



Research Paper

The role of cognitive self-regulation, metacognition, and social support in predicting test anxiety



Mohammad Narimani¹, Sajjad Basharpour²,

Nima Sadeghzadeh Bilil^{3*}, Mohammadreza Nasiri Garmeh Cheshmeh⁴

1 Professor of the Department of General Psychology, Faculty of Psychology and Educational Sciences, Mohaghegh Ardabili University, Ardabil, Iran.

2 Professor of the Department of General Psychology, Faculty of Psychology and Educational Sciences, Mohaghegh Ardabili University, Ardabil, Iran.

3 Master's degree in educational psychology, Mohaghegh Ardabili University, Ardabil, Iran.

Corresponding author: Nimasadeghzadehbilil@gmail.com

4 Master's degree in educational psychology, Mohaghegh Ardabili University, Ardabil, Iran.

Received: 2024/01/15

Revised: 2024/01/16

Accepted: 2024/03/27

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Keywords:

Self-regulation, Social support,
Exam Anxiety, Student

Abstract

The purpose of this research is to investigate the role of cognitive self-regulation, metacognition, and social support in predicting test anxiety. The research method is descriptive of the correlation type, in terms of purpose it belongs to applied research, and in terms of nature, it belongs to quantitative research. The statistical population includes 1200 students of Mohaghegh Ardabili University in 1402, of which 291 were selected by multi-stage random sampling. To collect data, questionnaires of social support, test anxiety of Friedman and Jacob, and self-regulation questionnaire of Boufard were used. For data analysis, Pearson's correlation coefficient tests and multiple regression analysis were used using Spss software. The findings showed that test anxiety with cognitive self-regulation component ($r=-0.690$, $p<0.01$) and metacognitive self-regulation component ($r=-0.190$, $p<0.01$) of self-regulation, negative correlation, and meaning There is a significant negative correlation with social support with the components of family support ($r=-0.390$, $p<0.01$) and friends' support ($r=-0.720$, $p<0.01$). The regression results showed that cognitive and metacognitive self-regulation cannot significantly predict students' test anxiety, but social support could significantly predict students' test anxiety. According to the results, it is suggested that universities and educational centers pay special attention to cognitive and metacognitive self-regulation in people to control and reduce anxiety, as well as families and friends as a very effective factor in Students' lives should provide the social support they need to reduce exam anxiety.

Citation: Narimani, M., Basharpour, S., Sadeghzadeh Bilil, N., & Nasiri Garmeh Cheshmeh, M. (2024). The role of cognitive self-regulation, metacognition, and social support in predicting test anxiety. *A Review of Theorizing of Behavioral Sciences*, 1(1), 43-60. doi: [10.22098/j92532.2024.14451.1010](https://doi.org/10.22098/j92532.2024.14451.1010)

Introduction

Exam anxiety is a type of rumination that is characterized by self-blame and doubt about one's abilities, and often leads to negative cognitive evaluation, lack of concentration, adverse physiological reaction, and drop in academic performance, and has a destructive and inhibiting role. It plays an important role in the mental health of students (Poorman et al., 2019), in the general definition of test anxiety, it refers to a specific type of fear that makes a person doubt his abilities and the result is a reduction in coping ability. It is with situations that expose a person to evaluation and test (Peyman-nia, 2019), Exam anxiety is a common phenomenon among students and is considered one of the problems of the educational system (Nunzepana et al., 2016). Exam anxiety is a type of anxiety that occurs in an evaluation or problem-solving situation (Mehdi-Zadeh and Bamri, 2015) and the center of it is doubt about one's performance in the exam, which may have negative consequences for the individual and ultimately cause the individual to lose their functions and ability to cope (Crispens et al., 2019). The axis of exam anxiety is doubt about one's performance and efficiency and worry about its consequences, which causes a clear drop in the student's ability to deal with the problem-solving situation and his inability. The greater the anxiety in this case, the lower the academic efficiency. Also, anxiety is an unpleasant experience that will affect a person's beliefs, attitudes, and motivations (Revik and Ringisen, 2017). When a student becomes worried and anxious

about his performance and individual ability in the exam situation, this feeling causes a decrease in performance by causing mental disorder (Carsley et al., 2020), also exam anxiety in learners as An academic problem becomes a problem by jeopardizing a person's adaptations and hurting self-esteem, success, efficiency, and academic performance (Brady et al., 2018).

