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Seventy-five years of motivation measures (1930–2005): A descriptive analysis

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Abstract The literature on motivational measures from 1930 to 2005 is reviewed. First, major theoretical models in the area are discussed. Next, a search of PsycINFO is reported for the most frequently employed measures of motivation, with additional support from an SPSP Listserv query of researchers. From this, a diverse group of measures is sorted into various categories, including general scales, context-specific scales (e.g., schooling, work, athletics), and new scales of significance. Then, a descriptive taxonomy of measures in the field of motivation is suggested in order to synthesize ideas about measurement scales. Suggestions are offered for further research in motivational measurement.

Keywords Motivation · Motives · Psychological tests · Review · Personality

Introduction

Motives help to develop an individual's psychic energy and to guide the person toward important tasks and goals. Sigmund Freud began his analysis of human personality with a focus on sexual and aggressive motives (though, in the terminology of the time, he referred to them as instincts; e.g., Freud 1915/1963, 1920/1950). The contribution of an individual's learning to his or her motivation also was recognized (Allport 1937; Dewey 1916). In 1938, when Henry Murray and members of the Harvard Guidance Center published *Explorations in Personality*, they viewed motivation as central to understanding what the person does and how the person acts (Murray 1938). Over the 20th century and into the 21st, theories of motives, and how those motives were measured, have continued to diversify and broaden (Deci and Ryan 2000).

A key element of any field of psychological study is how the target concept is measured. Measurement defines the limits and progress of a field, demarcating what the psychologist can study, and, simultaneously, reflecting current thinking about a topic. Motivational measurement has flourished since the first standardized measures of motives were introduced. For example, a search of PsycINFO for the terms *motivational measure*, *motivation scale*, or *motivation test* indicates that from the 1930s to the 1970s, studies measuring motives rose from 111 to 3,086 per decade (.002–.011% of all indexed psychology articles), and then rose more slowly from the 1970s to the present, with just over 5,220 such studies in the 1990s—falling to .008% in percentage terms (see Fig. 1; June 5, 2005 from PsycINFO).

This article examines the measures of motivation that psychologists employ, and how those measures can be described. The area has not had a review of measures in some time. For example, a search of PsycINFO for motivation measures (or scales, or tests), and the word ''review'' yielded no relevant articles since a review by Clarke (1973) more than 30 years ago (June 13, 2005, from PsycINFO). Given that gap, a renewed conversation about measurement must begin one step at a time. One good first step is to provide a rough survey of the measurement activity going on in the field today.

To initiate this process, we have surveyed some commonly used scales in the area. Any survey approach is prone to various limitations concerning its accurate representation; for that reason, we will make no claims as to the

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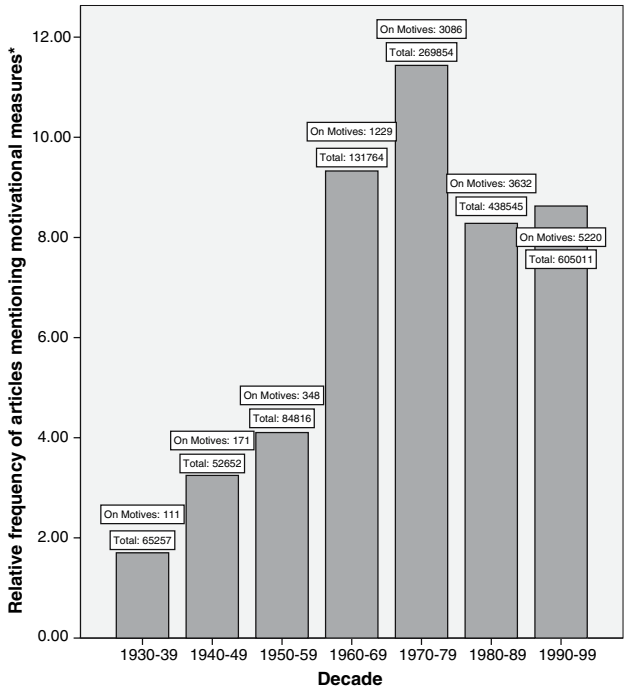

Fig. 1 A decade-by-decade look at number of studies on motivation measurement as compared with the total number of psychology publications. * Denotes relative frequency shown is the frequency of motivational articles times 1,000 divided by the total number of articles in PsycINFO

most important scales in the area (although we will employ a rough index of test usage as we proceed). Rather, we will focus on what the pattern of scales and scale types tell us about the area. We hope this article may provide a jumping-off point to stimulate others' theoretical and empirical work regarding measurement in the area.

The first major section of the article, ''The Evolving Understanding of Motivation and Its Measure,'' sketches the development of a few key motivational ideas and measures through the 20th century. Following that, ''Measures of Motivation and Trends in Measuring Motives'' details information-gathering techniques we used to identify some of the trends in scale utilization relevant to motivation. This section also presents tables of motivational tests presently in use. The third section of the article, ''Motivational Measures: A Descriptive Analysis,'' summarizes findings from the survey and provides a descriptive view of measures of motivation that may facilitate thinking about approaches to measurement. A final Discussion section follows.

We think of this article as providing a first statement in a renewed conversation about measurement in motivation. Measurement in the motivation area is important not only for motivation researchers themselves, but also because of the issues that the area's findings raise for the different ways of assessing any part of personality. The careful study of both individual motives (e.g., *n* Achievement) and multiple motives, as well as the various ways that they have been measured (e.g., thematic and self-judgment), and the integration of those motives within personality (e.g., intrinsic motivation), make a rich area for the consideration of how such a key personality attribute should be assessed.

The evolving understanding of motivation and its measure

Twentieth century beginnings

The study of motivational measures can be better appreciated in the context of a basic sketch of motivational concepts and their measurement as developed through the 20th century. Two powerful influences on American psychology in the early 20th century were psychodynamic theory and behaviorism. Both these perspectives initially focused psychologists' attention on biological urges as the foundation of human needs. Working in Vienna, and employing an evolutionarily-informed perspective, Sigmund Freud initially argued that all of human motivation was predicated on reproduction and its psychological manifestation, *libido*—people's instinctual urges for sex and pleasure (Freud 1915/1963). After considering human's destructive capacity in the wake of the First World War, however, he paired libido with *thanatos*—people's urge for aggression and death (Freud 1920/1950). In Russia, meanwhile, Ivan Pavlov's research focused psychologists on the motivating power of unconditioned stimuli. Simple physiological necessities such as food, drink, and safety were seen as the basis for directed behavior (Ryan and Deci 2000a).

Viewpoints on motivation, however, quickly broadened beyond a strictly biological focus. For example, one line of research focused on the individual as a locus of his or her own motivation: John Dewey published *Democracy and Education*, in which he contended that school children were more motivated by their present interests than by any promise of future rewards for learning (Dewey 1916); moreover, Harlow's (1953) primate research argued for the existence of a self-directed curiosity motive. A second line of research, spearheaded by operant-learning theorists, focused on how external rewards motivated behavior. These two lines of work together anticipated the modern distinction between intrinsic motivation, in which a person does things for reasons of personal fulfillment, and extrinsic motivation, in which a person does things out of concern for external controls or consequences (e.g., Wegener 1956; White 1959).

