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Achievement Motivation and the Dynamics of Task Difficulty Choices

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Undergraduate students performed a vigilance task in a study of the dynamic theory of achievement motivation. Positively motivated subjects ($n = 66$) and negatively motivated subjects ($n = 60$) did not differ in initial task difficulty choices. Both groups shifted to more difficult tasks over time, but this linear trend interacted with achievement motive group, with positively motivated subjects shifting faster. Quadratic and cubic trends in task difficulty choices were also observed. Periodic interruptions attenuated achievement group differences in average task difficulty choices. Subject gender affected average task difficulty choices, but gender did not interact with theoretically important variables in this study.

Achievement motivation has long been associated with task difficulty preferences. In an early formulation of achievement motivation theory, Atkinson (1957) proposed that positively motivated subjects (i.e., subjects with motive to achieve success stronger than motive to avoid failure) would prefer tasks of moderate difficulty, whereas negatively motivated subjects (i.e., subjects with motive to achieve success weaker than motive to avoid failure) would prefer either very easy or very difficult tasks. The empirical support for this prediction, however, is weak (cf. Atkinson & Litwin, 1960; Cooper, 1983; Hamilton, 1974). Recently, Kuhl and Blankenship (1979a) presented data that show a more complex pattern of task difficulty preferences in that both positively and negatively motivated subjects preferred successively more difficult tasks over time; that is, there is evidence of a systematic shift toward more difficult tasks by both motive groups.

A theoretical explanation of shifting task difficulty choices has been provided in dynamic achievement motivation theory (Atkinson & Birch, 1970, 1974). Dynamic achievement theory postulates an interaction of personality (i.e., motive to achieve success and motive to avoid failure) and dynamic motivational forces that affects task difficulty choices in an ongoing stream of behavior. Specifically, goal-directed tendencies are thought to possess inertial properties that are similar to mass in Newtonian physics; that is, the tendencies change in importance only when some force operates on them (Atkinson & Cartwright, 1964).

Two inertial processes were hypothesized by Atkinson and Birch (1970). The first process is the *action tendency*, which theoretically determines the activity an individual would choose to perform. The action tendency for an activity increases as the result of an instigating force. Stimuli present in achievement-oriented settings, for example, result in an instigating force for an achievement task. If these stimuli persist, the instigating force will increase the action tendency for the task until the action tendency is dominant and the individual engages in the behavior. A collateral consummatory force reduces the action tendency whenever the individual engages in the task until the action tendency of another task becomes dominant and the individual switches to that task.

The second inertial process is the *negaction tendency*, which "opposes, resists, and dampens the effect of an action tendency" (Atkinson & Birch, 1970, p. 204). Environmental stimuli related to, for example, sanctions for task failure result in an inhibitory force that increases the negaction tendency. The negaction tendency is expressed *and* reduced by the force of resistance to the action tendency. This leads to a critical difference between the action and negaction tendencies: The action tendency is reduced only when the individual actually engages in the behavior, whereas the negaction tendency is reduced whenever the action tendency is resisted. When there is a constant instigating stimulus for an activity, an inhibitory force merely delays the onset of the activity until the action tendency builds enough strength to overwhelm the negaction tendency (cf. Atkinson & Birch, 1970, pp. 232–233; 1974, pp. 297–301). An inhibitory force, no matter how strong, cannot permanently suppress an activity with an instigating stimulus.

The action and negaction tendencies are related to personality through the instigating and inhibitory forces. The motive to achieve success (i.e., achievement motive) is related to instigating forces in that an individual high in achievement motive is more responsive to achievement cues, engages in achievement tasks more quickly, and persists at these tasks longer than someone low in achievement motive. Conversely, the motive to avoid failure (i.e., fear of failure) is related to inhibitory forces, so that

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an individual high in fear of failure is slower to engage in achievement tasks and more easily switches to nonachievement tasks than a person low in fear of failure.

The interaction of these personality variables and motivational tendencies creates a complex dynamic system underlying the expression of achievement-oriented behavior. The interplay of these forces was modeled in a computer simulation of the mental processes affecting task difficulty choices by Kuhl and Blankenship (1979b). The theory-based stimulation suggested the following effects: (a) Positively motivated individuals would initially select more difficult tasks than negatively motivated individuals, consistent with Atkinson's (1957) episodic model of achievement motivation; (b) there would be a gradual shift to more difficult task choices for both positively motivated individuals and negatively motivated individuals as they complete more trials on the task; and (c) positively motivated individuals would exhibit a faster shift to more difficult task choices than negatively motivated individuals.

