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Selected Constructs and Measures**

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# **INDIVIDUAL DIFFERENCES IN CONATION: SELECTED CONSTRUCTS AND MEASURES**

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## **Introduction**

In recent years, a plethora of psychological constructs and their associated measures have been proposed for attention in instructional research and evaluation. These constructs are attempts to capture, in one way or another, aspects of human learning and performance relevant to instruction that go beyond conventional constructs of cognitive ability. Some are old concepts in psychology that have not received much attention in contemporary work. Some are quite new, with relatively little foundation in prior research. Some represent the inventions of educational practitioners. Many are designed to identify potentially important individual differences among students that influence learning in instructional situations. Many also can be used to assess outcomes from such learning.

Among the most interesting and potentially useful of these constructs are those reflecting motivational and volitional aspects of human behavior; we call these “conative” constructs. There are of course also important “cognitive” constructs and “affective” constructs, both old and new. The distinction between cognition, conation, and affection is convenient and historically well-founded in psychology, though it should be regarded as a matter of emphasis rather than a true partition; all human behavior, especially including instructional learning and achievement, involves some mixture of all three aspects (Hilgard, 1980). But the conative side of school learning has been largely ignored in instructional assessment until very recently (Snow, 1980; Snow & Farr, 1987).

By way of formal definition, “conation” represents

that aspect of mental process or behavior by which it tends to develop into something else; an intrinsic “unrest” of the organism . . . almost the opposite of homeostasis. A conscious tendency to act; a conscious striving. . . . Impulse, desire, volition, purposive striving all emphasize the conative aspect. (English & English, 1958, p. 104)

Among the constructs we place in this category today are several kinds of achievement motivational distinctions, including need for achievement and fear of failure, but also various beliefs about one's own abilities and their use, feelings of self-esteem and self-efficacy, and attitudes and interests concerning particular subject matter learning; volitional aspects pertaining to persistence, academic work ethic, will to learn, mental effort investment, and mindfulness in learning; intentional constructs reflecting control or regulation of actions leading toward chosen goals, attitudes toward the future, and self-awareness about proximal and distal goals and consequences; and many kinds of learning styles and strategies hypothesized to influence cognitive processes and outcomes of instruction. Many other, more traditional personality or style constructs, such as intellectual flexibility, conscientiousness, extraversion, or reflection-impulsivity, could also be added to the list. And many of these constructs and measures may prove extremely useful in understanding student commitment to learning, or lack thereof.

Unfortunately, most of the research on conative constructs in education has been limited to small-scale, isolated and piecemeal studies. Measures have usually been limited to questionnaires, often hastily developed and inadequately evaluated. No programmatic validation research has yet been mounted to determine what theoretical and practical distinctions and what kinds of assessments will best serve the needs of instructional research, evaluation, and improvement.

The purpose of this chapter is to review briefly some of the constructs and measures that seem most promising as useful for future research and evaluation in instructional psychology. We include examples of innovative assessment methods where possible. We also discuss questions and criticisms relating to construct validation in hopes of promoting more programmatic research in this direction. However, we cannot here provide a comprehensive review of literature on any particular construct or on conative functions in general. More general discussions of the problems and prospects of conative assessment in instruction, and details on various aspects, are available elsewhere (see, e.g., Snow, 1989a, 1989b, 1990; Snow, Corno, & Jackson, 1996; Snow & Farr 1987; and Snow & Jackson, 1992).

## **Theoretical Framework**

### **A Provisional Taxonomy**

It should be helpful as an overview to provide some rationale for our selection of the constructs included, and for their organization into categorical order here. This may help explain terminology and ultimately step toward a more standardized taxonomy for use in further research. Our categorization is admittedly rough and provisional, and in some instances rather arbitrary. However, we do see some proximities and symmetries we think worth preserving and considering further as suggestions for research, even if they are not ultimately retained in a more formal or complete theory.

Figure 1 shows our present schematic taxonomy of conative constructs and its place in relation to the cognitive and affective domains. We see the conative domain as “located” in some sense between affect and cognition, and there is some theoretical justification for this (see Kuhl & Beckman, 1985, 1994). We also see motivation and volition as forming a continuum within the conative category—a kind of commitment pathway from wishes to wants to intentions to actions, again following other theory (Heckhausen & Kuhl, 1985). However, we do not extend this continuum to the temperament and emotion constructs of the affective domain or to the ability and knowledge constructs of the cognitive domain, which would be located in the shaded regions of Figure 1. Nor do we enter the old and continuing theoretical debates about the priority or primacy of cognitive versus affective influences (see, e.g., Izard, Kagan, & Zajonc, 1984; Lazarus, 1991; Reisenzein & Schönplflug, 1992). For the most part, we shade these domains out of consideration here. Finally, we note that conation as a category seems to include aspects of both “personality” and “intelligence.” We avoid these cloudy concepts as too molar and vague for our purposes here.

The first two categories of conative constructs identified in Figure 1 are the main concern in this chapter. The first includes the various constructs of achievement motivation and anxiety. Related motivational constructs address individual differences in wishes, wants, needs, or goals, and either positive or negative expectations with respect to them. The second category contains volitional, self-regulatory constructs addressing individual differences in intentions and the control of effort and action with respect to them. Here are constructs representing action control, effort investment, and the like.

