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Communications

DO MAJORING SUBJECTS AFFECT THE MORNINGNESS-EVENINGNESS PREFERENCE BY STUDENTS?

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Women preferred morningness significantly more than men. Differences in scores between both sexes became greater in order of the phase points of 'rising time,' 'peak of activities,' and 'falling-to-sleep time,' suggesting that oscillator(s) of men are more easily free-running than those of women. Women majoring in natural sciences or agriculture preferred morningness significantly more than women majoring in humanities, economics, or education.

INTRODUCTION

Many studies (Costa et al., 1987; Ishihara et al., 1988; Macacci and Zani, 1983; Motohashi, 1988; Posey and Ford, 1981) on 'morning and evening types' have been made so far, using morning-evening questionnaires, including a popular questionnaire by Horne and Östberg (1976). Some reports on questionnaires administered to Japanese people showed that the score distribution of women was significantly shifted to morningness rather than that of men (Ishihara et al., 1987; Motohashi, 1988). There have been, however, no significant differences in score distribution between both sexes in some reports from the United States and Italy (Costa et al., 1987; Posey and Ford, 1981). The difference may be specific for Japanese.

Working young women and men prefer morningness more than students (Ishihara et al., 1988; Macacci and Zani, 1983). An extent of social restriction higher to workers than to students seems to make the score distribution shift to 'morningness,' However, whether majoring subjects relate to morningness (eveningness) has not yet been studied.

The present work aims first to investigate the effects of majoring subjects by students of universities or schools for nurses and therapists on morningness-eveningness by using Torsvall and Åkerstedt's Questionnaire (Torsvall and Akerstedt, 1980). Second, the chronobiological mechanisms will be clarified for the difference in score distribution between sexes: Are oscillators of men easier to be free-running than those of women? Or are oscillators of men entrained to zeitgebers at a 'later phase point' than those of women?

METHODS

In this study, a Japanese version (Ishihara, 1991) of a questionnaire made by Torsvall and Åkerstedt (1980) was used for administration to many volunteer students (417). The questionnaire consists of only 7 fundamental and generalized questions (3 for 'rising time,' 3 for 'falling-to-sleep time,' and 1 for 'peak of activities'). Therefore it is easy to fill out regardless of present schedules and conditions of students' lives. The volunteer students consist of 216 university students [172 fresh students, 35 (9 women, 26 men) of the 172 majoring in natural science, 25 (9, 16) in agriculture, 44 (32, 12) in humanities, 30 (6, 24) in economics, 38 (25, 13) in education; 44 third-grade students majoring in education], 121 (113 women, 8 men) students going to two training schools for nurses, and 80 (44,

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36) ones going to a training school for physical therapists. The questionnaire was administered on several occasions in 1993 to 1995. All the training schools and university are in Kochi city. The data only by fresh boys and girls were used for comparisons between major subjects. Students in the first year study subjects for 'general and common education' in Kochi University. The ages of students sampled in the present study ranged from 18 to 27. The average scores to the 7 questions in the questionnaire by Torsvall and Åkerstedt (1980) were expressed as scores (1 to 4) on the diurnal-type scale.

