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Research note

The relationship between time pressure and performance: A field test of Parkinson's Law[1]

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INTRODUCTION

Parkinson's Law suggests that work will expand or contract to fill the amount of time available for it. It, therefore, reflects the fact that people choose their effort levels to be appropriate to the tasks at hand and the amount of time they have available to accomplish those tasks.

Locke and his associates have attempted to explain the principle on which this folk wisdom operates in terms of goal-setting processes. With regard to the time made available to accomplish a task, shorter time limits are said to lead to the setting of more difficult goals, and longer time limits are said to lead to easier goals. Since performance on work tasks has been repeatedly shown to be an increasing function of the difficulty of one's accepted goals (see Locke, 1968), it follows, therefore, that time limits should also affect performance through their influence on goal difficulty.

Parkinson's Law has been tested in both laboratory and field settings. In a laboratory investigation, Bryan and Locke (1967) presented college students with a fixed number of simple arithmetic tasks and varied the amount of time allowed to work on them. Their results indicated that subjects who were given twice the amount of time to complete the tasks worked significantly longer than subjects who were given just enough time to complete them. An analysis of the personal goals

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reported by subjects suggested that, as hypothesized, goal-setting mediated this relationship. Persons with shorter time limits reported more difficult goals than persons with longer time limits.

This same notion was tested in a field setting with a large sample of wood harvesters by Latham and Locke (1975). Here, quotas were established on the amount of wood that the mills would accept from independent harvesters. Production quotas, however, were not given to all harvesters, but rather, to from 31 per cent to 41 per cent of them over a three-month period. For those wood harvesters who were limited to how much they could sell, the only way to minimize their business costs was to compress the amount of time needed to fill these restricted production quotas. In effect, workers were given particular time limits (e.g. 2 days) to fill particular production quotas set by the mills.

Latham and Locke (1975) argued that persons working under such time restrictions would exert a greater rate of effort toward task completion than would their counterparts who had no such time restriction. As predicted, logging crews that were limited to mill deliveries on 1 or 2 days a week showed a significantly higher 'rate' of output than those who had no such restriction. Data on person's goals, however, were not collected.

In another field investigation, Bassett (1979) manipulated choice versus assignment of task goal, goal difficulty, and work time limit for 116 persons who were hired for what was ostensibly a part-time job. Subjects in this study worked on a simple clerical task. No main or interactive effects were found with regard to the quality of work done. With regard to the rate of work, however, appropriate main effects were observed for both the experimentally manipulated goal difficulty and time limit variables, as well as for their interaction. As expected, persons worked at a faster pace when given more difficult goals and shorter time limits. No attempt was made to determine whether the results with regard to time pressure in this study reflected corresponding differences in perceived goal difficulty.

Finally, Andrews and Farris (1972), in a five-year panel design field study, reported on the impact of time pressure on the productivity of NASA scientists and engineers. In this investigation, time pressure was assessed through self-report measures, and performance, rather than performance rate, was assessed based on the ratings of supervisors and senior scientists. In this case, performance was assessed in terms of the dimensions of innovation, productiveness and usefulness. Results indicated that time pressure and performance were indeed related. Further, based on the cross-lagged analyses, these results suggested that time pressure preceded and influenced later performance rather than the reverse.

Andrews and Farris (1972) also found some evidence that the impact of time pressure on performance varied as a function of the 'absolute' amount of time pressure reported. That is, for two of the three performance dimensions (innovation and productiveness), performance tended to increase with increasing time pressure only to fall off as time pressures became too severe. These latter data suggest the importance of the 'absolute' level of time pressure as a limiting factor on the positive influence of this variable on performance. As with the other field studies, no attempt was made to examine perceived goal difficulty as a causal explanation for the impact of time pressure on performance.

With the exception of the Andrews and Farris (1972) study, the impact of time restrictions was assessed in terms of the 'rate of work' as opposed to the 'level' of

performance. In the laboratory study, a fixed level of output was determined by experimental design, and in the field studies, output level was restricted by the mills or the experimenter. Given that the level of output is fixed, one should naturally anticipate that the *rate* of work would vary with the amount of time made available to do it. In other settings, however, time pressures might exist even though the amount of work to be accomplished is not limited. In these settings, felt time pressures might exist because of the 'endless' supply of pressing tasks to be accomplished rather than the restricted time limits imposed for the accomplishment of a fixed number of tasks.

We are arguing that persons should experience time pressures not only as the amount of time decreases to work on a fixed number of tasks, but also as the number of important work tasks increase within a fixed time limit. In such instances, one can anticipate not only the rate of work to increase, but, in addition, the *level* of performance to increase as well. This latter prediction reflects the fact that persons who tend to be overburdened with a continual supply of pressing tasks at work always feel a time pressure to pursue work-related activities (see Andrews and Farris, 1972). Thus, time pressure should be reflected in an increased rate of work, which, over an eight-hour work day, will, in turn, be reflected in higher levels of performance. Thus, we hypothesize that perceived time pressure at work will be significantly and positively correlated with performance.