These stimulation-based predictions received partial support in an empirical study conducted by Kuhl and Blankenship (1979a) to investigate actual task difficulty preferences. An analysis of initial task difficulty preferences in a free choice condition, pertaining to the first prediction, revealed that the mean difficulty level chosen by positively motivated subjects (P_s = .57) did not differ significantly from the expected value of .5, and that the mean difficulty level chosen by negatively motivated subjects (P_s = .66) was significantly higher than the intermediate .5 probability of success. The difference in these mean initial preference levels approached but did not obtain a conventional level of significance, however. Other analyses regarding the second prediction examined the slope (linear trend) of preferred difficulty levels for men and women combined across 10 blocks of five trials. These analyses revealed a significant positive slope for both positively and negatively motivated subjects. Kuhl and Blankenship did not report a test of the third prediction, but it seems unlikely that the slopes for the positively and negatively motivated subjects differed significantly (because they were .32 and .31, respectively).

The work of Kuhl and Blankenship represents an important conceptual and empirical advance in achievement motivation theory. However, several unanswered questions arise from this line of research. First, it seems plausible to expect that the shift to increasingly more difficult tasks would not continue indefinitely. A ceiling affect may occur, for example, in that subjects would shift to increasingly difficult tasks for a while and then settle on a preferred, constant level of task difficulty. A ceiling effect is a logical necessity when (a) there is a finite number of task difficulty choices and (b) none of the tasks are infinitely difficult (i.e., none have a zero probability of success). Under these conditions, a linear shift to more difficult tasks would end when the most difficult task was chosen.[1] Individual factors (e.g., fatigue and cumulative consummatory effect) may also affect the temporal processes. An optimal duration model (Dunham, 1977), for example, indicates that individuals have preferred durations of activities and preferred intervals of time between each duration of an activity. An investigation of polynomial trends in task difficulty preferences across an extended range of trials may reveal asymptotic effects (e.g., ceiling effects) or other patterns not discernible in a simple linear trend analysis across relatively few trials.

A second question concerns the issue of a constant instigating environment. Kuhl and Blankenship (1979b) assumed a constant environment in both their theoretical developments and their empirical investigation. Yet many settings where task difficulty choices are of interest (e.g., work organizations) are characterized by changing conditions and interruptions. Investigation of a variety of environments will help illuminate the generalizability of the dynamic theory of achievement motivation. Nominally, environmental conditions could affect (a) individual responsiveness to achievement-oriented cues in the environment, (b) the dynamics of achievement behavior, or (c) the interplay of the dynamics of action and individual differences in achievement motive.

The present study was designed to investigate these issues. To the extent that the theoretical predictions derived by Kuhl and Blankenship (1979b) generalize to an environment characterized by frequent interruption, the following effects would be hypothesized:

1. Positively motivated subjects will initially choose more difficult tasks than negatively motivated subjects.
2. Both positively and negatively motivated subjects will choose successively more difficult tasks over repeated trials (until reaching some asymptotic or ceiling level).
3. Positively motivated subjects will exhibit a faster shift to more difficult task choices than negatively motivated subjects.

The last two predictions implicitly suggest a significant main effect for motive group, a main effect for a linear (and possibly higher order) trend across repeated task difficulty choices, and a significant interaction between motive group and the trend effects representing preferred task difficulty levels.

Method

Subjects

Participants in this study were students enrolled in undergraduate management and psychology classes at the University of Tennessee. Complete data were collected from 162 subjects, 56.9% of whom were women. The average age of the participants was 21.5 years (SD = 3.8), with ages ranging from 18 to 44 years.

Personality Measures

Two measures of achievement motive were used: the need for achievement scale of the Manifest Needs Questionnaire (MNQ; Steers & Braunstein, 1976) and the Prestatic Motivation Test (PMT; Hermans, 1970). The MNQ achievement motive scale (M = 22.2, SD = 3.1)

[1] Because Kuhl and Blankenship's (1979a) task met both of these conditions, the lack of an observed ceiling effect in their data may have resulted from insufficient time on task. Furthermore, V. Blankenship (personal communication, March 1, 1986) pointed out that there may have been a nonlinear pattern of task difficulty choices for the female subjects (see Figure 4 from Kuhl & Blankenship, 1979a, p. 559), in that their preferred task difficulty apparently dropped at the end of the study. Thus, there is both logical reason and tentative empirical evidence to expect nonlinear trends in task difficulty choice data.

had a coefficient alpha of .57. The 5-item achievement motive scale exhibited a median corrected item–total correlation of .32 (range from .28 to .41). The PMT (M = 14.5, SD = 4.0) had a coefficient alpha of .74. For the 29 items on the PMT, the median corrected item–total correlation was .26 (range from −.08 to .50). Three items on the PMT exhibited low corrected item–total correlations (Item 8, r = −.08; Item 25, r = .08; and Item 26, r = .02). Even with the low corrected item–total correlations of these three items, the overall internal consistency of the PMT was deemed quite good, so that no items were dropped from the scale.

