



Original Article

# Validity and reliability of Eysenck and Murray Impulsivity Scale and Divided Attention Questionnaire (DAQ) in students of University of Isfahan, Iran

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## Abstract

**Introduction:** The purpose of this study was to investigate the validity and reliability of Eysenck and Murray Impulsivity Scale and Divided Attention Questionnaire (DAQ) in students of University of Isfahan.

**Materials and Methods:** The statistical society included all of students of University of Isfahan in the academic year 2013-2014. Number of 200 students selected by multistage sampling method. Barratt Impulsiveness Scale (BIS-11) was used to assess the concurrent validity of Eysenck and Murray Impulsivity Scale and DAQ. Data were analyzed through cronbach's alpha, split-half coefficients, and Pearson and point-biserial correlation coefficients.

**Results:** Our findings confirmed the concurrent validity of Eysenck and Murray Impulsivity Scale and DAQ based on significant correlations between scores of Barratt Impulsiveness Scale (BIS-11) with Eysenck and Murray Impulsivity Scale and DAQ ( $P < 0.05$ ). The reliabilities of the two questionnaires were confirmed based on cronbach's alpha and split-half coefficients. Also there were no significant correlations between age, gender, education, and marital status with the scores of the two questionnaires ( $P > 0.05$ ).

**Conclusion:** Based on the results of this study, the validity and reliability of Eysenck and Murray Impulsivity Scale and DAQ are appropriate to use in the population of Iranian university students.

**Keywords:** Attention, Impulsivity, Students

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## Introduction

Impulsivity is one of important concepts in clinical psychology which have been discussed and theorized since 2000 years ago by Plato for the first time (1). This concept usually characterized by behaving without thinking and usually is considered as a symptom of mental disorders or even a mental disorder separately which needs to clinical intervention (2). However, spontaneous response to situations without thinking is not abnormal per se, and even it is necessary for adaptation with some situations. For example, fast reactions in some dangerous situations in driving usually are not accompanied by thinking but these spontaneous reactions are necessary for adaptation with the situations. In fact, this is not maladaptive or

malfunctioned impulsivity. So it is necessary to distinguish between functional and malfunctioned impulsivity. In most of studies and psychometric tools, impulsivity usually refers to malfunctioned impulsivity. Malfunctioned impulsivity is defined as acting without thinking so that leads to disorder in person's performance in several situations (3). In fact, impulsive people act based on their spontaneous feelings without consideration of rules or situational expediencies (4). Behaving without thinking is a common component in several definitions of impulsivity. This concept refers to behaving without thinking about its consequences and its effects on other people and in other words behaving without any evaluation about behavior. Actually we can consider impulsivity as disconnection between situational expediencies and person's behavioral responses to situations (3).

Psychometric scientific research in field of impulsivity has been begun since 50 years ago (3).

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The questionnaires of Eysenck, Barrat, Dickman and Zuckerman are numbers of the best known questionnaire for assessment of impulsivity in the last decades. The psychometric characteristics of these questionnaires have been confirmed in several studies in different countries for instance Iran. Moreover, in the recent years a scale has been proposed for assessment of impulsivity based on Eysenck and Murray's personality theories. Actually this scale is combination of items of Eysenck and Murray's personality scales that are specified to assessment of impulsivity. Revelle (1997), combined these items in to a unified questionnaire which assesses impulsivity specifically based on Eysenck's personality theory and Murray's (1). Based on the search of the authors of this study, the psychometric characteristics of this questionnaire have not been assessed in scientific researches. However, considering the theoretical basis of this scale, if its psychometric components be confirmed, this questionnaire can be applied in many clinical assessments and scientific researches. Thus this study investigates the validity and reliability of this scale among university students.

Attention and concentration difficulties usually are referred when we want to discuss impulsivity, because impulsivity is often accompanied by attention deficit. For example, in Attention Deficit Hyper Activity Disorder (ADHD), it is rare to observe impulsivity without attention deficit (2,6). Attention is the first phase of information processing which help to register and store all of information in memory system of everybody. This cognitive process begins from infancy and will be developed and more efficient gradually until adulthood (7). We can consider attention as the capacity of reception of information to processing. Every capacity usually accompanied by some limitations. The capacity of attention distributes to different information. So each information reduces the capacity of attention system. So when a lot of information enters concurrently into attention system, the function of attention will not be optimal (8). The ability of distributed attention to several information refers to a cognitive ability which called divided attention [9]. It is supposed that the capacity of divided attention will be reduced by aging but this assumption is controversial and there are not sufficient scientific studies to investigate it [10]. Furthermore, divided attention can be investigated in many fundamental and applied scientific studies of cognitive psychology and information processing. There are several laboratory tasks to investigate divided attention, but we have a few self-report

