Original Article

Examining the Relationships between Extroversion/Introversion, Neuroticism, Emotional Dysregulation, Emotion Regulation Strategies, and the Amount of Time Spent by Iranian Users on the Instagram Social Network Based on the Structural Equation Approach

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A B S T R A C T

The purpose of this study is to investigate the relationships between the time spent on the Instagram network based on the personality traits of introversion/extroversion, neuroticism, emotional dysregulation, and emotion regulation strategies in Iranian users of this network. Our hypothesis was based on the fact that the time spent by Iranian users on this network is much longer compared to other countries, and part of its causality is related to the practical use of this network as a tool for emotion regulation, for a limited reason. The methods of expressing emotions in this country have led users to excessively use this network. Data collection was done through an online questionnaire, which was completed by a total of 918 people. The hypothesis test and evaluation of the proposed model were examined by the structural equation modeling (SEM). The results showed that the attributes of neuroticism (N), extroversion (E), emotional dysregulation, and emotion regulation strategies can well predict the time spent by the user. The variables of neuroticism, extroversion, and emotional dysregulation all have a positive effect on the target variable (increasing time), and the variable of emotion regulation strategies can reverse this effect and reduce the time spent by users.

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Introduction

Social networks, and specifically Instagram, are widely popular in Iranian society. The number of active Iranian users of this network in 2018 was reported to be more than 23 million people, which is about 30% of the population. It seems that this figure is currently higher than this number at the beginning of 2024. The amount of time users spend on this network varies in different countries; for example, in North America, the average usage is 33.1 minutes; in the UAE, it reaches 2 hours and 13 minutes; and in Europe, it is about 29 minutes. It should be noted that no data about the time spent by Iranian users was available from statistical institutions and sites before this study. The data from our research indicates an average time spent of 3 hours and 14 minutes, and this is while this network is Filtered in this country by the government. There can be many different reasons for the difference in the time spent by users in different places, like the access method, age, and demographic structure of a country, the device used (such as a phone or computer), and the main needs of users. Our hypothesis in this study was based on the fact that one of the determining factors of this amount of time is related to emotion regulation factors. Apparently, due to many reasons, including the limitations of many methods of expressing emotions in this country, users have been led to excessive use of this network.

Theoretical Background

Emotional Regulation Processes and the Role of Social Networks

The process of emotion regulation involves the expression having the ability to manage and delay immediate and spontaneous reactions if necessary [1]. The low level of this ability is a phenomenon called emotion dysregulation. This state is considered an effective factor in emotional arousal and the quality of thoughts, behaviors, and interactions, and at the same time, emotion regulation disorder is associated with many disorders, including depression, anxiety, binge eating, anorexia nervosa, and substance abuse [2]. Furthermore, this characteristic has a significant effect on decision-making processes [3]. At the same time, considering the expansion Evidence from digital services shows that the use of these tools as a factor in regulating the emotions of their users is increasing. Tools such as social networks, online games, and online shopping are part of a process called digital emotion regulation [4].

Personality Traits in the Form of Several General Factors

On the other hand, our proposal for justifying the time spent was related to the person's personality traits. In the newer approaches to trait psychology, instead of explaining the characteristics of a person based on a multitude of variables, it has been tried to summarize these variables as the majority of a limited number of factors. Among the prominent theories in this field, we can mention two theories of five personality factors (Cary and Costa) and Eysenck's theory. In this study, instead of examining multiple personality traits, two factors- neuroticism and extroversion/introversion- were considered predictive factors.

Neuroticism as a Predictor of Some Disorders

It seems that people with a high neuroticism index are exposed to many common mental disorders, including mood disorders, anxiety disorders, and substance abuse [5]. This category of disorders is what we traditionally call "Nowruz" [6]. A high score in the factor of neuroticism is correlated with many personality traits such as anxiety, worry, anger, aggression, fatigue, psychosis, pessimism, and depressed mood [7].

The Role of Introversion and Extroversion Traits

On the other side of the predictors of personality traits, the factors of introversion and extroversion have been found, which seems to be a predictor variable for choosing a different type of behavior, especially effective interactive and social behaviors. Based on the

"instrumental view" perspective, personality traits create conditions that cause individual differences in people's emotions [8]. Specifically, extroverted people enjoy social interactions more than introverted people, and these interactions increase their happiness [9]. The results of studies show that extroverted people are more likely to choose social activities with high emotional content, activities such as crowded parties, extensive communication with people, cinema, and playing pranks on people [10].