Fear of failure was assessed with a shortened version of the Test Anxiety Questionnaire (TAQ; Mandler & Sarason, 1952). The TAQ was scored following the procedure suggested by Mandler and Cowen (1958), except that a template with five intervals (rather than 10) was used to score the responses (cf. Blankenship, 1982, p. 906). The 12-item scale (M = 33.4, SD = 10.4) obtained a coefficient alpha of .88. The 12 items composing the TAQ had a median corrected item–total correlation of .59 (range from .41 to .73). Subjects completed these three measures along with a brief biographical questionnaire before beginning the experimental task.

The correlation between the achievement motive scores from the MNQ and PMT was .44 ($p < .001$), indicating moderate convergent validity between these two measures of achievement motive. The MNQ was negatively correlated with the TAQ measure of fear of failure ($r = -.20$, $p < .01$), and the PMT had a marginally significant negative correlation with the TAQ ($r = -.15$, $p = .06$), thus providing some evidence of divergent validity between these measures of achievement motive and fear of failure.

Classification of subjects into achievement motive groups was accomplished following the procedure used by Kuhl and Blankenship (1979a). Subjects were separately rank ordered from lowest to highest on both the PMT and the MNQ measures of achievement motive. They were also rank ordered on the fear of failure measure. Classification as positively or negatively motivated was based on the relative magnitude of the subject's achievement motive rank and his or her fear of failure rank. If the achievement motive rank was greater than the fear of failure rank, the subject was classified as positively motivated; alternatively, if the fear of failure rank was greater than the achievement motive rank, the subject was classified as negatively motivated. All rankings were done separately for men and women to control for the possibility of gender differences.

If the achievement motive rank and the fear of failure rank were tied, the subject's achievement motivation was considered indeterminate. Achievement motivation was also considered indeterminate if the classifications based on the two achievement motive measures disagreed (i.e., the subject was classified as negatively motivated when using the PMT and classified as positively motivated when using the MNQ, or vice versa). The data from 36 subjects were eliminated from further analyses because of indeterminate achievement motivation; of these subjects, 35 were classified differently by the two measures of achievement motive, and 1 subject had a tie between the rank for fear of failure and the rank for achievement motive from the MNQ.

An analysis of the frequencies of women and men in the three motive groups revealed no significant differences in the gender of the subjects with indeterminate motivation, positive motivation, and negative motivation, $\chi^2(2, N = 162) = 3.52$, $p = .17$. An analysis of the mean ages of the three motive groups also failed to reveal any significant effects, $F(2, 161) = 0.68$, $p = .51$. Thus, it may be concluded that the achievement motive classification procedure did not differentially discriminate on the basis of gender or age.

Experimental Task

The experimental task was a work simulation that ran on an IBM personal computer. In the simulation, subjects monitored an "aircraft instrument panel" consisting of eight dials on the computer screen. Events, consisting of an abnormal reading on a single instrument, occurred at irregular intervals. Subjects were instructed to respond to an event as quickly as possible by tapping the function key (F-key) on the computer keyboard that corresponded to the instrument with the abnormal reading. Success–failure feedback for each trial in the vigilance task was based on the subject's response time for that trial in relation to a criterion cutoff time for the level of task difficulty.

The instrument panel that the subjects watched had four types of simulated instruments (oil pressure, oil temperature, fuel pressure, and volts) for four engines. Of these 16 instruments, 8 were visible on the screen at a time. All instruments for two of the engines (viz., either Engines 1 and 2 or else Engines 3 and 4) were visible at one time. To switch to the other instruments (e.g., from Engines 3 and 4 to Engines 1 and 2), subjects pressed the space bar on the computer keyboard.

Task difficulty level was presented to the subjects as the altitude (in feet) at which the aircraft was flying. There were five altitude levels: 500 ft, 1,000 ft, 2,500 ft, 5,000 ft, and 10,000 ft. At high altitudes (e.g., 10,000 ft), the subject had a relatively long time to detect and respond to an abnormal instrument reading, whereas at low altitudes (e.g., 500 ft), the subject had relatively little time to respond. The altitude level was displayed on the computer screen during the task.

