

THE LIFE ACTIVITIES ACHIEVEMENT SCALE: AN ACT-FREQUENCY APPROACH TO THE MEASUREMENT OF MOTIVATION

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The TAT has long been considered the measure of choice for capturing operant aspects of achievement motivation. Not only does the psychometric integrity of the TAT continue to be challenged, but the instrument is cumbersome and inefficient for use in a research setting. Thus, there remains a need for a measure of achievement motivation that is easy to administer, is psychometrically sound, and has the interpretive depth of a projective test. The Life Activities Achievement Scale (LAAS), based on an act-frequency approach, was developed to meet this need. A sample of 414 undergraduates completed the LAAS and a variety of other person and performance measures, including the TAT. The results showed certain LAAS scales to correlate significantly with TAT scores and with other operant and respondent achievement criteria. The act-frequency approach is seen as offering a promising method for assessing operant motivation.

It has long been recognized in both motivation theory and research that there are many levels to need expression (deCharms, Morrison, Reitman, and McClelland, 1955; McClelland, 1971, 1985; Murray, 1938). McClelland (1971, 1985) distinguishes between operant (i.e., underlying nonspecific, affective forces which guide

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behavior in unstructured situations and in a general life direction) and respondent (i.e., discrete cognitive sequences arising in response to clearly designated stimulus situations) need processes. These two processes are considered orthogonal and are associated with different behavioral criteria (deCharms et al., 1955). It has been argued that the Thematic Apperception Test (TAT) is the most efficacious method for assessing operant processes while self-report measures capture the more cognitive, respondent aspects of motivation. Yet, the theoretical and empirical controversy surrounding the usage of the TAT (e.g., McClelland, 1972; Scott and Johnson, 1972) underscores the need for alternate methods of operant assessment. The purpose of this report is to present a new measure of achievement motivation, based on an act-frequency methodology (Buss and Craik, 1980, 1983), that captures both operant and respondent aspects of achievement motivation.

Entwisle (1972) reviewed the psychometric evidence surrounding the TAT and concluded that there was no demonstrated support for either its reliability or validity. However, supporters of the TAT continue to argue that current psychometric procedures are inappropriate for evaluating the TAT and provide their own evidence supporting its relational fertility and empirical value (Atkinson, Bongort, and Price, 1977; Atkinson and Litwin, 1960; McClelland, 1961, 1980; McClelland and Pilon, 1983). In addition, there are two, more practical factors which vitiate the utility of the TAT. First, the TAT is extremely sensitive to extraneous elements of the testing situation (e.g., types of cues given, testing ambiance, qualities of the examiner, instructional set, etc., McClelland, Atkinson, Clark, and Lowell, 1953; Lundy, 1988; Murstein, 1965; Winter and Stewart, 1977). Second, the TAT is extremely cumbersome to administer and score, particularly for research purposes. Before administering the technique, one must invest a large amount of time learning the scoring procedures; and there is no guarantee that one will master the method. Hiring "expert" scorers can also be expensive. Nonetheless, once these time/financial hurdles are overcome, the actual testing itself can also be relatively time consuming. Having subjects complete the 4-6 stories in a typical protocol can take 30-45 minutes of assessment time, which provides one score, on one construct (overlooking the considerable time needed to analyze the protocols and make the necessary statistical adjustments to arrive at the final score). This can only make one wonder about the cost-benefit ratio for using the TAT.

It is clear that the TAT, as a measure of achievement motivation, is a very labor intensive instrument that is not easily accessible to

the majority of research psychologists. There exists a need for an instrument that has the administrative and scoring ease of a respondent measure, but assesses operant aspects of personality. Based on an act-frequency approach to assessment (Buss and Craik, 1980, 1983) the Life Activities Achievement Scale (LAAS) was developed to meet this need.