Murray, the Harvard Psychological Clinic, and the Thematic Apperception Test

By 1934, the 27 members of the *Harvard Psychological Clinic* in Boston, including Henry Murray, Eric Homberger (later Erik H. Erikson), Christiana Morgan, and R. Nevitt Sanford, published *Explorations in Personality* (Murray 1938), in which they listed, with some variations, 20-plus human needs and motives, based on their in-depth study of 51 male participants (Murray 1938, p. xi). Their study included some of the first measures of motivation, including the Thematic Apperception Test (TAT; Murray 1943).

On the Thematic Apperception Test, people responded to cards featuring ambiguous pictures by telling stories about the characters and situations they saw. The examiners then drew conclusions about the test-taker's motivations from the nature of their stories; for example, an individual who told stories involving challenges and meeting standards of excellence would be judged as possessing a high need for achievement. The TAT could be scored for motives in a number of different ways. Originally, Murray and his colleagues focused on 20 or more specific needs. These specific motives were typically drawn from the Harvard Psychological Clinic lists (Murray 1938). Examples include *n* Achievement, *n* Succorance, *n* Play, and many others. Murray argued that these needs were psychologically acquired rather than physiologically innate (Deci and Ryan 2000).

Later, McClelland distilled Murray's needs into three broad classes: the needs for *achievement*, *power*, and *affiliation* (McClelland et al. 1953, pp. 114–116). Although the TAT is only a data gathering device, the TAT and a scoring system together can be considered as making a measurement instrument or test (Smith et al. 1992).

Self-judgment measures of Murray's needs

A basic idea behind the TAT was that people's motives were expressed thematically, through habitual ways of thinking about matters rather than via conscious self-awareness. The purpose of the TAT and similar scales was to circumvent a person's conscious self-judgments which might be inaccurate, or which the person might be reluctant to share honestly.

Others, however believed that self-judgment of such needs was a potentially viable approach. Edwards sought to correct for people's tendency to present their motives in a socially desirable light. His scale, the Edwards Personal Preference Schedule (EPPS), forced test-takers to choose between two alternatives, roughly matched for their desirability (Edwards 1959). For example, test-takers reported their motives by choosing between two options such as: (a) ''I like to show a great deal of affection toward my friends,'' and (b) ''I like to be regarded by others as a leader'' (Edwards 1959).

Later, scale-makers reasoned that even more direct queries might work better than had been supposed. The Personality Research Form (PRF; Jackson 1987) is a self-judgment test of 20 motives based on Murray's needs theory, and also includes scales to monitor social desirability and infrequency of response. Factor analyses of the PRF have generally confirmed the Murrayan nature of the test (e.g., Fowler 1986; Helmes and Jackson 1977; Lorr and Seifert 1977; Stricker 1974). Some of its true-false items include, ''People consider me a serious, reserved person'' (a reverse-scored measure of Play) and ''There is no excuse for a messy desk'' (Order) (Jackson 1987).

Motivational dynamics in the mid-20th century

By the mid-20th century, interest in the dynamic interaction, expression, and sources of motives had increased: Maslow (1943) proposed a new set of needs arranged in a hierarchy, including safety, esteem, and self-actualization; built into this was the idea that some needs were developmentally primary. Self-judgment scales later arose to measure Maslow's approach, such as the Porter Need Satisfaction Questionnaire (see Imparato 1972).

Another group of researchers departed from Murray's motive-by-motive measurement approach to examine a person's sources of motives, incentives acting upon the person, and the expectancy of a reward (Deci and Ryan 2000; Rotter 1990; Vroom 1964). deCharms (1968) proposed a ''perceived locus of causality'' along these lines: on the one hand, a person might feel that she initiated certain actions; on the other, she might believe herself to be a pawn in the machinations of others (Rigby et al. 1992; Ryan and Deci 2000a). A person's perceived locus of causality eventually became central to Self-Determination Theory (SDT)—an approach to understanding how intrinsically motivated an individual may be. A whole family of measures has emerged from SDT, many focusing on needs for competence, autonomy, and relatedness (Ryan and Deci 2000a, b).

The General Causality Orientation Scale (Deci and Ryan 1985) provides a measure of the forces a person perceives as initiating or regulating their actions. The scale contains 12 vignettes such as, ''You have been offered a new position in a company where you have worked for some time.'' The test-taker is then asked to choose one of three selections that most represents how they would think about the situation. A choice of ''I wonder if the new work will be interesting?'' is said to reflect a sense of making one's own choices. Choosing ''Will I make more at this position?'' reflects a focus on external rewards, whereas ''What if I can't live up to the new responsibility?'' reflects a

perception that events often are out of one's control (Deci and Ryan 1985, p. 118).

These are just a few of the motivational pursuits and measures that were developed in the past 75 years. There were, in addition, a number of variations based on them, including developmental instruments—that is, for children—and instruments focused on particular settings. One scale that illustrates both of these ideas is the Children's Academic Intrinsic Motivation Inventory (CAIMI; Gottfried 1985) which measures academic motives among children.

Contemporary conceptions of motives and motivational dynamics

If there is a consistent theme underlying the motivational concepts and measures discussed so far, it is that motivation involves the organization of needs and goals within the personality system; that is, it concerns the organized pursuits of the individual (Koch 1951). It is worth noting that motivation is also studied in adjoining disciplines, including comparative and evolutionary psychology, learning theory, and social incentives (e.g., Mook 1996). Focusing on personality-related motivation, Ferguson (1994, p. 429) defines motives as the ''why'' of behavior, ''referring to internal states of the organism that lead to the instigation, persistence, energy, and direction of behavior'' (cf. Kassin 1998; King and Emmons 2000; Shuman 2003; Wood and Wood 1999). A suggestion from McClelland (1987, p. 590) was that motivation involves ''a recurrent concern for a goal state based on a natural incentive—a concern that energizes, orients, and selects behavior...''. Ryan and Deci (2000a, p. 54) characterize motivation as being ''...*moved* to do something.... Orientation of motivation concerns the underlying goals and attitudes that give rise to action—that is, it concerns the why of actions...''. Definitions such as these provide a useful backdrop for examining how motives and motivation are measured.

Measures of motivation and trends in measuring motives

The above characterizations of the different motivational measures and approaches provide a starting point for understanding how human motivation has been (and can be) assessed. To progress beyond this point, however, requires a firmer grasp of what further measures actually are used in the area. To accomplish this, we employed several information-gathering techniques intended to provide a general picture of the tests and usage trends of contemporary motivation measurement.

Information gathering techniques

Obtaining scale names

The first research method relied on searching several key databases; we searched PsycINFO, *Tests in Print* (Murphy et al. 2002), and *Buros Mental Measurements Yearbook* (Buros 1978; Plake et al. 2003) in detail for motivation measures. Our goal was to create a list of scales that have been regularly used or recently introduced in the motivation area. Our procedure can be summarized as follows (see Appendix for more details).

First, we identified the names of approximately 230 tests potentially related to motivation through various search techniques. Certain among the 230 tests were more related to motivation than others, and we then narrowed the list to the 155 scales arguably most relevant to motivation (guided by the conceptions of motives described in the ''Evolving Understanding of Motivation'' section).

Further information from PsycINFO

We further employed PsycINFO to understand the research impact of a measure. Using a research study on a test as a ''vote'' for the potential significance of the scale, we further reduced the list by assessing which tests had research work conducted on them. In order to do this, we again searched PsycINFO with the full name of the test. Readers should be aware that the numbers may underestimate certain tests' frequency of use if the test is commonly only referred to by an acronym.