questionnaires to assess this variable. Divided Attention Questionnaire (DAQ) is the best known of these questionnaires. The psychometric characteristics of DAQ have been assessed in a few studies and their results were so different. Thus it is important to investigate the psychometric characteristics of the questionnaire and certainly the investigation can help to develop many studies in fields of cognitive psychology and information processing. Based on the search of the authors, the psychometric characteristics of Eysenck and Murray Impulsivity Scale (EMIS) have not been assessed in scientific studies; also the psychometric characteristics of DAQ have not been assessed in Iran. Thus, the purpose of the study is to investigate the validity and reliability of these questionnaires among university students in Iran.

### Materials and Methods

The statistical population of this study was all of students of University of Isfahan (Iran) who among them 200 students selected by random multistage sampling as the sample of the study. For sampling, among all of the faculties of University of Isfahan, 3 faculties (Ahl Al-Bayt, Chemistry and Engineering) selected randomly and among them 200 students selected randomly and respond to the questionnaire of the study. The inclusion criteria of this study were education in University of Isfahan and consent to participate in the study. Exclusion criteria were lack of consent to participate to the study and responding to the questionnaire incompletely.

Ethical considerations in this study were: achieving aware consent of participants before responding to the questionnaire and secrecy of identity information participants.

### Research instrument

- *Eysenck and Murray Impulsivity Scale (EMIS)*: This scale has 23 items by 5 point Likert scale. Minimum possible score of EMIS is 0 and maximum possible score is 92. Higher score shows higher levels of impulsivity. Reverse scoring items are 4, 5, 6, 23, 18 (1). As it's mentioned, the psychometric characteristics of this questionnaire have not been reported in the past studies.

- *Divided Attention Questionnaire (DAQ)*: This questionnaire has been proposed by Tun and Wingfield in 1995. DAQ has 15 items by 5 point Likert scale. Higher scores show higher difficulties in divided attention and lower scores show easiness in divided attention. Maximum possible score of DAQ is 75 and minimum possible score is 15. In study of Tun and Wingfield the reliability of this scale computed by Cronbach alpha as 0.87 and by

test-retest as 0.63 (10). Also correlation coefficient of this scale with age computed as 0/25, but there were no significant correlation between DAQ with gender and education ( $P < 0.05$ ). In study of Salthouse and Siedlecki (10), reliability of this scale computed by Cronbach alpha and test-retest as 0/87. In their research, the correlation of DAQ with age computed 0.19, but its correlation with gender and education was not significant ( $P < 0.05$ ). Also Salthouse and Siedlecki investigated validity of DAQ by computing its correlation with laboratory task of divided attention. The results not confirmed the validity of DAQ.

- *Barratt Impulsiveness Scale-11 (BIS-11)*: This scale is a self-reported scale which has 30 items by 4 point Likert scale. The scores may differ from 30 to 120 (11). Higher scores show higher level of impulsivity and lower scores show lower levels of impulsivity. Internal consistency of BIS-11 has been computed between 0.79-0.83 in studies of its authors among several populations such as students, substance addicts, psychiatric patients and prisoners (4). This scale has been translated to several language and its psychometric characteristics have been confirmed in non-English language countries such as Brazil (11), South Korea (12), Japan and Italia (11). In Iran, Ekhtiari et al. computed reliability of BIS-11 between 0.47-0.84. Also in that study, validity of this scale confirmed by concurrent validity, internal consistency between subscales and comparing known groups (5). BIS-11 is known as one of the most common and valid scales for assessing impulsivity in several countries for instance Iran. Also, difficulty in attention is one of the main components of the scale. Thus in this study we use this scale for computing the concurrent validity of EMIS and DAQ.

**Results**

The majority of participants of this study were women (men= 4; women= 196). 147 participants were undergraduates who among them 137 individuals were in first half of their educational period and 10 individuals were in second half of their educational period. 51 students were postgraduate and 2 students were in PhD period. 144 students were single and 56 students were married.

Reliability coefficients of EMIS for total score and total score with removing each item presented in table1.

**Table 1.** The results of Eysenck and Murray Impulsivity Scale reliability coefficients

Indicators Variable	Cronbach's alpha	Half of coefficient	Cronbach's alpha if item deleted
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Total score scale	0.77	0.74	-
Item 1			0.75
Item 2			0.77
Item 3			0.76
Item 4			0.77
Item 5			0.78
Item 6			0.77
Item 7			0.77
Item 8			0.77
Item 9			0.78
Item 10			0.75
Item 11			0.77
Item 12			0.79
Item 13			0.76
Item 14			0.75
Item 15			0.75
Item 16			0.76
Item 17			0.75
Item 18			0.83
Item 19			0.75
Item 20			0.76
Item 21			0.77
Item 22			0.76
Item 23			0.77

Based on Table 1, the results of Cronbach alpha and split-half coefficients show that EMIS has appropriate reliability. Also the table shows that removing items can't help increase the rate of reliability. So the reliability of EMIS confirmed accompanied by all of its items.