The act-frequency approach attempts to measure dispositions, or the tendency of an individual to behave in a certain way (Buss and Craik, 1980). The essence of this approach is to identify discrete behaviors (acts) that comprise a dispositional category (e.g., dominance, achievement motivation). By summing the frequencies with which a person engages in such behaviors over a specified period, a multiple act composite index of the disposition is provided. These act frequency tallies ". . . provide not only summary interpretations of past conduct but also, on actuarial grounds, a basis for predicting future trends in behavior." (Buss and Craik, 1983, p. 106). The identification of behavioral regularities appears to be an amenable technique for capturing operant processes. As McClelland (1972) has pointed out, to predict theoretically relevant (operant) actions one needs to use behavior samples of both thoughts and actions not coded by the person. In many ways the act-frequency approach is similar to the random behavior sampling techniques (cf. Diener and Emmons, 1984) that have been successfully used as a measure of operant motivation (Constantian, 1981). However, instead of sampling a person's behavior in "real time" and summing frequencies, the act-frequency approach merely asks the subject to determine frequencies to specific behaviors over a desired time period.

Unlike traditional respondent measures, the act-frequency method does not ask subjects to make evaluations of their behavior or feelings under particular circumstances. Like a projective measure, it evaluates the frequency a person engages in certain spontaneous (achievement-related) behaviors. Capitalizing on this methodology, the LAAS attempts to straddle both the operant and respondent aspects of personality. If successful, the LAAS offers a much more efficient way of assessing operant aspects of personality. Furthermore, the psychometric integrity of the LAAS can be readily determined by traditional empirical techniques.

This report outlines the development and validation of the LAAS. Part of this process will be to determine the correlation of this measure with a TAT derived score of achievement motivation. Given that the achievement orientations of males and females are different and thus may be expressed in different ways (Gaeddert, 1985; Piedmont, 1988; Piedmont, diPlacido and Keller, 1989; Travis,

Burnett-Doering, and Reid, 1982; Veroff, 1977), separate analyses will be performed by gender.

Method

Subjects

Subjects consisted of 264 female and 150 male undergraduate volunteers (mean age 19.1 years, $SD = 3.15$). All subjects received course credit for their participation.

Measures

The Adjective Check List (ACL-Gough and Heilbrun, 1980) provided measures of achievement motivation, masculinity and femininity. A second measure was the achievement scale of the Edwards Personal Preference Schedule (EPPS-Edwards, 1959). Achievement motivation was also measured projectively. Four standard cues (2 men in a workshop; a little girl sitting at a desk; 2 women working in a laboratory; and 2 young boys playing at a table) were presented to subjects who had 4 minutes to write a story. Protocols were scored according to McClelland et al. (1953) by a scorer who had previously attained a category agreement coefficient of 0.9 with expert-scored materials. All scores were corrected for verbal fluency (i.e., story length) by a regression analysis.

Performance anxiety was assessed by 2 scales: Sarason's (1984) Test Anxiety Scale (which comprises 4 subscales: tension, worry, bodily symptoms, and test irrelevant thinking), and the negative anxiety subscale of Alpert and Haber's (1960) Achievement Anxiety Scale. Given the conceptual and empirical relatedness of these 5 subscales, one large composite anxiety measure was created by converting each subscale score into a z-score and summing. This was done both to enhance the reliability of the anxiety measures and improve interpretive clarity.

Subjects also received a cognitive performance task, which consisted of viewing individually a list of 40 nontrait descriptive adjectives. Following this presentation subjects received a list of 200 adjectives from which they were instructed to select all those words they remembered viewing. The dependent variable was the number of correctly recognized adjectives. Following this task subjects completed performance attributions of ability, effort, luck and task difficulty.

Finally, subjects provided some background information concerning GPA, high school GPA and rank, and rated how successful they believed themselves to be academically.

