

Psychometric Evaluation of the Mating Intelligence Scale in Iran

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Abstract

The cognitive abilities that are necessary to make-mating interactions effectively have been described as "Mating Intelligence." This is an evolutionary construct that has just recently initiated to receive practical consideration. This research work investigated the psychometric properties of the Persian translation of the Mating Intelligence Scale in Iran. A total of 760 male and female heterosexual participants (380 for each sex) were recruited from colleges. Participants completed a self-reported questionnaire and reported some demographic information such as age, their qualification degree and major. The male and female version of the Geher and Kaufman (2007) Mating Intelligence Scale were used to gather data. The factor analysis with the Oblimin rotation showed five factors with Eigen-values greater than one (Sexual Over-Estimation, Cross-Sex Mind Reading, Self-Deception, Other-Deception, and Courtship Display) in males sample. Also, a confirmatory factor analysis was performed to confirm the results of the exploratory analysis. The values of fitness indicators show that this model benefits from good fitness. Results showed four factors with eigenvalues greater than one (Sexual Over-Estimation, Cross-Sex Mind Reading, Other-Deception, and Courtship Display) in females sample, and again, the confirmatory factor analysis confirmed the results of exploratory analysis. In general, the use of the MI questionnaire is appropriate regarding the Iranian population due to the excellent validity and reliability and can be used in screening, therapeutic and educational situations.

Keywords: mating, intelligence, evolutionary, psychometric, Iran

Introduction

Mate choosing, based on physical fitness indices, is likely to lead to the emergence of individuals who can reproduce themselves (Singh, 1994). Hence, mate preferences are considered to be adaptive behaviours that should promote successful reproduction (Reeve, Kelly, & Welling, 2017). This evolutionary process depends on two factors, for which both are based on physical fitness indices. The first factor helps to show the potential value of

mate, and the second factor refers to the ability to understand the signals displayed by potential mates .

Mating Intelligence is one of the new structures recently added to the evolutionary psychology literature. We are adopting Miller, Tybur, and Jordan (2007) definition of mating intelligence as high-level cognitive processes associated with human mating. Glenn Geher (2013) believes that Mating Intelligence is different from other concepts in the field of mating because of its more vibrant, more abstract, and more intellectual nature. The initial structure of Mating Intelligence was introduced by G. Geher and Kaufman (2007), and they defined this structure in four areas. The cross-sex reading includes all issues that are related to some knowledge of a person's potential mate interests. In the mating-relevant self-deception category, knowledge is associated with the general confidence of the individual as a mate. On the other hand, other deception of the mating-relevant includes the ability to manipulate the potential mates. The cognitive courtship display also refers to cognitive strategies that are used to attract a mate. A kind of caring mechanism that includes various psychological traits such as vocabulary (Rosenberg & Tunney, 2008), humour (Greengross & Miller, 2008), altruism (Barclay, 2010) and creative writing (Kaufman & Kaufman, 2009). Concerning men, there is another component called sexual over-estimation and which is referred to as the sexual interest of men to multiple partners. In the case of females, this component was called commitment skepticism which is referred to test of devotion of mates; as they bear greater expenditure in the case of abandonment.

According to available evidence, the two-gender mating processes are distinct and involve different cognition (Buss, 2003). For example, mating intelligence in men is more relevant to short-term mating opportunities, while women have the interest to involve themselves in long-term prospects. In various studies, the relationship between mate selection and multiple indicators has been studied. Although the mate selection is not the same as the mating intelligence, reviewing researches that are related to this concept can help to get an insight into the mating intelligence. Baker Jr, Sloan, Hall, Leo, and Maner (2015) revealed some evidence about the effect of mating cues on memory displays in men. Pandeirada, Fernandes, Vasconcelos, and Nairne (2017) showed a potential mnemonic tuning for the faces of potential partners. Research has also shown that external factors such as family members, parents, and friends can influence the process of selecting a mate (Knobloch & DONOVAN-KICKEN, 2006; Zhang & Kline, 2009).