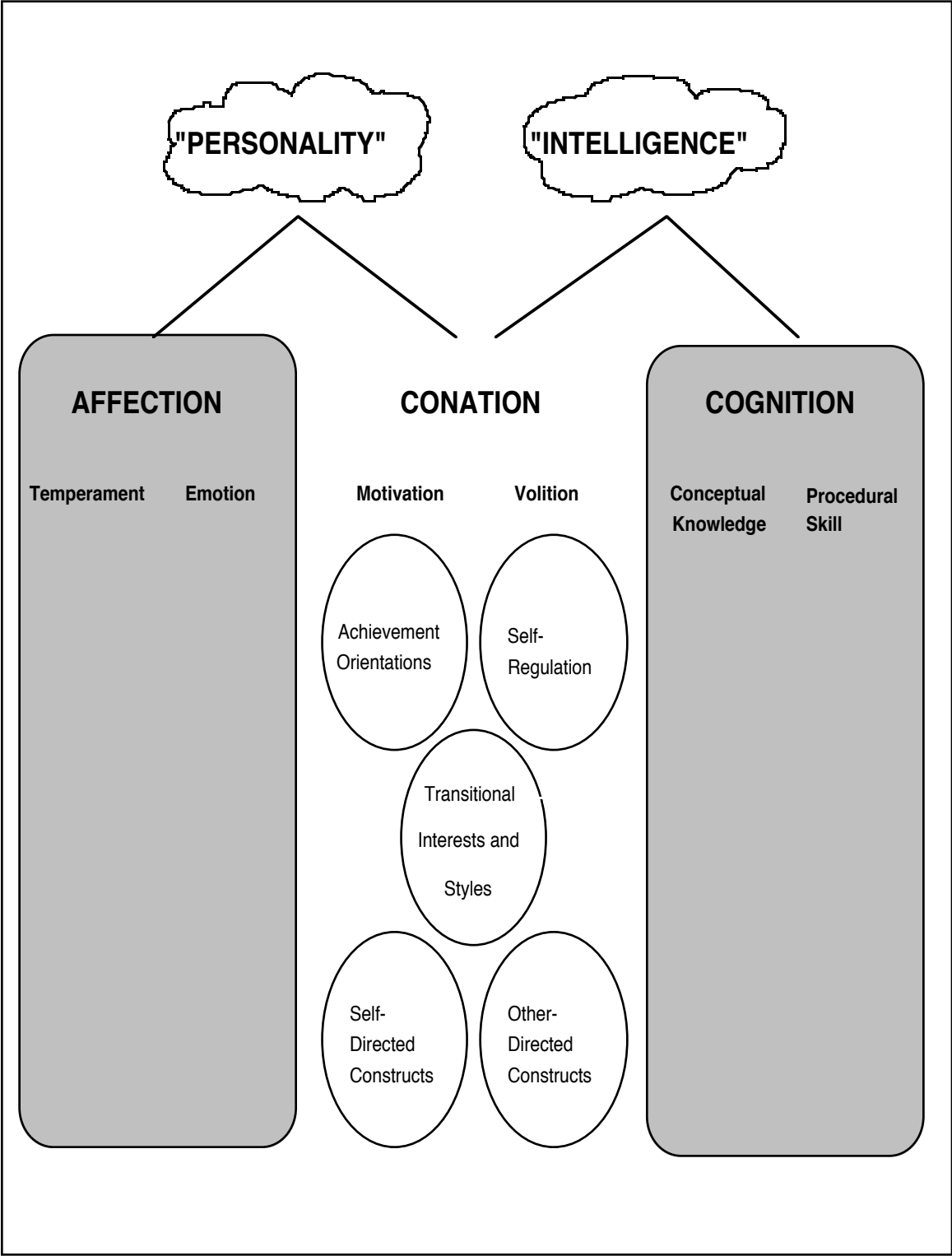


Figure 1. Provisional taxonomy of conative constructs.

But there are also interest constructs that seem to have intrinsic motivational significance in either short- or long-range connection to performance in instructional learning. There is voluminous research on long-range, career goal interests and also scattered new work on particular subject matters or kinds of activities or situations. There are also dozens of personal and learning style constructs, some of which seem to reflect characteristic volitional differences. Some interest and style constructs should relate to one another, in that particular kinds of instructional methods and content seem to call for and promote development of characteristic interests and styles of work. Also, both kinds of construct represent preferences. We include reference to some examples in this chapter as transitional constructs between the motivational and volitional categories, but we cannot review the whole category here.

Finally, on the motivational side, we locate the category of self-directed constructs, self-esteem, self-efficacy, etc., and on the volition side, we form a category of other-directed constructs. This would include beliefs and perceptions about subject matter domains, instructional situations, instructors, and other students, and also such constructs as persuasibility, leadership, social competence, need for social approval, and Machiavellianism. We omit discussion of these altogether.

Each of our categories touches one or another of our domain boundaries in some way. This underscores the fuzzy character of many distinctions and reminds us that some investigators prefer cognitive interpretations of what we call volitional constructs and affective interpretations of what we call motivational constructs. Thus, aspects of self-regulation, style and strategy, and knowledge and belief structure are often described as strictly cognitive, or metacognitive. Achievement motivation, anxiety, some interest factors, and self-concepts are often interpreted as temperamental dispositions. There is also sometimes a state-trait distinction in the interpretive contrast as well. We emphasize the conative aspect here because it is so often ignored. But only time and much validation research will show us what kinds of interpretation we are entitled to. In the interim, promoting research in this direction will at least enrich the psychological spectrum with which instructional research and evaluation contends.

## **A Performance Commitment and Assembly Pathway**

As noted above, we imagine a commitment pathway from wishes to wants to intentions to actions along which the distinction between motivation and volition can be made (following Heckhausen & Kuhl, 1985). We also think it useful to imagine a parallel assembly pathway along which the production of cognitive performance can be traced (Snow, 1989b). A condensed representation of the result is shown in Figure 2. Although highly speculative and schematic, such a view may help suggest how some conative constructs can be distinguished from one another in process terms.

In brief, the Heckhausen-Kuhl (1985) theory concerns the processes that transform wishes to wants, to intentions, to actions, and that regulate the progress of actions in relation to goals. A wish is essentially a value attached to a goal. These values are valences or incentives with respect to anticipated end states, which can be positive or negative. The individual's basic emotional needs and interests presumably dictate these wishes or goal values, at least in part. There are also expectancies with respect to the attainment of any particular goal. The expectancy-value theories of Atkinson and Feather (1966) and Heckhausen (1977) then predict what goal will be chosen in a given situation. However, there is also a goal hierarchy, and lower order or more proximal goals can differ in their instrumentality with respect to higher order or more distal goals. A wish becomes a want when there is sufficient expectancy and instrumentality (i.e., when it exceeds a certain threshold of potency). Also, proximal or lower goals receive valence and potency from distal or higher goals. So, for example, some learners want to learn from today's instruction, because they want to do well on the next achievement test, because they want to pass the course, etc., ultimately, to graduate and reach a higher level of education. We see most kinds of individual differences classed as achievement orientations in Figure 1 as related mainly to processes in this wish-want segment of the pathway.

Then, for a want to become an intention, it must also be relevant to action conditions expected in the future. That is, conditions will need to favor the intended action goals in terms of opportunity, time, and means, as well as importance and urgency. Achievement orientations or styles that concern preferences for some kinds of learning conditions over others should be related to