Exam anxiety is associated with a feeling of tension, fear of evaluation, worry, and negative physiological, emotional, and behavioral reactions (Vandrambos et al., 2018). There are more female than male students (Court et al., 2014; Nunezpena et al., 2016). Exam anxiety has a negative relationship with a person's psychological performance and causes academic failure in students (Balouqun et al., 2017). Various research have shown that the prevalence of test anxiety in students is from 22 to 32%, and this estimate is reported to be 27% for high school students in Iran (Fathi et al., 2016), test anxiety is an important variable. It is in the prediction of academic performance and is one of the most important causes of failure or lack of success of learners in learning and achieving academic progress programs (Spielberger et al., 2015) and is a factor causing cognitive interference in the process of attention, distorted thoughts and Unrelated to the task, it causes cognitive impairment in the learning process, drop in academic performance and turning away from school (Rees et al., 2017).

A stressor is defined as a personal or environmental event that can cause stress. In today's world, anxiety is defined as a state in which a person is constantly struggling to get from one day to the next (Tangaraj, 2014; Firth, 1986; Ray and Joseph, 2010; Rothenstein et al., 2016). Anxiety causes physical and mental complications, physical complications such as heart palpitations, muscle weakness, fatigue, shortness of breath, abdominal pain, and headache, and emotional complications such as feeling apprehensive, lack of concentration, feeling tense, anticipating the worst, and irritation. Susceptibility, restlessness, nightmares, etc. Anxiety also has some cognitive symptoms. such as racing thoughts, blanking, panic attacks, and difficulty organizing thoughts (Firth, 1986; Ray & Joseph, 2010; Rothenstein et al., 2016; Stewart et al., 1995; Deason & Rink, 2006; Niemi & Vainiomaki, 1999; Naqpal et al., 2015), excessive stress may seriously and negatively affect student health and academic performance (Kakunj, 2011). In a study conducted in Brazil, the stress factors identified by students include lack of time, excessive curriculum content, oral and written assessments, excessive load of extracurricular activities, and competition between students. and family and social problems (Pereira, 2013). According to health students, the most important stressors are practical and oral exams and lack of time to study at home (Tek et al., 2019). Students tend to look for different methods and techniques to reduce stress. The most common method is to use drugs such as beta-blockers (propranolol) to overcome anxiety and test performance stress (Mehraj et al.,

2016). Kiat Hoi Kang and Min (2020) have stated that research shows that exam anxiety is always associated with low academic performance hinders the progress of students in their work and is the most important weakening of academic performance at all levels. It is academic. Some researchers consider self-regulation as an effective factor in test anxiety, it is important to know how metacognitive thinking is reflected in the designer's practice and experiences (Osk, 2021), focusing on metacognition is also important for high-quality production. Educators should use metacognition as a learning framework to inspire thinking. Paying attention to metacognition in design education has been well expressed by countless researchers (Butler, 2018; Jamal, 2021; Martinez, 2020; Causi, 2020). Since metacognition also refers to the knowledge of regulating one's cognitive processes, therefore it is one of the vital components of creative thinking and plays an essential role in the process of creativity and ability (Jia et al., 2019), as well as in the field of cognitive and metacognitive self-regulation. Cognitive resilience is a dynamic capacity in a person that curbs the impact of stress and at the same time maintains balance in daily cognitive performance both at the individual and social levels (Rezapour et al., 2021). (Zimmerman, 2002) believes that self-regulation is the process of keeping thoughts, behaviors, and emotions active to achieve goals, and self-regulated people are those who choose a goal for themselves, choose appropriate learning strategies, maintain their motivation, and monitor their performance. They pay and evaluate their progress. The most important

aspect of self-regulated learning is the active participation of the learner in the learning process (Zahed et al., 2012), low self-regulated learning leads to a person having low self-efficacy and self-confidence in performing academic tasks and assignments, and during his studies show less effort (Brooks and Cochrane, 2016).

