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Original Article (Quantified)

Presenting the model of academic resilience based on behavioral brain systems and academic perfectionism with the mediator role of emotional dyslexia

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Abstract

The aim of the present study was to investigate the structural equation model between behavioral brain systems and perfectionism with academic resilience with the mediating role of emotional dyslexia. The research method was correlative study of structural equation model type. The statistical population of this research included all male and female students of secondary schools in Urmia city in 2023, and a sample of 200 people was selected through a multi-stage cluster random sampling method. The standard academic resilience questionnaire of Martin and Marsh (2003), the behavioral inhibition and activation systems scale (BIS/BAS), Rasouli and Bahrami academic perfectionism questionnaire (2015), and the Toronto Ataxia Questionnaire (TAS-20) were used to collect data. The results of Pearson's correlation coefficient analysis showed that there is a significant relationship between emotional dyslexia (mediating variable) and behavioral brain systems, perfectionism, resilience and also significant correlations between resilience and behavioral brain systems and perfectionism. Also, all the model fit indices confirmed the fit of the model, so that the standard coefficients of the paths showed the direct paths of behavioral brain systems to resilience (β=0.49); perfectionism to resilience (β=0.35); behavioral brain systems to emotional dyslexia (β=0.38); and perfectionism to emotional ataxia (β=0.40) are significant. Also, the results of the AMOS software bootstrap test showed that the indirect effects of behavioral brain systems and perfectionism on resilience through emotional dyslexia are significant. Based on the findings of the present research, it can be concluded that the relationship between behavioral brain systems and perfectionism with resilience is not a simple linear relationship, but other variables such as emotional dyslexia play a moderating role in this relationship.

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Extended abstract

Introduction

Resilience as a process is the ability to successfully adapt to threatening conditions, and in other words, positive adaptation in response to adverse conditions (Atadokht et al., 2013; Khabaz et al., 2011). Academic resilience is the ability of students to overcome obstacles, problems and pressures in school over time and try to achieve academic and social success despite these problems (Khalaf, 2014). Academic resilience means that students achieve good educational results despite adverse conditions and challenges through changing existing behaviors or creating new behaviors, such as discipline, practice or planning. In other words, resilient students maintain a high level of motivation and progress despite stressful events and conditions, even if they are at risk of failing in school and eventually dropping out (Samuels & Woo, 2009).

Individual, social, family and physiological factors play a role in the emergence of resilient behavior. One of the personality and biological factors effective in the occurrence of resilient behaviors is brain-behavioral systems. Studies show that there is a relationship between behavioral brain systems and resilience (Masuyama et al, 2022). Brain-behavioral systems include the system of behavioral tendency and behavioral inhibition. The behavioral inhibition system (stopping current behaviors) is sensitive to signs of punishment, lack of reward, novelty and uncertainty, as well as negative sentimental and emotional states, including anxiety and depression (Merchán-Clavellino et al, 2019). On the other hand, the behavioral activation system is sensitive to signs of reward, lack of punishment, and escape from punishment, and is related to positive sentiments and emotions, including hope, happiness, and euphoria (Kim & Kwon, 2017).

Among the variables related to resilience is perfectionism. The results of numerous studies indicate that perfectionism is one of the personality structures that can play an important role in people's resilience, and therefore, with the increase of positive perfectionism, the level of people's resilience increases (Çerkez, 2017; Kruger et al., 2023). Academic perfectionism refers to the relentless striving for perfection and high achievement in academic pursuits, often accompanied by unrealistic self-imposed expectations and overly self-critical evaluations. Students who exhibit perfectionistic tendencies often strive for perfection, are overly critical of themselves in response to perceived failures, and derive their self-worth primarily from academic success (Liu et al, 2022).

Recent findings of cognitive neuroscience show that the underlying neural mechanisms of emotion may be similar to the underlying mechanisms of cognitive processes (Bagby et al, 1994), so that in various researches, including Burger et al., (2006), they showed that emotion regulation strategies are a key and determining factor in mental well-being, which also plays an essential role in adapting to life's stressful events. **Emotional dyslexia**, also known as alexithymia, is a construct proposed by Sipheneus (Cisler et al, 2010). Alexithymia is a unique emotion processing disorder that is primarily associated with a reduced capacity to identify and understand emotions (Kinnaird et al, 2019).

