

# The mediating role of emotional processing in the relationship between self-efficacy and tendency for virtual networks in gifted students

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## Abstract

**Context:** Cyberspace covers many aspects of humans' life, and the tendency to cyberspace can be influenced by cognitive and emotional aspects.

**Aims:** The purpose of the present study was to investigate the mediating role of emotional processing in relation to self-efficacy on tendency to virtual networks in gifted students.

**Settings and Design:** The present study was a correlational research with structural equation modeling.

**Materials and Methods:** The statistical population of the present study was all 300 gifted students of Sampad High School in the 11<sup>th</sup> course of experimental field in the academic year of 2019 in Gorgan city, 300 students of which were selected as samples through census method and evaluated by virtual network questionnaire of Mojardi *et al.*, emotional processing questionnaire of Baker *et al.*, and self-efficacy questionnaire of Sherer *et al.* (1982).

**Statistical Analysis Used:** The collected data were analyzed using structural regression equations using SPSS 18 and Amos 23 software.

**Results:** The results showed that there is a significant negative relationship between self-efficacy and emotional processing with the tendency to virtual networks ( $P \leq 0.01$ ). Self-efficacy ( $\beta = -0.267, P \leq 0.002$ ) and emotional processing ( $\beta = -0.221, P \leq 0.000$ ) had a significant negative effect on tendency toward cyberspace. The research model was fitted and confirmed and 0.38 of the variance of tendency to virtual networks was explained by self-efficacy and emotional processing, and emotional processing had a mediating role in the relationship self-efficacy with tendency to virtual networks.

**Conclusions:** Changes in tendency to cyberspace can be explained directly based on self-efficacy and indirectly based on emotional processing in gifted students, and this study has practical implications for school counselors.

**Keywords:** Emotional processing, Gifted students, Self-efficacy, Tendency to virtual networks

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## INTRODUCTION

Using new technologies is one of the obvious manifestations of the present world,<sup>[1]</sup> and virtual networks also play an important role in transforming the people of the society's life as one of the new aspects of these new technologies in the contemporary world.<sup>[2,3]</sup> The major disadvantage of virtual network communications is that communication in virtual networks is fundamentally text based, and therefore, there are no visual and auditory signals as in face-to-face interactions.<sup>[4]</sup> Some studies have shown that the tendency to virtual networks is influenced by cognitive, behavioral, and personality contexts such as self-efficacy.<sup>[5]</sup> Self-efficacy is derived from the social cognition theory of the renowned psychologist who refers to one's beliefs or judgments to ego's abilities to perform tasks and responsibilities.<sup>[6]</sup> Social cognition theory is based on triple causal pattern of behavior, environment, and the individual.<sup>[7]</sup> According to this theory, individuals influence their motivation and behavior in a triple causality system,<sup>[8]</sup> rejecting one-dimensional effects of the environment on one's behavior, which has been one of the important hypotheses of behavioral psychologists.<sup>[9]</sup> Individuals may find themselves proficient in one single field or a small part of it,<sup>[10]</sup> but the generality of the self-efficacy is influenced by several factors: the similarity of activities, its emergence scope, the quality of the conditions, and the attribute of the individuals to whom the behavior or activity relates.<sup>[11]</sup> On the other hand, some studies suggest that emotional aspects such as emotion processing can influence in positive or negative tendency to cyberspace.<sup>[12]</sup> Emotion's processing is a process by which emotional disturbances downfall,<sup>[13]</sup> in order that other experiences and behavior in the individuals proceed without any obstructions and enhance.<sup>[14]</sup>

In Rachman opinion, four categories of factors, which may lead to problems in emotional processing, are cognitive avoidance, lack of experience of getting accustomed in short term, depression, and overvalued beliefs.<sup>[15]</sup> Using emotion processing strategies can be effective in enhancing emotional skills to reduce emotional and psychological distress.<sup>[16,17]</sup> In this regard, Hamidi *et al.* (2018) have shown in their research that self-efficacy is related to the tendency to virtual networks in students.<sup>[18]</sup> Paul and Glassman (2017) in their research concluded that there is a significant relationship between self-efficacy in virtual networks and negative emotions.<sup>[1]</sup> Allen *et al.* concluded in their research that the inappropriate use of virtual networks is due to the level of emotional processing and metacognitive beliefs in users.<sup>[19]</sup> Lee concluded in his research that there is a significant relationship between information received from virtual networks and self-efficacy in virtual networks and emotions.<sup>[20]</sup>