LAAS Development

A list of 100 statements believed to represent achievement behaviors in a variety of contexts was generated by the author and several undergraduate and graduate students. These items were given to 22 undergraduate students (17 females, 5 males; part of a psychological testing course) who rated each act in terms of its prototypicality for someone high in achievement motivation. All ratings were made on a 1 to 9, very uncharacteristic-very characteristic, likert scale. Of the 100 items, 26 had an overall mean rating of 7 or greater, and they were retained in the scale. Ten other items, not having as high a rating (greater than 6), were also included because they were hypothesized to reflect activities high achievers would engage in outside of a competitive situation (e.g., leisure time activities). These 36 items comprised the scale.

These same 22 individuals then rated how frequently they engaged in these behaviors on a 0 (never) to 4 (very frequently) likert scale. The overall Alpha of the 36 items based on these responses was .84. No gender difference in overall achievement activity was found (males: $M = 68.29$, $sd = 15.21$; females: $M = 61.27$, $sd = 14.85$; $t = 1.02$, $p = n.s.$).

Procedure

All subjects completed the achievement measures first. Whether they received the projective or self-reports first was counterbalanced. Subjects then received the performance task, anxiety measures and finally the LAAS.

Results

Scores from the LAAS were factor analyzed separately by gender according to procedures outlined by Cureton and D'Agostino (1983). This method involved 2 steps: first, a principal axis factor analysis with no rotations was performed to determine item communalities and the number of factors to be extracted. A 5 factor solution was determined appropriate for both sexes, which accounted for 47% of the common variance. A second analysis was then performed substituting the communalities derived from the first step on the diagonal of the correlation matrix, and the factors rotated. An oblique rotation provided the clearest simple structure (highest interfactor correlations were for males; .31; females: $-.52$). The items comprising each of the factors and subscale alphas are

TABLE 1
*Factor Loadings for LAAS Items on the 5 Empirically Derived Dimensions
 for Females*

Item	Loading
Factor 1 "Group Involvements" (Alpha = .77)	
Run for some type of office	.86
Run for a student government office	.81
Join an honor society	.53
Learn to play a musical instrument	.40
Try out for an athletic team	.38
Start a student newsletter	.35
Volunteer to work for your favorite politician	.32
Factor 2 "Home Achievement" (Alpha = .77)	
Do a "do it yourself" project around the house	.73
Rearrange the furniture in the home	.73
Paint an old piece of furniture	.65
Teach a pet new tricks	.50
Think up more efficient ways to do common tasks	.46
Buy a file cabinet to organize personal-school materials	.43
Factor 3 "Academic Achievement" (Alpha = .67)	
Read nonrequired materials for class	.57
Do research in your major field	.53
Go to the library to clarify questions raised in class	.47
Write a critical essay on a reading for class	.40
Become a teaching assistant for class	.37
Audit a graduate or upper level class	.32
Factor 4 "Personal Excellence" (Alpha = .67)	
Recheck a task that was just completed	.47
Try to do more than what is expected	.46
Factor 5 "Anti-Achievement" (Alpha = .80)	
Do work for a professor and get extra course credit	-.79
Work on an extra credit project for class	-.69
Talk with a professor during his/her office hours about questions raised in class	-.45
Apply to graduate school	-.42
Start your own business	-.34

presented in Tables 1 and 2 for females and males, respectively. Only items with loadings of .3 or greater were used in determining subjects' scores on each subscale. Scores were found by summing frequency ratings for each item: the more often a behavior was rated as being done, the higher the score. As can be seen, somewhat different dimensions emerged for males and females, and underscores the differences that exist in achievement orientations between the sexes.

Correlations of scores with other person and performance variables are presented in Tables 3 and 4. Several interesting findings are noted. First, the LAAS scales correlated significantly, for the most part, with the ACL and EPPS achievement scales. Given that the

TABLE 2
*Factor Loadings for LAAS Items on the 5 Empirically Derived Dimensions
 for Males*