The effects of time pressure on performance were anticipated due to the hypothesized influence of time pressure on the difficulty of one's work-related personal goals, and, in turn, the influence of goal difficulty on performance (see Bryan and Locke, 1967). Unlike the other field investigations, this explanatory mechanism was tested in the present study, and as such, extends the previous research done in field settings. Thus, we can hypothesize that (a) perceived time pressure will be positively related to performance, (b) perceived time pressure will be positively correlated with goal difficulty, (c) goal difficulty will be positively correlated with performance, and (d) goal difficulty will *explain* the relationship between time pressure and performance.

METHOD

Subjects and procedures

Data for the present study were collected as part of an evaluation of an applied goal-setting programme in a medium size commercial banking organization located in the Southwest. Participants were 164 employees who worked on a variety of managerial and non-managerial jobs. The sample included 109 males and 55 females, with an average age of 39 years. The average organizational tenure in this sample was approximately 11 years. Sixty-six of the subjects were classified as managers. All participation was voluntary.

The current research utilized data collected on two questionnaires. The first was designed to capture the perceptions of bank employees with regard to the jobs they performed. Perceived time pressure was assessed on this questionnaire. The second questionnaire, administered only to those who had direct supervisory responsibilities, had persons rate various personal and job characteristics for each of their

subordinates. Goal difficulty was assessed here. In addition, the job performance for each person, based on supervisory ratings, was obtained directly from company records. The performance measure utilized data from the annual performance review. In the present study, performance data were collected approximately one month after the goal difficulty ratings were obtained.

While both goal difficulty and performance were assessed from supervisory ratings, these data were collected on different assessment instruments, for different purposes (research versus administrative purposes), and at different points in time. As such, since the key variables in this study were assessed either from different persons (employees or their supervisors), for different reasons, or at different points in time, limited concern about common method variance explanations for the results seems warranted.

Measures

Subjects expressed the degree of time pressure they experienced at work with regard to (a) the amount of time they had available to do the tasks assigned, and (b) the extent to which they could use the available time flexibly in order to accomplish task goals. Subjects responded to each dimension on a series of 7-point bipolar rating scales (e.g. useful–useless, available–unavailable, obtainable–unobtainable). Responses to these items were standardized within dimension and then averaged to create an overall time pressure score. Higher scores reflected more severe perceived time pressures. The mean for this standardized scale, naturally, was 0, and the standard deviation was 1.80. The reliability, based on Cronbach's alpha, was 0.87.

Goal difficulty was assessed through supervisory ratings. Supervisor's ratings were considered appropriate due to the supervisors' close interaction with subordinates as part of the on-going applied goal-setting programme. In particular, each supervisor responded to three items designed to assess the difficulty level of their subordinate's task goals (e.g. this employee's goals and objectives are rather easy to achieve). Responses, made on 5-point Likert scales, were averaged, with higher scores reflecting more difficult goals. The mean and standard deviation for this variable were 4.01 and 0.68, respectively, and the reliability, based on Cronbach's alpha, was 0.84.

The data on job performance were obtained directly from personnel records, and were based on the ratings given on seven specific performance-relevant items. These seven items were selected, for research purposes, from a larger subset of potential performance appraisal items because (a) these particular items seemed to allow for an overall assessment of an employee's worth and (b) the results of a principal components analysis which indicated the appropriateness of combining scores across these items into an overall performance score. The mean and standard deviation for this measure of overall performance were 32.56 and 4.30, respectively. The alpha reliability of this measure was 0.89.

RESULTS AND DISCUSSION

The correlation between perceived time pressure and performance was 0.19 ($p < 0.05$). Although not strong, this relationship exceeded chance expectations,

indicating that persons who reported greater time pressure also tended to perform better. These data, therefore, provide some support for Parkinson's Law and the previous research aimed at testing it (Andrews and Farris, 1972; Bassett, 1979; Bryan and Locke, 1967; Latham and Locke, 1975). Further, the present results replicate those of Andrews and Farris (1972) by demonstrating the existence of a relationship between time pressure and the level, as opposed to the rate, of appraised job performance. Perhaps the rather low, but significant, correlation between time pressure and performance level reflects the facts that (a) time pressure is more inherently and directly associated with the rate of work than with the total amount of work done, and (b) rate of work is but one of several factors (i.e. ability) which influences performance.

With regard to the explanatory hypotheses, the results tended to support Locke's propositions concerning the importance of goals as precursors to behaviour. In the present data set, time pressure was found to be significantly correlated with goal difficulty ($r = 0.17$, $p < 0.05$), and goal difficulty, in turn, was found to be significantly correlated with rated performance ($r = 0.43$, $p < 0.001$).