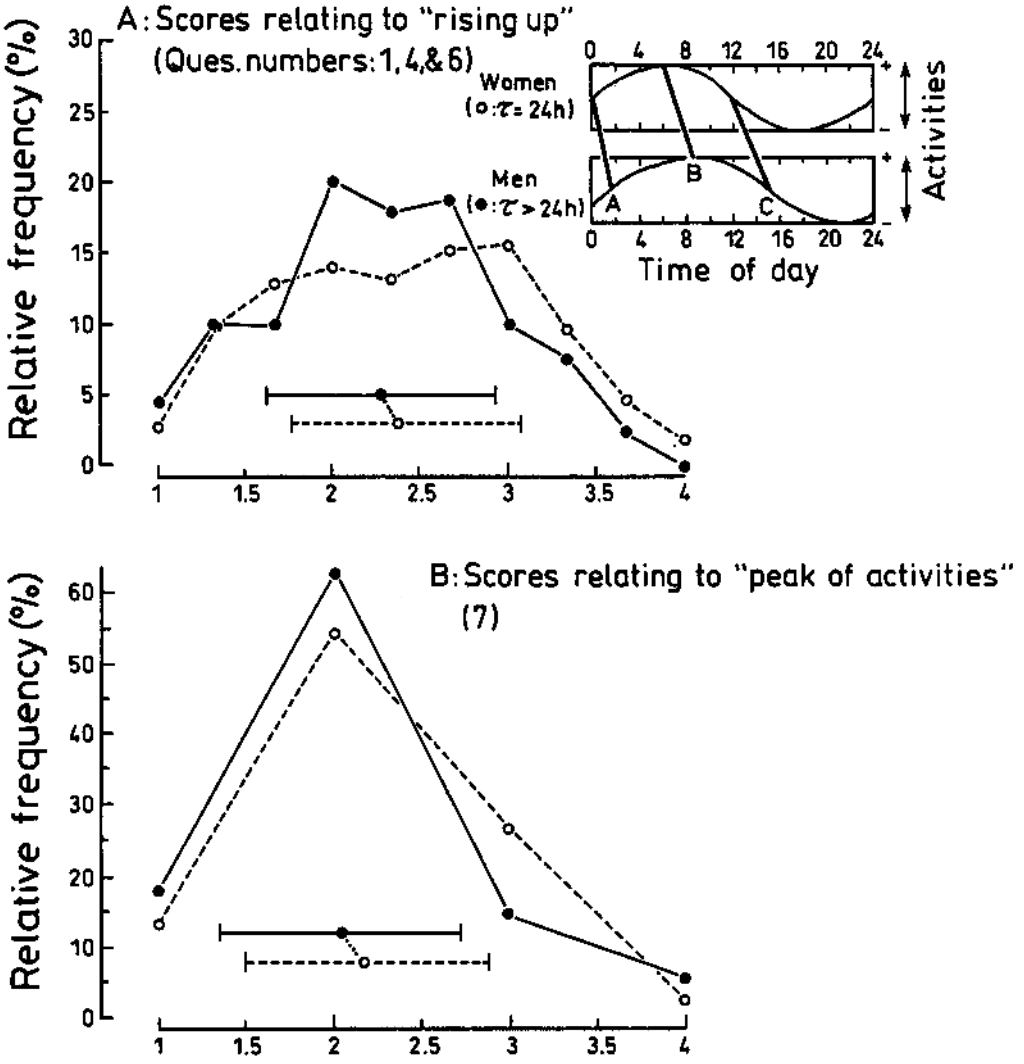

Fig. 1. Comparisons among the three phase points (A: 'rising time', B: 'peak of activities', and C: 'falling-to-sleep time') for differences between the scores of women and men. The differences become greater in order of A, B, and C (Mann-Whitney U-statistics between women and men at A: P=0.047, B: P=0.018, and C: P=0.00021). (to be continued).