Item	Loading
Factor 1 "Academic Achievement" (Alpha = .81)	
Audit a graduate or upper level course	.73
Go to the library to clarify questions raised in class	.64
Volunteer to give an oral presentation to a class	.61
Go to a weekend seminar in the area of one's interests	.59
Do research in your major field	.49
Read nonrequired materials for class	.45
Do work for a professor and get extra course credit	.44
Volunteer to work for your favorite politician	.43
Apply to graduate school	.41
Become a teaching assistant for a class	.41
Factor 2 "Personal Organization" (Alpha = .75)	
Think up more efficient ways to do common tasks	.63
Do a "do it yourself" project around the house	.63
Buy a file cabinet to organize personal materials	.59
Rearrange the furniture in the home	.53
Paint an old piece of furniture	.45
Teach a pet new tricks	.43
Write a computer program	.37
Hand in assignments before they are due	.37
Factor 3 "Social Achievements" (Alpha = .73)	
Run for a student government office	.91
Run for some type of office	.76
Join an honor society	.41
Factor 4 "Personal Achievement" (Alpha = .66)	
Recheck a task that was just completed	.60
Try to do more than what is expected	.48
Saving money in your bank account	.44
Stop and ask directions when lost	.43
Tutor a person in a subject you know well	.35
Factor 5 "Anti-Achievement" (Alpha = .63)	
Try out for an athletic team	-.62
Start your own business	-.44
Work on an extra credit project for class	-.38
Engage in a regular exercise program	-.36

ACL and EPPS scales measure different aspects of achievement motivation (Piedmont et al., 1989), and that the LAAS subscales sample behaviors in a wide range of nontraditional achievement contexts (e.g., the home), the number of significant correlations is strong evidence of the convergent validity of the LAAS. However, the more relevant correlations are with the TAT. For females 3 scales and for males 4 scales correlated significantly with the TAT. The magnitude of some of these correlations are quite high (above .4) and remain significant even when not adjusted for attenuation. It is interesting to note that it is those scales which deal with personal

TABLE 3
Correlations between Empirically Derived LAAS Scales and other Person and Performance Variables for Females

Variable	FA 1	FA 2	FA 3	FA 4	FA 5
	(N = 264)				
ACL Ach	.20***	.06	.26***	.28***	-.08
EPPS Ach	.13*	.14*	.14*	.22***	-.11
TAT Ach ^a	.02	.05	.26***	.40***	-.29***
Anxiety ^b	-.08	.05	-.08	-.08	-.08
Masculinity ^c	.15**	.02	.14*	.12*	-.15**
Femininity ^c	-.008	-.17**	-.10	-.09	.15**
GPA	.07	.01	.12	.20**	.02
H.S. GPA	.20***	-.07	.08	.14*	-.003
H.S. Rank	.21**	-.13*	-.01	.15*	.04
Performance	-.11	-.08	-.01	-.08	.12
S-R Ability ^d	.15*	.03	.13*	.21***	-.12*
S-R Effort	.14*	.14*	.03	.14*	-.07
Success ^e	.14*	.001	.08	.25***	-.04

* $p < .05$; ** $p < .01$; *** $p < .001$.

^a correlations with FA scales corrected for attenuation.

^b composite anxiety measure.

^c measured via the ACL.

^d S-R Ability/Effort are performance attributions to a cognitive task. Higher values associated with more ability/effort to do task.

^e how successful subjects believe themselves to be academically.

aspirations to achieve that correlate the highest with the TAT scores.

The pattern of correlations with the remaining measures lends further evidence for the construct validity of the LAAS subscales. For females, factor 4 (Personal Excellence) and factor 1 (Group Involvements) consistently correlated to academic criteria of achievement. It also appears that levels of masculinity are related to the expression of achievement behaviors in women. For males, it is factor 3 (Social Achievements) that consistently related to the academic criteria.

For both sexes, all LAAS subscales were independent of performance on the recognition task. Closer examination showed that all achievement measures were unrelated to performance. That the Anti-Achievement scales did correlate suggests that the testing situation was not sufficiently compelling to arouse subjects' achievement drives. However, at least for females, perceptions of their performance (e.g., ability and effort) were linked to achievement levels.