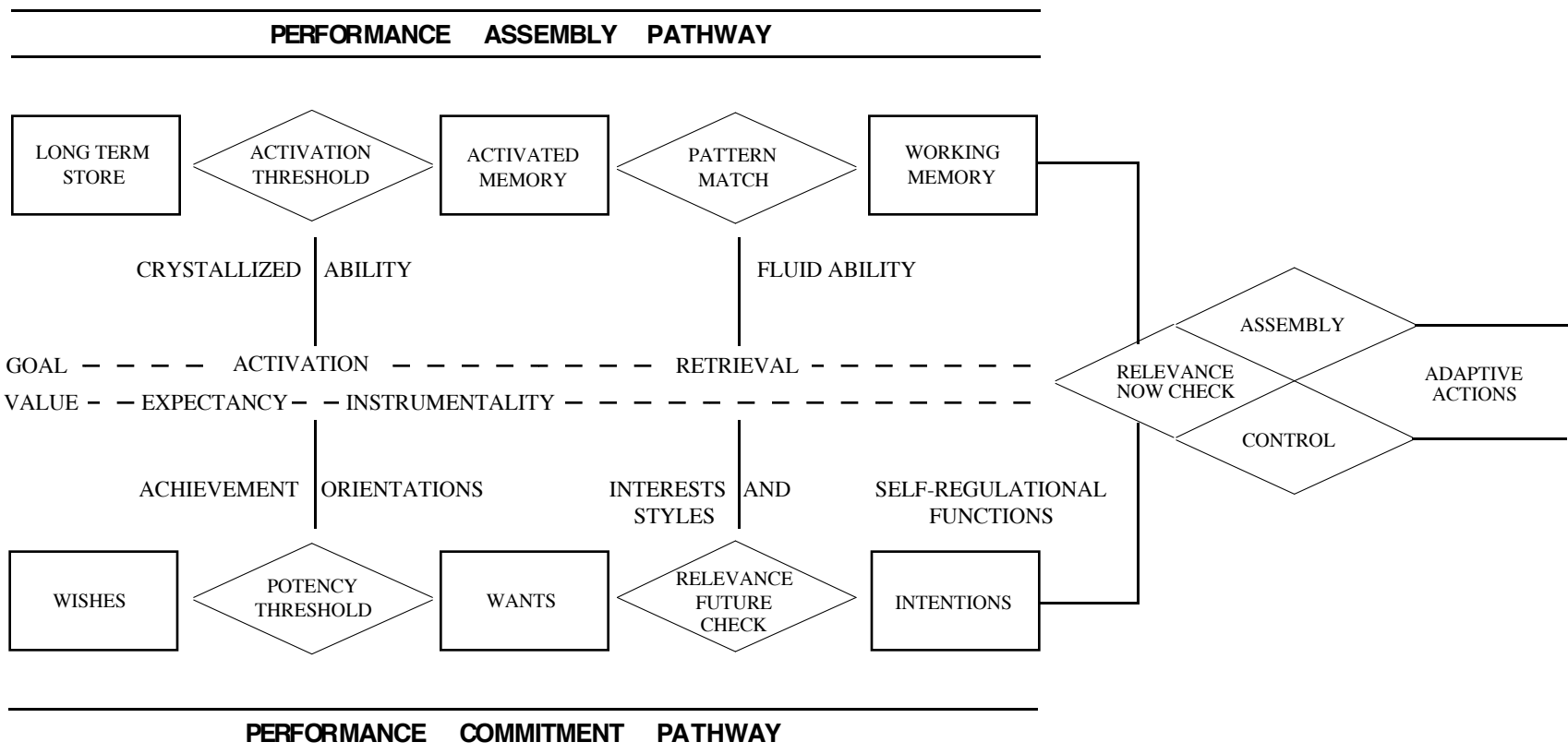


Figure 2. Performance commitment and assembly pathway.

this want-intention segment. So also should interests in particular learning activities, though broad subject matter or career interests would presumably be relevant throughout the wish-want-intention region.

Lastly, for an intention to become an action it must also be immediately relevant in the present situation, under control in the person-situation interaction, and maintained or protected against competing intentions and action tendencies in the ongoing flow of performance. The category of individual difference constructs called action controls seems most related to this intention-action segment. Various personality and learning style constructs should also be connected here.

Figure 2 also depicts a cognitive performance assembly pathway, as noted. This part of the schema is intended to represent the retrieval of cognitive knowledge and skill components and their assembly and reassembly into performance programs in a particular sequence of learning tasks (see Snow 1989b, 1992). Consistent with available theory and evidence, it suggests that crystallized cognitive abilities are more associated with the long-term store and activation region of the assembly pathway, because they are thought to be triggered and retrieved as units given appropriate stimulus conditions. Fluid ability is more associated with the pattern matching and assembly functions in working memory because it is thought to reflect more fine-grain adaptation to the flow of person-task interaction as well as inferential reasoning therein. Although it may seem fanciful to suggest parallels and connections of this sort at this stage of research, there is evidence to suggest that crystallized ability interacts with some achievement orientations and fluid ability correlates with some kinds of action controls and styles, at least under some instructional conditions.

## **Achievement Orientations**

### **Need for Achievement**

Perhaps the oldest standing conative construct relevant to instruction is Need for Achievement, traditionally defined in terms of competition with a standard of excellence in relation to particular goals. Until the late 1940s, the prevailing view was that human motivational phenomena could be explained by an analysis of the primary needs (such as hunger) of all animals. But

psychologists influenced by Murray (1938) had accumulated a corpus of data on complexities of human motivation that seemed difficult to account for by reference to basic organismic factors. Atkinson and McClelland (1948) sought a new approach to the study of human motivation that went beyond the reductionism of the time (Heckhausen, Schmalt, & Schneider, 1985). Their measure was Murray's (1938) Thematic Apperception Test (TAT), a projective technique using ambiguous pictures as stimuli about which respondents generate stories. The stories are then scored for particular themes.

The assessment technique assumes that if a person is motivated to achieve a particular goal, then thoughts concerning that motive should be readily accessible in the person's memory and should be reflected in his or her stories and scores. Although the TAT had been used in clinical work, evidence for its validity and theoretical viability was weak. Atkinson and McClelland (1948) successfully demonstrated validity for the TAT as a measure of need for food in a food deprivation experiment and as a measure of experimentally induced need for achievement. In further studies, they and their colleagues investigated individual differences in need for achievement in a variety of experiments guided by the Lewinian notion that achievement behavior would be influenced by characteristics of both person and environment. But questions about the validity of the TAT remained.

McClelland later distinguished two dimensions of achievement motivation: fear-of-failure and hope-of-success. Some persons are primarily motivated to avoid failure, whereas others are primarily motivated to achieve success. Both aspects of motivation can lead to effort investment and success. But persons with different profiles differ in the kinds of risks they prefer to take. Those seeking success choose moderately difficult tasks where the payoff is also moderate. Those wishing to avoid failure choose either easy, low-payoff tasks where failure is unlikely, or very difficult, high-payoff tasks where failure is probable and expected.

Assessment of both dimensions is possible using McClelland, Atkinson, Clark, & Lowell's (1953) adaptation of the TAT, scored for hope of success and fear of failure, and deriving measures of net hope (the difference) and total achievement motivation (the sum). Another measure of the same variables from the TAT was devised by Schmalt (1976) called the Achievement-Motive Grid.

