought-listing measures (the order of assessment was counterbalanced across subjects). Cullen found that both split-half and test-retest reliabilities were acceptably high for these measures and that order of measurement made no difference. Specifically, she found that the average split-half reliability was $+ .78$ for thought-listings, $+ .83$ for Likert scales, and $+ .55$ for Thurstone scales. The average test-retest reliability was $+ .64$ for thought listings, $+ .83$ for Likert scales, and $+ .53$ for Thurstone scales. These data suggest that the thought-listing procedure obtains reliable information from a subject.

Sensitivity

Is the thought-listing measure sensitive to interventions? To test this, we conducted some studies in which we attempted to disrupt the subjects' thought processes (e.g., Cacioppo *et al.*, 1978; Petty *et al.*, 1976) and other studies in which we attempted to facilitate thinking (e.g., Cacioppo & Petty, 1979b; Petty & Cacioppo, 1979b).

Disrupting Cognitive Elaboration. We constructed two communications for a study in which thought processes were disrupted (Petty *et al.*, 1976). One contained rather weak arguments, and we expected that subjects would primarily counterargue this low-quality message while hearing it. We reasoned that, if we could impair cognitive elaboration while leaving comprehension relatively intact, then we could disrupt primarily counterarguments and make the person more susceptible to the speaker's appeal. The second message contained very strong arguments on the same topic. For this high-quality message, we expected subjects to be generating favorable thoughts to themselves regarding the advocacy as they listened to it. If we impaired cognitive elaboration in this instance, then we would expect to disrupt primarily favorable thoughts about the advocacy, thereby leading to less attitude change than if no disruption of thoughts occurred.

To test these hypotheses, Petty *et al.* presented a discrepant message (increasing tuition) to the subjects. Half heard the low-quality communication (weak arguments) for increasing tuition, whereas half heard the high-quality communication (strong arguments). In addition, half of the subjects engaged in a distracting task during the message, whereas half did not. The results confirmed the hypotheses: Distraction decreased counterargumentation and increased attitude change for the low-quality communication, but it decreased favorable thoughts and attitude change for the high-quality communication. This study has been replicated recently using different topics and distractors but yielding, in essence, the same effect (Lammers & Becker, 1980).

Enhancing Cognitive Elaboration. In other studies, we exposed subjects repeatedly to a persuasive communication. We reasoned that repeated presentations would provide subjects with additional opportunities to think about and elaborate upon the arguments given for adopting a discrepant position. Hence facilitated thought should increase attitude change if the arguments are strong (at least until repetition becomes tedious) and decrease attitude change if the arguments are weak. In our first studies, we tested and found support for the first notion, that it, that a moderate number of presentations of a high-quality communication increased attitude change (Cacioppo & Petty, 1979b, 1980a).

We recently completed a study in which subjects heard a high- or low-quality communication for instituting senior comprehensive exams (a discrepant message). Some subjects heard the message once, whereas others heard it three times. As expected, moderate repetition reduced counterarguing and increased attitude change when the arguments were strong, but it increased counterarguing and decreased attitude change when the arguments were weak. Together, these studies indicate that the thought-listing measure is sensitive to manipulations of information processing and illustrate the importance of self-statements in mediating affective responses to communications.

Reflecting Motivational Changes. Cognitive response processes operate at the service of two general factors: the *motivation* and the *ability* to think about and elaborate upon some stimulus or event. (Freud, for instance referred to repression in order to indicate motivated forgetting or nonthinking about some traumatic event.) The issue of the sensitivity of the thought-listing procedure can be extended to these two factors as well. Simply stated, does the thought-listing procedure reflect changes in cognitive response when a person's motivation or ability to think about some stimulus has been manipulated? Again, the answer seems to be a firm "yes."

One of the best known findings in social psychology is that the real or imagined presence of other people inhibits individuals from helping in emergencies (Latané & Darley, 1970). This social laziness is not limited to emergency (e.g., Ingham, Levinger, Graves, & Peckham, 1974; Petty, Williams, Harkins, & Latané, 1977) or even to physical tasks (Petty, Harkins, & Williams, 1980; Petty, Harkins, Williams, & Latané, 1977). The "social loafing" elicited by the presence of others who could also perform or assist in a task appears to be motivational in origin, as the effect is evident even when care is taken to ensure that participants are equally able to perform the task when alone and when with others.

Petty, Harkins, and Williams (1980) have shown that the implied or real presence of others working on the same cognitive task lessens the cognitive work an individual devotes to the task. More important here, this motivational effect was evident in thought listings. For instance, when evaluating a high-quality communication, individual evaluators generated more favorable thoughts and evaluated the stimulus more positively than group

evaluators; when evaluating a low-quality communication, however, individual evaluators generated more unfavorable thoughts and evaluated the stimulus more negatively than group evaluators.