Reliability coefficients of DAQ for total score and total score with removing each item presented in Table 2.

**Table 2.** The results of Divided Attention Questionnaire reliability coefficients

Indicators Variable	Cronbach's alpha	Half of coefficient	Cronbach's alpha if item deleted
Total score scale	0.67	0.57	-
Item 1			0.65
Item 2			0.65
Item 3			0.65
Item 4			0.66
Item 5			0.68
Item 6			0.66
Item 7			0.67
Item 8			0.70
Item 9			0.64
Item 10			0.66
Item 11			0.63
Item 12			0.64
Item 13			0.63
Item 14			0.64
Item 15			0.65

Based on Table 2, Cronbach alpha coefficient is near to optimal level (0.70) but split-half coefficient is not in an appropriate level. Also the results of table 2 shows that with removing item 8, the reliability coefficients of this scale can be improved.

The results of Pearson's correlations of EMIS and DAQ with BIS-11, is presented in Table 3.

**Table 3.** The results of Pearson's correlations of EMIS and DAQ with BIS-11

Indicators Variable	Pearson's correlation coefficient	Significant
Eysenck Impulsivity Scale and Murray Barratt Impulsiveness Questionnaire	0.47	0.00
Questionnaire divided attention Barratt Impulsiveness Questionnaire	0.41	0.02

Based on Table 3, the correlation coefficients between EMIS and DAQ with BIS-11, are significant. So the concurrent validities of EMIS and DAQ are confirmed.

Correlation coefficients for investigating relationships between age, gender, education and marital status, with EMIS and DAQ, are presented in table4.

**Table 4.** The results of Pearson and point-biserial correlations to investigate relationships between age, gender, education and marital status, with EMIS and DAQ

Indicators Variable	Pearson's correlation coefficient	Significant
Eysenck and Murray Impulsivity Scale	-0.02	0.78
Age	0.04	0.56
Sex	0.00	0.90
Education	0.00	0.89
Married		
Questionnaire divided attention	0.13-	0.09
Age	0.10	0.12
Sex	0.03	0.59
Education	-0.03	0.60
Married		

Based on Table 4, there are no significant relationships between age, gender, education and marital status, with EMIS and DAQ.

**Discussion**

The purpose of the study was to investigate validity and reliability of EMIS and DAQ in university students of University of Isfahan (Iran). The results of this study showed that both of the questionnaires had appropriate validity and reliability, but these results suggested removing item 8 of DAQ.

As we mentioned in this article, the psychometric characteristics of EMIS investigated in this study for

the first time. Thus we can consider the results of the study as the first results of psychometric features of this scale. But the psychometric characteristics of DAQ had been investigated in some studies such as Tun, Wingfield, Salthouse and Siedlecki (10,13). The results of this study is similar to previous studies in confirmation of reliability of DAQ, but there are two differences between the results of this study and previous studies: 1- the rate of reliability coefficients in this study is less than previous studies, and 2- the results of this study suggest removing item 8 of DAQ. In study of Salthouse and Siedlecki (10), concurrent validity of this scale had not been confirmed, but the results of this study confirmed the concurrent validity of DAQ.

In addition, the results of this study showed that there was no significant correlation between age, gender, education and marital status, with EMIS and DAQ. These results are similar to those results of previous studies which show no significant relationship between gender and education with DAQ, but the results of this study is different from previous studies which show significant correlations between age and DAQ (10,13). However, it's necessary to note that the range of age in this study is not vast sufficiently. Also insufficient diversity of gender in the sample of this study was an important limitation of this study, while previous studies had appropriate ranges of age and sufficient numbers of both gender (10,13). Thus we can conclude that in early adulthood probably there is no relationship between age and divided attention. However, it is just an assumption which needs to investigate in future studies. Considering the fact that both impulsivity and divided attention are related to developmental periods, the authors of this article propose that future studies attempt to investigate psychometric characteristics of EMIS and DAQ, in different developmental stages.

**Conclusion**

Based on the results of this study it seems that EMIS can be considered as an efficient questionnaire for assessing impulsivity in psychological research and clinical situations. Also, the results of this study showed that although DAQ had limited research background, it can be used as an efficient questionnaire in related fields. However, both of these questionnaires need more scientific investigations which can be considered in future studies.

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