The relationships between morningness–eveningness, ageing and personality

LUCIANO MECACCI, ALBERTO ZANI, GASTONE ROCCHETTI and REGINALDO LUCIOLI
Istituto di Psicologia CNR, Via del Monti Tiburtini 309, 00157 Roma, Italia

(Received 28 October 1985)

Summary—In an attempt to study the relationships between ageing and personality and the morningness–eveningness dimension two experiments were carried out. In Experiment I, an Italian version of the Morningness–Eveningness Questionnaire (MEQ) was administered to 435 Ss ranging in age from 20 to 79 yr, and divided in to six age groups. In comparison with younger people older Ss tended to display greater Morningness–Eveningness scores. These results suggest that ageing relates to a shifting toward morningness. In Experiment II the Eysenck Personality Questionnaire (EPQ) and the MEQ were administered to 233 Ss (20–29 yr). Morning-types had significantly higher N scores and tended to be insignificantly more introverted. Evening-types had significantly higher P scores and tended to be insignificantly more extraverted. The present findings are consistent with reports of a tendency for morning-types to be introverted and for evening-types extraverted. However, they do provide some evidence of individual differences on the neuroticism and psychoticism dimensions of personality between the two diurnal types.

INTRODUCTION

Early research on human sleep-wake habits suggested the existence of ‘morning’ (M) and ‘evening’ (E) individuals, with intermediate types between the two extremes, according to an ‘early’ and a ‘late’ peak in body temperature and efficiency curves over the day (Kleitman, 1963). Since then the differentiation between ‘morning’ and ‘evening’ types has become a topic of systematic physiological and behavioural investigation. Relevant differences shown in their sleep–wake habits (Horne and Östberg, 1976, 1977; Webb and Bonnet, 1978) have been found to be strictly related to life-style also. In comparison with students, in fact, workers of the same age expressed a preference toward a ‘morning behaviour’ (Mecacci and Zani, 1983). Since previous research has shown that sleep–wake behaviour changes with ageing (Tune, 1969; Webb, 1982), one might expect that morningness–eveningness preferences are related to ageing, as originally suggested by Horne and Östberg (1976). Hence, Experiment I was aimed at investigating the effect of ageing on morningness–eveningness preferences.

A phase difference for several physiological variables and performance levels in motor and cognitive tasks has also been found between these two extreme types, with a phase advance for the M-types as compared with the E-types (Pitt, 1970, 1971a; Kerkhof, Korving, Geest and Rietveld, 1981; Horne, Brass and Pettit, 1980). Similar results have been found for introverts and extraverts. In particular, these findings show there is a trend for introverts to be higher in arousal and temperature in the morning and for extraverts to reach their peak later in the day (Blake, 1967, 1971; Eysenck, 1967; Colquhoun and Folkard, 1978). For this reason attention has been devoted to the possibility of a close relationship between the individual differences in personality and those in the diurnal variations of activity patterns. Pittke (1971a) found a significant difference in extraversion between M and E Ss: the former were introverted, whereas the latter were extraverted. However, in a further study the same author (Pittke, 1971b) did not find any difference in the Introversion-Extraversion scores of M and E Ss. Horne and Östberg (1977) administered the Eysenck Personality Inventory (EPI) and the Morningness–Eveningness Questionnaire (MEQ) to 48 Ss equally divided between the sexes. Although there was a trend, M-types were not significantly more introverted than E-types. In the light of these earlier studies, Experiment II aimed to re-examine the possibility of a relationship between personality and individual differences in diurnal activity patterns. However, in contrast to the previous research, we considered the neuroticism and psychoticism dimensions as well as extraversion-introversion (Eysenck and Eysenck, 1975).

EXPERIMENT I

Subjects and Procedure

An Italian version of the Morningness–Eveningness Questionnaire (MEQ) of Horne and Östberg (1976) was administered to 435 Ss (245 females and 186 males) of six age groups:

- group 1: 20–29 yr, 45 females and 45 males;
- group 2: 30–39 yr, 45 females and 45 males;
- group 3: 40–49 yr, 40 females and 24 males;
- group 4: 50–59 yr, 45 females and 21 males;
- group 5: 60–69 yr, 45 females and 33 males;
- group 6: 70–79 yr, 29 females and 18 males.
Fig. 1. Mean scores and standard deviations on the MEQ for the six age groups.