Task difficulty level was operationally defined on the basis of the elapsed time between the beginning of the event (viz., when the instrument first showed an abnormal reading) and the subject's response (viz., tapping the correct F-key on the computer keyboard). This elapsed time was compared with a criterion cutoff time that varied with the altitude of the simulated plane. If the elapsed time for a trial was less than or equal to the cutoff time, then the subject was given a success message for that trial. If the elapsed time was greater than the cutoff time, then the subject was given a failure message. At lower altitudes, more stringent criterion cutoff times were used to make success on the task more difficult.

The first phase of the simulation consisted of training the subjects on the task and providing sufficient practice to stabilize their response times. The practice period also included an objective assessment of each subject's ability (i.e., response time), which subsequently allowed the success–failure cutoff times to be set individually. This procedure served to remove the effects of individual differences in task-related abilities that would affect response time. At the middle altitude (2,500 ft), for example, subjects had an objective probability of success of .5 because the criterion cutoff time was the median of the subject's response times during the practice period. The practice phase also allowed for stabilization of subjective probability of success on the task (cf. Kuhl & Blankenship, 1979a).

During the experimental phase of the simulation task, subjects were allowed to freely choose the level of task difficulty. Before each block of four trials, subjects selected one of the five altitude levels (i.e., a task difficulty level) from a menu on the computer screen. There were 12 blocks of four trials each plus a final choice required after Trial 48, resulting in 13 task difficulty choices by each subject.

Task Interruption

During the course of the simulation, subjects were periodically interrupted to respond to several questions ancillary to the present study. These measures were collected using a computer-based questionnaire. Consequently, the questionnaire measures served as an insistent, temporary interruption of the task, experientially resembling a telephone call that interrupts an individual's office work. Of the 126 subjects included in the data analysis, 108 were exposed to the periodic interruptions (the "interrupted group"). A randomly selected group of 18 subjects (14.3%) was not exposed to the interruptions and served as the

Table 1
Mean Task Difficulty Choices Across Trials

	Positively motivated[a]		Negatively motivated[b]	
Choice block	Mean choice	*SD*	Mean choice	*SD*
1	2.73	1.16	2.73	1.06
2	2.94	0.98	2.98	1.07
3	3.39	1.05	3.45	1.16
4	3.67	1.13	3.63	1.15
5	3.64	1.26	3.63	1.28
6	3.56	1.15	3.53	1.27
7	3.67	1.22	3.52	1.19
8	3.73	1.03	3.45	1.31
9	3.59	1.24	3.45	1.32
10	3.76	1.16	3.53	1.32
11	3.53	1.19	3.18	1.47
12	3.56	1.23	3.20	1.42
13	3.59	1.28	3.22	1.35

Note. Task difficulty ranged from 1 (easiest) to 5 (most difficult). At 3, objective probability of success was .5.
[a] $n = .66$. [b] $n = 60$.

"noninterrupted group." This noninterrupted group performed in a constant environment similar to the one used by Kuhl and Blankenship (1979a), and thus provided a control group to evaluate the impact of interruptions.

Results

Initial Task Difficulty Choices

Following the predictions from Kuhl and Blankenship (1979b), it was hypothesized that positively motivated subjects would initially choose more difficult tasks than negatively motivated subjects. In the current study, there was no support for this hypothesis. The mean levels of initial task difficulty for positively and negatively motivated individuals were virtually identical (2.727 vs. 2.733, respectively), $t(124) = -.03$, *ns*, indicating no difference in the average level of initial task difficulty choice. An analysis of the frequency of initial task difficulty levels for the two achievement motive groups further revealed no significant difference in the distribution of initially chosen task difficulty levels for the two motive groups, $\chi^2(4, N = 126) = 0.75$, $p = .95$. There was also no evidence of a difference between the two achievement motive groups in the frequency of initial task difficulty choices for either women, $\chi^2(4, N = 75) = 1.13$, $p = .89$, or men, $\chi^2(4, N = 51) = 3.31$, $p = .55$, indicating that even within subgroups of women and men there were no differences in initial task difficulty choices. These results are in direct contrast to the predicted effect of a difference in the initial task difficulty choice for the two motive groups.