In addition, this information-gathering approach likely undercounted innovative measures that were used repeatedly in laboratories but were, perhaps, unnamed, or not yet more widely distributed. To compensate for this limitation, we sought information from a further source.

Survey of SPSP Listserv members

Our survey of PsycINFO could help determine the most widely employed scales over the past 75 years, but might miss some atypical historical scales, and certainly might overlook more recent innovations. To address this issue, we surveyed members of the Society for Personality and Social Psychology (SPSP) Listserv on October 27, 2006. In our e-mail message we explained that we were preparing a review of measures of motivation and asked:

> What do you consider to be the most important measures (i.e., tests and scales) of motivation, either historically, or in use today? If you could write a brief phrase or note as to why you have nominated a given scale or scales, that would be helpful as well.

In the same message, we defined ''important measures'' as possessing either an historical, theoretical, empirical, and/or applied significance.

In all, we received 19 valid messages to our query over the next 2 weeks. A subgroup of 17 respondents gave permission to summarize their remarks specifically for this paper, including a number of individuals whom generally would be regarded as leading researchers in the motivation area. The responses differed substantially in their form but many of the experts suggested individual scales or groups of scales that we describe next.

Findings about motivational measures

Widely used scales

General measures of motivation: We first examined the most widely studied scales from PsycINFO and divided them into several categories. The first of these included general measures of motivation (see Table 1). As indicated in Table 1, the most frequently employed general motivation scale, at over 1,791 studies, is the Thematic Apperception Test (Murray 1943). This figure, however, represents somewhat of an over-count. Recall that the TAT must be paired with a motivation-scoring system to measure motivation; the TAT is also widely used in clinical psychology. Even with that reservation, the TAT is inarguably central to much interesting work in the motivational area (e.g., Cramer 1996; McClelland et al. 1989; Winter 1973).

The second and third most frequently used scales are two self-judgment scales: the Personality Research Form (PRF; Jackson 1999) and Edwards Personal Preference Schedule (EPPS; Edwards 1959). The use of the EPPS, however, has fallen off sharply in the last few decades (see 25-year intervals in Table 1).

Table 1 further indicates that the top six general scales of motivation measure either a number of Murray's specific needs (referred to as *classic motives* in the ''major scales'' column of the table), or McClelland and Atkinson's revised focus on the needs for achievement, power, and affiliation (referred to as *revised motives*).

Deci and Ryan's (1985) General Causality Orientation Scale—seventh on the list—is the first scale there that focuses on motivational dynamics—in this case, the degree to which motives are experienced as self-determined. The scale's usage rank is impressive given its relatively recent introduction. A number of more recent tests now include scales of intrinsic and extrinsic motivation as well, such as the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich et al. 1993), the Work Preference Inventory (WPI; Amabile et al. 1994), and the Motivation Sources Inventory (MSI; Barbuto and Scholl 1998). These have been designated as measures of *motivational locus* in the tables.

Motives in context and specific motives

Tables 2–4 represent motivational measures keyed to specific contexts: work (Table 2), school/academic (Table 3), or athletic performance (Table 4). The motives measured in some contexts vary from those represented by the most general measures. For example, at least two work-related scales employed Maslow's need hierarchy: Cunningham and Wakefield's (1975) Work Motivation Inventory, and the Porter Need Satisfaction Questionnaire (see Imparato 1972); these scales were labeled as measuring *motivational hierarchies* (see Table 2). Finally, another special class of scales arose that measured only a single motive—typically the achievement motive (Table 5).

Other findings concerning widely used scales

A comparison of Table 1's general measures to Tables 2–5's more context-sensitive measures indicates that motivational measurement has become more specialized over time. The social-cognitive perspective on personality emphasizes that traits, including motivational traits, will vary from context to context (e.g., Cervone et al. 2001; Mischel and Shoda 1995). Whereas from 1956 to 1980, the use of general vs. specific tests was about equal (with a use ratio of around 1:1), from 1981 to 2005 general tests were used only a third as much as specific tests (a use ratio of around 1:3).

Many tests can be found in these specific motivation areas. Academic motivation tests such as the Motivated Strategies for Learning Questionnaire (Pintrich et al. 1993) are now commonly used (see Table 3), as are work motivation tests such as the Job Diagnostic Survey (JDS; Hackman and Oldham 1975; see Table 2) and athletic motivation tests, such as the Task and Ego Orientation in Sport Questionnaire (TEOSQ; Duda et al. 1995; see Table 4).

Newer tests of importance

The experts from the SPSP Listserv in general pointed out the most widely used tests above, mentioning particularly the TAT, PRF, and General Causality Orientations Scale as being important, both historically and today (e.g., Deci and Moller 2005; Deci and Ryan 1985, 2000; Jackson 1987; McClelland 1985; McClelland et al. 1953; Murray 1943; Rousseau and Vallerand 2000; Ryan and Connell 1989; Ryan and Deci 2000b; Sheldon 2004; Smith et al. 1992; Winter 1973). Most of their comments, however, focused on newer measures. Table 6 represents a number of the

Table 1 Tests of general motivation

Test name	Type of test	Number of hits				Major scales	Key reference in PsycINFO
		Interval I (1930–1955)	Interval II (1956–1980)	Interval III (1981–2005)	All intervals		
Thematic Apperception Test (TAT)	Projective	326	545	920	***1,791****	*Revised motives:* achievement, power, affiliation (McClelland scoring)	Murray (1943)
Personality Research Form (PRF)	Self-judgment	–	197	337	***534***	*Classic motives*: abasement, achievement, affiliation, aggression, autonomy, change, dominance, 15 others	Jackson et al. (1996)
Edwards Personal Preference Schedule (EPPS)	Self-judgment	1	408	114	***523***	*Classic motives*: achievement, deference, order, exhibition, autonomy, 10 others	Edwards (1959)
Geist Picture Interest Inventory (GPII)	Projective	–	20	1	***21***	*Other motives*: occupational choice motives and personality characteristics (assessed by triads of pictures).	Geist (1959)
Motivation Analysis Test (MAT)	Self-judgment	–	6	12	***18***	*Other motives*: motivational resources and areas of dynamic conflict (e.g., home, fear, career, superego, mating, assertiveness)	Cattell et al. (1963)
Life Styles Inventory	Self-judgment	–	–	17	***17***	*Other motives*: 12 personal lifestyle and thinking patterns based on people/ security, satisfaction, and task/security	Cooke and Rousseau (1983)
General Causality Orientations Scale	Self-judgment	–	–	13	***13***	*Motivational locus*: autonomy, control, and impersonal causality orientations	Deci and Ryan (1985)
Motivation Sources Inventory (MSI)	Self-judgment	–	–	8	***8***	*Motivational locus*: intrinsic processes, instrumental motivation, external and internal self-concept-based motivation, and goal internalization	Barbuto and Scholl (1998)
Children's Motivation Analysis Test (CMAT)	Self-judgment	–	–	7	***7***	*Other motives*: biological drives and culturally-driven motives in young children: curiosity, play, school/home orientation, etc	Boyle et al. (1988)
Situational Motivation Scale (SIMS)	Self-judgment	–	–	4	***4***	*Motivational locus*: situational intrinsic motivation, identified regulation, external regulation, amotivation	Guay et al. (2000)
Multi-Motive Grid (MMG)	Projective	–	–	3	***3***	*Revised motives*: hope of affiliation, fear of power, hope of success, fear of rejection, fear of failure, hope of power	Sokolowski et al. (2000)

* This number includes non-motivational measurement uses of the Thematic Apperception Test