In the field of teacher work, cognitive self-regulation is: "an active process through which teachers guide and maintain their cognitive and metacognitive strategies in the direction of effective and efficient work behavior" (Metren and Bauer, 2014). There is a growing body of research that shows that students do not activate the self-regulation skills necessary to manage their learning (Askel, 2012; De Bruyne, 2017; Karlen, 2014; Wein, 2014). Many teachers do not provide or provide very little explicit instruction designed to improve students' self-regulatory skills and abilities to monitor students' understanding (Dignat, 2016; Griffin et al., 2012; Spruce, 2015). The main explanations offered to explain the lack of explicit teaching of self-regulation in the classroom are that pre-service and in-service teachers do not know, do not value, and especially do not believe that teaching effective self-regulation skills to students is of fundamental importance. has (Dignat, Van Uyck, 2016; Lawson et al., 2019; Spras and Bull, 2015; Vesniadou, 2020). Sometimes the terms metacognition and self-regulation are used interchangeably, but self-regulation and metacognition do not refer to the same thing. Self-regulation includes metacognition along with many other things such as "setting goals,

monitoring and evaluating one's actions" (Williams, Mercer, & Ryan, 2015), cognitive strategies are, in short, mental processes that help learners process information. process what they have to learn. Therefore, while cognition refers to thinking, metacognition can be related to thinking about thinking (Oz, 2014; Williams et al., 2015). Metacognition has an important place in self-regulation, and the literature also shows that people who have good metacognitive abilities are effective learners, and facilitating the use of metacognitive strategies leads to more successful language learning and makes language learners more autonomous and active (Borsali, 2018). Cohen and Griffiths (2015) emphasized the aspect of choice and described learning strategies as processes that are consciously chosen by the learner. Metacognition means awareness of cognition and cognitive processes and active control, monitoring, and regulation of cognition (Favarito et al., 2020). Metacognition is a multidimensional concept and includes knowledge, beliefs, processes, and strategies that control, monitor, and evaluate cognition (Kim and Lim, 2019) through processes such as control, supervision, planning, and correction of cognitive processing. It has an effect and has an effective role in reducing psychological disturbance and improving academic performance (Saines et al., 2017). This structure causes emotions and cognitions called by external stimuli to be under the supervision of metacognitive processes and take a managed and organized form (Lundin et al., 2020). Ceylan and Suygens (2022), in a research on the mutual relationship between each cognitive process

and the overall design process, and by researching whether oral and written tasks, as cognitive exercises, contribute to the design process, reached this conclusion. They found that there is a high correlation between the level of students' participation in writing exercises and their success in design work. The previous findings showed that the creative idea and metacognitive ability of design have a positive relationship with the ability and expertise of design (Kasakin, 2020), as well as Baezt and Nouri (2017) in research based on the effectiveness of cognitive rehabilitation on improving students' attention and working memory. , Niknam et al. (2019) based on the effectiveness of educational-cognitive package on strengthening the dimensions of sustained attention, selective attention, and transitional attention of children, Bonavita et al. (2015) based on the effectiveness of teaching creative problem solving on students' creativity, Savulich et al. (2019) based on the effectiveness of the rehabilitation program on strengthening working memory and information processing of children with attention-deficit/hyperactivity disorder, Nahum et al. (2021) based on the effectiveness of cognitive training on attention and the effectiveness of online social cognition training on improving performance Cognitive and metacognitive have been discussed. Research shows a significant relationship between metacognition and self-directed learning. For example, the research results of Shojaei, Jadidi, Moradi, and Akbari (2018) indicated a positive and significant relationship between positive emotion-regulation strategies and

self-directed learning and a negative and significant relationship between negative emotion-regulation strategies and self-directed learning in students. In another study, Haunga et al. (2013) reported that metacognition and problem-solving skills increased self-directed learning. Perceived social support has positive effects on a person's quality of life and health (Kang et al., 2018; Wang et al., 2014; Kurashiki, 2014). Another factor is social support. Based on the perspective of interpersonal relationships, social support is classified into emotional support, instrumental support, informational support, and evaluation support (May et al., 2021). Also, social support is very important in situations related to negative emotions (Sobel et al., 2021), social support means feeling supported by others (Sato et al., 2016), this means that social support is A slow person is loved and respected (Farshad et al., 2017).

Social support is a kind of subjective feeling about belonging, acceptance, being liked, and receiving help in needed situations (Alexopoulou et al., 2016; Kay and Jang, 2018), in examining the concept of social support perceived by theorists of this issue. They point out that the individual's perception of the existence of resources to meet needs is essential (Chadwick and Collins, 2015). Saadeh et al. (2020) have stated that many studies have confirmed the positive and significant effects of social support on psychological well-being, especially in the elderly. It seems that the more people have social support, they face positive consequences such as higher self-esteem,

fewer symptoms of depression, and overall better physical and psychological functions, leading to the improvement of their psychological well-being. Safaei et al. (2018) have stated that the effect of family social support on academic performance adaptive behavior and academic progress has been confirmed. Also, Kamarkhani and Ghanbari (2019) have stated that the level of perceived social support has a profound effect on academic behavior and knowledge. It has students. According to the mentioned concepts, the purpose of this research is to investigate the role of cognitive self-regulation, metacognition, and social support in predicting test anxiety.