Concerning gifted students' tendency, recent studies such as Lavrijsen *et al.* and Jonassen (2010) have shown that the gifted students' tendency to cyberspace, as a safe space, is increasing because the environment cannot meet their needs and can even affect their level of quality of life and their interactions with family and teachers in communication environment,<sup>[21,22]</sup> and on the one hand, gifted students sometimes incur many disadvantages in education such as boredom as the educational content is always lower than their underlying cognitive-behavioral level,<sup>[23]</sup> and on the other hand, communication circle of a peer group gets smaller and the environment becomes highly competitive and this causes them to experience behavioral and emotional problems and even more frustration, which is, in turn, a factor for such persons to harbor cyberspace.<sup>[24]</sup> Extreme tendencies to virtual networks cause them to spend less time with family in addition to the negative effect on their family life<sup>[25]</sup> and feelings of loneliness, depression, and low self-esteem increase.<sup>[26]</sup> They are also more vulnerable to financial, physical, and cultural aspects.<sup>[27]</sup> Therefore, in order to bridge the gap between studies in the consensus of the past findings, the question of the present study is, Is there a mediating role of emotional processing in the relationship between self-efficacy and the tendency to virtual networks in gifted students?

## MATERIALS AND METHODS

The purpose of this study was applied in terms of aim, and the research methodology was descriptive-correlational in structural equation modeling type. The statistical population of the present study was all 300 gifted students of Sampad High School in the 11<sup>th</sup> course of experimental field in the academic year of 2019 in Gorgan city, 300 students of which were selected as samples through census method with regard to the number of observed variables and allocation of coefficient of 25 for each observed variable (11 variables observed in the model) by Klein method<sup>[28]</sup> and considering the probability of the existence of incomplete questionnaires.

Inclusion to the research criteria included: male gender, students of Sampad high schools, 11<sup>th</sup> year, resident of Gorgan city, completion of informed consent form, and absence of psychological and physical problems for cooperation according to the individual's own words.

Exclusion criteria: Incomplete filling of the questionnaires and also they could left the study whenever they wished.

At the executive process, before the beginning of the sampling, the students (subjects) were explained about the

purpose of the study and keeping the confidentiality of the materials, and concurrently, informed consent letter regarding the samples' participation in the research was received from the students, and then, the questionnaires were received from the samples. The present study has also registered under the code of ethics of IR.IAU. AH.REC.1398.059 at Azad University of Ahvaz. The collected data were analyzed using structural regression equations using SPSS 18 and Amos 23 software (SPSS 18, Amos 23, in the USA, California, Stanford University).

#### **Virtual Network Questionnaire of Mojardi *et al.***

This questionnaire was designed by Mojardi *et al.*<sup>[29]</sup> The questionnaire consists of 19 questions and includes three aspects of amount of usage, type of use, and the amount of trust on the user. The questionnaire is developed based on a 5-point Likert scale from strongly disagree (1), slightly disagree (2), moderate (3), slightly agree (4), and strongly agree (5). The validity of the construct and content was confirmed by the developers, and Cronbach's alpha coefficient of the amount of usage was 0.76, type of use 0.80 and trust on the users 0.71, and 0.83 in total. The reliability in Cronbach's alpha method was obtained 0.81 for the amount of usage, 0.79 for type of usage, and 0.66 for the trust on the users and 0.80 in total at the present research.