Table 2 Specific area tests: work motivation

Test name	Number of hits				Major scales	Key reference in PsycINFO
	Interval I (1930–1955)	Interval II (1956–1980)	Interval III (1981–2005)	All intervals		
Minnesota Satisfaction Questionnaire (MSQ)	–	40	220	***260***	*Other motives*: 21 scales (long form) or 3 scales (short form) of employee performance motives and job satisfaction	Weiss et al. (1967)
Job Diagnostic Survey (JDS)	–	36	174	***210***	*Other motives*: designed for employee enrichment motivation and productivity	Hackman and Oldham (1975)
Minnesota Importance Questionnaire (MIQ)	–	37	30	***67***	*Other motives*: 16 scales of vocational needs and abilities	Weiss et al. (1964)
Miner Sentence Completion Scale (MSCS)	–	20	23	***43***	*Other motives*: management attitudes and potential	Miner (1971)
Manifest Needs Questionnaire (MNQ)	–	6	32	***38***	*Classic motives*: achievement, affiliation, autonomy, and dominance in work milieu	Steers and Braunstein (1976)
Porter Need Satisfaction Questionnaire (PNSQ)	–	19	12	***31***	*Motivational hierarchy*: fulfillment of needs: security, social, esteem, autonomy, self-actualization	Imparato (1972)
Work Preference Inventory (WPI)	–	–	17	***17***	*Motivational locus*: intrinsic motivation (challenge and enjoyment) and extrinsic motivation (compensation and outward)	Amabile et al. (1994)
Work Motivation Inventory (WMI)	–	3	6	***9***	*Motivational hierarchy*: Maslow's hierarchy of needs in work setting: basic, safety, belonging, ego status, self-actualization	Cunningham, Wakefield and Ward (1975)
Work Preference Questionnaire (WPQ)	–	2	3	***5***	*Revised motives*: managerial work achievement (24 forced-choice pairs)	Fineman (1975)
Workaholism Battery	–	–	3	***3***	*Other motives*: work involvement, enjoyment, and drive	McMillan et al. (2002)
Career Advancement Ambition Scale	–	–	2	***2***	*Other motives*: professional motivation (job satisfaction, withdrawal intentions, commitment and ambition)	Desrochers and Dahir (2000)

Table 3 Specific area tests: academic motivation

Test name	Number of hits				Major scales	Key reference in PsycINFO
	Interval I (1930–1955)	Interval II (1956–1980)	Interval III (1981–2005)	All intervals		
Motivated Strategies for Learning Questionnaire (MSLQ)	–	–	69	***69***	*Motivational locus*: 15 scales of strategies for college students measuring cognitive and motivational components of learning and resource management	Pintrich et al. (1993)
School Motivation Analysis Test (SMAT)	–	14	17	***31***	*Classic motives*: 15 drive factors from Cattell: fluid and crystallized intelligence	Cattell et al. (1963)
Self-Concept and Motivation Inventory (SCAMIN)	–	10	15	***25***	*Other motives*: self-concept in children relating to school: achievement investment, failure avoidance, role expectancy and self-adequacy	Drummond and McIntire (1975)
Academic Motivation Scale (AMS)	–	–	21	***21***	*Motivational locus*: 7 subscales measuring intrinsic motivation, extrinsic motivation, and amotivation in education	Vallerand et al. (1992)
School Attitude Measure(s) (SAM)	–	–	15	***15***	*Other motives*: school motivation, academic self-concept, and student performance	Dolan (1983)
Children's Academic Intrinsic Motivation Inventory (CAIMI)	–	–	11	***11***	*Motivational locus*: intrinsic motivation for reading, math, social studies, science, and general learning	Gottfried and Gottfried (1996)
Academic Competence Evaluation Scale (ACES)	–	–	3	***3***	*Other motives*: academic and interpersonal skills, academic motivation, participation, and study skills (60 items)	DiPerna and Elliott (1999)
Motivation for Reading Questionnaire	–	–	3	***3***	*Other motives*: 11 dimensions concerning motivation to read, self-efficacy, and engagement	Baker and Wigfield (1999)

Table 4 Specific area tests: athletic motivation

Test name	Number of hits				Major scales	Key reference in PsycINFO
	Interval I (1930–1955)	Interval II (1956–1980)	Interval III (1981–2005)	All intervals		
Task and Ego Orientation in Sport Questionnaire (TEOSQ)	–	–	64	***64***	*Motivational locus*: dispositional differences in goal perspectives in sport contexts	Duda et al. (1995)
Sport Orientation Questionnaire (SOQ)	–	–	34	***34***	*Other motives*: competitiveness and achievement orientation; motive for participation	Gill et al. (1988)
Sport Motivation Scale (SMS)	–	–	22	***22***	*Motivational locus*: 7 subscales for measuring intrinsic motivation (stimulation), extrinsic motivation (regulation), and amotivation in sports	Pelletier et al. (1995)
Perceived Motivational Climate in Sport Questionnaire (PMCSQ)	–	–	17	***17***	*Motivational locus*: 2 subscales of mastery-orientation (enjoyment and effort) and performance-orientation (ability and success).	Seifriz et al. (1992)
Sport Fan Motivation Scale (SFMS)	–	–	9	***9***	*Other motives*: 8 motives of sports fans: entertainment, aesthetic, group affiliation, etc	Wann et al. (1999)
Participation Motivation Inventory	–	–	8	***8***	*Other motives*: sport motive structures; e.g., fun, fitness, skill improvement, team atmosphere, and challenge (30 items)	Gould et al. (1985)
Test of Performance Strategies (TOPS)	–	–	4	***4***	*Other motives*: psychological skills usage in competition and practice situations	Fletcher and Hanton (2001)
Sports Imagery Questionnaire (SIQ)	–	–	3	***3***	*Other motives*: motivational and cognitive functions of the use of imagery in sports (46 items)	Hall et al. (1998)

Table 5 Tests focusing on one motive or one motivational area (general and specific)

Test name	Number of hits				Major scales	Key reference in PsycINFO
	Interval I (1930–1955)	Interval II (1956–1980)	Interval III (1981–2005)	All intervals		
Fear of Success Scale (FOSS)	–	9	38	***47***	*Other motives*: motive to avoid success (27 items)	Zuckerman and Allison (1976)
Motivation Assessment Scale (MAS)	–	–	31	***31***	*Other motives*: motivation for problem behavior in those with autism and other developmental disorders	Durand and Crimmins (1988)
Self-Motivation Inventory (SMI)	–	1	26	***27***	*Other motives*: motivation to be physically active and to exercise (40 items)	Dishman et al. (1980)
Achievement Motives Scale (AMS)	–	3	21	***24***	*Revised motives*: achievement subscales (approach success and avoid failure)	Nygard and Gjesme (1973)
Prestatie Motivatie Test (PMT)	–	12	7	***19***	*Revised motives*: self-reported measures of achievement and success-seeking	Hamilton (1974)
Achievement Motivation Questionnaire (AMQ)	–	3	5	***8***	*Revised motives*: McClelland's concept of achievement	Lynn (1969)
Measures of Achieving Tendency	–	3	4	***7***	*Revised motives*: achievement tendency and task orientation (38 items)	Mehrabian and Bank (1978)
Motivation to Control Prejudiced Reactions Scale (MCPRS)	–	–	5	***5***	*Other motives*: individual control of prejudiced reactions	Dunton and Fazio (1997)
Motivation Toward the Environment Scale (MTES)	–	–	5	***5***	*Other motives*: environmentalism motive	Pelletier et al. (1998)
Achievement Goals Questionnaire	–	–	3	***3***	*Revised motives*: achievement goals; motivation to avoid failure	Elliot and Sheldon (1997)
Self-Injury Motivation Scale (SIMS)	–	–	3	***3***	*Other motives*: motivation to self-injure	Osuch, Noll and Putnam (1999)