The Ss in the age range 20–39 yr were white-collar workers (morning working schedule: 0900–1400/1500 hr), the Ss in the age range 60–79 yr were retired or unemployed. A single morningness–eveningness score was computed for each S using the scoring criterion of Horne and Östberg (1976), resulting in five categories:

1. score 16–30: extremely E-type;
2. score 31–41: moderately E-type;
3. score 42–58: intermediate type;
4. score 59–69: moderately M-type;
5. score 70–86: extremely M-type.

Results

The change in the expressed preferences as a function of age was tested by means of a two-way ANOVA with sex (two levels) and age (six levels) as factors. Only age turned out to be significant \[ F(1,423) = 6.63; P < 0.01 \], with higher Morningness scores in the aged groups.

Discussion

The morningness–eveningness expressed preferences turned out to be related to age. As shown in Fig. 1, in the older groups a gradual shifting towards the morningness preference was evident and the eveningness typology disappeared. The results are in agreement with data on sleep behaviour in older people, showing in particular an advanced rising time (Ture, 1969; Webb, 1982). As shift-work research has found, on one hand, older people have the greatest difficulty tolerating shifting of working schedules (Torsvall and Åkerstedt, 1980) and, on the other hand, morning Ss are not suited to shift work (Hildebrandt and Stratman, 1979), it is very likely that this behaviour depends to some degree on the trend towards a morning habitual activity phase in older people.

EXPERIMENT II

Subjects and Procedure

Two hundred and thirty-three Ss (128 females and 105 males) ranging in age from 20 to 29 yr participated in the research. All the Ss completed an Italian version of both the MEQ and the EPQ. Since in small samples extremely E- and M-types are relatively few (Horne and Östberg, 1976; Maccaio and Zani, 1983), extreme types were grouped together both for the E- and M-tails of the distribution. Evening \((n = 30: 19 \text{ females and } 11 \text{ males})\), morning \((n = 93: 52 \text{ females and } 41 \text{ males})\) and intermediate \((n = 110: 57 \text{ females and } 53 \text{ males})\) groups were compared on their E, N and P scores.

Fig. 2. E, N and P scores on the EPQ for the evening (E), intermediate (I) and morning (M) Ss (Δ, females; •, males).
Results

Mean morningness–eveningness scores for females and males, respectively, were 54 (SD = 10.6) and 52.4 (SD = 11.7). The two distributions were not significantly different ($t = 1.091; df = 231$). The two-way ANOVA of the EPI scores (with sex and the three circadian groups as factors) yielded a significant effect of the circadian typology for $F(2,227) = 7.06, P < 0.01$, but not for $E$ [$F(2,227) = 0.8$] or $N$ [$F(2,227) = 3.04$]. Females had significantly higher $N$ scores than males [$F(1,227) = 12.71; P < 0.001$]. Not considering the intermediate group and comparing only the two extreme groups (E- and M-types) on $N$ scores, a significant effect of the circadian typology [$F(1,119) = 5.74; P < 0.05$) was obtained.

An inspection of Fig. 2 shows: (1) a trend for $E$ scores to be higher in the E-type than the M-type group; (2) M-types have higher $N$ scores; (3) E-types have higher P scores.

GENERAL DISCUSSION

M- and E-types showed a trend to be introverts and extraverts, respectively, confirming previous works. However, a significant differentiation emerged when M- and E-types were compared on the two other personality parameters: M- and E-types had higher N and P scores, respectively. Further research should be devoted to the personality traits of the diurnal types in relation to the adjusting to the activity pattern and working schedule during the day. In fact there is evidence (Colquhoun and Folkard, 1978) that, particularly in regard to shift-work, M- and E-types employ different coping mechanisms, and this may be partly related to their personality.

Acknowledgements—Experiment I of this study was supported by the CNR special project ‘Preventive Medicine (Mechanisms of Aging)’.

Requests for reprints should be addressed to L. Mecacci.

REFERENCES