Along with the mating intelligence introduction in evolutionary psychology, the studies have begun to operationalize this structure. In one of the most significant studies, G. Geher and

Kaufman (2007) published two self-report questionnaires (one for each sex) which have helped to measure this emerging structure. In the other study, O'Brien, Geher, Gallup, Garcia, and Kaufman (2010) tried to evaluate the psychometric indices of these two questionnaires. The results of this research showed that these two surveys have good psychometric indices in measuring mating intelligence.

Considering the essential need for measuring mating intelligence in the field of marriage counselling and family therapy, as well as testing the application of this questionnaire in different cultural fields, we decided to evaluate the psychometric indices of this questionnaire in a sample consisting of Iranian male and female students.

Method

Participants

A total of 760 male and female heterosexual participants (380 for each sex) were recruited from the students of an institution. The sample size was determined by some considerations (Tabachnick & Fidell, 2007). Participants' ages ranged from 19 to 37 years (M 27.5, SD 3.6). Regarding educational qualification, in male's sample, 225 participants were bachelor students, 97 participants were MA students, and 58 participants were the Ph.D. students. In the case of females sample 235 participants were bachelor students, 92 participants were MA students, and 53 participants were the Ph.D. All participants were never married.

Procedure

Participants were recruited from a university in a city of Iran. Participants completed a self-reported questionnaire and reported some demographic information such as age, their qualification degree and major. Participation were informed about the nature of the study, that participation was voluntary and anonymous, that they could withdraw from the study at any time, and that they were not obliged to respond to all questionnaire items. Also, the research plan was approved by the Ethics Committee of the university.

Measure

Participants were asked to complete the Geher and Kaufman (2007) Mating Intelligence Scale, male and female version. The scale was changed in somewhat ways from its original form. The original True/False answering format was changed to a 5-point Likert scale (like as O'Brien et al. (2010) study). In the male scale, the items 1, 7, 10, 12, 18, 19, 20, 22, and 24 and in the female scale the items 2, 4, 8, 9, 11, 13, 16, 19, 21 and 23 were reverse scored. The scale consisted of 24 questions and five (5) subscales. We excluded four items in both scales that capture mating success and analyzed 20 items, following the Glenn Geher, Kaufman,

Garcia, Kaufman, and Dawson (2016) study. The cross-sex mind reading subscale has the items such as "I am pretty good at knowing if a woman is attracted to me." , "Honestly, I don't think I understand men at all! ". The self-deception subscale has the items such as "If a woman does not seem interested in me, I figure she does not know what she is missing.", " I look younger than most women my age". The other-deception subscale has the items such as "I am good at saying the right things to women I flirt with.", "I have a sense of style and wear clothes that make me look sexy". The courtship display subscale has the items such as "People tell me that I have a great sense of humour", " I am not very artistic". The last of it in male scale is the sexual over-estimation subscale which has the items such as "Women tend to flirt with me pretty regularly" and in female scale is the Commitment Skepticism subscale which has the items such as "Most guys who are nice to me are just trying to get into my pants". The Mating Intelligence Scale took approximately 15 minutes to complete. Psychometric characteristics of this scale are well-documented in some earlier studies (Glenn Geher et al., 2016; O'Brien et al., 2010). The details of psychometric issues have been discussed more in the discussion.

Following a back-translation procedure, all items were translated into Persian by an English translator. Then, an independent translator translated all items back into English. Finally, the authors approved the final version of the scale. The reliability of the full scale and subscales was evaluated by Cronbach's Alpha, and the validity of it was examined by exploratory factor analysis. We use principal axis factoring because we were interested in the dimensions of the variables. After the factor extraction, a confirmatory factor analysis was performed to confirm the results of the exploratory analysis.

Results

Before the analysis, the normality of data was checked by the Kolmogorov-Smirnov test, and its result confirmed normality of data. All analyses were done separately for each sex. Analysis was performed using the SPSS software version 16, and the AMOS version 16 software. For the males sample, the correlation matrix and descriptive statistics (mean and standard deviation) of the five factors of the mating intelligence questionnaire, namely Sexual Over-Estimation, Cross-Sex Mind Reading, Self-Deception, Other-Deception, and Courtship Display, are presented in Table 1.