#### **Emotional processing of Baker *et al.***

The scale, which is developed by Baker *et al.*,<sup>[30]</sup> has 25 questions, and the questionnaire is developed based on a 5-point Likert scale from strongly disagree (1), slightly disagree (2), moderate (3), slightly agree (4), and strongly agree (5). This scale has 5 components of sedation, emotion deregulation, lack of emotional experience, symptoms of lack of emotional processing, and avoidance. The validity of the construct and content has been confirmed by the developers, and the reliability has been reported in Cronbach's alpha method to be 0.81 for sedation, 0.87 for emotion deregulation, 0.84 for the lack of emotional experience, 0.80 for symptoms of lack of emotional processing, 0.78 for avoidance, and 0.89 for the total. The validity of the construct and content has been confirmed in Lotfi *et al.* research, and the reliability has been reported in Cronbach's alpha method to be 0.8 for sedation, 0.81 for emotion deregulation, 0.78 for the lack of emotional experience, 0.75 for symptoms of lack of emotional processing, 0.74 for avoidance, and 0.83 for the total.<sup>[31]</sup> In the present study, the reliability has been obtained in Cronbach's alpha method as 0.75, emotion deregulation as 0.74, lack of emotional experience as 0.79, symptoms of lack of emotional processing as 0.81, avoidance as 0.80, and the total as 0.86.

#### **Self-efficacy questionnaire of Sherer *et al.***

This questionnaire is developed by Shearer *et al.* with 17 items.<sup>[32]</sup> The method of self-efficacy questionnaire scoring is as follows: based on a 5-point Likert scale from strongly disagree (1), slightly disagree (2), moderate (3), slightly agree (4), and strongly agree (5). It has three subscales: the willingness to initiate a behavior, different in face of obstacles, and the desire to expand the effort. The validity of the construct and content has been confirmed by the developers, and the reliability in Cronbach's alpha method for the willingness to initiate a behavior was 0.84, different in face of obstacles was 0.87, and the tendency to expand the effort was 0.89 and the total was 0.91. In Iran, the validity of the construct and content was confirmed by Barati Bakhtiari, and the reliability in Cronbach's alpha method for the willingness to initiate a behavior was 0.79, different in face of obstacles was obtained 0.85, and the tendency to expand the effort was 0.83 and the total was 0.87.<sup>[33]</sup> In the present study, the reliability in Cronbach's alpha method was obtained for the willingness to initiate a behavior as 0.78, different in face of obstacles as 0.81, and the willingness to expand the effort as 0.74 and the total was 0.83.

## **RESULTS**

Initially, statistical assumptions were evaluated by means of kurtosis, skewness, box, and Kolmogorov–Smirnov tests, the normality of the data was confirmed, and the measurement model of the three variables of the research was confirmed.

The results shown in Table 1 show a significant correlation between self-efficacy, emotional processing, and tendency to virtual networks in the subjects. There is a significant negative relationship (0.01) between self-efficacy and emotional processing with a tendency to virtual networks, i.e., tendency to cyberspace in students decreases when self-efficacy and emotional processing increases.

According to Table 2, the value of the root mean square error of approximation is 0.039, so it is <0.1 that indicates that the mean square of the model errors is appropriate and the model is acceptable. In addition, the Chi-square value in degree of freedom (2.985) is between 1 and 3 and the amount of goodness-of-fit index, comparative fit index, and normed fit index is approximately equal to and greater than 0.9, indicating that the measurement model of the research variables is an appropriate model.

According to Table 3, self-efficacy pathways and emotional processing have a significant direct effect

**Table 1: Descriptive statistics and Pearson's correlation matrix between self-efficacy and emotional processing with a tendency to virtual networks**