Discussion

The results of this study document the ability of a respondent-type measure to capture an operant process. Although these correlations

TABLE 4
Correlations between Empirically Derived LAAS Scales and other Person and Performance Variables for Males

Variable	FA 1	FA 2	FA 3	FA 4	FA 5
	(N = 150)				
ACL Ach	.17*	.13	.18*	.27***	-.12
EPPS Ach	.11	.12	.17*	.06	-.12
TAT Ach ^a	.13	.43***	.22**	.51***	-.24**
Anxiety ^b	-.16*	.04	-.07	-.06	-.04
Masculinity ^c	.14	.21**	.08	.11	-.28***
Femininity ^c	-.07	-.09	-.05	-.09	.04
GPA	.08	.02	.21***	.18*	.17*
H.S. GPA	-.04	-.02	.23**	.12	.20**
H.S. Rank	-.06	-.02	.22**	.03	.15
Performance	-.21**	-.28**	-.10	-.12	.17*
S-R Ability ^d	.11	-.06	.03	.06	-.08
S-R Effort	.06	.07	.07	.07	-.13
Success ^e	.03	-.12	.20**	.13	.16*

* $p < .05$; ** $p < .01$; *** $p < .001$.

^a correlations with FA scales corrected for attenuation.

^b composite anxiety measure.

^c measured via the ACL.

^d S-R Ability/Effort are performance attributions to a cognitive task. Higher values associated with more ability/effort to do task.

^e how successful subjects believe themselves to be academically.

clearly show that the LAAS is not redundant with the TAT, they are significant for several reasons. First, that the LAAS scales correlated with respondent achievement measures that are orthogonal to the TAT shows that the LAAS can indeed capture both operant and respondent aspects of motivation. By manipulating act content, these scales may be further refined to increase their relationship to the TAT. Second, given the lack of evidence documenting the TAT's relationship to any self-report measure of achievement (e.g., deCharms et al., 1955; Marlowe, 1959), the magnitude of some of these correlations (.4-.5) are indeed quite impressive.

It is also interesting to note the kind of behaviors represented in the LAAS subscales that correlated to the TAT. These items deal less with classroom/academic behaviors and more with personal aspirations and organization. Thus, TAT scores may reflect more a person's wish for achievement than their expression of particular achievement behaviors. That respondent measures are more focused on these latter type activities may partially explain the lack of association between these two types of measures.

The LAAS's relationship to the TAT opens the door to the possibility of a more efficient method to the assessment of operant processes. The logic of the act-frequency approach parallels the

notion of operant dynamics and their expression. However, its methodology is simple and direct. The LAAS takes subjects approximately 10 minutes to complete and can be scored in just as many—by simply summing frequencies. Further, the psychometric integrity of the LAAS can be readily determined by traditional empirical techniques.

Two other aspects of the LAAS that do not concern the TAT need mentioning. First, the LAAS recognizes that achievement motivation influences behavior far beyond competitive academic situations. One's home life, recreational choices, personal demeanor are all domains influenced by these needs. The different scales attempt to capture the factorial complexity of achievement motivation. Sampling such a broad array of behaviors may enhance the predictive efficacy of the instrument.

Finally, the gender differences in achievement orientation need mentioning (Gaeddert, 1985; Piedmont et al., 1989; Veroff, 1977). Men and women both interpret achievement tasks and value achievement goals differently, and these differences need to be reflected in our assessment instruments. That the item content of the factor analytically derived subscales were different for the sexes underscores this point. The internal achievement orientation of females was reflected in the salience of the Personal Aspiration factor as a correlate of academic achievement, while the external orientation of males was reflected in the correlation of the Social Achievement factor with the same criteria.

In conclusion, the initial validation of the LAAS offers encouraging support to its ability to capture both operant and respondent aspects of achievement motivation. More work can be done to help further refine the subscales and to validate those dimensions that deal with nonacademic behaviors. No longer should the TAT be considered as the sole (or best) medium for capturing operant processes. The act-frequency approach provides a new and useful methodology for measuring motives.

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