The Purpose of the Study and Formulation of the Hypothesis

The purpose of the present research was to be able to create a causal structure in the amount of time spent by Instagram users based on the "structural equation modeling" approach. In the hypothetical model, the factors of extroversion, neuroticism, ability to regulate emotions, and the emotional dysregulation factor have been included as predictor variables in explaining the time spent by users. Structural equation modeling is a statistical method that tries to verify and validate a causal structure based on the relationship between variables [11].

Methods and Materials

Procedure and Design Study in this Study

In this study, a cross-sectional survey method was used (study sectional cross-research survey) in such a way that the questionnaires in most cases, the online form were provided to users through short messages and social networks. The descriptive information of the resulting research, including standard deviation, variance, mean, and percentage rank, was done based on 27 SPSS IBM and R version 4.3.2, as in the previous stage. The assumption test, normality tests, internal validity, Cronbach's alpha, skewness, and data elongation have been examined. Pearson's correlation coefficient is used to check the correlation and collinearity between variables. 24.0 AMOS was used to build a structural equation model to examine the relationships between exogenous, endogenous, mediating, and control variables. At first, the analysis was started based on hypothetical models, and later on, it was modified to increase the accuracy of the quantitative model. Path coefficients are determined and reported based on standard regression correlation coefficients. To check the fit indexes of the model, the chi-square index (2χ), root mean squared error of approximation (RMSEA) index, and GFI index ($\chi 2/df$ (normal square)) were used.

Participants

This study uses a self-made general information questionnaire, including questions about age, gender, marital status, level of education, employment status, and the status of using virtual networks and Instagram. It should be noted that the time was determined by the Instagram program, which was reported by the user. The number of valid data points was 918. In the following, only the data of users whose first or second choice was the Instagram network was included in the research, and the data of people who had economic activities such as stores through the Instagram network were deleted. A total of 918 people completed the questionnaires. In continuation of the data, the lie detector index above 7 in the L scale of the Eysenck questionnaire and also the people who do economic activities through Instagram were removed (in Iran, the use of Instagram tools as a concept of an online shop is very popular). In the end, only the data was analyzed to show that the Instagram network was their first or second priority in choosing a social network, and the final sample size was 644. The average age of the people was 29 years old. 14 to 62 years old, the number of men (60.3%) is higher than women (39.7%), the percentage of single people is 58%, and the percentage of married people is 42%. The level of education of people with a diploma or under-diploma, 13.4% post-diploma, 6.6% university students 16.1% bachelor's degree, 35.4% bachelor degree student, 9.8% master's degree student, 16.9% master's degree, and 1.7% doctorate. In terms of employment status, the percentage of people in full-time employment is 36.4%, full-time government 23.7%, part-time 11.9%, 26.3% had no job, 0.3% had online jobs, and

1.4% were housewives. Descriptive information about the samples is given in Table 1.

Table 1. Demographic information of the participants

Variable	Description	% (n=644)
Gender	Male	58
	Female	42
Education	Diploma and below	13.4%
	Higher Diploma	6.6%
	Undergraduate Student	35.4%
	Graduate of BS Degree	9.8%
	Graduate of Master	16.9%
	PHD	1.7%
Occupation	Full Time	36.4%
	Government	23.7%
	Part Time	11.9%
	Unemployed	26.3%
	Online job	0.3%
	Housewife	1.4%
Age	Average	29 years
	14-20	17.1%
	21-40	74.6%
	41-50	6.6%
	50-62	1.7%
Marital status	Married	42%
	Single	68%

Data Collection and Analysis

Measurements: To evaluate the level of emotional dysregulation clinically from the Difficulty in Emotional Regulation Scale (DERS); Gertz and Roemer 2004, which is a 41-item self-report instrument, was used. The range of responses on the Likert scale is 1 (meaning almost never) to 5 (meaning almost always). five factors were removed due to a lack of correlation with the whole scale and due to low or double factor loading on two factors. In the end, 36 items remained, and these 36 items are 6 factors of non-acceptance of emotional responses, difficulty in performing purposeful behaviors, difficulty in impulse control, lack of emotional awareness, limited access to emotional regulation strategies, and lack of emotional clarity. The results show that this scale has a high internal consistency, 0.93. In this study, Cronbach's alpha was between 0.80 and 0.833.