Table 6 Families of newer tests having current significance

Scale category	Name of scale (or area of measurement)	Relevant references
Outgrowths of Current Scales	(From the TAT) Picture Story Exercises (PSE)	Brunstein et al. (1998); Heckhausen and Gollwitzer (1987), Schultheiss (in press)
	(From the TAT) Multi-Motive Grid (MMG)	Sokolowski et al. (2000)
	(From the GCOS) Various related scales	See http://www.selfdeterminationtheory.org
Biological bases of motives	Regulatory Focus Questionnaire (RFQ)	Cesario et al. (2004), Higgins et al. (2001)
	Behavioral Inhibition System/Behavioral Activation System (BIS/BAS) scales	Carver and White (1994)
Individual's current concerns and endeavors	Personal Projects Analysis	Little (1983)
	Personal Strivings assessment	Emmons (1986)
	Concern Dimensions Questionnaire/Personal Concerns Inventory/Motivational Structure Questionnaire	Cox et al. (2003), Cox and Klinger (2004), Klinger et al. (1980), Roberson et al. (1989), Sellen et al. (2006)
The self as motivator	Self-monitoring	Gangestad and Snyder (2000), Snyder (1974)
	Motivational primacy: individual vs. collective self	Gaertner et al. (1999, 2002), Sedikides et al. (2004)
Social psychology-related motives	Need for cognition	Cacioppo et al. (1996)
	Need for closure	Webster and Kruglanski (1994)
	Need for uncertainty	Sorrentino et al. (1995)
	Need for uniqueness/independence	Singelis et al. (1999)
	Need for structure	Moskowitz (1993), Neuberg and Newsom (1993)
	Authoritarianism	Kemmelmeier et al. (2003)
	Desirability of Control Scale	Burger and Cooper (1979), DeNeve and Cooper (1998)
	Motivation to Control Prejudiced Reactions Scale (MCPRS)	Dunton and Fazio (1997), Plant and Devine (1998), Fazio and Olson (2003)
	Fear of social rejection	Mehrabian (1994)
Implicit attitudes and other implicit measures	Implicit Association Test/Implicit Attitudes Scale	Greenwald et al. (2002, 1998), Olson and Fazio (2004)
	Emotion Stroop test	Williams et al. (1996)
Values and motives	Circumplex Scales of Interpersonal Values (CSIV)	Horowitz et al. (2006), Locke (2000)
	Schwartz Value Survey Potrait Values Questionnaire	Schwartz and Bilsky (1990)

scales the respondents measured, categorized in ways that also reflect their commentaries and suggestions.

The first group of measures involve outgrowths of already-existing tests represented on the PsycINFO list. These included outgrowths of the TAT, including the Picture-Story Exercises (PSE; Brunstein et al. 1998; Heckhausen and Gollwitzer 1987; Schultheiss in press) and the Multi-Motive Grid (Sokolowski et al. 2000), as well as outgrowths around Self-Determination Theory and the General Causality Orientations Scale (Deci and Ryan 1985; see http://www.selfdeterminationtheory.org for further measures).

A second group of scales involves ''biological bases of motives,'' i.e., scales that address a person's general responses to rewards and punishments; these include the Regulatory Focus Questionnaire, which concerns styles of approaching pleasure and avoiding pain, and the Behavioral Inhibition System/Behavioral Activation System Scale (RFQ; Cesario et al. 2004; Higgins et al. 2001; BIS/BAS scales; Carver and White 1994).

The third group of scales shown focus on a person's current concerns and endeavors. These include scales that grew out of Little's (1983) Personal Project Analyses, Klinger's work on current concerns (Cox et al. 2003; Cox and Klinger 2004; Klinger et al. 1980; Roberson et al. 1989; Sellen et al. 2006), and Emmons' (1986) Personal Strivings assessment.

Several respondents drew our attention to a fourth new category of scales focused on the self and its role in motivation. For example, self-monitoring can be viewed as a motivational dynamic (Gangestad and Snyder 2000; Snyder 1974), as can viewing oneself as an individual or as part of a collective (e.g., Gaertner et al. 1999, 2002; Sedikides et al. 2004).

We were not surprised (given that our respondents were drawn from the Society for Personality and Social Psychology Listserv) to be reminded of a group of motivations of particular interest to social psychologists including the needs for cognition (Cacioppo et al. 1996), for uncertainty (Sorrentino et al. 1995), authoritarianism (Kemmelmeier et al. 2003), the Desirability of Control Scale (Burger and Cooper 1979; DeNeve and Cooper 1998) and the motivation to control prejudiced reactions (e.g., Dunton and Fazio 1997; Plant and Devine 1998; see also Fazio and Olson 2003), among others (see Table 6).

Some of the suggested scales involve the role of implicit attitudes in motivation. These implicit measures include the Implicit Associations Test (Greenwald et al. 1998; Olson and Fazio 2004) and the Emotion Stroop test (Williams et al. 1996).

A final group of recommendations involved scales of values. Values and motives have frequently been linked in the psychological literature (Allport et al. 1960). Although we are uncertain about why values are more closely related to motives than, say, emotions, we include some representative nominated scales as the sixth group in the table, for example, the Circumplex Scales of Interpersonal Values (CSIV; Horowitz et al. 2006; Locke 2000), the Schwartz Value Survey and Portrait Values Questionnaire (Schwartz and Bilsky 1990).

Trends and lists can only take us so far in an appreciation of these measurement instruments, however. Trying to describe this wide diversity of measures, from the most used to the most contemporary examples, can help satisfy our own motive to reduce our cognitive load.

Motivational measures: a descriptive analysis

After compiling our lists of motivational measures, we considered several alternatives for organizing measures in the area. We ultimately were drawn to a two-part conception that provided a reasonable fit to the wide diversity of scales available while keeping the complexity of the descriptive system in check. This model involved a basic division of the measurement scales into two areas: (a) what the tests measure, and (b) how they measure what they do. No model can capture the full complexity of the tests; this model, however, may provide a reasonable representation of the diversity of scales.

What the motivational tests measure

Perhaps no aspect of measurement is as central to a test as its content, or *what* is measured. Although one might assume that all motivation scales measure motives, this is simply not the case. Some scales measure motivational dynamics; others, the self as a motivator, and still others, para-motivational features such as values.

Figure 2 illustrates one possible division of motivational measures into four broad areas. The first, or leftmost, area concerns general, or Murrayan, motives. These include Murray's original needs such as those for acquisition, play, and harmavoidance (Murray 1938), as well as needs that grew from Murray's work—such as the need for intimacy—and the ''big needs'' of McClelland, such as the Achievement, Power, and Affiliation motives (McClelland et al. 1953; Smith et al. 1992).