Task Choice Trends

In order to examine the patterns of task difficulty choices of positively and negatively motivated subjects across blocks of trials, a repeated measures analysis was performed using the within-subjects variable of 13 task difficulty choices across experimental blocks. A multivariate analysis of variance (MANOVA) approach to the repeated measures analysis was used because univariate repeated measures analysis is not robust when the sphericity assumption is violated (O'Brien & Kaiser, 1985).

Following Kuhl and Blankenship (1979b), it was predicted that positively motivated individuals would prefer successively more difficult tasks over repeated trials. Table 1 reports the mean task difficulty choices by block for positively motivated subjects and for negatively motivated subjects. An analysis of repeated measures for only positively motivated subjects revealed a significant overall effect for block on task difficulty, Wilks's $\lambda = .528$, approximate multivariate $F(12, 53) = 4.02$, $p < .001$. Furthermore, a set of polynomial contrasts revealed a significant linear trend, $t(54) = 3.95$, $p < .001$, indicating that positively motivated subjects chose successively more difficult tasks across trials during the free choice period. This finding supports the hypothesis for positively motivated subjects.

The polynomial contrasts of the task difficulty choices of positively motivated subjects also revealed a significant quadratic trend, $t(54) = -4.75$, $p < .001$, as well as a significant cubic trend, $t(54) = 2.12$, $p = .037$. These higher order trends indicated the existence of two inflection points (or "bends") in the pattern of choices for positively motivated subjects. As illustrated in Figure 1, there was a strong linear trend toward increasingly difficult task choices for the positively motivated subjects through Block 4. The first bend in the plot was associated with a plateauing of task difficulty choices between Blocks 4 and 10. The second bend in the plot was an abrupt drop in preferred task difficulty level at Block 10, where the task difficulty choices seemed to stabilize at an intermediate difficulty of about 3.55.

It was predicted that negatively motivated subjects would also prefer successively more difficult tasks across repeated trials. Although the analysis of the difficulty choices for the negatively motivated subjects revealed a significant overall effect for block, Wilks's $\lambda = .503$, approximate multivariate $F(12, 47) = 3.95$, $p < .001$, the linear trend effect for negatively motivated subjects was not statistically significant, $t(48) = 0.88$, $p = .38$. The coefficient for the linear trend was in the predicted direction, however. As with positively motivated subjects, evidence

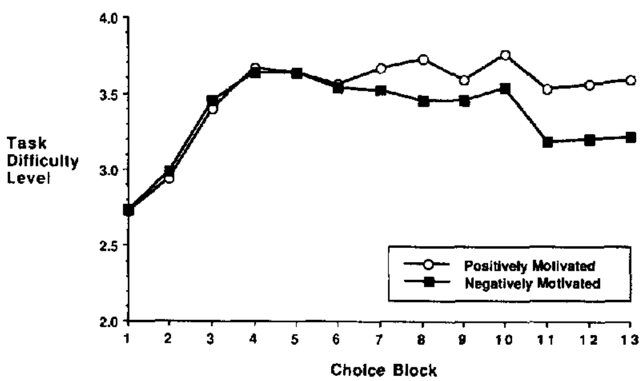

Figure 1. Plot of mean task difficulty choices by achievement motivation.

was found for both a quadratic trend, $t(48) = -5.24$, $p < .001$, and a cubic trend, $t(48) = 2.51$, $p = .015$, among the difficulty levels for negatively motivated subjects, indicating the presence of two inflection points in the pattern of choices.

The pattern of task difficulty choices for the negatively motivated subjects was very similar to the pattern of choices for positively motivated subjects (see Figure 1). Although the test of the linear trend across all 13 blocks was nonsignificant for negatively motivated subjects, there was a clear shift toward more difficult task choices for the negatively motivated subjects through Block 4.

To investigate the difference in the linear trend for positively and negatively motivated individuals, a mixed model MANOVA repeated measures analysis combining both achievement motive groups was used. The analysis incorporated achievement motive, subject gender, and presence–absence of task interruption as between-subjects variables. The within-subjects variable of experimental block was again used to represent the repeated measure of task difficulty choice. The results of this analysis are reported in Tables 2 and 3.

In the combined group analysis, chosen task difficulty level varied significantly overall across blocks, Wilks's $\lambda = .682$, approximate multivariate $F(12, 107) = 4.16$, $p < .001$. An analysis of the polynomial trends across choice block also revealed the significant linear, $t(107) = 3.07$, $p = .003$; quadratic, $t(107) = 4.27$, $p < .001$; and cubic, $t(107) = 3.25$, $p = .002$, trends found in the two achievement motive subsamples reported earlier.

