



The Content and Convergent Validity of the Persian Morningness-Eveningness Personality Questionnaire in Employees: A Personality Profile Distribution

Gholamreza Rajabi ^{1,*}

¹Department of Counseling, Faculty of Education and Psychology, Shahid Chamran University of Ahvaz, Ahvaz, Iran

*Corresponding author: Department of Counseling, Faculty of Education and Psychology, Shahid Chamran University of Ahvaz, Ahvaz, Iran. Email: rajabireza@scu.ac.ir

Received 2019 February 16; Accepted 2019 June 23.

Abstract

Background: The people with morningness orientation wake up early morning, and people with eveningness orientation wake up with difficulty.

Objectives: The purpose of this study was to investigate the content and convergent validity of the Persian Morningness-Eveningness Personality Questionnaire in employees and a personality profile distribution.

Methods: The current study is a descriptive type of survey, which 200 employees of Shahid Chamran University Ahvaz were randomly selected among the population of Shahid Chamran University employees. They completed the Morningness-Eveningness Personality Questionnaire, and Late/Early Sleep Preferences Scale.

Results: The content validity ratio indicated that the total of experts agreed on that there was an association between the items and domain of 0.54 to +1. The Cronbach's alpha coefficient was 0.82 for the entire questionnaire. The coefficients of each item with the total score of MEPQ ranged from 0.25 to 0.57. The convergent validity coefficient for this questionnaire with Late/Early Sleep Preferences Scale was significant ($P < 0.001$). The personality profile revealed that about 143 (71.5%) of the 200 participants fell into the intermediate category.

Conclusions: Given the validity and reliability of the Morningness-Eveningness Personality Questionnaire, this questionnaire can be used in professional, industrial, and occupational environments to assign people to specialized and non-specialized jobs.

Keywords: Content, Reliability, Validity, Mourning Orientation, Evening Orientation, Personality

1. Background

Biological changes caused by darkness and the temperature degree in human metabolism during 24 hours are known as "circadian or diurnal rhythms" (1). These rhythms encompass body temperature, different levels of hormones, number of immunological cells in the blood, and sleep-awakening cycle. Interpersonal variation in some stages and other circadian rhythms is attributed to factors such as age, gender, and morningness-eveningness trait in particular. These 24-hour rhythms affect temperament, psychological performance, and physiological states. When the body temperature is higher in the morning, according to the stimulus theory, the metabolism is motivated in the afternoon. As a result, performance and temperature are in a better situation (2).

Studies have revealed that psychological conditions such as sleep, happiness, and sadness are improved four hours after waking up (3). Gupta showed that the re-

sults of intelligence tests are higher in the evening compared to those in the morning (4). Oquist in 1970 developed Eveningness-Morningness Questionnaire in Sweden, which could differentiate between these two extremities (2). Oquist modified the questionnaire in a study of circadian rhythm, which could differentiate between two types of morningness and eveningness (2).

In this regard, people with morningness orientation wake up early morning. They are delighted while awake, and are emotionally stable. On the other hand, people with eveningness orientation wake up with difficulty and stay late at night. These two personality orientations resulted in the formulation and development of specific questionnaires. Horn and Osterg in 1976 developed the morningness and eveningness questionnaire with 15 items about waking and sleeping time, psychological and physical performance time preferences as well as mental alertness after waking up (2). Adan and Almirall in 1991 identified a re-

duced MEQ scale (MEQ) with 5 items, which identified intermediate eveningness types (5).

Thus, morningness-eveningness personality types have many applications for different environments and fields. In sports, it has been shown that the sports played during the day result in increased performance (6). In education, it has been shown that when the studies are taken in days and early morning, in particular, affect students' performance (achievement). Further, students with eveningness personality may be efficient, especially in exams taken early morning (7). Also, evaluation of morningness type may help in appointing and consulting night shift-workers, nurses, in particular, control rooms of airports, the police, etc. (8).

2. Objectives

This study expands upon this previous research and aims to answer the following questions: (1) does the Persian version of the Morningness-Eveningness Personality Questionnaire has a proper convergent validity and reliability? (2) How is the content validity ratio of items M-EPQ by experts? (3) How is the categorization of morningness-eveningness personality types of distribution among Shahid Chamran University staffs?