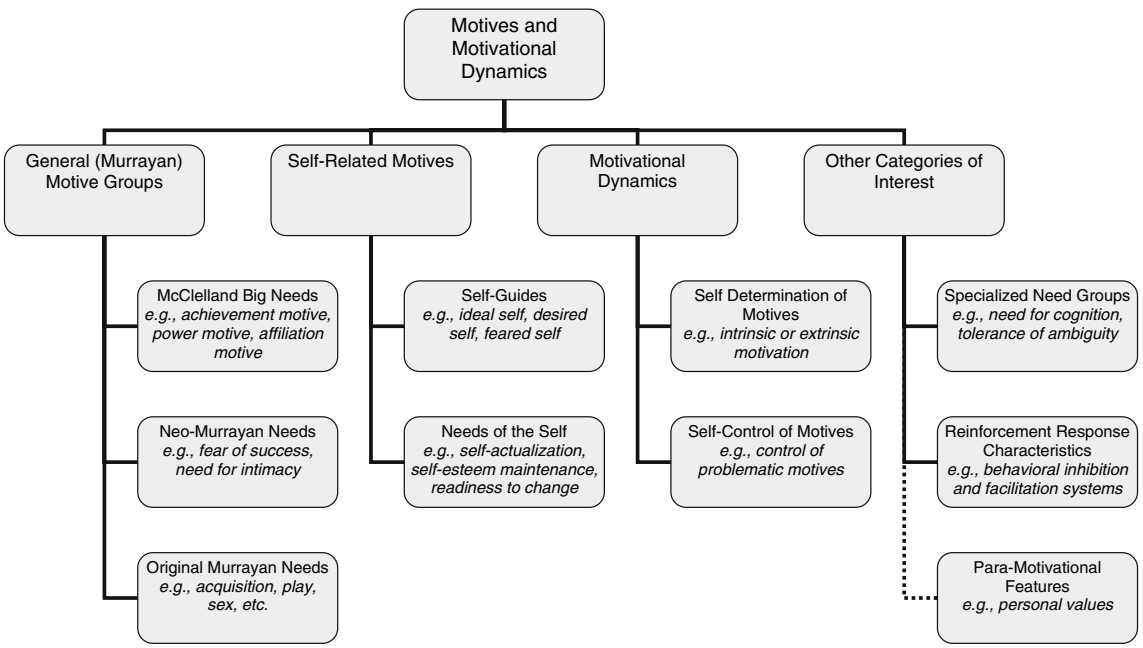

Fig. 2 A descriptive taxonomy of the content areas of motivational scales now in use

The second content area of measurement concerns self-related motives. Included here are a group of Maslowian needs such as self-actualization, self-esteem, and the like (Maslow 1943). Also included, however, are aspects of the self as a motivator—for example, the influence of feared and/or desired selves as motivational guides (Cesario et al. 2004; Higgins et al. 2001; Markus and Nurius 1986).

A third area of motivational measurement concerns motivational dynamics, or how motives are integrated within an individual's mental life. Some of these measures focus on how self-determined such motives are—how much they are seen as originating from within a person versus stemming from external pressures (Wegener 1956; Deci and Ryan 1987). An early example of such a scale was Allport and Ross's (1967) measure of intrinsic motivation for religion. Today, a substantial number of scales examine such issues. Ryan and Connell (1989) have reviewed the Perceived Locus of Causality family of measures, which assess the extent to which a behavior is autonomously or heteronomously motivated. As another example, the General Causality Orientations Scale (Deci and Ryan 1985) examines whether a person's overall motives are inner- vs. outer-directed. A quite different set of measures focus on motivational control. Such scales presuppose a motive that needs some control (e.g., prejudiced thinking; see Dunton and Fazio 1997), and ask to what degree can the individual control it.

The last, or rightmost, part of Fig. 2 concerns further motivational areas that form smaller categories. These include specialized motive groups, such as those studied by social psychologists interested in attitudes: e.g., the need for cognition, the tolerance of ambiguity, etc. (e.g., Burger and Cooper 1979; Cacioppo et al. 1996; Singelis et al. 1999; Webster and Kruglanski 1994). Also in this area of Fig. 2 are measures of biopsychological responsiveness, such as those exhibited by an individual's Behavioral Inhibition and Facilitation Systems (Carver and White 1994), and measures that examine personality areas closely related to the expression and selection of motives (called para-motivational features), especially including personal values (Vernon and Allport 1931; Horowitz et al. 2006; Locke 2000; Schwartz and Bilsky 1990).

Approaches to measurement (Or, assessing different manifestations of motives)

The approach an instrument takes to measure a motive is perhaps as important as the motivational content itself. Put another way, what manifestation of the motive is measured? Motives manifest themselves in an individual's personality in various ways, as indicated in Fig. 3.

The first (leftmost) column of Fig. 3 focuses on assessment methods that involve inferring motives from a person's individual mental models. In assessing mental models, for example, one can examine the thematic content of a person's stories in relation to ambiguous pictures by using an instrument such as the TAT.

A second approach, of course, has been more direct (Fig. 3, column 2), and asks the person more directly about the activities they prefer. A frequently used scale that employs this approach is the Personality Research Form (Jackson 1987). Such self-judgment scales also are used to

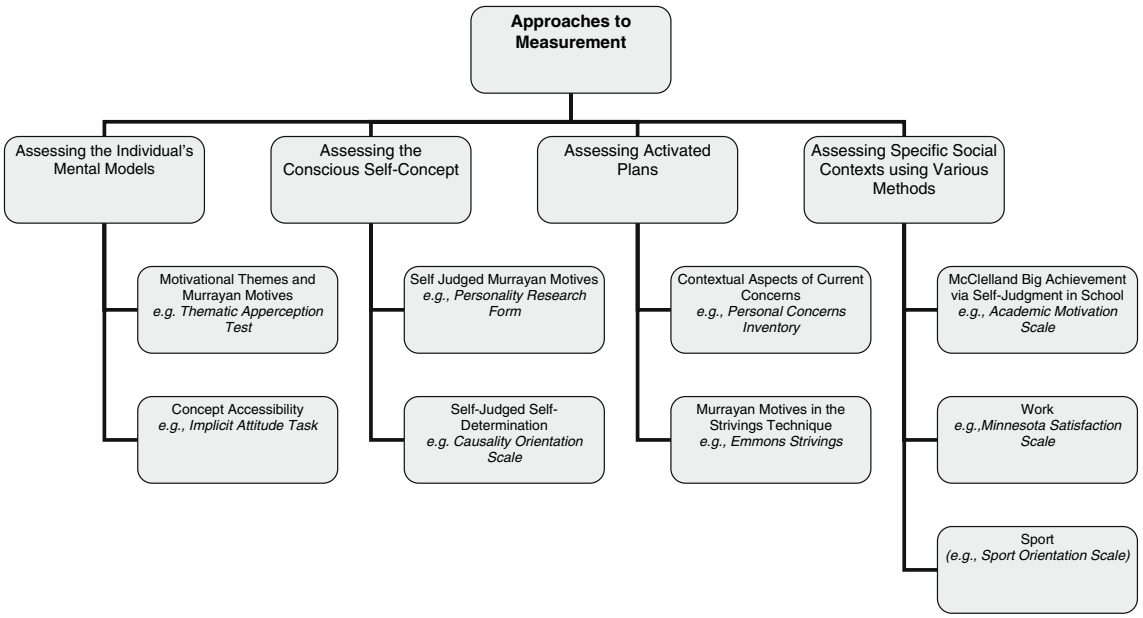

Fig. 3 A descriptive taxonomy of the measurement approaches of motivational scales now in use

help determine the internality or self-determined quality of a motive, such as with the General Causality Orientation Scale.