It was also predicted that positively motivated individuals would shift to more difficult tasks faster than negatively motivated individuals. The interaction between the linear trend effect of task difficulty choices and achievement motive was significant, $t(107) = 2.02$, $p = .046$, reflecting a stronger linear trend effect for positively motivated individuals than for negatively motivated subjects, as predicted in the hypothesis.

Note, however, that the pattern of choices obtained in the present study was much more intricate than these analyses suggest and much more intricate than the pattern reported in Kuhl and Blankenship (1979a). Inspection of Figure 1 reveals that the task difficulty choices of both positively and negatively motivated subjects shifted toward more difficult tasks through Block 4 and then stabilized for a period. There was a shift toward easier tasks at Block 11, then the task difficulty choices stabilized at a level between the initial choice level and the high point reached at Block 4. The pattern of choices was quite similar for the two achievement motive groups through Block 6. The significant achievement motive by linear trend interaction revealed in the analysis seems to have occurred because of the difference in the final stabilization level (Blocks 11–13) of the two motive groups rather than differences in the initial rate of shift toward more difficult tasks. As noted earlier, there was surprising similarity between the task difficulty choices of the two motive groups during the early phases of the study. Accordingly, although the test of the linear trend by achievement motive interaction was significant, inspection of Figure 1 casts doubt on whether the interaction supports the theoretical deductions from which this hypothesis was derived.

The between-subjects effects revealed in the combined group analysis indicated a significant main effect for motive group, $F(1, 118) = 13.41$, $p < .001$, with positively motivated subjects choosing harder tasks on average than negatively motivated subjects. The main effect for gender was also significant in the analysis, $F(1, 118) = 4.41$, $p = .038$, with women choosing easier tasks than men. There were no significant interactions between the within-subjects variable of task difficulty choice block and any of the between-subjects variables (see Tables 2 and 3).[2]

The mixed model analysis also revealed a significant Achievement Motive × Task Interruption interaction, $F(1, 118) = 14.2$, $p < .001$. The means reported in Table 4 indicate that positively motivated subjects in the noninterrupted group chose harder tasks on average than positively motivated subjects in the interrupted group, whereas negatively motivated subjects in the noninterrupted condition chose easier tasks than negatively motivated subjects in the interrupted condition. Secondary analyses of the trend effects failed to reveal any interactions between task interruption and any of the polynomial trends among task difficulty choices.

Table 2
Between-Subjects Analysis for Task Difficulty Choices

Source	Mean square	$F(1)$	p
Motive	81.70	13.41	<.001
Gender	26.83	4.41	.038
Task interruption	0.77	0.13	.723
Motive × Gender	2.43	0.40	.529
Motive × Task Interruption	86.55	14.21	<.001
Gender × Task Interruption	11.28	1.85	.176
Motive × Gender × Task Interruption	0.12	0.03	.861

Note. $MS_e = 6.09$, $df = 118$.

Table 3
Within-Subjects Analysis for Task Difficulty Choices

Source	Wilks's λ	Approximate multivariate $F(12)$	p
Block	.682	4.16	<.001
Motive & block	.946	0.51	.907
Gender & block	.976	0.22	.997
Task interruption & block	.909	0.89	.557
Motive × Gender & Block	.935	0.63	.817
Motive × Task Interruption & Block	.951	0.46	.935
Gender × Task Interruption & Block	.947	0.50	.911
Motive × Gender × Task Interruption & Block	.899	1.01	.448

[2] Although the interaction between achievement motive and task difficulty choice block was not significant, the interaction between achievement motive and the specific linear trend contrast within task difficulty choice block was significant (as discussed earlier). Because the Achievement Motive × Linear Trend Interaction was predicted a priori, it was appropriate to test the specific contrast even though the general effect was not significant.

Table 4
Task Difficulty Choices by Achievement Motive and Task Interruption

Subject classification	Task interruption: Interrupted *M*	*SD*	Noninterrupted *M*	*SD*
Positively motivated	3.42[a]	0.60	4.03[b]	0.70
Negatively motivated	3.49[c]	0.78	2.72[d]	0.78

[a] $n = 59$. [b] $n = 7$. [c] $n = 49$. [d] $n = 11$.

Discussion

Dynamic achievement motivation theory, as currently stated, postulates that individuals should prefer successively more difficult tasks regardless of level of achievement motivation. Achievement motivation is expected, however, to influence the *initial level* of task difficulty choice as well as the *rate* of shift to more difficult tasks. The results of the present study revealed the expected main effect for motive group, albeit attenuated by task interruptions, and the expected positive trend toward increasingly more difficult tasks as predicted by theory. The results of the study also, however, raise questions about the general trend of task difficulty choices, the differences in the choices of positively and negatively motivated subjects, and the impact of task environments on the dynamics of achievement-oriented behavior.