Research Method

The research method is a descriptive correlational type, and in terms of purpose, it is among applied research. The statistical population includes 1200 students of Mohaghegh Ardabili University in 1402, of which 291 were selected by multi-stage random sampling. To collect data, questionnaires of social support, test anxiety of Friedman and Jacob (1997), and Boufard's self-regulation questionnaire were used. For data analysis, Pearson's correlation coefficient tests and multiple regression analysis were used using Spss 26 software.

Research tools

Questionnaires used for social support were created by Samati (2008) and have 28 questions that measure two factors, family (13 questions) and friends (15 questions). (two dimensions of family and peers), in the second study, the correlation coefficients of

the total social support scale were 0.73, the family factor was 0.73 and the friend's factor was 0.68, and Cronbach's alpha for the whole scale was 0.83 for the family was 0.63 and For friends, it was 0.93 (Shamani, 2010). The reliability of the social support questionnaire was obtained through Cronbach's alpha coefficient of 0.78 in this research. (family support 0.63, friends support 0.93).

Boufard's self-regulation questionnaire is a 14-question questionnaire designed to measure self-regulation based on Bandura's social-cognitive theory. Questionnaire questions measure the two factors of cognitive strategies and metacognitive strategies of self-regulation. The overall reliability coefficient of Bouffard's self-regulation questionnaire is 0.71 based on Cronbach's alpha, the reliability of the cognitive strategies subscale is 0.70 and the metacognitive subscale is 0.68. The reliability of the above test was reported as 0.63 in research conducted by Gholami in 2012. The reliability of the above test was reported as 0.67 and 0.69 respectively in research conducted by Nikdel (2005), and Arabzadeh (2007).

The construct validity of this questionnaire with Cronbach's alpha coefficient for measuring internal consistency was 0.80. The reliability of Bouffard's self-regulation questionnaire was obtained through Cronbach's alpha coefficient of 0.75 in this study. (cognitive self-regulation 0.78 and metacognitive self-regulation 0.72).

The test anxiety questionnaire was designed and developed by Friedman and

Jacob (1997) to measure the test anxiety of adults and it was validated in Iran by Narimani et al. (2016). This questionnaire has 23 questions and three components of social humiliation, cognitive error, and tension, and measures test anxiety in adults. The reliability of the test anxiety questionnaire in this research was obtained based on Cronbach's alpha of 0.86. (social humiliation 0.90, cognitive error 0.85, and tension 0.83).

Findings
- Descriptive findings

To get familiar with the performance of the participants in the research, in Table 1, the mean and standard deviation of the research variables have been obtain

Table 1: Mean, and standard deviation of research variables

Variables	standard deviation	Mean
1. Cognitive self-regulation	3/169	19/038
2. Metacognitive self-regulation	4/507	3/169
3. Family support	1/971	12/288
4. Support of friends	2/223	11/908
5. Exam Anxiety	4/226	35/831

- Inferential findings

in Table 2, the mean, standard deviation, and Pearson correlation coefficients of the research variables are obtained

Table 2: correlation coefficients of research variables

Variables	1	2	3	4
1. Cognitive self-regulation	1			
2. Metacognitive self-regulation	0/826	2		

3. Family support	0/005	-0/122	3	
4. Support of friends	0/437	0/215	0/287	4
5. Exam Anxiety	-0/690*	-0/192*	-0/390*	-0/720*
*p < 0/01				

Table 2 shows that test anxiety with cognitive self-regulation component ($r=-0.690$, $p<0.01$) and metacognitive self-regulation component ($r=-0.190$, $p<0.01$) of self-regulation, negative correlation, and meaning There is a negative and significant correlation with social support with the components of family support ($p<0.01$, $r=-0.390$) and friends' support ($p<0.01$, $r=-0.720$).