3. Methods

In this descriptive study, a random sample of 200 subjects were selected randomly from different offices and colleges of Shahid Chamran University of Ahvaz, Iran, participated in the study in accordance with the following criteria: being married, having at least two children, having at least 2 years of work experience, not having psychological disorders, and having a higher degree of diploma education, and Cochran sampling formula. Subsequently, the goals of the research were conveyed to staffs who had these criteria and who were volunteer. Then 92 males (46%) and 108 females (54%) recruited from among 486 personal different offices, and colleges in Shahid Chamran University of Ahvaz (Educational and Psychology, Sports Science, Basic Science, etc.) (9).

3.1. Data Collection Tool

3.1.1. Morningness-Eveningness Personality Self-Assessment Questionnaire

This questionnaire has 19 items and was developed by Horn and Ostberg in 1976 to measure personality types. For each question, four probable answers are included. For the questions of 1, 2, 10, 17, and 18 the timetable was used. This

table is divided into seven 15-minute intervals. Scoring system is as follows: answers to the questions of 3, 4, 5, 6, 7, 8, 9, 13, 14, 15, and, 16 from 1 to 4, answers to the questions of 1, 2, 10, 17, and 18 from 1 to 5, answers to the questions of 11 and 19 from zero to 6, and the answer to the question of 12 from zero to 5 (2).

Punduk et al. (1) obtained the Cronbach's alpha coefficient in the first study 0.78 and the second study 0.81, Ishibara et al. (10) and Chelminski et al. (11) 0.78, Anderson et al. (12) 0.83, Chelminski et al. (13) 0.70, Smith et al. (8) 0.82, Kosece et al. (14) 0.77, and Aden and Almirall (15) 0.60 and 0.70, respectively.

3.2. Procedures

After receiving the relevant approvals from the Office of the University, the sample was collected in accordance with the criteria. Then the whole procedure and goals of the research were conveyed to the staffs, and after obtaining oral informed consent in the early phases of the research and making them sure about the confidentiality and anonymity of the data, the research began to be conducted. Furthermore, the participants were given the right to quit the study at any time point. To obtain the questionnaire, the Persian manuscript was used of back-translated translation. Implementation of the questionnaire on staffs was made by three students of counseling who were under a short time instruction and implementing the tool for a few hours and with respect to the confidentiality and full consent of the participants to respond to personal materials, and it was individually done with respect to all professional and research ethics.

3.3. Data Analysis

Different statistical methods were applied, (1) the Kolmogorov-Smirnov test, (2) Cronbach's alpha, (3) Convergent validity (16), (4) Content validity ratio (essential, useful, but necessary and not necessary; CVR it is more than 0.54 acceptable), and (5) A personality type's distribution.

4. Results

The mean age of the participants was 40.33 (SD = 7.70), with a range of 24 to 61 years. The results of Kolmogorov-Smirnov test ($z = 0.091$, $P = 1.24$) showed that the distribution of the collected data is not significant.

As shown in Table 1, the range of values of the measured content validity ratio was approved by experts from +0.54 to +1, and indicated that there was an agreement among experts on the items and domain (> 0.54) (16). The range of correlation coefficients of each item in MEQ with the total

Table 1. Content Validity Ratio (CVR) and Correlation Coefficients Each Item with the Total Score (r_{tt}) the MEPQ

Items	CVR	r_{tt}
1	0.84	0.56 ^a
2	0.84	0.47 ^a
3	0.84	0.45 ^a
4	0.84	0.40 ^a
5	0.69	0.39 ^a
6	0.69	0.35 ^a
7	0.84	0.38 ^a
8	0.54	0.24 ^a
9	0.69	0.29 ^a
10	0.69	0.31 ^a
11	1	0.57 ^a
12	0.54	0.36 ^a
13	0.69	0.38 ^a
14	0.84	0.44 ^a
15	0.84	0.48 ^a
16	0.54	0.25 ^a
17	0.54	0.30 ^a
18	0.84	0.42 ^a
19	0.84	0.54 ^a
$\alpha = 0.82$		

^aAll of the coefficients are significant in $P < 0.001$.

score showed that the questionnaire items had an acceptable internal consistency. The alpha reliability coefficient was 0.82 for the total questionnaire. The convergent validity coefficient of MEPQ with the Late/Early Sleep Preferences Scale was -0.40 statistically significant (Here, the negative correlation does not mean that the two constructs are not matched, but it is related to invert scoring method in the two measuring instruments) ($P < 0.001$).