To measure personality traits from the short form of the Eysenck Questionnaire (RS-EPQ) (which is the shortened version of the Revised Eysenck Personality Questionnaire) R-EPQ; Eysenck et al., 1985) which has 48 items. This self-assessment questionnaire is used to measure the dimensions of neuroticism (N), extraversion (E), and psychoticism (P). Also, this tool has a lie detector scale (L) that measures the tendency to look good. Each of these tests has 12 questions. The reliability coefficients of this questionnaire are 0.62 (men) and 0.61 (women) for the P scale, 0.88 (men), 0.84 (women) for the E scale, 0.84 (men) and 0.80 (men). women) for the N scale, and 0.77 (men) and 0.73 (women) were reported for the L scale. The correlation of the questions of this form with its long version is also acceptable. Likewise, the evaluation of emotion regulation strategies by the regulation questionnaire Emotion (ERQ) compiled by Gross and John 9 was carried out. This questionnaire contains 10 items, two parts of the reappraisal scale include 4 items, 10 includes 6 items and, suppression. The range of answers is in a 7-point Likert scale. It ranges from strongly disagree (with a score of 1) to strongly agree (with a score of 7).

In Gross and John's research, the internal correlation for reappraisal was 79% and for suppression was 73%, and the retest validity after 3 months for the whole scale of 0.69 has been reported (Gross and John, 2003), the Cronbach's alpha between the two factors of suppression was 0.7 and reappraisal was 0.817 in our research data. To measure the time variable, the user questionnaire was directed to the Instagram settings section. (Menu → your activity → Time Spent) its daily average value is reported by the user.

Results

The Emotional Dysregulation Variable (DERS) has five scales; the standardized path coefficients of the scales are given in Figure 1. The mean of DERS was 88.22 (SD=21.82). The emotion regulation strategies variable (ERQ) has two scales; the standardized path coefficients of the scales are given in Figure 2. The average ERQ is 42.34, and the standard deviation is 9.13. Since it was possible to calculate the final value of the factors in the DERS and ERQ questionnaires, to increase the accuracy of the model, they were entered as an observed variable, and the scales were not used independently in the model.
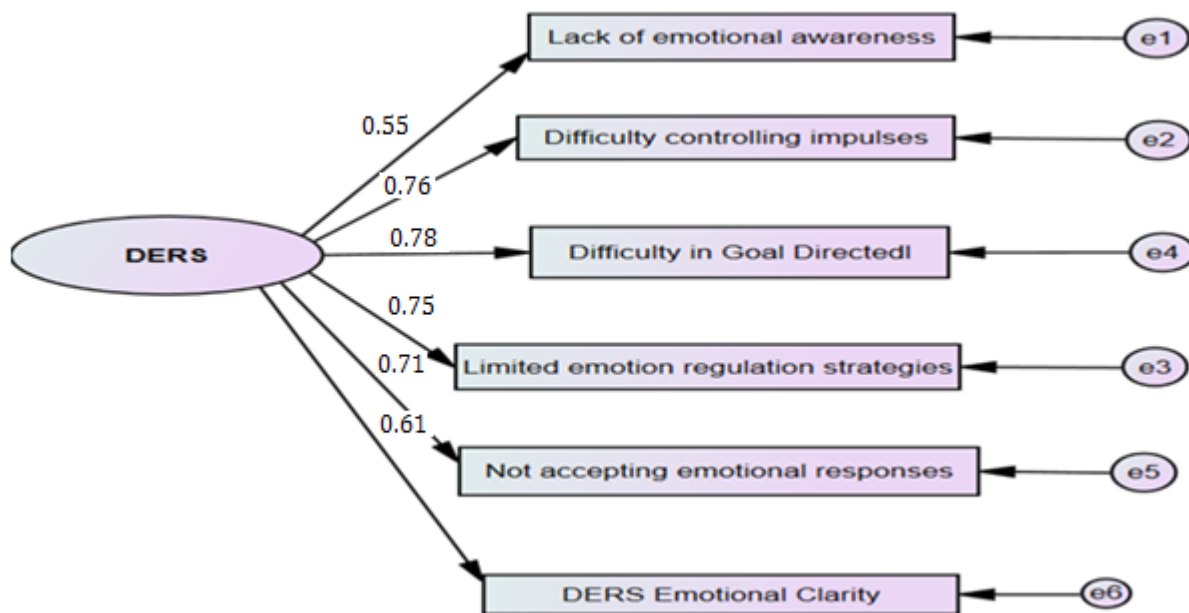
Figure 1. Path coefficients between the DERS factor and its scales
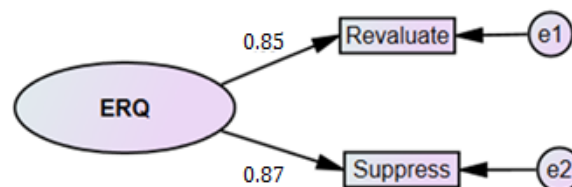
Figure 2. Standardized path coefficients between the ERQ factor and its scales

Also, the average value of the extraversion variable is equal to 7.5 (SD = 2.55), and the average value of the neuroticism variable is equal to 6.07 with a standard deviation of 2.69.

