# Extended workdays: Effects on performance and ratings of fatigue and alertness

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The present investigation provided a laboratory test of long workdays and served as an initial step in developing a field-test battery that is sensitive to fatigue. Six subjects worked both a 12h/4-day workweek and an 8-h/6-day week at a data-entry job simulation. Before and after the first and last days of each week, they completed a battery of brief tests measuring cognitive, perceptual-motor, task-sharing, motor, and sensory capacities, as well as subjective feelings. Results suggest that the 12-h/4-day week was more fatiguing than the 8-h/6-day week. In the data-entry job, it was easier to improve performance across the 8-h/6-day week. This result suggested that the fatigue of the 12-h days slowed the rate of improvement across the week. With respect to the test battery, two cognitive tasks (grammatical reasoning and digit addition) and several selfreport scales also reflected greater fatigue in the 12-h/4-day week. Performance efficiency decreased and reports of drowsiness and lack of concentration increased from the beginning to the end of the final 12-h workday. On the basis of these results, it was concluded that the test battery has utility for the assessment of the potential fatigue effects of long workdays in actual work settings.

Employee demands for increased "usable" leisure time and evolving industrial needs for longer work shifts have stimulated interest in alternatives to the common 8-h/5day workweek (e.g., Hedges, 1971). Alternative schedules often include work shifts longer than 8 h because the 5-day week is "compressed" into 4 days or fewer or because overtime is required. The increased use of longer workdays under such schedules has led to concerns about reduced job efficiency and related problems involving safety and health hazards attributable to cumulative fatigue. The literature on work scheduling (see Alluisi & Morgan, 1982, for a review) provides only a few clues about the effects of long workdays on performance efficiency or individual well-being.

Studies examining the effects of the compressed workweek have reported inconsistent changes (i.e., increases in some cases and decreases in others) in absenteeism (e.g., Campbell, 1980), worker satisfaction (e.g., Nord

work efficiency or safety. There are some reports (e.g., Ellingstad & Heimstra, 1970; Grandjean, Wotzka, Schaad, & Gilgen, 1971) of demonstrated declines in performance across a work shift of 8 or more hours, but these studies have not systematically compared different work schedules in terms of days worked or hours worked per day. Other researchers (see Alluisi & Morgan, 1982, for a review) have compared performance during various work schedules requiring 12 or 16 h of work per day. However, these studies usually have involved atypical work-rest cycles, such as 4 h on duty/4 h off duty, 4 h on/2 h off, or 6 h on/2 h off, which were designed to simulate military oprations. The alteration of the normal sleep routine during such short work-rest schedules makes it difficult to apply the results of these studies to the long work-rest cycles, such as 10 h on/14 h off, common in come civilian occupations.

& Costigan, 1973), and productivity (Ivancevich, 1974;

Ivancevich & Lyon, 1977). Furthermore, it has been sug-

gested that, in situations in which production levels have

been maintained following conversion to a compressed

schedule, this may have been at the expense of increased

fatigue as reported by workers (Hodge & Tellier, 1975).

In addition, there are few data on how the workers' sub-

jective reports related to actual behavioral measures of

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