Numerous questionnaire measures have been devised to measure need for achievement (see, e.g., Lens & DeCruyenaere, 1991). Proponents of TAT procedures (e.g., McClelland, 1972; McClelland, Koestner, & Weinberger, 1989) argue that TAT more validly measures different aspects of achievement motivation than questionnaire procedures. Over the years, proponents of questionnaires have disputed the reliability and validity of TAT, citing the various concerns about projective assessment techniques in general (for discussion, see Cronbach, 1990). Most recently, in a meta-analysis of 105 empirical research articles, Spangler (1992) compared TAT and questionnaire measures, to conclude that

the correlations between TAT measures of need for achievement with outcomes were on average positive; that these correlations were particularly large for outcomes such as career success measured in the presence of intrinsic, or task-related, achievement incentives; that questionnaire measures of need for achievement were also positively correlated with outcomes, particularly in the presence of external or social achievement incentives; and that on average TAT-based correlations were larger than questionnaire-based correlations. (p. 140)

In other words, Spangler found an interaction between the type of measure (TAT vs. questionnaire) and the environmental stimuli (task-related vs. social achievement incentives). Furthermore, Spangler found a low correlation of .09 between TAT and questionnaire measures of need for achievement. This supports the notion that TATs and questionnaires are validly measuring different aspects of achievement motivation. However, Spangler's meta-analysis compared TAT results to those obtained from what must be a diverse set of questionnaire measures of variable reliability and test construction standards. The correlations between questionnaire measures and achievement outcomes might well have differed depending on the particular questionnaire measures used in the studies included; Spangler did not discuss these measures in detail.

Lens and DeCruyenaere (1991) reported educational achievement relations for several of the most widely used questionnaire measures. It does seem that these measures offer useful prediction in educational settings. Both TAT and questionnaire measures have also been used with success in research on aptitude-treatment interactions in instruction, most notably by McKeachie and his colleagues (see summaries of these and other studies by Cronbach & Snow, 1977). Of particular note is Lens's (1983) demonstration of curvilinear relations

with educational achievement measures for both need for achievement and fear of failure. Maximum achievement was shown by students in the middle range on both questionnaires, on average. Achievement declined as students were scored more toward either end of either dimension. These relations are consistent with the classical theory of arousal and serve as a warning against thoughtless use of linear models in conative measurement.

### **Fear of Failure and Test Anxiety**

The fear of failure dimension of achievement motivation is essentially the same construct widely referred to as test anxiety but more properly interpreted as evaluation anxiety. The typical measures are questionnaires designed to reflect individual differences in proneness to fear of failure in evaluative situations generally, not just on tests.

Mandler and Sarason (1952) began the study of test anxiety, interpreting differences in performance of high- and low-test-anxious students on the basis of learned psychological drives. Two kinds of drives were said to be evoked by test situations: task-directed drives and learned anxiety drives. These stimulate two opposite and incompatible kinds of behavior: task-relevant efforts to finish the task and thereby reduce the anxiety; and self-directed, task-irrelevant responses, manifested by insecurity, anticipation of negative outcomes or diminished self-worth and status, and implicit attempts to leave the evaluative situation (Mandler & Sarason, 1952).

Alpert and Haber (1960) labeled these task-directed and task-irrelevant drives as facilitating and debilitating anxieties, respectively, and devised a questionnaire to distinguish these components in subscales. Mandler and Sarason provided their questionnaire with only a debilitating scale, inferring the presence of one anxiety from the absence of the other. From factor analyses of this scale, Liebert and Morris (1967) proposed that debilitating test anxiety is itself bidimensional, consisting of separate components for worry and emotionality. They defined worry as cognitive concerns about the consequences of failure and emotionality as reactions of the autonomic nervous system that are evoked by evaluative stress. This evaluative stress can be associated with particular content domains or performance situations, such as learning mathematics or using computers. Spielberger (1980) has applied these concepts of worry and emotionality in the construction and development of another

questionnaire system that also provides the distinction between trait and state anxiety.

The research literature on test anxiety is voluminous (Hembree, 1988), and in addition to much correlational and experimental evidence, there are strong demonstrations of test anxiety operating in interaction with ability differences and instructional treatment variations to influence educational learning (see Cronbach & Snow, 1977; Snow, 1989a, 1989b). There are also indications that test anxiety interacts with test format and test taking strategy to influence student performance (Schmitt & Crocker, 1981). Unfortunately, it is also the case that most of this research fails to distinguish among the components of test anxiety or to recognize it as only the negative side of motivation, that is, only half the story of performance in evaluative situations. The positive side of motivation (e.g., need for achievement) is also aroused in evaluative situations and makes a contribution that needs to be included when explaining differences in test performance (Naveh-Benjamin, McKeachie, Lin, & Tucker, 1986; Rand, Lens, & Decock, 1989).

Also important are information processing approaches to the study of test anxiety, as discussed by Hunsley (1987), Naveh-Benjamin, McKeachie, and Lin (1987), Sieber, O'Neil, and Tobias (1977), and Tobias (1985), among others. Tobias (1985), for example, discusses competing hypotheses concerned with how anxiety might hinder information processing in learning and performance at different stages of processing. The interference hypothesis suggests that the evaluative threat posed in testing situations impedes the retrieval of already learned information for high-anxious students by reducing their cognitive processing resources. The deficit-skills hypothesis argues that inadequate initial preparation and poor test-taking skills account for the reduced performance of high-anxious students. Tobias cites evidence suggesting that these competing hypotheses are not mutually exclusive, and that both can yield instructionally relevant research. Other work along these lines by Naveh-Benjamin et al. (1987) has used non-evaluative situations to distinguish students with retrieval problems from students having organizational and other problems. Identifying the nature of the relationship between anxiety and information processing could serve as a foundation for designing differential treatment programs for high-anxious students that might be more effective in improving learning and performance than global test anxiety reduction programs or study skill

improvement programs. It might also lead to measurement techniques based on performance indicators as well as questionnaires.

### **Other Components of Achievement Motivation**

Just as fear of failure seems composed of distinct parts, the original positive, hope-for-success aspect of achievement motivation has also been decomposed. The many measures noted above may well tap different aspects. Ray (1982) listed over 70 different achievement measures, and Fineman (1977) listed 22. As noted above, projective and questionnaire measures have often been found uncorrelated (e.g., Spangler, 1992; Weinstein, 1969). Sometimes different questionnaire measures seem to be linked by little more than the use of the word “achievement” in their descriptors.

Jackson, Ahmed, and Heapy (1976) sought to explore the multidimensional nature of achievement motivation using a multitrait multimethod design. Following a conceptual analysis of the achievement construct, they postulated six distinct components: Concern for Excellence (motivation for competition with a standard of excellence, to do one’s best, as the component originally defined by McClelland et al., 1953); Competitiveness (motivation for competing with others in order to win); Acquisitiveness (motivation based on the reinforcing properties of material rewards); Status With Experts (motivation associated with the rewarding aspects of striving for social recognition with experts); Status With Peers (motivation associated with the rewarding aspects of striving for social recognition with one’s peers); Achievement via Independence (motivation to do well in tasks and environments where individual initiative is rewarded).