In order to test the hypothesis that goals mediate the relationship between time pressure and performance, partial correlational analyses were performed. If goals do provide the explanation for why time pressure affects performance, than we should find the relationship between time pressure and performance to drop to zero with goal difficulty held constant (see Asher, 1976). In like manner, to the extent that goals come between time pressure and performance, controlling for time pressure should leave the relationship between goal difficulty and performance unchanged.

Based on this logic, appropriate partial correlations were computed. The partial correlation between time pressure and performance, controlling for goal difficulty, dropped off to non-significance (partial $r = 0.14$, ns). While no longer significant, this correlation clearly did not fall off to zero as hypothesized. On the other hand, when time pressure was used as a control variable on the relationship between goal difficulty and performance, the partial correlation remained statistically significant (partial $r = 0.40$, $p < 0.001$). It should be noted that when used as a control variable, goal difficulty accounted for a substantial portion (32 per cent) of the observed variance in the relationship between time pressure and performance. On the other hand, when time pressure was used as a control variable, it accounted for only 13 per cent of the observed variance in the goal difficulty–performance association. Thus, one of the two mediating conditions was clearly supported, and in all, the results are consistent with the hypothesis that goals do act in the manner predicted by Bryan and Locke (1967).

Since our sample included both managerial and non-managerial focal personnel, the results might be due, in part, to having managers rate the goal difficulty higher and the performance better for managers than for non-managers. Such an occurrence would produce findings similar to those reported for the total sample, and thus, would more parsimoniously account for those results. In order to rule out this alternative explanation, two additional sets of analyses were conducted. First, the total sample was split into managerial and non-managerial subsamples, and mean levels of both goal difficulty and performance were compared across groups. No differences were found. Second, the major analyses conducted to test our hypotheses were repeated separately within each organizational level subsample.

Both sets of results suggest that the findings reported for the total sample are substantive, and therefore not easily attributed to having higher ratings being given to managerial personnel.

The present results imply that time pressure might be an effective means of impacting upon the difficulty of the goals held by persons at work, and therefore, their level of performance. One way of doing this is through the use of 'time deadlines'. Such deadlines are often established as part of the performance contracts within applied goal-setting and MBO programmes (e.g. Streidl, 1976). The current data suggest that the difficulty level of the objectives contained in such performance contracts can be increased *or* decreased by appropriate changes in the deadlines established for goal accomplishment. As such, completion deadlines can be utilized in helping to insure that the difficulty of the established goals are neither too high nor too low.

While the present results provide some support for the Parkinson's Law concept and the goal difficulty hypotheses which explain it, they simultaneously appear to contradict other theory and data involving situational factors such as time pressure. In particular, research and theory in the area of situational performance constraints suggest that situational factors such as severe time pressure will lower, not raise performance. In fact, Peters, O'Connor and Rudolf (1980) identified 'time availability' as one of the eight categories of constraints in their early taxonomic work. While these authors, to date, have not provided any data relevant to specific relationships between measured time constraints and performance, they have shown constraining situational factors which reflect the overall work setting to be negatively related to performance (see, for example, Peters *et al.*, 1980; O'Connor, Peters, Pooyan, Weekley, Frank and Erenkrantz, 1983). Thus, an apparent contradiction exists between their prior work and the current results.

It may be, as suggested by Andrews and Farris (1972), that situational factors such as time pressure do not have a linear effect on performance. As time pressures become stronger, but are nonetheless relatively mild, performance may increase as suggested by Parkinson's Law. However, as such pressures become increasingly more severe, they may well result in decreased performance as suggested by Peters and O'Connor (1980).

This argument reflects Bryan and Locke's (1967) hypothesis that person's conscious goals mediate the effects of time pressure on performance. Since goal acceptance is a pivotal construct within goal theory, it may well be that when time pressures are mild, an increase in them results in the acceptance of the correspondingly more difficult task goals. However, when time pressures become severe, people may no longer be willing to accept the difficult goals that result. The consequence of not accepting goals, of course, is to strip them of their motivating potential. Similarly, Peters and O'Connor (1980) have argued that reduced levels of motivation can be expected for persons who have a long history of working in a severely constraining work setting. Consistent with Bryan and Locke (1967), they argued that severe constraints would act to lower persons' expectancy beliefs, or the extent to which they believed that the task goals can be accomplished through their personal efforts.

The present data cannot address this important issue. To be sure, bank employees in the current sample did not describe severe time pressures at work. The unstandardized mean levels of time pressure reported along both the time

availability and time flexibility dimensions were 3.21 and 2.52, respectively. These mean scores were well below the mid-points (i.e. 4.0) on the 7-point rating scales utilized. Thus, given the 'mild' absolute level of time pressures reported, the above logic could argue for a small to medium positive time pressure–performance association within the current sample. This relationship would be predicted to become weaker as time pressures increased further, and then, finally, to become negative as time pressures become severe. It would, therefore, appear useful for future research to explore the impact of situational factors such as time pressure on performance at both mild and severe levels of this situational factor. It may well be that situational constraints, like time availability, only constrain behaviour when severe; when mild, they may actually facilitate it.

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