As seen in Table 2, where the raw scores were transformed to standard scores, no case was left in the two classes with standard deviation scores over $z = +3$ (definitely morningness) and the standard deviation scores between $z = +2$ to $+3$ (morningness), in the class with standard deviation score $z = +2$ (close to morningness) 27 par-

Table 2. Distribution of Circadian Types in MEPQ

Circadian Type	No. (%)
Definitely morningness	0 (0)
Morningness	0 (0)
Close to morningness	27 (13.5)
Intermediate type	143 (71.5)
Close to eveningness	22 (11)
Eveningness	7 (3.5)
Definitely eveningness	1 (0.5)

ticipants (13.5%), 143 participants (71.5%) in the class with standard deviation score $z = -1$ to $+1$ (intermediate), in the class with standard deviation $z = -1$ to -2 (close to eveningness), 22 participants (11%), in the class with standard deviation $z = -2$ to -3 (eveningness), 7 participants (3.5%), and in the class with standard deviation over $z = -3$ (definitely eveningness) one participant (0.5%) were placed. In other words, according to normal curve distribution, 143 individuals out of 200 were placed at 68.26% from the mean standard distribution.

5. Discussion

Horn and Ostbergs questionnaire is one of the most used individual preferences indicators of a morningness-eveningness continuum. Previous studies showed that this questionnaire had satisfactory internal consistency and higher test-retest coefficients (8, 11-15).

The advantages of this questionnaire have been discussed compared to circadian cycle scales. However, this questionnaire has been criticized, specifically for screening and identifying individuals (8). Raising this critique, Adan and Almirall suggested a brief version of Morn and Ostberg questionnaire (5). This questionnaire is reliable in classifying participants into five classes in a “morningness-eveningness” continuum.

In the present study, a 19-item questionnaire was administered to a group of staffs. The findings showed that all of the items had internal consistency. There was a correlation between the items and the total score. From the participants’ point of view, items of 1, 11, and 19 had the highest correlation coefficient with the total score. Also, the Cronbach’s alpha for the 19 items was acceptable compared with alpha coefficients of other studies such as Punduch et al., in two times (1), Ishihare et al. (10), and Adan and Almirall (15), The alpha obtained is approximately the same as the above studies.

The content validity ratio showed that among the 19 items of the personality questionnaire of the experts agreed on 19 items. The content validity ratio according to the Lawshe table was obtained by 13 expertise on 19 items in the range of +0.54 to +1, which is acceptable (16).

Convergent validity coefficient of MEQ with Late/early Sleep Preferences Scale (17) was significant. This means that both constructs almost measure the same concept.

Personality profile showed that the percentages obtained are in concordance with the findings of other studies: 20% for morningness type, 61% for intermediate type, and 19% for eveningness type (15). Chelminsky et al. reported 62.4% intermediate type, 8.3% morningness type, 29.3% eveningness type, 3 persons (3.24%) morningness

type, 66 persons (72.53%) intermediate type, and 22 persons (24.18%) eveningness type (11, 13); and Koscec et al., the percentages reported by Punduk et al., for the intermediate type, 11.63% for close to eveningness type and about 2% for the definitely eveningness that obtained values of this studies are close together (14). However, they are different from the percentages reported by Adan and Natale, especially where about 10.5% for intermediate type and 10% for eveningness type are concerned (18).

5.1. Limitations

The major limitation of the present study is that the population studied is limited to the staffs only. Thus the results must be cautiously generalized to other groups. In this regard, it is suggested that this instrument should be applied to various groups such as shift-working labors, sportsmen, and the aged, etc. to enable researchers to generalize the results.

5.2. Conclusions

Considering the findings of previous studies on the validity of the morningness-eveningness preference questionnaire, the configuration of personality profiles and the confirmation of previous findings in this study on the appropriateness of questionnaire items and identification the participants in the intermediate type of this questionnaire, it is necessary that managers and relevant authorities use scientific methods in replacing personnel in different businesses and, in particular, using this measurement tool.