The time variable is included in our model as an owner-dependent variable; the average time spent by users is 198.08 minutes (3 hours and thirty minutes), with a standard deviation of

167.24. The Pearson correlation matrix between the variables is given in Table 2. Extroversion, neuroticism, and DERS variables have a positive correlation with the time variable (the highest correlation was related to the neuroticism variable, with a value of 0.442). The correlation between ERQ and time was negative and equal to 0.263.

Table 2. Pearson correlation matrix and significance between variables

Variable	Correlation /sig	Time	Extroversion	Neuroticism	DERS	ERQ
Time		1	0.233 /0.000	0.442 / 0.000	0.421 / 0.000	-0.263/0.000
Extroversion		0.233/0.000	1	0.016 / 0.378	-0.076/0.069	-0.036/0.242
Neuroticism		0.442 /0.000	0.16/0.378	1	0.570/0.000	-0.283/0.000
DERS		0.421/0.000	-0.076/0.069	0.570/0.000	1	-0.213/0.000
ERQ		-0.263/0.000	-0.036/0.242	-0.283/0.000	-0.213/0.000	1

Structural Model

Our model includes three exogenous variables (ERQ, neuroticism, and extroversion), a mediator variable (DERS), and one endogenous variable (time). To optimize the model, some routes were removed and modified. All paths in the final model except for the path between ERQ and DERS are significant (P > 0.05) (Table 4), the fit indices in the final model are acceptable and are as follows (Table 3).

Table 3. Fit indices of the final model

Index	χ2/df	GFI	NFI	CFI	RMSEA	IFI	AIC
Value	0.252	0.999	0.998	0.999	0.000	1.005	26.503

In our model, extraversion, neuroticism, and ERQ are included as independent variables, DERS variable as a mediating variable, and actual time spent as a dependent variable. Bootstrap analysis (B=5000) to determine the direct effect, the effect Indirect and final effects were performed in AMOS (Tables 5 to 7). The results showed that the personality traits of introversion and neuroticism can not only predict the time spent by users, but they can also predict the amount of time through the DERS variable. The same situation exists with the ERQ variable, with the difference that this variable has a negative effect (reduction of time/reduction of emotional dysregulation) on both variables of emotional dysregulation (DERS) and time spent. Likewise, this variable has a negative effect on the variable of neuroticism.

Table 4. Standardized direct paths in the model by AMOS

	Extroversion	ERQ	Neuroticism	DERS
DERS	-0.087	-0.059	0.554	0.000
Time	0.222	-0.143	0.399	0.273

Table 5. Standardized indirect paths in the model by AMOS

	Extraversion	ERQ	Neuroticism	DERS
Time	-0.024	-0.016	0.151	0.000

Table 6. Standardized final effect in the model by AMOS

	Extroversion	ERQ	Neuroticism	DERS
DERS	-0.087	-0.059	0.554	0.000
Time	0.222	-0.143	0.399	0.273