Factor analytic results supported these distinctions. For example, the emergence of acquisitiveness as distinct from achievement is important because it stands in contrast to McClelland (1961, p. 47), who views wealth as a symbol and secondary to achievement. Jackson et al.’s (1976) work suggests that achievement and acquisitiveness do not necessarily covary. Furthermore, Jackson et al. and Atkinson have slightly different views on the nature of achievement behavior. According to Jackson et al. (1976), achievement-oriented behavior is “the resolution of the six primary vectors interacting with a given situation” (p. 19), whereas Atkinson views achievement-oriented behavior as the resultant of hope for success minus fear of failure plus various extrinsic influences. For a methodological treatment of the Jackson et al. (1976) study, see

Messick (1989). Cassidy and Lynn (1989) report a questionnaire measure of multidimensional achievement motivation combining the Jackson et al. (1976) questionnaire with questionnaires from Lynn, Hampson, and Magee (1983), Spence and Helmreich (1983), and Warr, Cook, and Wall (1979).

Other perspectives on achievement motivation could also be included here. For example, attribution theory offers another approach to this analysis (Weiner, 1986). Although work in this line often ignores individual differences, there have been attempts to develop usable assessment instruments from this perspective. A main example is Anderson's (1983) work on attributional styles.

In a similar vein, Nicholls, Patashnick, and Nolen (1985) examined high-school students' perceptions of the causal attributions related to school success. For example, students who believed that school should enable them to enhance their wealth and status were less likely to be committed to learning for its own sake than students who believed schools should teach commitment to society, understanding of the world, and high standards. Nicholls et al.'s work is important because it links students' personal goals with their educational ideologies and causal attributions for success. A related approach assesses a broad array of personal goals and personal agency beliefs to capture the multifaceted character of achievement motivation (see Ford & Ford, 1987; Ford & Thompson, 1985). For other approaches to personal goals, see Ames and Ames (1984); Ames and Archer (1988); Ames (1992); Blumenfeld (1992), and Nicholls, Cheung, Lauer, and Patashnick (1989).

### **Achievement via Independence Versus Achievement via Conformance**

It was noted above that achievement via independence has been identified as a component of achievement motivation. A related approach to subdividing achievement motivation is to contrast achievement via independence with achievement via conformance. The former was defined as a drive to do well in tasks and environments where individual initiative is rewarded. A high-scoring person here is described as mature, foresighted, demanding, and self-reliant. In contrast, the latter refers to a drive to do well when tasks and environment are well defined. A high-scoring person is described as capable, efficient, organized, responsible, and sincere. These constructs have been measured by scales of the California Psychological Inventory, a well-known self-report personality inventory that has been subjected to extensive research. Factor analytic studies



tend to group the two scales with other scales to create more general personality constructs; the independence scale is grouped with intellectual efficiency and flexibility, whereas the conformance scale is grouped with conformity, responsibility, compliance, and conscientiousness.

Morris and Snyder (1978) reported strong correlations between one achievement motivation scale and both achievement via conformance (Ac) and achievement via independence (Ai). But another achievement motivation measure correlated only moderately. Morris and Snyder also experimented with several a priori scoring procedures that differed from the standard procedures, and these dramatically changed the relationships observed among the measures. Ac and Ai have also been included in several Aptitude-Treatment-Interaction studies designed to test whether students who are high Ac or Ai would be more successful when presented with instruction that was structured and demanding of conformity versus instruction that emphasized student initiative and independence, respectively (Domino, 1968; 1971). In these studies, better student work was produced when the instructor's teaching style was matched to the student. High Acs did better with formal instruction, and high Ais excelled when allowed initiative and self-direction. Other studies at the high school level (see Snow, 1977, for a summary) have confirmed the importance of the Ai-Ac distinction and its relation to achievement in these different instructional situations. Furthermore, the two measures seem unrelated to ability or anxiety.

## **Transitional Interests and Styles**

### **Intrinsic Motivation**

Researchers often use the terms intrinsic motivation and interest interchangeably, even though it appears that the two may be different though closely related constructs. Persons engage in tasks and activities that are intrinsically motivating for their own sake, not to receive some external reward or avoid some negative consequence. "Intrinsically motivated learning is learning that occurs in a situation in which the most narrowly defined activity from which the learning occurs would be done without any external reward or punishment" (Malone & Lepper, 1987, p. 229). Interest in the concept of intrinsic motivation was stimulated in part by White (1959), who argued that curiosity, exploration, and attempts at mastery can be considered expressions of an

intrinsic need to deal competently with one's environment (Harter & Connell, 1984). Recent cognitive evaluation theory (Deci & Ryan, 1985) strikes a similar tone. According to Deci and Ryan, intrinsically motivated behavior is based in an individual's need to be competent and self-determining and arises from an internal locus of causality in which individuals undertake behavior for its "internal rewards," including interest and mastery. Deci and Ryan (1985) view interest as an emotional outcome or reward of intrinsic motivation. Factor analytic studies of school motivation have obtained factors for curiosity and interest in school work, and intrinsic motivation (Snow, 1989b).

A few self-report scales have recently been constructed to measure aspects of intrinsic motivation. One by Ryan and Connell (1989) for late elementary and middle school students contains subscales for intrinsic motivation, and three forms of extrinsic motivation. The same scales are provided by Vallerand, Blais, Briere, and Pelletier (1989) for use with college students. This instrument also adds a scale for lack of interest or poor motivation for academic material. Harter's (1981) instrument is a forced-choice measure of intrinsic versus extrinsic motivation including subscales for preference for challenge versus easy work; incentive to work to satisfy one's own interest and curiosity versus to please the teacher and obtain good grades; attempts at independent mastery versus dependence on the teacher; independent judgment versus reliance on teacher's judgment; and internal versus external criteria for success and failure. These subscales clustered and can be scored for constructs labeled Autonomous Judgment and Intrinsic Mastery Motivation.

Measures used to assess the presence or degree of intrinsic motivation for a particular person and situation at a particular time need to be designed to represent the person-situation interactional character of the construct, as well as its state versus trait aspect. In comparison with most other achievement motivation constructs, intrinsic motivation seems more interstitial between person, situation, and time, and thus less accessible by conventional questionnaire. Given the theoretical as well as practical importance of the construct, much more extensive assessment research is needed.

Another line of work refers to motives directed towards specific content areas or subject-matter-oriented interests, which may also vary within learning situations. Nenniger (1987) describes a content motive in learning as "an enduring, highly general and very stable personality trait that determines the

person's sensitivity to situational determinants" (p. 159). He contrasts content motives with achievement motives, which he regards as "highly general and a very stable result of the socialization process" (p. 159). In contrast to achievement motives, content motives may need to be considered as individual difference variables, which are modified, even as they affect learning. In several studies, Nenniger has used a questionnaire to assess content-oriented motive toward mathematics. There are separate scales for interest in mathematics, and readiness for work in mathematics.