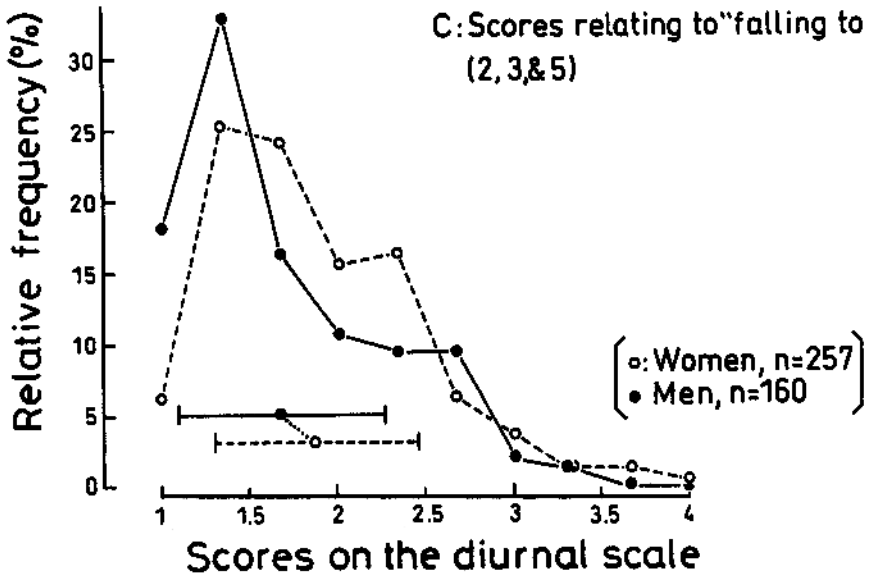

Fig. 1. (continued).

RESULTS AND DISCUSSION

The scores of women (mean ± S.D.= 2.13 ± 0.47, n=257) were significantly higher than those of men (1.99 ± 0.46, n=160) (Mann-Whitney U-statistics: P=0.0017). This means that women prefer morningness more than men. The significant differences between both sexes were shown by university students and by those of the training school for physical therapists. Japanese women during childhood and teenage years seem to suffer unfair pressures in a religious background derived from Confucianism: They should get up earlier in the morning than men and help their mother do householding chores. This social restriction may be a factor in making women prefer morningness that applies only to Japanese. As shown in Figure 1, the differences in mean scores between women and men become greater in order of point A (rising time), point B (peak of activities), and point C (falling-to-sleep time). Therefore the oscillator(s) of men seems to be more easily free-running.

Women of training schools relating to medicine (mean ± S.D. in scores: 2.17 ± 0.50) tended to prefer morningness more than university women students majoring in humanities, economics, or education (2.04 ± 0.43) (Mann-Whitney U-statistics: P=0.0582). The women majoring in natural sciences or agriculture showed significantly higher scorings than those majoring in humanities, economics, or education (Figure 2). However, there were no significant differences in scores between women of the training schools and those majoring in natural sciences or agriculture. With men, significant differences among the major subjects were not shown in score distribution (mean ± S.D. for men majoring in humanities, economics, or education: 1.99 ± 0.47, n=49; men majoring in natural sciences or agriculture: 2.01 ± 0.46, n=42; men studying in training schools relating to medicine: 1.99 ± 0.48, n=44). Students interested in nature may easily have their oscillators entrained to environmental (natural) zeitgebers (e.g., photoperiodic cycles) than students majoring in the other subjects, especially for women.