Table1. Males correlation matrix and descriptive statistics (mean and standard deviation)

For the females sample, the correlation matrix and descriptive statistics (mean and standard deviation) of the five factors of the mating intelligence questionnaire, namely Commitment Skepticism, Cross-Sex Mind Reading, Other-Deception, and Courtship Display are presented in Table 2.

Table 2. Females correlation matrix and descriptive statistics (mean and standard deviation)

An exploratory analysis was performed to evaluate the validity of the MI scale. The 20 items of the Mating IQ questionnaire were examined by the principal axis factoring method using SPSS version 16. Before the analysis, the assumptions of the data analysis method (factor analysis) were tested. Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was 0.801 for male scale and 0.774 for female scale and Bartlett's Sphericity test was significant in both scales ($\chi^2 = 3962.43$, $p < 0.0001$ in male scale and $\chi^2 = 5760.17$, $p < 0.0001$ in female scale). In the case of male scale, the factor analysis with the Oblimin rotation showed five factors with Eigen-values greater than one. The Monte Carlo PCA for Parallel Analysis was performed in evaluating the accuracy of the number of factors, and the five-factor solution was confirmed. The results are presented in Table 3.

Table 3. Males Mating intelligence factor loadings

In the case of female scale, also the factor analysis with the Oblimin rotation showed four factors with Eigen-values greater than one. The Monte Carlo PCA for Parallel Analysis was performed in evaluating the accuracy of the number of factors, and the four-factor solution was confirmed. The results are presented in Table 4.

Table 4. Females Mating intelligence factor loadings

After the extraction of the factor, a confirmatory factor analysis, along maximum likelihood estimation was performed to confirm the results of the exploratory analysis in the both male and female samples. In the male sample, the values of fitness indicators show that this model benefits from functional fitness. The outcome of confirmatory factor analysis shows that RMSEA equal to 0.069, CFI was 0.93, GFI was 0.89, AGFI was 0.86, NFI was 0.89, IFI was 0.93, TLI was 0.91 and χ^2/df was 2.82 of which demonstrated a good fit with observed data. In the female sample, the values of fitness indicators show that this model benefits from functional fitness too. The outcome of confirmatory factor analysis shows that RMSEA equal

to 0.088, CFI was 0.94, GFI was 0.89, AGFI was 0.84, NFI was 0.92, IFI was 0.94, TLI was 0.93 and χ^2/df was 3.96 of which demonstrated a good fit with observed data. None of the covariances among factors were significant in both samples. Table 5 and 6 present the factor loadings for the scale items in the both samples. According to Tables 5 and 6, coefficients of all items were above 0.30.

Table 5. Males confirmatory factor analysis on mating intelligence items

Table 6. Females confirmatory factor analysis on mating intelligence items

Cronbach's alpha was used for the evaluation of the reliability of the scale and its subscales. Reliability for the total scale in male and female samples was 0.82 and 0.74 respectively. Reliability for the Sexual Over-Estimation, Cross-Sex Mind Reading, Self-Deception, Other Deception and Courtship Display subscales in male sample were 0.89, 0.86, 0.81, 0.83, and 0.81 successively. Reliability for the Commitment Skepticism, Cross-Sex Mind Reading, Other Deception and Courtship Display subscales in female sample were 0.93, 0.90, 0.91, and 0.89 successively. The results show that the scale and its subscales in the both samples benefit from proper reliability coefficients.

Discussion

The purpose of this study was to evaluate the psychometric properties of Mating IQ Scale in college students. In general, according to the results, the questionnaire is suitable for measuring mating intelligence. The evidence obtained from carrying out the exploratory and confirmatory analysis reveals that the factor structure of the Persian version Mating IQ Scale is consistent with the original version with a slight difference. Also, the reliability coefficients for all factors and the total questionnaire in both samples were higher than 0.70, which indicates the appropriate reliability. The results are in line with studies that examine the validity and reliability of this scale (Glenn Geher et al., 2016; O'Brien et al., 2010).