The final image of the model and standardized path coefficients can be seen in Figure 3.
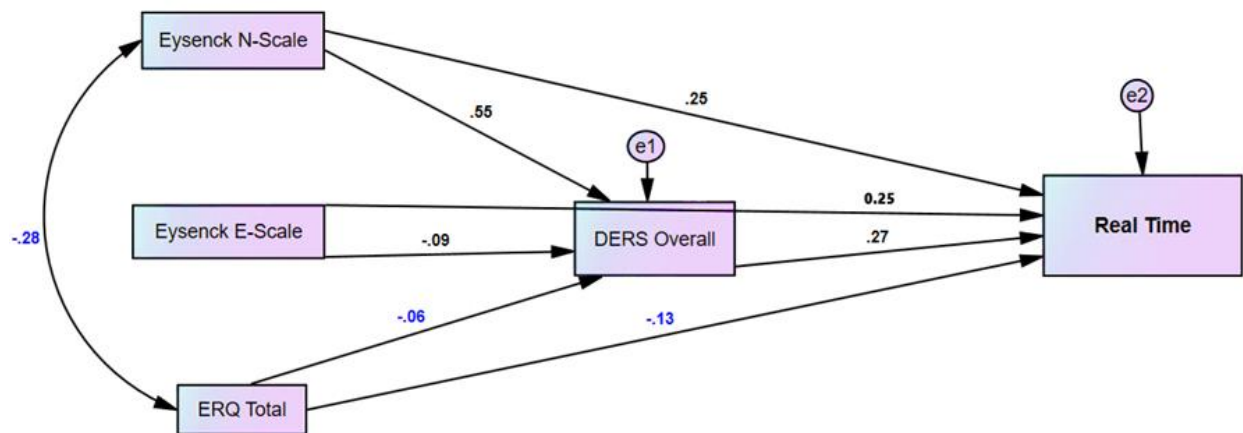
Figure 3. The final model of the variable structural equation of time spent on the Instagram network.

Discussion

Research background indicates that in 2018, about 23 million people of the Iranian population were active users of Instagram, which indicates the wide popularity of this social network, and the data of this study also confirmed the popularity of this network among Iranians. This popularity can be analyzed and investigated differently based on culture, lifestyle, and communication needs in Iran. Emotion regulation has been investigated as a process that shows the theoretical and practical ability of a person to manage his emotional reactions. Likewise, the article emphasizes that neuroticism, as a psychological indicator, can be exposed to various disorders and have a significant effect on the behavior of users.

Average Time Spent on Instagram: On average, Iranian users spend about 3 hours and 14 minutes a day on this social network. This can be for many reasons, including the need for social interaction, business needs, or entertainment. Since this network can be used as a platform for the emergence and regulation of emotion, this article has also mentioned the variable of emotion regulation as a variable that may be effective in the model. Furthermore, the article refers to the comparison of the time spent in Iran with other countries. These differences can be based on different cultural, economic, and social factors. Similarly, the variables examined in the model include poor emotional regulation (DERS), emotional regulation strategies (ERQ), neuroticism, extroversion, and time spent on Instagram.

Conclusion

Regarding the effect of emotional regulation on time spent, the model shows that people with higher levels of bad emotional regulation (DERS) spend more time on Instagram. This issue can be due to the use of Instagram as a tool to regulate emotions. Likewise, concerning the role of neuroticism, people with high levels of neuroticism may be more prone to use Instagram to regulate their lives. This can lead to excessive and possibly addictive use of social networks. This variable can not only directly have a positive effect on the time spent; it also indirectly affects the time spent with the effect it has on the variable of emotional dysregulation.

Given the role of extroversion, extroversion is known as one of the important variables in social interactions and the use of Instagram. The study suggests that extroversion can have a positive effect on Instagram use and help people make wider social connections. At the

same time, studies have shown that extroverted people prefer communication spaces with a high emotional context. Instagram has a high emotional context among social networks. The role of emotion regulation strategies also shows that although all three variables of neuroticism, extraversion, and high levels of emotional dysregulation have a positive effect on the dependent variable (target) (predicting the increase in time spent), the ERQ variable has a negative effect on all paths of the model. In fact, this variable, in addition to direct reduce the time spent, can reduce the time spent with the reducing effect it has on the variable's neuroticism and emotional dysregulation.

Suggestions for Future Research

Investigating the long-term effects: Further research can examine the long-term effects of using social networks on mental health and social behaviors.

Comparison with other social networks: Studying the differences and similarities between the use of Instagram and other social networks can provide a better understanding of how these platforms affect users.

Investigating cultural and social factors: More research can be done on the role of cultural and social factors in the use and effects of social networks on people. This specialized and comprehensive discussion based on the content of the article and the important points that were suggested at the beginning and in the theoretical foundations and research results section has been made. I hope that this discussion can provide a deeper understanding of the effects of social networks, especially Instagram, in Iranian society and, in a larger dimension, examine the role of these tools as a factor in emotion regulation.

Research Limitations

Since this study was conducted when filtering was applied and public access was restricted to networks such as Facebook, YouTube, and Instagram, its implementation in conditions other than the conditions of applying filtering

can bring different results. Also, according to the investigation of this network as a space for the expression of emotions and the discharge of unexpressed emotions, it can be important to enter a variable that includes other methods of expressing emotions.

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