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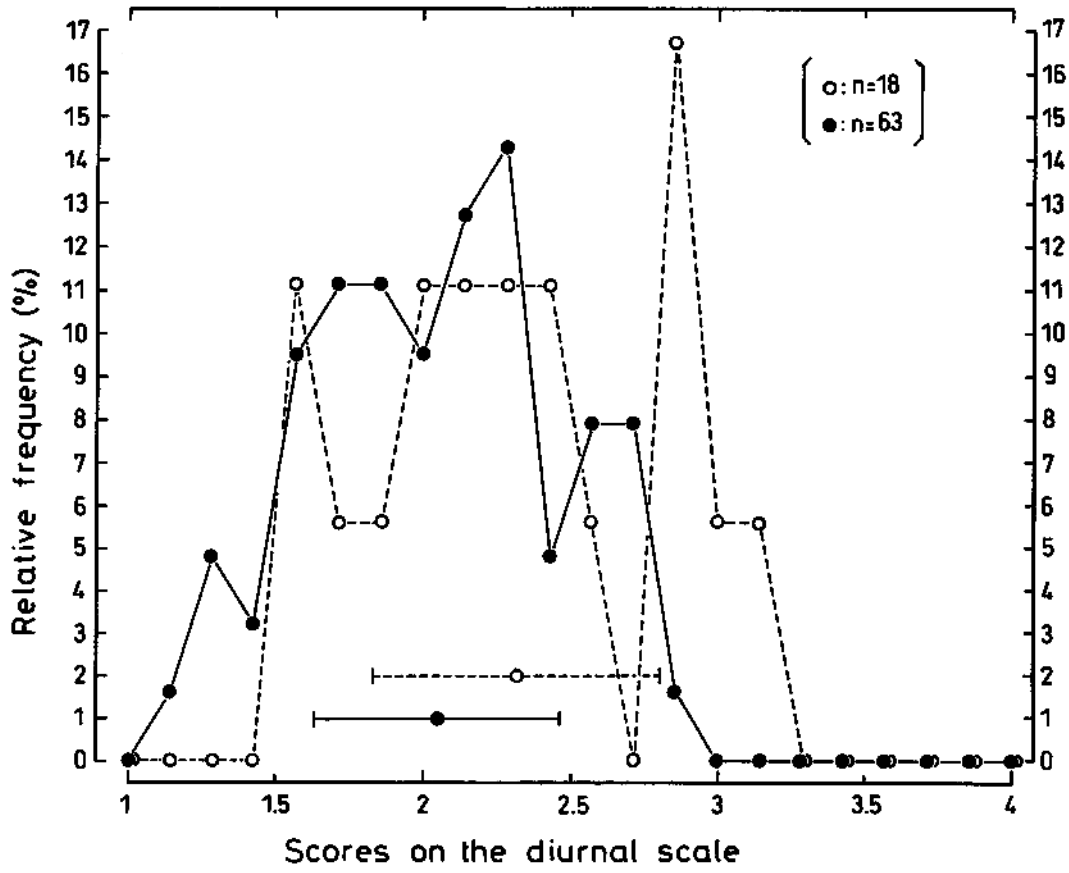

Fig. 2. Distributions of M-E scores for women students majoring in natural sciences or agriculture (○) and in humanities, economics, or education (●). Mann-Whitney U-statistics between the two groups: $P<0.05$.

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APPENDIX

Questions chosen for the questionnaire. Figures in parentheses indicate scoring (Torsvall and Åkerstedt, 1980).

Question	Optimal answers
1. When would you prefer to rise (provided you have a full day's work of 8 h ahead) if you were totally free to arrange your time?	(4) before 6:30 (3) 06:30-07:29 (2) 07:30-08:29 (1) 08:30 or later
2. When would you prefer to go to bed (provided you have a full day's work of 8 h ahead) if you were totally free to arrange your time?	(4) before 21:00 (3) 21:00-21:59 (2) 22:00-22:59 (1) 23:00 or later
3. If you always had to go to bed at 24:00, what do you think it would be like to fall asleep then?	(4) easy -- would fall asleep almost at once (3) rather easy -- would lie awake for a short while (2) rather difficult -- would lie awake for some time (1) very difficult -- would lie awake for a long time
4. If you always had to rise at 06:00, what do you think it would be like?	(4) easy -- no problem at all (3) a little unpleasant, but no great problem (2) rather difficult -- would lie awake for some time (1) very difficult and unpleasant
5. When do you usually begin to feel the first signs of tiredness and need for sleep?	(4) before 21:00 (3) 21:00-21:59 (2) 22:00-22:59 (1) 23:00 or later
6. How long does it usually take before you 'recover your faculties' in the morning after rising from a night's sleep?	(4) 0-10 min (3) 11-20 min (2) 21-40 min (1) more than 40 min
7. Please indicate to what extent you are a morning or evening active individual?	(4) pronounced morning active (i.e., morning alert and evening tired) (3) to some extent morning active (2) to some extent evening active (i.e., morning tired and evening alert) (1) pronounced evening active