In comparison with the original version, in the male sample, item 21 had factor loading of 0.58 on self-deception factor, while in the original version (O'Brien et al., 2010), this item had factor loading on the courtship display. Since the self-deception reveals the adaptive cognitive distortions of individuals to understate the defects and overestimate the positive attributes, they try to use exaggerated positive attributes to influence the potential mate; whereas this overall assurance of their abilities may be reasonable or irrational. On the other

hand, the courtship display factor refers to real features such as overall intelligence, humour, art skills, and so on, to attract mate's attention. The item 21 "At parties, I tend to tell stories that catch the attention of the most revealing women" reveals the individual's emphasis on the positive abilities that they imagine and not necessarily the real prominent dimensions that help the individual in attracting the attention of the mate.

A look at the extracted factors showed the sexual over-estimation as the greatest factor accounted Twenty-five (about a quarter) percentage of MI variance. It is predictable that the highest proportion of MI in men is explained by this factor. Have multiple partnerships for a man is as a privilege, so success in this task can be an important sign of high mate intelligence among men. In the second place, there is the cross-sex mind reading which has explained about seventeen percentage of MI variance. This factor is also closely related to the previous factor. For a man to have multiple partners is necessary to properly identify and process signals from potential mates. This strongly depends on cross-sex mind reading ability.

In the female sample, results showed the self-deception scale was not extracted. But how can explain this finding? According to the related literature, the mate selection based on self-deception required to cognitive misinterpretations so that it causes to individuals unconsciously underestimate their defections and overestimate favorable attitudes to self. This tendency is the result of self-confidence and value-dependent attributes that are directly influenced by culture.

Cultural traditions to evaluate the positive qualities and attributes of women in Iranian culture are such as to even prevent them from revealing their true positive qualities. Therefore, the low items factor loading in this scale (self- deception) compare to original scale may be explained by the cultural effects. Therefore, it can be claimed that in Iranian culture, the process of human mating and the its required cognitive abilities is less affected by self-deception, and the statistical results-that is, the low factor loading of items 3 and 15, the deletion of the item 19 and loading item 4 on cross-sex mind reading factor confirm it.

Also, the low factor loading of items 3 and 15 of this scale is due to the lower sense of self-worth of Iranian women, which prevents the improvement of the desired attitude toward its own positive characteristics or neglects the deficiencies; the removal of the item 19 is also revealing of self- deficiency and inferiority, affected by culture based on prohibiting the positive evaluation of their body by women and even the need to hide it.

On the other hand, the item 4 has factor loading on cross-sex mind reading (whereas belongs to the self-deception scale in original version) can be explained by cultural differences;

Sometimes cultural barriers prevent women from trying to understand and recognize the mental states of potential mates and decrease their chances to success in mate selecting.

These cultural limitations cause in lower self-esteem in women and make them vulnerable to miss the opportunities in attracting the attention of potential mates. The relatively high factor loading of item 4 on the cross-sex mind reading confirm this issue. Most respondents explain failure to attract a man's interest by assigning their own problem and personalizing it and this is just the opposite of the positive function of cross-sex mind reading in increasing the chances of success in selecting the right mate.

As observed in the results section, the results of the current study provide a psychometrically valid and reliable version of the MI questionnaire that can be used in Iran, and the observed factor structure is related to five factors in male sample and four factors in female sample. Based on the finding, this questionnaire can be used to explore various aspects of mating IQ considering the necessity of having an objective tool for measuring mating IQ. This questionnaire is not only designed to evaluate mating IQ but can also be used as a tool to assist counsellors and psychologists to provide marriage and family counselling services. The questionnaire can also serve as a useful tool for researchers to explore mating IQ with different goals. Researchers can use this tool as a pre-test and post-test in assessing the impact of educational training on mating IQ and its components.

In general, the MI questionnaire is an appropriate tool that can be used in Iran due to the excellent validity and reliability and can be used in screening, therapeutic and educational situations. This tool is one of the most useful tools available to study the various aspects of mating IQ as far as researchers who have the interest are concerned.