General Task Difficulty Choice Trends

One key finding revealed in the analysis of task difficulty choices was that these choices did shift toward more difficult tasks with experience on the task, regardless of level of achievement motivation. As predicted from the computer simulation of the dynamic achievement motivation processes by Kuhl and Blankenship (1979b), evidence was obtained of a clear shift toward preferences for more difficult tasks through the first four task difficulty choices for both positively and negatively motivated subjects. Interestingly, if the current study had ended after the fourth task difficulty choice, our conclusions about the linear trend effect in task preference would have been identical to the conclusions drawn from the Kuhl and Blankenship (1979a) empirical study of task difficulty choices; that is, there was a shift to successively more difficult tasks during the free choice period (as predicted), and there was no significant difference in the rate of shift for positively and negatively motivated subjects (in contrast to theoretical prediction).

Of greater interest is the fact that the current study also identified nonlinear trends in the task difficulty choices. The results of Kuhl and Blankenship's (1979b) simulation also reveal nonlinear effects after successive trials in that easier tasks become dominant later in the simulation (see Figures 2 and 3, pp. 145 and 147)[3]. The empirical results suggest that individuals do shift to more difficult task choices, as predicted in the computer simulation of dynamic achievement by Kuhl and Blankenship (1979b), but also suggest that individuals eventually shift back to easier tasks. Further, the nonlinear trends in task difficulty choices exhibited in the present study were apparent for both positively and negatively motivated subjects, and these effects occurred regardless of whether the subjects were exposed to an interrupted or constant task environment.

This complex pattern of task choice preferences does not fit the stable preferences postulated by Atkinson (1957), nor does it fit the simple linear trend effects emphasized by the Kuhl and Blankenship (1979b) computer simulation. If the results of the current study are found to be reliable, the dynamic model of achievement motivation may require some modification to accommodate these previously unidentified temporal effects.

One possible modification would be to consider the addition of a third inertial tendency to the current action and negaction tendencies. This third tendency would effect a shift to easier task choices after some period of time on the task had elapsed. Thus, it would operate in a slower fashion, coming into play only after individuals had gained task experience. Although admittedly speculative, it may be that after engaging in an achievement task for a relatively long period of time, fatigue, boredom, or some type of cumulative consummatory effect may lessen the individual's responsiveness to the achievement cues embedded in the situation. As the achievement cues become less salient, the instigating force for the task diminishes. As a result, the action and negaction tendencies would tend to reach a new dynamic equilibrium at a lower level of preferred task difficulty. Because we neither predicted the shift back to easier tasks nor collected data on fatigue or boredom, this speculation should be considered cautiously.

Achievement Motivation and Task Experience

The lack of differences in the initial task difficulty choices for positively and negatively motivated subjects obtained in the present study is inconsistent with predictions from achievement motivation theory (Atkinson, 1957; Kuhl & Blankenship, 1979b). As noted earlier, empirical support for this predicted difference in initial task choices has been largely equivocal (cf. Cooper, 1983; Hamilton, 1974). Likewise, the empirical work of Kuhl and Blankenship (1979a), though at first glance supportive of the hypothesized differences, did not really provide a test of the differences in the initial choices of the two groups. Instead, they predicted (and found) that the initial choices for positively motivated subjects would not differ from a probability of success equal to .5 (their Hypothesis 2) and that the initial choices of negatively motivated subjects would have a probability of success significantly less than .5 (their Hypothesis 4). However, it is the difference between the two motive groups that has theoretical and practical significance, not the significance/nonsignificance of the difference of each group from a value of .5. Thus, Kuhl and Blankenship's findings do not support the hypothesis of initial differences in task difficulty preferences. We can conclude that differences in initial task choice are either nonexistent or else they are not large enough to be consistently detected. As Cooper (1983) noted, "The failure . . . to predict correctly the initial task choice behavior is thus not

[3] We thank an anonymous reviewer for pointing this out to us.

unusual and points to complex, long-standing problems in this portion of the achievement motivation domain" (p. 853). Further research focusing solely on the issue of initial task difficulty choices would seem to have little practical or theoretical utility.