Table 3: Regression results of test anxiety on cognitive self-regulation, metacognition, and social support

Predictor variables	R	R ²	R ² Adjusted	F	B	Beta	t	p
1. Cognitive self-regulation					-0/157	-0/118	-1/248	0/213
2. Metacognitive self-regulation					-0/125	-0/133	-1/331	0/185
3. Family support	0/545	0/297	0/283	21/401*	-1/237	-0/651	-8/718	0/000
4. Support of friends					-0/955	-0/445	-5/811	0/000
*p < 0/01								

In the following, the multiple regression analysis method was used to investigate the research hypotheses of predicting test anxiety based on cognitive, metacognitive self-regulation, and social support, and the results are shown in Table 3. The results of Table 3 show that the desired regression is significant ($p < 0.01$, $F = 21.401$) and self-regulation and social support together can increase 0.283% of students' exam anxiety. Also, among the predictor variables, the components of family support ($\text{Beta} = -0.651$, $p < 0.01$) and friends' support ($\text{Beta} = -0.445$, $p < 0.01$) were able to significantly reduce test anxiety. Anticipate students.

Discussion and conclusion

The purpose of investigating the role of cognitive self-regulation, metacognitive and social support in predicting test anxiety, the findings of the research showed that test anxiety with the component of cognitive self-regulation and the component of metacognitive self-regulation of self-regulation has a negative and significant correlation with the component Family support has a negative and significant correlation with social support. Also, the regression results showed that the components of family support and friend support could significantly predict students' test anxiety.

Based on the findings of cognitive self-regulation and meta-cognitive self-regulation with test anxiety, these results are in agreement with the results of Farley and Kimspoon (2014) and Moilanin and Lin-Maniol (2017) on the influential role of

family, peers, and teachers in self-regulation. The study of students, by Evans et al. (2013) based on the ability of self-regulation to protect people from stress and its negative consequences, the research of Merosanova et al. (2016), Blasiman et al. (2017) and McCabe (2018) in the field Self-regulation and its role in feeling efficient and competent, internal motivation and improving academic performance and reducing stress and anxiety and Diamond (2013) based on self-regulation abilities in shaping the quality of friendship and romantic relationships, academic progress, career success, and performance improvement far from anxiety. On the other hand, in a research, Zakai (1390) has stated that there is a relationship between metacognitive beliefs, test anxiety, and academic progress of students, and there is a relationship between them, The results of this study are consistent with other studies

In explaining the findings of the research and previous research, it can be stated that in most of the research, the role of cognitive and metacognitive self-regulation in anxiety, stress, and depression has been emphasized based on Pearson's correlation coefficients. It can be stated in the research that there is a relationship between cognitive and metacognitive self-regulation and test anxiety and it is confirmed, but in the regression model of the research, cognitive and metacognitive self-regulation could not predict test anxiety in students. In general, it can be said that cognitive and meta-cognitive self-regulation is effective in controlling students' anxiety, but other factors predict exam anxiety.

According to research findings in the field of social support and test anxiety, Shi et al. (2020), Tom et al. (2020), and Biden et al. (2020) point to the effect of perceived social support in reducing anxiety. Osborne et al. (2019) emphasized the role of support from family, friends, and significant others in predicting generalized anxiety disorder. Lotfi et al. (2019) in their research found this important factor that there is a relationship between social support and anxiety. Also, Amiri et al. (2017) stated that social support is related to cognitive, physical, and behavioral symptoms of anxiety. Skorenski and Talik (2020) refer to the effect of perceived social support on a person's quality of life. Weakness of perceived social support is related to low levels of psychological well-being (anxiety and depression) (Wilson et al., 2020; Fan and Lu, 2020), Khiu et al. (2020) in a research refer to the role of social support in predicting the quality of life, health, reducing stress and all-round anxiety of the hospital personnel of the Corona ward in China, The results of this study are consistent with other studies.

In general, the results of this research show that self-regulation (cognitive self-regulation and meta-cognitive self-regulation) is more active in reducing exam anxiety in students, and social support (support from family and friends) more from family and friends reduces anxiety. It will be in people. According to the results, it is suggested that universities, education, and training centers pay special attention to cognitive and metacognitive self-regulation in people and take action to make it more active to control and reduce stress, as

well as family friends and family as a very effective factor in students' lives, provide them with the social support they need to reduce exam anxiety.

Finally, it should be noted that this research was conducted on students, and the generalization of its results to other groups in society should be done cautiously. The limitation of the sample compared to the statistical population is another limitation of this research.

It is suggested to use the relationship of cognitive self-regulation, metacognitive, and social support components with test anxiety in primary, first, and second-year secondary schools in the next research. This research should be done especially on the employees of many departments.

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