Variable	Mean (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Propensity to start a behavior	11.82 2.45	1													
Different in face of barriers	21.68 2.58	0.66**	1												
Willingness to spread the effort	13.83 3.38	0.53**	0.49**	1											
Self-efficacy	41.18 5.04	0.69**	0.78**	0.71**	1										
Avoidance	12.54 4.52	0.16**	0.19**	0.17**	0.20**	1									
Signal of lack of processing	12.32 5.30	0.19**	0.18**	0.22**	0.24**	0.63**	1								
Lack of experience	14.67 4.75	0.25**	0.24**	0.31**	0.34**	0.47**	0.46**	1							
Emotion deregulation	13.75 4.06	0.18**	0.19**	0.112*	0.14*	0.48**	0.53**	0.49**	1						
Sedation	16.25 4.86	0.21**	0.28**	0.17*	0.22**	0.51**	0.62**	0.65**	0.54**	1					
Emotional processing	78.25 19.58	0.26**	0.19**	0.27**	0.23**	0.67**	0.75**	0.79**	0.81**	0.77**	1				
Amount of use	13.73 2.41	-0.20**	-0.25**	-0.22**	-0.26**	-0.19**	-0.23**	-0.14*	-0.16**	-0.19**	-0.22**	1			
Type of use	10.24 1.84	-0.23**	-0.22**	-0.28**	-0.28**	-0.19**	-0.18**	-0.10**	-0.17**	-0.18**	-0.24**	0.54**	1		
Amount of trust to users	15.35 1.78	-0.19**	-0.20**	-0.18**	-0.26**	-0.19**	-0.20**	-0.12*	-0.19**	-0.19**	-0.20**	0.43**	0.54**	1	
Tendency to virtual network	39.23 5.13	-0.24**	-0.27**	-0.25**	-0.31**	-0.19**	-0.24**	-0.16**	-0.20**	-0.21**	-0.28**	0.61**	0.69**	0.70**	1

\*\*Significant at the level of 0.01. SD: Standard deviation

**Table 2: Fit indices resulted from variables and data analysis**

Test name	Explanations	Acceptable amounts	Achieved amount
$\chi^2$	Relative Chi-square	3>	2.985
RMSEA	The root mean square error of approximation	>0.1	0.039
GFI	Goodness-of-fit index	<0.9	0.990
NFI	Normed fit index	<0.9	0.996
CFI	Comparative fit index	<0.9	0.991
DF	142		

**Table 3: Direct model estimation by maximum likelihood method**

Variable	B	$\beta$	$R_2$	t	Significant
Self-efficacy on tendency to virtual networks	-0.345	-0.267	0.092	5.403	0.002
Emotional processing on tendency to virtual networks	-0.357	-0.221	0.078	4.567	0.000

on tendency to virtual networks. Specifically,  $-0.267$  self-efficacy affects the tendency to virtual networks and emotional processing of  $-0.221$  affects the tendency to virtual networks.

As can be seen in Table 4, the two indirect paths considered, with respect to the obtained values, were significant and confirmed in Bootstrap method at the level of 0.01.

According to Figure 1, the research model was fitted and confirmed and 0.38 of the variance of tendency to virtual networks was explained by self-efficacy and emotional processing.

## DISCUSSION

The main purpose of this study was to investigate the mediating role of emotional processing in relationship between self-efficacy and the tendency to virtual networks in gifted students. With regard to the results of the conducted analysis, emotional processing in relationship between self-efficacy and the tendency to virtual networks in gifted students has an indirect effect. In addition, the results in direction of variables' relationships are in line with findings such as Lee who concluded in his research that there is a significant relationship between information received from virtual networks with self-efficacy in virtual networks and emotions.<sup>[20]</sup> Paul and Glassman (2017) in their research concluded that there is a significant relationship between self-efficacy in virtual networks and negative emotions.<sup>[11]</sup> Hamidi *et al.* showed in their research that self-efficacy is related to the tendency to virtual networks in students.<sup>[18]</sup> Allen *et al.* concluded in their research that the inappropriate use of virtual networks is due to the processing level of emotions and metacognitive beliefs in users.<sup>[19]</sup> Low self-efficacy and negative emotional processing have a positive and significant relationship with preparation to addiction tendency.<sup>[34]</sup> On the other hand, it seems that this processing defect refers to a cognitive-emotional style, the result of which is special impairment in expressing and processing of emotions and its real meaning is distress in the verbal description of emotions.<sup>[2]</sup> The concept of negative emotions is essentially characterized