Acknowledgments

Finally, it is necessary to sincerely thank a group of consultancy students who helped the author in sampling and data collection. Also, our special thanks to those who spent their valuable time to help the researchers.

Footnotes

Conflict of Interests: The author declared there was no conflict of interests.

Ethical Approval: It is not declared by the author.

Funding/Support: No funds have been received.

References

- Punduk Z, Gur H, Ercan I. A reliability study of the Turkish version of the morningness-eveningness questionnaire. *Turkish J Psychiatr*. 2005;16(1):40-5.
- Horne JA, Ostberg O. A self-assessment questionnaire to determine morningness-eveningness in human circadian rhythms. *Int J Chronobiol*. 1976;4(2):97-110. [PubMed: 1027738].
- Monk TH, Fookson JE, Moline ML, Pollak CP. Diurnal variation in mood and performance in a time-isolated environment. *Chronobiol Int J Biol Med Rhythm Res*. 2009;2(3):185-93. doi: 10.3109/07420528509055558.
- Gupta S. Effects of time of day and personality on intelligence test scores. *Pers Indiv Differ*. 1991;12(11):1227-31. doi: 10.1016/0191-8869(91)90089-t.
- Adan A, Almirall H. Horne & Ostberg morningness-eveningness questionnaire: A reduced scale. *Pers Indiv Differ*. 1991;12(3):241-53. doi: 10.1016/0191-8869(91)90110-w.
- Smith RS, Guilleminault C, Efron B. Circadian rhythms and enhanced athletic performance in the National Football League. *Sleep*. 1997;20(5):362-5. [PubMed: 9381059].
- Callan RJ. Early morning challenge: The potential effects of chronobiology on taking the scholastic aptitude test. *Clear House J Educ Strat Issues Ideas*. 2010;68(3):174-6. doi: 10.1080/00098655.1995.9957224.
- Smith CS, Reilly C, Midkiff K. Evaluation of three circadian rhythm questionnaires with suggestions for an improved measure of morningness. *J Appl Psychol*. 1989;74(5):728-38. [PubMed: 2793773].
- Krejcie RV, Morgan DW. Determining sample size for research activities. *Educ Psychol Meas*. 1970;30(3):607-10. doi: 10.1177/001316447003000308.
- Ishihara K, Miyashita A, Inugami M, Fukuda K, Yamazaki K, Miyata Y. [The results of investigation by the Japanese version of Morningness-Eveningness Questionnaire]. *Shinrigaku Kenkyu*. 1986;57(2):87-91. Japanese. [PubMed: 3784166].
- Chelminski I, Ferraro FR, Petros T, Plaud JJ. Horne and Ostberg questionnaire: A score distribution in a large sample of young adults. *Pers Indiv Differ*. 1997;23(4):647-52. doi: 10.1016/S0191-8869(97)00073-1.
- Anderson MJ, Petros TV, Beckwith BE, Mitchell WW, Fritz S. Individual differences in the effect of time of day on long-term memory access. *Am J Psychol*. 1991;104(2):241. doi: 10.2307/1423157.
- Chelminski I, Petros TV, Plaud JJ, Ferraro FR. Psychometric properties of the reduced Horne and Ostberg questionnaire. *Pers Indiv Differ*. 2000;29(3):469-78. doi: 10.1016/S0191-8869(99)00208-1.
- Koscec A, Radosevic-Vidacek B, Kostovic M. Morningness-eveningness across two student generations: Would two decades make a difference? *Pers Indiv Differ*. 2001;31(4):627-38. doi: 10.1016/S0191-8869(00)00167-7.
- Adan A, Almirall H. Adaptation and standardization of a Spanish version of the morningness-eveningness questionnaire: Individual differences. *Pers Indiv Differ*. 1990;11(11):1123-30. doi: 10.1016/0191-8869(90)90023-k.
- Lawshe CH. A quantitative approach to content validity. *Person Psychol*. 1975;28(4):563-75. doi: 10.1111/j.1744-6570.1975.tb01393.x.
- Rajabi G. [Psychometric properties of the early/late preferences scales sleep among employees of Shahid Chamran University of Ahvaz]. *J Psychol Ach*. 2011;4(2):3-17. Persian.
- Adan A, Natale V. Gender differences in morningness-eveningness preference. *Chronobiol Int*. 2002;19(4):709-20. [PubMed: 12182498].