### **Individual Interest**

Individual interest is a relatively enduring and stable preference for certain topics, subject areas, or activities (Schiefele, 1991). In an attempt to provide a theoretical definition of individual differences in interest, Schiefele and Krapp (1988) proposed an "Educational Interest Theory," which regards interest as a "specific form of relationship between a person and an object." This relationship is characterized by a concrete interaction between the person and the object and an enduring, stable disposition or orientation toward the object. They suggest that this interest relationship is expressed in cognitive, emotional, and value terms, in which there is strong subjective meaning and self-intentionality towards the object. Prenzel (1988) adds to the definition qualities of persistence (the maintenance of the relationship by repeated engagements with the object) and selectivity (the stability of content in consecutive engagements over time). Observing the need for a theoretically-based means of assessing interest, Schiefele, Krapp, and Winteler (1988) described the development of a questionnaire by Winteler and Sierwald (1987) yielding scores for both interest and cognitive competence. Further developments focus on assessing the combined "tendency or the willingness to acquire knowledge about the object of interest" (Schiefele et al., 1988, p. 7).

There is evidence that high-interest learners achieve deeper understanding than low-interest learners. But it is not clear how the learning of high-interest learners differs from that of extrinsically motivated learners, or how interest and the quality of learning outcome relate (Schiefele, 1991). Further research needs to address not only the relationship between learning processes and strategies and interest, but also the emotional aspect or valence associated with interest. Further, because working on interesting tasks improves the quality of the

learning experience, interest should be considered a desired outcome of learning as well as a factor that motivates learning.

### **Deep Versus Surface Approaches to Learning**

There are very long lists of learning styles and strategies proposed as distinct constructs of use in instructional research, and there are also many multiscale questionnaires available (see, e.g., Curry, 1990; Keefe, 1987; Pintrich et al., 1988; Schmeck, 1988; Weinstein, Goetz, & Alexander, 1988). Styles are usually defined as characteristic ways in which individuals prefer to learn, and strategies are particular information processing activities habitually applied in learning situations with the aim of promoting more efficient or effective performance. Rather than address the complex definition, measurement, and validation problems involved in this category, we adopt the pervasive style distinction between deep and surface approaches to the processing of information in learning situations proposed by Marton and Säljö (1976) and Entwistle (1987a, 1987b), and their coworkers (Entwistle & Ramsden, 1983; Marton, Hounsell, & Entwistle, 1984). We think this distinction summarizes the effective result in learning activities of a large number of other style and strategy differences. Also, while this result may be interpreted in cognitive information processing terms, it clearly reflects differences in intention or commitment to learn, which is a broader conative construct.

In the deep approach, learners regard the learning material (text, problem, etc.) as the means through which to gain an understanding of the underlying meaning found in the material. In the surface approach, learners regard the particular learning material as what needs to be learned, without attempting to link it to a larger conceptual framework. Students who are intrinsically motivated and learning for its own sake, with less concern about their performance, and particularly others' evaluations of their performance, are more likely to use a deep approach. Learning is viewed primarily as constructing meaning and as an interpretive process of understanding reality. A surface approach is likely to occur when students are motivated to fulfill the demands placed on them by others, so it relates more to extrinsic motivation and evaluation anxiety and is particularly sensitive to assessment procedures. Learning is regarded as a passive transmission of what is found in learning materials to the head of the learner, with particular emphasis on memorization

in knowledge acquisition. The deep versus surface dichotomy has elements that are both state- and trait-like. Marton et al. (1984) described it as not “a stable characteristic of the student, but rather . . . a relation between the student’s perception of a task and his approach to it” (p. 135). Yet research has implied that it “was to some extent a stable characteristic of the student—or at least that some students adopted consistent approaches across a range of different study tasks” (p. 213). The relationship between deep versus surface approach and performance is, of course, indirect. Successful performance can be achieved through either approach with effort, but the deep approach will lead to far greater understanding than the surface approach.

Both questionnaire and interview assessment methods have been developed, and there is now solid evidence on the deep versus surface distinction as important in learning. There is also evidence for another distinct approach, called “strategic,” to represent learners whose activities aim mainly at impressing instructors and obtaining the highest possible grade by whatever means or process is necessary. Unfortunately, there has not yet been sufficient work on relating these distinctions to the many other style and strategy constructs previously noted. Deep versus surface processing ought to correlate with measures of subject matter interests and intrinsic motivation, and also with other components of achievement motivation. The strategic approach may also be close to what others have called a performance as opposed to a deeper mastery orientation (Dweck & Leggett, 1988). This distinction is one of our volitional constructs taken up below.

## **Action Controls**

### **Action Versus State Orientation**

According to action control theory, volitional control processes are called on to maintain intended actions and inhibit competing actions or distractions when a desired intention is perceived to be difficult to enact. The difficulty of enacting an intention is influenced by the strength of competing intentions, the amount of social pressure to engage in alternative activities, and the extent to which the individual is currently “state oriented.” State orientation is simultaneously an ability-like and state-like construct hypothesized to influence self-regulatory efficiency. State-oriented persons are characterized by a “fixation on past,

present, or future states, for example, on a past failure to attain a goal, on the present emotional consequences of that failure, or on the desired goal state itself” (Kuhl & Kraska, 1989, p. 366).

A second factor leading to volitional control is that the student’s perceived ability or sense of personal agency or self-efficacy (Bandura, 1977; Ford & Thompson, 1985) to enact an intention must exceed some critical level. That is, students must both perceive that they can implement the intention and also perceive that the environment or situation will allow them to implement it.

Kuhl’s theory includes a taxonomy of six volitional strategies that allow students to protect selected intentions from competing action tendencies (see Kuhl, 1984, and Corno, 1986 and 1989, for presentations of the complete taxonomy). To illustrate these strategies, suppose that a student needs to support the intention to do homework and inhibit the preference to watch television. The student could use *selective attention* strategies to try to avoid visual contact and engagement with the television set, or *motivation control* strategies involving self-reinforcement and punishment to emphasize the sense of satisfaction that comes from completing the homework. *Emotion control* strategies (such as reassuring self-speech) could also be used to limit anxiety about the difficulty in starting the homework. *Environmental control* strategies, such as choosing a work environment away from the distraction of the television, could also be used.

Kuhl and Kraska (1989) have developed a standardized measure of these strategies called the Metamotivational Knowledge Test for Children (MKTC). This measure consists of three pictures that depict situations in which it is difficult to maintain an intention. For example, one picture shows a student working on homework while friends play outside the window. Respondents are asked questions about alternative strategies for maintaining desired intentions and avoiding distractions. Scores increase almost linearly from Grade 1 to Grade 4 for motivation control, attention control, and coping with failure, but scores on emotion control remain flat, suggesting that emotion control might develop later in childhood. Scores also correlate positively with teacher ratings of compliance with classroom rules and overall adjustment to school.