by difficulty in recognizing and expressing emotions, very low daydreaming, cognitive style with an external and stimulus-dependent orientation as well as difficulty in distinguishing between emotions and physical senses<sup>[12]</sup> that lead the individual's self-efficacy to the direction that seems to be abnormal<sup>[35]</sup> and can affect emotion-based behaviors in all situations.<sup>[15]</sup> These features are thought to reflect a typical deficiency in cognitive processing and ordering of emotional situations, and Chou and Lee believe that low self-efficacy, with failure to good understand and describe emotions, makes some people be more prepared to be dependent to cyberspace.<sup>[4]</sup> since people with negative emotions misinterpret symptoms of emotional, they exhibit low self-efficacy.<sup>[16]</sup> That is why they are likely to tend to cyberspace,<sup>[8]</sup> so that the people with negative emotions have distinct feelings and that these feelings are accompanied by a psychological arousal.<sup>[9]</sup> However, due to the difficulty in distinguishing, describing, and regulating feelings, the arousal remains active and does not disappear, which can turn into an inappropriate metacognitive state that forms a maladaptive pattern or scheme, disrupting the automatic nervous system and immune system.<sup>[30]</sup> Such arousal, which couples with emotions, can produce symptoms of physical illnesses, anxiety, and depression and may eventually make the individual depend on cyberspace to alleviate these symptoms and reduce the level of anxiety and depression of the person with high emotions.<sup>[36]</sup>

**Table 4: Direct estimation of model by Bootstrap method**

Variable	Amounts	Lower limit	Higher limit	Significance
Self-efficacy on tendency to virtual networks through emotional processing mediation	-0.380	-0.275	-0.441	0.000

This research has faced the limitations of research, the research limitation to the gifted students' schools, limitation to male gender, limitation to the students on the 11<sup>th</sup> educational year at high schools, limitation to the first semester of 2019 of Gorgan city, and limitation to using self-report questionnaire.

**CONCLUSIONS**

This study showed that emotional processing plays a mediating role in the relationship between self-efficacy and the students' tendency to virtual networks, and in general, 0.38 of the explained variance of tendency to virtual networks by emotional processing and self-efficacy can be explained in direct and indirect paths.

The study also shows that students with low self-efficacy in cognitive-behavioral processing and along with the negative emotions received by combining low self-efficacy can lead to a negative and extreme tendency for cyberspace in students. In general, students with stronger self-efficacy have a better emotional processing and less negative tendency to cyberspace. Changes in tendency to cyberspace can be explained directly based on self-efficacy and indirectly based on emotional processing in gifted students, and this study has practical implications for school counselors.

It is suggested that the researches made in this area to be conducted in broader areas with examples from different and larger communities to make the results be more generalizable. Paying attention to training based on emotion regulation and self-efficacy improvement, counselors and psychologists can reduce the negative tendencies to cyberspace in gifted schools.

**Conflicts of interest**

There are no conflicts of interest.

**Authors' contribution**

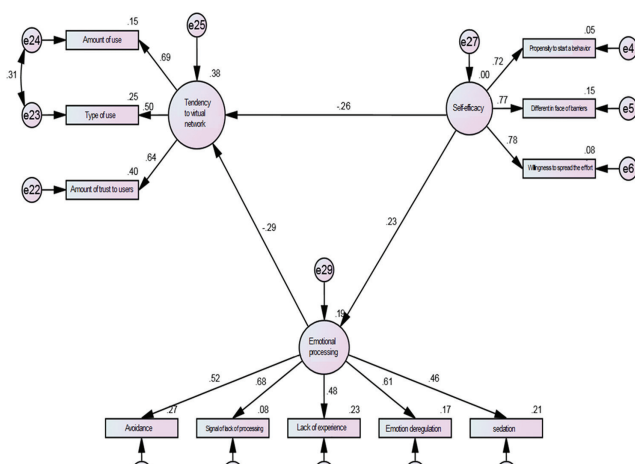
All authors contributed equally.

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**Figure 1:** The final model tested along with standardized prediction statistics

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