A third approach has grown out of such research as Klinger's current concerns, Little's personal projects, and Emmons's striving techniques (Emmons 1986; Little 1983; Sellen et al. 2006). Such approaches ask, in essence, *what motives are propelling the person now*. For example, Emmons's and Little's procedures ask people what life tasks they are working on and infer motives from those (Emmons 1986; Little 1983). Cox and Klinger (2004) have developed a new family of such contextualized measures.

A fourth approach has been to examine motives in a social context (Fig. 3, last column). The ''Social Contexts'' approach looks at a person's motivational profile in a specific area such as at work, at school, or in sports. For example, the Academic Motivation Scale measures an intrinsic–extrinsic motivational locus dynamic, but does so specifically in a school context (Vallerand et al. 1992).

Other approaches to motivation measurement have been used but discarded, and are thus not shown. For example, some performance measures involve directly eliciting behavioral data concerning how long a person will persist at an experimental task. An example is the Koerth pursuit rotor measure, for which participants track a stimulus on a revolving disk—a task that requires considerable motivation and learning to master (Kimble 1950). After its inception as a measure, however, researchers soon came to doubt whether persistence on a laboratory motor task could be generalized to real life motivation; these tasks are rarely used today (see Wiener-Levy and Exner 1981).

Further consideration of the ''Approaches to measurement'' taxonomy

By the mid-20th century, a growing crisis emerged regarding different approaches to measuring motives. Psychologists increasingly understood that scales that measured the same motives with different approaches often failed to converge (e.g., McClelland 1985). This is still the case. For example, Table 7 summarizes results from eight studies (reported in five articles) concerning the relationship between self-judgment and thematic scales. Whereas self-judgment scales can and do correlate with each other fairly highly (the median value is $r = .73$), self-judgment scales correlate almost negligibly with thematic scales —and, somewhat oddly, thematic scales similarly fail to correlate with each other. Most such correlations involving thematic measures are below $r = .20$.

Campbell and Fiske (1959) famously interpreted such discrepancies in measurement approaches as a weakness. They reported research area after area in which this pattern showed up, and, proposed a statistical display technique—the

Table 7 Correlations between different major motivation measures

Type of comparison	*n* achievement vs. *n* achievement	*n* power vs. *n* power or dominance	*n* affiliation vs. *n* affiliation	Scales compared	Reference
Self-judgment vs. self-judgment	.25	.73	.43	PRF vs. EPPS	Edwards et al. (1972)
	.55	.74	.38	PRF vs. MNQ	Mayes and Ganster (1983)
Thematic report vs. self-judgment report	.06	.04	.13	TAT vs. PRF	Schultheiss and Brunstein (2001)
	.39	.58	.45	TAT vs. EPPS	Schroth (1985)
	−.05	.04	.09	TAT vs. PRF	King (1995)
	.33	.23	.04	PRF vs. ESA	King (1995)
	−.17	−.13	.06	TAT vs. EPPS	Wotruba and Price (1975)
Thematic report vs. thematic report	.18	.17	.02	TAT vs. ESA	King (1995)

Note: Test abbreviations are: PRF, Personality Research Form; EPPS, Edwards Personal Preference Schedule; MNQ Manifest Needs Questionnaire; TAT, Thematic Apperception Test; ESA, Emmons Striving Assessment.

multi-trait, multi-method table—with which to record such discrepancies.

The emerging viewpoint today, however, is that although Campbell and Fiske contributed a great deal by recognizing that various measurement methods provide different results, they may have been wrong to have expected them to correlate highly. That is, different sources of data are valuable precisely because they measure different attributes (e.g., Funder 1995; Mayer 2004).

According to this new view, different data-collection methods draw on different aspects of an individual's mental processes. McClelland et al. (1989) argued specifically that the systematic differences between thematic vs. self-judgment data reflected measurements of different, implicit and explicit mental processes. More generally, different types of data draw on different parts of the memory system (models of the self vs. the world), and additionally, draw on different mental processes (ongoing introspection, problem-solving, self-summarization, etc.; Mayer 2004). Because these different kinds of data draw on different processes, a strong argument can be made that they ought not to converge.

What all this means is that motivation researchers are better off using multiple approaches to assessing motives because they tap different mental processes. Although they will not converge, each measure is informative of a different process or aspect of personality. The interrelation among the measures, in fact, opens up an exciting area for theorizing concerning motivation. For example, when a person's achievement motives are congruent across measures such as the TAT and self-judgment scales, that individual's need for achievement appears more self-determined and better predicts certain outcomes (Biernat 1989; Thrash and Elliot 2002). In addition, people higher in mindfulness tend to converge on Implicit Attitude measures of motives and explicit self-judgments (Brown and Ryan 2003). These studies suggest that one promising area for future research is to assess the congruence between two (or more) measures of a given motive. Under some circumstances, when multiple indicators agree, stronger predictions may be possible.

Discussion

A number of years have passed since a general review of motivational measures has been undertaken. The long interval since the last review of the area suggests the usefulness of taking a census of such measures. This would answer the question, ''What are the motivational measures out there?''

Psychological measures of motivation first were developed roughly 75 years ago, in a creative if somewhat chaotic time of psychological research. Just over 70 years ago, Murray (1938) wrote of measurement practices in motivation:

> Some use physiological techniques, others present batteries of questionnaires. Some record dreams and listen for hours to free associations, others note attitudes in social situations. These different methods yield data which, if not incommensurate, are, at least, difficult to organize into one construction (Murray 1938, p. 6).

Perhaps more than Murray might have imagined, the diversity and range of motivational measures has increased since his time. To determine the range of measures now employed, we used a computer survey of the literature, supplemented by a query sent to the SPSP Listserv. The findings from our surveys fill six tables of measures. Those six tables indicate the sheer quantity of scales.

Generally speaking, the use of measures of motives increased through the 1960s and then leveled off. The rise of the cognitive revolution (e.g., Sperry 1993) may have diverted interest from motivational research; more recently, however, interest in the area has returned. Measures of motives that focus on specific social contexts such as work and education are increasing in relation to the use of general measures of motives. Perhaps of greater importance, many new measures—measures identified as developed in the last two decades or so—appear most important to contemporary researchers.

What is one to make of collection of scales we just have compiled? To organize them, we introduced a model that divides measurement into two aspects: (a) what is measured and (b) how it is measured. We then introduced a figure that sketches a number of targets of motivational measurement in the area, and a second figure that indicates approaches to measurement. Among those things measured can be found Murrayan motives (e.g., *n* Play), neo-Murrayan motives (e.g., fear of success), and McClelland's big three motives (achievement, power, affiliation). Also present, however, are Maslowian motives such as the need for self-regard (esteem) and self-actualization, motivational dynamics, such as dynamics of self-control, and special areas of motives, such as those employed by social psychologists (mostly) to study attitudes and behaviors.

Among approaches to measurement, some measures employ self-report, some attempt to tap a person's implicit models of his or her self and world, and others examine motives in specific psychological and social contexts. This two-part system serves as a heuristic or memory aid to considering the vast diversity of scales. The organizational system is not perfect, to be sure, but it does help to bring some order to a sprawling, complex, measurement field.

Limitations and strengths of our approach

In regard to identifying tests, our combined methods insured that many published tests were included, as well as tests of

current significance to many researchers. Still, we likely overlooked scales of interest—and possibly, whole types of scales of interest. In respect to the frequency with which tests were employed, we were able to hint at how frequently various scales have been used, and whether they rose in use over three 25-year intervals, declined, or remained somewhat stable. Our database searches minimized false positives for test uses, but probably undercounted uses for scales known by acronyms. We may have overlooked some important tests while elevating other instruments.