Action control theory led to empirical research on an individual difference construct labeled Action Orientation (vs. State Orientation). The action-oriented

individual “is characterized by an intentional focus on a situationally appropriate action plan” (Kuhl & Kraska, 1989, p. 366). He or she is able to attend successively or even simultaneously to all of the following: (a) the present state; (b) some future state; (c) a discrepancy between the present and future states; and (d) an appropriate action that will lead to the transformation of the present state into the desired future state (Kuhl, 1987). Action-oriented individuals tend to take immediate action to achieve their goals. In contrast, state-oriented individuals tend to focus on past difficulties and situationally inappropriate intentions. The state-oriented individual is unable to deal effectively with these four elements. His or her behavior is marked by the overmaintenance of an intention that is either unrealistic or should be postponed. This overmaintenance can result in a “fixation on past, present, or future states, for example, on a past failure to attain a goal, on the present emotional consequences of that failure, or on the desired goal state itself” (Kuhl & Kraska, 1989, p. 366).

Kuhl (1981, 1984) developed a self-report measure of action versus state orientation. Each item specifies a situation followed by an action-oriented and a state-oriented response. This measure yields scores on three types of action versus state orientation—performance related, failure related, and decision related—and does not yield a combined score. A sample item from the decision-related subscale is “When I have work to do at home: (1) It is often hard for me to get the work done, (2) I usually get it done right away.” Kuhl (1984) reports moderate correlations between action-orientation subscale scores and personality variables such as test anxiety, extroversion, self-consciousness, achievement motivation, future orientation, and cognitive complexity. These correlations reflect the theoretically expected overlap and at the same time indicate that a sizable proportion of variance in action-orientation scores cannot be accounted for by these variables.

In addition to the self-report measure, more recent work by Kuhl and Kraska (1989) has emphasized a computerized, performance-based assessment of the efficiency of action control. In the children’s version, respondents complete a choice-reaction-time task in the lower left portion of the screen. Successful performance earns them money to buy a toy after the experiment. Occasionally, while they are working on the speeded task, an interesting and uncontrollable distraction appears in the upper right portion of the screen. The distraction

affects the amount of money they will earn. Children readily understand that interrupting their performance on the speeded task to watch the distraction will reduce their earnings, so they form an intention to avoid looking at the distraction. Children having low strategy knowledge, as measured by Kuhl's Metamotivational Knowledge Test for Children, tend to have much higher variances in their response times, although they often do not show longer average response times on distracter trials. Had Kuhl found different mean response times for distracter versus non-distracter trials, he would have been unable to determine whether the decreased task performance was the result of an inability to maintain the intention or a change in the intention to view the race. According to Kuhl, when children become distracted, they notice that their performance has decreased, so they try to make up for it by increasing their speed on later trials. The development of a performance-based measure of volitional efficiency and its convergence with scores from the strategy knowledge measure is significant and provides a valuable source of validity evidence for both measures.

### **Mastery Versus Performance Orientation**

Similar to Kuhl's distinction between action and state orientation, mastery and performance learning orientations result in different patterns of response to failure on achievement tasks (Dweck & Leggett, 1988). A mastery orientation is characterized by the seeking of challenging tasks and the maintenance of effective striving under failure (Dweck & Leggett, 1988). In achievement tasks, mastery-oriented individuals exhibit solution-oriented self-instruction and sustained performance in challenging situations (Diener & Dweck, 1978, 1980). Unsolved problems are seen as challenges, and attention becomes focused on strategy and effort. A performance orientation is characterized by avoidance of challenge, impaired performance, and negative affect in the face of failure (Elliott & Dweck, 1988). Individuals who are performance oriented seek to maintain positive judgments of their ability and avoid negative judgments (Nicholls & Dweck, 1979).

Dweck's research program places motivational measures within the context of general theories of achievement goals, showing how attributions and anxiety follow from a focus on particular goals. Dweck and Leggett (1988) suggest that these differences arise from implicit theories of intelligence. An individual with



an entity theory of intelligence believes that social and personality attributes are fixed. Such a theory leads to performance goals, and a performance-oriented response to failure. In contrast, an individual with an incremental theory of intelligence believes that social and personality attributes are malleable (Goodnow, 1980). An incremental theory is said to lead to learning goals and a mastery orientation. Implicit theories of intelligence help formulate goals. According to Elliott and Dweck (1988), goal orientation interacts with confidence in order to set in motion a sequence of specific processes that influence task choice, performance, and persistence.

Measurement of mastery versus performance orientation depends on the age of the students. Dweck uses ten effort-related items taken from Crandall, Katkovsky, and Crandall's (1965) attributional scale to classify primary school children as mastery- or performance-oriented. This scale was chosen because past research (Dweck, 1975) showed that the major difference between the mastery and performance orientations was in the respective tendency to neglect or emphasize the role of effort in determining failure. Mastery-oriented responses focus on effort as the major cause of failure, resulting in renewed attention toward the task. Performance-oriented responses, on the other hand, focus on failure as a result of ability, with additional effort not regarded as helpful. For older children and adolescents, Dweck administers questions that assess students' theories about the nature of intelligence, and she infers learning orientation from their responses. For a related approach that investigates the mastery, evaluation, prosocial, and compliance goals that students pursue in relation to achievement, see Wentzel (1993).

### **Mindful Effort Investment Versus Effort Avoidance**

Mindfulness involves intentional, purposeful, metacognitively guided employment of non-automatic, hence effort demanding, mental processes (Salomon, 1987). A learner rarely applies knowledge and skill automatically when needed or appropriate. There must be an intention to mobilize and apply knowledge and skill to a new situation. This intention mobilization is mentally taxing—it demands effort investment in mindful application of knowledge and skill. The difference between what a person can do and what a person actually does in a situation indicates the effect of mindful effort investment. The

distinction between mindfulness and mindlessness seems parallel to that between controlled and automatic processing.

Mindfulness is a function of stable individual differences but also of situational, perceptual, and instructional conditions. Persons differ in their tendency to engage in and enjoy effortful cognitive activity versus to minimize mental effort in processing incoming information. Learners high in mindfulness perform better when given loose guidance and enough freedom to work on their own, but react negatively when given unduly specific and continuous guidance. The opposite is seen for learners low in mindfulness. High-mindful learners perform better when working alone than in teams. However, in teams that also allow independent activity, highs are unaffected while low-mindful learners tend to loaf. Mindful learners intentionally seek out opportunities to invest mental effort. They are selective—mindful about some aspects of a situation while ignoring others. Mindlessness occurs when a situation is perceived as familiar, undeserving of effort, or too demanding—the sequence of events is passively allowed to unfold without actively engaging it (see Salomon, 1981, 1983, 1984; Salomon & Leigh, 1984)

On the other hand, there also appears to be a mindful, volitional system aimed at actively avoiding the investment of effort in learning in achievement situations. The person's behavior seems motivated to escape from such situations, mentally or physically or both (Rollett, 1987). Effort avoidance can be distinguished from low need for achievement characterized by laziness and from high fear of failure characterized by striving to achieve. A person motivated by effort avoidance shows active mental or physical escape—that is, mindful avoidance, and no intention to succeed. The causes of effort avoidance seem to be frustrating early experiences in a task domain, so the construct is usually domain specific. But experiencing frustration in many school activities can presumably lead to generalized effort avoidance.