In contrast, the delayed emergence of differences between positively and negatively motivated subjects' task choices obtained in the present study is intriguing. One potential explanation for this effect is that the personality differences reflected in measures of achievement motive and fear of failure operate in a weak but cumulative fashion. That is, initially, these constructs may have no discernible influence on task difficulty choices (i.e., initial responsiveness to instigating stimuli). Over time, however, their effects may manifest so that eventually positively and negatively motivated individuals exhibit different task difficulty preferences reflecting the dynamics of action (e.g., differential responsiveness to the action and negaction tendencies, and collateral consummatory effects prompted by the instigating stimulus).

Another possible explanation of the delayed importance of achievement motive and fear of failure is that there may be a discrete shift in the potency of these personality variables with task experience. When individuals are working at a new task, they are likely to be functioning under controlled cognitive processes (cf. Schneider & Shiffrin, 1977; Shiffrin & Schneider, 1977) that may be relatively immune to differences in achievement motive and fear of failure. With increased task experience, automatic processes associated with habitual decision making may become more important. These automatic processes may differ in form or content for positively and negatively motivated individuals, resulting in different task difficulty choices. Further research on these issues could provide an important addition to the literature on achievement motivation and task behavior.

Constancy of the Environment

In both their simulation and empirical analysis, Kuhl and Blankenship (1979a, 1979b) appear to assume a constant instigating environment. The data in the current study shed some additional light on the robustness of the theory in an environment characterized by interruptions. The results revealed an interaction between task interruption and achievement motive on average task difficulty choices across the entire study. In the interrupted condition, positively and negatively motivated subjects had similar average levels of task difficulty choice, whereas in the noninterrupted condition positively motivated subjects chose harder tasks and negatively motivated subjects chose easier tasks than subjects in the interrupted condition. In effect, task interruption seems to have attenuated differences in the average task difficulty level chosen across trials between the two motive groups, but had no effect on the trends across trials exhibited by positively and negatively motivated subjects.

The attenuation of achievement motive differences by task interruption may occur because interruptions tend to reinitialize the dynamic processes underlying task difficulty choices. Because there is no initial difference between positively and negatively motivated subjects, reinitialization of the dynamic processes would lessen mean differences between the two groups. It is also possible that task interruptions lessen the consummatory effect (which should be higher for positively motivated individuals), and thus decrease the rate of change to more difficult tasks and lower the average level of task difficulty choices, particularly for positively motivated individuals. Task interruptions could also dissipate the force of resistance (which should be higher for negatively motivated individuals), and thus increase the rate change and raise the average level of task difficulty choices, particularly for negatively motivated subjects. Clearly, further investigation regarding reinitialization, decreased consummatory effect, or a dissipated force of resistance would be required to understand the attenuation of achievement motive differences by task interruption.

The specific type of interruption in this study may also be responsible for the significant interaction between achievement motive and task interruption. When interrupted, the subjects were asked about task expectations and attributions for success and failure. Given the differences in attributional processes of positively and negatively motivated individuals (Weiner, 1974), it is likely that these questions may have primed the two achievement groups differently for future decisions. Future research should also investigate the type of task interruption as it affects task difficulty choices.

Gender Differences

Miner (1980) concluded that achievement motivation is a male theory, in that it does not explain female behavior very well. In contrast, Cooper (1983) found that the predicted relationships generally held for women as well as men (i.e., the relationships for women were somewhat attenuated, but still significant). The conclusion of Miner that achievement motivation is primarily a male theory may have been valid previously, but Cooper suggested that the importance of gender differences in achievement motivation may be decreasing with time.

The results of the current study provide further evidence that gender is not a critical boundary variable in achievement motivation theory. Even though gender had a significant main effect on preferred level of task difficulty in this study, it did not interact with achievement motive or the various polynomial trends tested in this study. In other words, gender did not qualify any of the theoretical relationships tested in this study. These results are consistent with those of Cooper (1983) in that the theory appears to explain the behavior of both women and men equally well.

One explanation is that the relative importance of achievement motivation has been increasing for women. Veroff, Depner, Kukla, and Douvan (1980) found that levels of achievement motive significantly increased among American women between 1957 and 1976. Likewise, in a longitudinal study Jenkins (1987) found that achievement motive increased for women between 1967 and 1981. As women have become more achievement oriented, gender may have decreased in importance as a boundary variable in achievement motivation.

In summary, the field of achievement motivation has experienced substantial theoretical and empirical development since the pioneering work of Atkinson (1957). Yet there are a number of important issues that still need to be addressed. This study has explored some of those issues, but further work on the dynamics of task difficulty choices remains to be done.

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