With those reservations in mind, it is almost certainly the case that we were able to draw together perhaps the most comprehensive collection of motivation measures to date, to list them, and to provide a heuristic means for organizing them by dividing them according to what they measure and the approach they use to carry out such measurement.

Going on from here

Beyond our analytic classification of tests, and our argument that diverse approaches to measurement are a strength, we have offered very little evaluation of the scales. We have refrained from deciding or identifying which scales are good or which are bad, or which are theoretically important and which are not, because we regard that as a ''next step.'' Rather, we view this article as a jumping-off point for further work on the measures of motives.

Opportunities regarding current measures of Murrayan motives

One opportunity, it seems to us, is for motivational researchers to better organize the Murrayan motives. Focusing on the results from thematic measures, McClelland (1987) reduced Murray's (et al.) 20 or so needs to 3: *n* Achievement, *n* Power, and *n* Affiliation. This was done on conceptual and pragmatic terms, based on McClelland's judgment as to which needs were most important and central to human behavior. Since then, a number of authors have focused on that reduced set (largely associated with the Thematic Apperception Test).

It may be possible now, however, to identify a better set by examining factor analyses of self-judged motives such as those present in the Personality Research Form. Table 8 summarizes several factor analytic studies of the PRF from 1974 to 1986 (excluding joint factor analyses with Big Five

Table 8 Factor analysis studies of the PRF

Reference	*N*	Extraction (rotation method)	Factor names and number of factors extracted
Stricker (1974)	71	Principle-axis (Oblique promax method)	Six factors 1. Conscientiousness 2. Hostility 3. Ascendance 4. Dependence 5. Imagination 6. Carefreeness
Fowler (1986)	215	Maximum likelihood (Varimax)	Five factors 1. Dependency vs. autonomy 2. Reflective vs. impulsive 3. Extraversion vs. introversion 4. Extrapunitiveness vs. intrapunitiveness 5. Sentient vs. analytic
Helmes and Jackson (1977)	214	Oblique orthogonal procrustes procedure	(A confirmation of the original 20-factor structure of the scale)
Lorr and Seifert (1977)	541	Principal components (Varimax)	Nine factors 1. Affiliation 2. Change 3. Dominance 4. Endurance 5. Harmavoidance 6. Order 7. Social recognition 8. Succorance 9. Understanding

scales). In all such cases, researchers obtained meaningful solutions that indicated larger factors describing certain groups of individual motives. Still, it seems as if clearer and more uniform solutions should be possible so as to create hierarchies of (at least) self-judged motives.

Opportunities involving new scales

Another exciting opportunity, it seems to us, emerges from the panoply of new measures that contemporary researchers (i.e., self-selected responders to our SPSP Listserv query, including many well-known experts) regard as significant. These new measures, from the offshoots of the widely used tests today, to those that assess activated plans, have not yet been examined together. Little is known about their correlations. For example, how do personal strivings correlate with self-judged motives on the PRF? Or with Cox and Klinger's (2004) new style of idiographic motivational measures? Are there certain kinds of activated plans that seem more self-determined than others?

From the past to the future

It may have been as long as 30 years since a comprehensive overview of motivational measures has appeared in a journal. Many changes have taken place within the area of motivation—and in motivational measurement—both before that earlier review and after. Measurement, however, forms a crucial backdrop—an infrastructure—to a scientific area. To begin to understand measurement in the area of motivation, a survey and descriptive analysis of measures was undertaken.

Here we surveyed motivational measures from PsycINFO and polled members of the SPSP Listserv to identify scales of significance. A wide range of measures are presently in use, and we suggested an organization of scales according to (a) what they measure, and (b) the measurement approaches they employ. Although our work is largely descriptive, the growth of motivational scales over the past 75 years does suggest the growth of motivational understanding. The growth of motivational measurement from a focus on motivational aims to an inclusion of motivational dynamics and personal and social contexts indicates an increasingly nuanced, sophisticated view of human motivation.

It is our hope that this revisiting of the area of motivational measures, after an absence of 30 or so years, can promote two directions already present in the field. The first direction involves a willingness to address via research the relations among these new measures, their similarities and differences, and to identify the best measurement approaches for a given task. The second direction involves the optimal use of these measures to promote the study of motives and motivational dynamics as they permeate the broader personality system, and guide the individual through his or her life.

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Appendix

Procedures for identifying major motivation measures

Part 1: initial search rules to get the initial names of tests

Step 1. The PsycINFO database was searched multiple times employing terms such as ''motivation'' ''test'' ''measure'' and a modifier for sub-listing purposes so as to identify a large number of tests and scales. Additional modifiers employed were ''self-report,'' ''projective,'' ''athletic,'' ''academic,'' ''work,'' and ''intrinsic.''
Step 2. Tests names also were retrieved from (a) *Tests in Print IV* (Murphy et al. 2002) using the search terms motivating, motivation, work motivation, work motives, intrinsic motivation, extrinsic motivation, athletics/sports, athletics, achievement, achievement motivation, and academic motivation; and also from (b) *Mental Measurements Yearbook* (Buros 1978; Plake et al. 2003), using a similar list of terms.
Step 3. These three sources—PsycINFO, Tests in Print, and Mental Measurements Yearbook— were scanned for test names. (Original search dates were the week of November 21-28, 2004). Approximately 140 names were identified from PsycINFO, 75 from Tests in Print VI, and the remaining from the Mental Measurements Yearbook. The original list of psychological measures eventually numbered around 230.

Part 2: search for the number of research studies on a given test

Step 1. During February 2005, we entered the full name of each test individually from the list compiled above into PsycINFO.
Step 2. In most cases, numerous results were returned. To evaluate the quality of the search, we spot-checked the first, (and where applicable) second, fifth, and, one

hundredth page of results to assess the degree to which the results really were research studies pertaining to the specific scale. Where the number was low, we spot checked all results.

Step 2a. If one or more mis-hits occurred, the test name was further specified by an acronym, or where appropriate, by an author.

Step 3. We then excluded a number of tests on the basis of recency and relevance. If a listed test had, for example, only three or four citations after 50 years, it was considered no longer in use and dropped from the list. Additionally, tests that were only peripherally related to motivation, such as those measuring social desirability, self-monitoring, or sensation-seeking, were not reviewed. This narrowed the list from more than 200 to 155 tests.

Step 4. A further exclusion rule was then applied in order to filter out more seldom-used tests. Scales published before 1980 with fewer than six references were eliminated, as were scales published before 1990 with fewer than three references.

Step 5. The ''Number of hits'' columns in Tables 1–5 are taken directly from each test's valid list of results. Where the number was extremely high, some irrelevant search results are likely included.

Part 3: classification rules

The final set of rules involved sorting the resulting scales into useful categories.

Step 1. Based on the discussion above, we sorted scales into five main categories: (a) general motivation scales (both thematic and self-judged), specific area scales of (b) work, (c) academic, and (d) athletic motivation, and (e) a catchall ''other'' category for specific scales measuring only one motive which did not fall into the original three ''specific'' categories.

Step 2. The last few peripheral scales (''Values'' scales) were then discarded. For the reasons behind this, see McClelland et al. 1989, pp. 690–691). The final group of 49 scales were included in Tables 1 through 5.

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