Unsupportive, restrictive intervention styles used by parents and teachers appear associated with the emergence of effort avoidance. The more teachers or parents use pressure to motivate such persons, the quicker effort avoidance appears. Effort avoiders use their intelligence to convince teachers they are not intelligent enough to cope with tasks given them. They tend to score lower on group tests than on individual intelligence tests. Their strategies for effort avoidance include working very slowly, working very rapidly in slipshod fashion,

stopping work when praised, producing feelings of resignation to induce teachers not to push them, and generating various excuses for not working.

Further research needs to distinguish “debilitating” or “defensive” effort avoidance from “intelligent” effort avoidance, that is, intelligent budgeting of minimal effort to reach desired goals. Effort avoidance may at times be a healthy reaction to exhausting or extremely difficult tasks. Thus, discontinuing work or setting lower standards for performance in such situations needs more study as an adaptive device. Also, the nature of prior frustrations and the appraisal of situations that lead to effort avoidance are not yet well understood.

Assessment of both effort investment and effort avoidance relies on questionnaires. Effort investment is reflected in self-reports about the number and kind of nonautomatic mental elaborations a person uses in various situations (Salomon, 1981). The scale has been used successfully in instructional research on television viewing and reading. A related measure of need for cognition also exists (Cacioppo & Petty, 1982). The effort avoidance scale includes items such as “I really can’t understand why I should know the multiplication table by heart,” “I can’t work when the sun is shining,” and “when I’m supposed to write for a long time I get quite tired.” The scale has been shown to be unidimensional and to contribute to prediction of learning criteria even with fear-of-failure partialled out. No research as yet seems to have included both investment and avoidance measures in the same study.

### **Toward Improved Assessment: A Summary**

The preceding sections lay out our selection of important old and new conative constructs. We think these constructs and their interrelationships deserve research in instructional psychology because they represent important influences on learning and development in instructional situations and also because they themselves often represent intended or unintended goals and outcomes of instruction. A continuing focus for research aimed at either point needs to be the elaboration and deepening of definition and validation of each construct in relation to proximal others. This research, however, also badly needs improved assessment techniques. This brief concluding section therefore offers a summary of some lines of development toward improved measurement, with some added notes on related methodological issues.

Perhaps the first need for further work is to collect in one place what is known about questionnaire design, the strengths and weaknesses of different formats, the need for controls on different response styles, etc. So many of today's measures rely on questionnaires developed and used without adequate evaluation that a comprehensive review of this technology seems a logical place to start.

A related need is for review of the accumulated literature on particular assessment techniques and the contrasts between them. Spangler's (1992) review of TAT versus questionnaire measures of achievement motivation, noted above, provides an invaluable addition to the construct validity argument. Other accumulations of research on particular techniques, such as Smith's (1992) handbook on the TAT, are also extremely valuable. Expanding the catalogue of constructs, measures, and directly related studies beyond that now available (e.g., as in Robinson, Shaver, & Wrightsman, 1991, and Snow & Jackson, 1992) is itself a useful early step.

But these reviews will suggest new lines of research that should advance and perhaps radically alter current approaches to assessment. One example is the work of Kline (1973) aimed at producing an information processing account of responses to some forms of projective assessments. Another line has sought to build process models of response to conventional personality inventory items and to analyze the subjective meaning of such items for different persons (see, e.g., Cliff, 1977; de Boeck, 1978, 1981; Rogers, 1973).

A particularly important advance may come from a computer-based free-response technique developed by a team of Belgian researchers (Claeys, de Boeck, van den Bosch, Biesmans, & Bohrer, no date). The free self-report gives the respondent only this instruction: "Describe your personality as completely as possible, using any personal adjectives you choose. Do not say how you want to be, but say how you really are. Try to use words of common usage." The adjectives are then scored for various personality dimensions, using a computerized dictionary of adjectives and system of weights for each of the personality dimensions, based on expert judgments previously obtained. A series of studies compared this free-response instrument with conventional, fixed-format personality measures. Both a traditional inventory and a fixed list of adjectives for self-rating were used; each represented personality dimensions

such as extraversion, agreeableness, conscientiousness, and neuroticism. The order of administration of fixed- and free-response instruments was also varied.

The results suggested that the validity of all of the personality measures may be substantially increased when a free-response self-description instrument is administered first in a battery including other, conventional instruments. Predictive validity coefficients were substantial with this order and near zero for the opposite order. These trends were strong in two studies with college students. Even in a study with military personnel, where the validity differences might be expected to be attenuated by several factors, the trend was notable at least for achievement motivation and self-confidence dimensions. The interpretation is that the free-response condition first activates the respondent's personal knowledge structure so that the content of active or working memory is enlarged and intensified in a state of free, self-focused attention. The effect is to improve the validity of the person's responses both to free-format instruments and to the fixed-format inventories that follow. When not preceded by free recall, conventional inventories, rating scales, and questionnaires may appear circumstantial, so response to them may be impulsive, superficial, and less valid.

The possibility that the personal knowledge structure that individuals bring to bear in self-reports of personality can be activated by free recall to increase the validity of ensuing reports deserves much further research. The rationale of conventional questionnaires is that individuals will reveal their personalities by recognizing themselves as fitting in some degree statements composed by researchers. Such an approach essentially ignores the individuality of personal self-concepts, as well as the possibility that such self-knowledge may not routinely be consciously available. Free response, on the other hand, allows individuality of response and may also provide a more intensive conscious search of personal knowledge. The free-recall form of reporting personal conceptions is also akin to the open-ended self-report methods used in cognitive research on learners' conceptions of their own learning in particular instructional situations. And computerization of the technique makes it easily used as well as applicable to more focused domains than general personality dimensions. One can imagine descriptor systems designed along the lines of the Belgian free self-report, but focused on learning-related motivations, interests, perceptions, and action tendencies, as well as learning activities in particular situations. It might even be possible to collect such scaled descriptions periodically during learning from

instruction. The coordination of these lines of research might produce a richer and more integrated view of the cognitive and conative psychology of personal knowledge, as well as practical improvements in assessment technology.

The computer performance task developed by Kuhl, as already noted, is an innovative prototype for many possible performance-based assessments of conative constructs. There have been occasional attempts to develop performance tests and other objective measures in the history of personality research (Cattell & Warburton, 1967; Eysenck & Eysenck, 1985; Kline, 1973; Kline & Cooper, 1984; Strelau, 1983). We believe much basic research is needed in this direction.

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