Therefore, the present study was trying to answer the question: can alexithymia play a mediating role between brain-behavioral systems and perfectionism with academic resilience?

Theoretical framework

alexithymia

Current conceptualizations introduce alexithymia as a characteristic defect in the cognitive processes of emotional experiences, which is related to the understanding and perception of the mental state (Kinnaird et al, 2019). Emotional dyslexia mean lack of words for emotions. In other words, alexithymia is considered a type of cognitive-emotional dysfunction in which

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a person is unable to convey his emotional experiences in the form of feelings and imaginations (Schimmenti et al, 2017).

Behavioral brain systems

The behavioral inhibitory system is assumed to direct behavior in response to new threats and stimuli, and in the presence of such signs and clues, it inhibits goal-based behavior; while the behavioral activation system is sensitive to encouragement signals and leads to an increase in goal-based behavior in the presence of such signs and adjusts the behavior in response to incentives (Dumitrescu et al, 2010; Sutterlin et al, 2011; Broerman et al, 2014). The behavioral activation system includes 3 driving subscales (a person's tendency to actively pursue desired goals), response to reward (focusing on positive responses to the occurrence of a reward or predicting it), seeking pleasure and entertainment (a person's tendency to seek new rewards and the desire to reach and achieve immediate rewarding events) (Babapur, 2010).

Perfectionism

In the morbid form of perfectionism, it is the belief that the work or performance of anything that is not perfect is unacceptable. Perfectionism is related to perfectionistic efforts such as having high personal standards, setting strict standards for performance, and striving for excellence (Cakici, 2013).

Academic Resilience

Academic resilience refers to high levels of motivation to progress and perform, despite stressful events and conditions that students face at school. In other words, academic resilience has been defined as the ability to succeed in school, despite the conditions of poverty, which includes competencies such as trust, well-being, motivation, orientation, strong communication and stress management (Sultannejad et al, 2013).

Methodology

The research method of this study was correlative, structural equation model type. The statistical population of this research included all second year high school students of Urmia city in 2024. The statistical sample including 200 students was selected through random cluster sampling. To analyze the obtained data, structural equations causal modeling method was used, along with AMOS software. To examine the relationships between the research variables, academic resilience questionnaires of Martin & Marsh (2003), behavioral inhibition and activation systems scale (BIS/BAS), academic perfectionism questionnaire and Toronto dyslexia questionnaire were used.

Research findings

The results related to the direct effects between the research variables showed that the path coefficients related to the direct effects of the research variables are statistically significant. Also, in order to test the significance of the role of emotional dyslexia in the relationship between behavioral brain systems and academic perfectionism with academic resilience, AMOS software bootstrap test was used, and the results showed that the lower limit and the upper limit of both indirect effects of behavioral brain systems and academic perfectionism on academic resilience through emotional dyslexia do not include zero; and this indicates the significance of these indirect paths, and the indirect effects of the model were confirmed.

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Conclusion

The aim of the present study was to provide a model of academic resilience based on brain-behavioral systems and academic perfectionism with the mediating role of alexithymia. The results of the analysis of Pearson's correlation coefficient test showed that there are significant relationships between alexithymia (mediating variable) and behavioral brain systems, perfectionism, resilience, and also between resilience and behavioral brain systems and perfectionism. Also, the standardized coefficients of the paths showed the direct paths of brain systems, behavior to resilience; perfectionism to resilience; behavioral brain systems to alexithymia; and perfectionism to alexithymia. In line with the direct effects and variables between relations, the results of this study are in line with the research findings of Masuyama et al, (2022); Demers et al, (2022); Akbarizadeh et al, (2021); and Porakbaran et al, (2018).

In connection with the indirect effect, the results of this research indicate the mediating role of emotional dyslexia in the relationship between behavioral brain systems and resilience. The results of several researches such as Çıkrıkçı (2023); Bilge, Y., & Tankut (2022); Marsero et al, (2018); Pourmohsani et al, (2023); and Shah Alizadegan (2018) has been confirmed the effect of brain-behavioral systems as an input variable Resilience.

Based on the results of the research, according to the findings of the present study, it is suggested to the planners of the field of education and the education system to pay essential attention to the basic role of alexithymia and the problems related to emotional disorders of students in order to prevent the academic decline of students, and by treating the emotional problems of the students; provide the ground for solving the problems of perfectionism and behavioral brain systems and improve the academic level of the students.