We have also found the thought listing to reflect enhancements of a person's motivation to think about a stimulus (Petty & Cacioppo, 1979b). Again, we used two forms of communication advocating the same position, one constituted by weak message arguments (low-quality communication), and one by strong arguments (high-quality communication). This time, however, subjects were told that the advocacy (instituting senior comprehensive exams) would occur at some distant school (low personal involvement, low motivation) or at their university (high involvement, high motivation). Increasing involvement enhanced persuasion for the high-quality communication but reduced persuasion for the low-quality communication. Moreover, thought listings revealed that the production of favorable thoughts was enhanced by involvement for the high-quality communication, whereas unfavorable thought production was enhanced by the more involving low-quality communication.

Collectively, these studies suggest that the thought-listing procedure can be used to detect differences in cognitive response caused by environmental influences on a person's motivation to think about a stimulus or event.

Reflecting Alterations of Ability. The thought listing has in several studies also proven quite sensitive to environmental influences on a person's ability to think about a stimulus or event. The distraction studies we reviewed above (e.g., Petty *et al.*, 1976) are based upon the logic that the person's ability to elaborate upon the stimulus was impaired. The level of distraction in these studies was finely determined so that reception of the message arguments was left intact while disabling subjects from elaborating as completely as normal upon these arguments. As we noted, these conditions had a dampening effect on any cognitive and attitudinal changes normally caused by these stimuli—and these effects were evident in the thought listings.

Enhancing a person's ability to process has been illustrated in the thought-listing technique by Cacioppo (1979). We found that under certain conditions an accelerated heart rate enhanced the performance on intellectual tasks of people wearing pacemakers. In a second study, subjects wearing implanted cardiac pacemakers read counterattitudinal communications when their heart rate was either accelerated or not accelerated. These subjects were more resistant to these communications (which consisted of weak arguments) when their heart rate was accelerated than when it was not. This change in their ability to elaborate cognitively was evident on the thought-listing measures as well (cf. Cacioppo & Petty, in press-c).

Reflecting Individual Differences. It is often more important in clinical matters to assess dispositional, rather than situational, differences in thought processes. How does the thought-listing procedure fare in assessing individual differences? The data are sparse but encouraging.

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cognitive responses to persuasive communication mediated the affective response (Cacioppo *et al.*, 1981; Insko, *et al.*, 1974; Osterhouse & Brock, 1970).

Finally, we discussed previously how personal involvement increases the cognitive elaboration of a communication as it is presented. If the thought-listing procedure taps post hoc rationalizations, then the correlation between these thoughts and affective responses should be about the same, regardless of issue involvement. On the other hand, if thought listings are tapping the actual (and accessible) cognitive responses to the communication, then the correlation between cognitive and affective responses should be higher when there is high, rather than low, issue involvement because the former elicits greater relevant cognitive elaboration. As mentioned previously, high-involvement issues produce stronger correlations among cognitive and affective responses than do low-involvement issues (Petty & Cacioppo, 1979a, 1979b).

Thought Listing as an Independent Variable

The thought-listing procedure has proven useful as a reliable and sensitive dependent variable; it has been employed successfully as an independent variable as well. One example of this is in research on the determinants of enduring attitude changes.

Most attitude changes that are produced in the laboratory are relatively short lived; there is little or no maintenance of the new attitude. Hovland (1959) and his colleagues originally believed that attitude change would persist if subjects could subsequently recall the arguments contained in the communication. Of course, from the cognitive response point of view, attitude change is not produced or maintained by argument learning but by the elicitation and retention of favorable thoughts about the advocacy. That is, attitude change may persist to the extent that subjects at some later time are able to recall the favorable cognitions that were elicited initially by the communication.

To test this, we asked subjects to read five arguments on an involving topic and to list five of their own thoughts on the topic (Petty, 1977). Subjects then memorized either their own five thoughts or the five message arguments. Attitudes on the topic were measured both immediately and one week later. The results supported the cognitive response view. Immediate attitude change was related more highly to the cognitive responses than to message learning. In addition, attitude change persisted more among those who memorized their own thoughts than among those who memorized message arguments.

The use of thought listing as an independent variable is important for other areas of psychology for at least two reasons. First, there is the obvious advantage for theory testing that we capitalized upon in the study described.

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For instance, recall that we found that highly socially anxious men were more likely to generate negative self-statements when awaiting their interaction with a woman than were less anxious men (Cacioppo, Glass, & Merluzzi, 1979). This study did not indicate whether or not these self-statements were instrumental in eliciting or heightening the anxiety and self-evaluations; the use of thought listing as an independent variable provides a means by which to test the causal role of a person's self-statements in bringing about the subsequently observed affective and self-evaluative responses.

Second, thought listing as an independent variable is important for its application in therapy. As a component of a treatment intervention, a therapist might want to select a subset of thoughts and have the client memorize these (e.g., the favorable self-statements in a phobic situation) to facilitate the client's affective and behavioral change.

In sum, the thought-listing procedure has provided a reliable and valid measure of cognitive responses. The procedure does not appear to be reactive, because it does not affect the responses to the task under investigation. Thought listings appear to be sensitive to environmental manipulations and to individual differences. The measure appears to tap thoughts that mediate affective responses rather than post hoc rationalizations for these responses. Finally, it has proven useful as an independent variable in assessing cognitions in research. Perhaps one of the most promising and exciting prospects for the thought-listing technique is its application as an independent variable to assessing and treating the underlying problems in an individual's thought processes.

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