Along with the results, the present study has been accompanied by limitations that the barriers related to gathering data tool and the study sample are the most important of these limitations. First, the MI scale should be used as one of the information sources about mating IQ along with other measurements. Also, despite the good psychometric properties, this scale is still a self-report questionnaire, and hence its results should be interpreted with caution.

Finally, the sample is limited to college students aged 20 to 40 years, which can limit the generalization of the results. Therefore, it is suggested that the psychometric properties of the questionnaire be examined in other samples of different age and educational categories. Also, the validity of this questionnaire has been evaluated by the use of one method (factor analysis). Therefore, future studies could evaluate the validity of the MI scale with other methods of evaluating validity. The findings in the present study contribute to the growing

literature on mating IQ and help to broader evolutionary psychological research in non-Western societies.

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Table 1. Male correlation matrix and descriptive statistics (mean and standard deviation)

Subscales	cross-sex mind reading	self-deception	other-deception	courtship display	Mean	SD
cross-sex mind reading	1				11.33	5.49
self-deception	0.046	1			15.72	5.04
other-deception	0.30**	0.06	1		12.46	4.32
courtship display	-0.033	0.36**	-0.06	1	8.40	3.27
sexual over-estimation	0.45**	0.09	0.29**	-0.03	11.05	5.54

** Significance level: 0.01

Table 2. Female correlation matrix and descriptive statistics (mean and standard deviation)

Subscales	Commitment	cross-sex mind reading	other-deception	Mean	SD
Commitment	1			11.77	4.27
cross-sex mind reading	0.007	1		14.71	6.04
other-deception	-0.026	-0.018	1	11.58	4.76
courtship display	0.13**	-0.056	-0.010	9.06	4.12

** Significance level: 0.01

Table 3. Male Mating intelligence factor loadings

Factors	over-estimation	cross-sex mind	self	other	courtship
Eigenvalues	5.01	3.45	2.09	1.64	1.55
% of Variance	25.04	17.27	10.47	8.24	7.76
Items	Factor Loadings				
13	0.94				
24	0.85				
15	0.81				
1	0.46				
19		0.80			
12		0.77			
8		0.74			
3		0.96			
9			0.88		
14			0.64		
10			0.64		
4			0.62		
21			0.55		
5				0.90	
20				0.76	
11				0.64	
18				0.59	
17					0.96
7					0.74
22					0.54

Total Variance Explained	60.15
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Table 4. Female Mating intelligence factor loadings

Factors	Commitment	cross-sex mind	other	courtship
Eigenvalues	3.87	3.63	3.13	2.81
% of Variance	19.38	18.17	15.68	14.06
Items	Factor Loadings			
22	0.98			
23	0.98			
21	0.85			
24	0.72			
1		0.98		
8		0.79		
13		0.78		
18		0.78		
4		0.71		
6			0.89	
9			0.89	
10			0.83	
2			0.77	
12				0.95
14				0.90
11				0.88
16				0.66
Total Variance Explained	67.31			

Table 5. Male confirmatory factor analysis on mating intelligence items

Factors	over-estimation	cross-sex mind	self	other	courtship
Items	Factor Loadings				
13	0.98				
24	0.87				
15	0.87				
1	0.56				
19		0.78			
12		0.80			
8		0.77			
3		0.77			
9			0.86		
14			0.69		
10			0.64		
4			0.64		
21			0.58		
5				0.94	
20				0.82	
11				0.62	
18				0.57	
17					0.94
7					0.79
22					0.59

Table 6. Female confirmatory factor analysis on mating intelligence items

Factors	Commitment	cross-sex mind	other	courtship
Items	Factor Loadings			
22	0.98			
23	0.97			
21	0.86			
24	0.72			
1		0.98		
8		0.78		
13		0.76		
18		0.78		
4		0.73		
6			0.82	
9			0.94	
10			0.89	
2			0.70	
12				0.99
14				0.83
11				0.93
16				0.59