Modeling the structural relationships of academic procrastination based on problem-solving styles with the mediating role of academic persistence

Rouhollah. Salehi Tabar[1], Rahim. Davari*[2] & Hossein. Ebrahimi Moghadam[3]

1. PhD student Educational Psychology, Department of Psychology, Roudehen Branch, Islamic Azad University, Roudehen, Iran
2. *Corresponding Author:* Assistant Professor, Department of Psychology, Roudehen Branch, Islamic Azad University, Roudehen, Iran
3. *Associate Professor, Department of Psychology, Roudehen Branch, Islamic Azad University, Roudehen, Iran*

ARTICLE INFORMATION	ABSTRACT
	Background and Aim: One of the most important objectives of the education system in any country is to enhance the scientific level and academic ability of students. The purpose of the current research was to model the structural relationships of academic procrastination based on problem-solving styles with the mediating role of academic persistence. **Methods:** This research is descriptive of the type of correlation designs based on structural equation modeling method. The statistical population of this research was the students of the second secondary school in Hamedan city in the academic year of 2021-22. 304 students were selected by multi-stage cluster sampling method. Solomon and Rothblum's (1986) academic procrastination questionnaires, Cassidy and Long's (1996) problem-solving styles, and Martin and Marsh's (2008) academic persistence questionnaires were used to collect data. Data analysis was done through SPSS-25 and Amos-24 software. **Results:** The findings showed that academic persistence and components of trust, tendency and creativity have a negative effect on academic procrastination. The helplessness component has a positive effect on academic procrastination. But the direct effect of inhibition and avoidance components on procrastination was not significant. The components of confidence, orientation and creativity have a positive effect, and helplessness, avoidance, restraint have a negative effect on academic persistence. The components of trust, tendency and creativity have a negative effect on academic procrastination with the mediation of persistence. Also, helplessness, restraint and avoidance have a positive effect on academic procrastination through the mediation of academic persistence. **Conclusion:** Problem-solving styles and academic persistence are factors that affect academic procrastination. These findings can be considered a model for intervention.

How to Cite This Article:
Salehi Tabar, R., Davari, R., & Ebrahimi Moghadam, H. (2023). Modeling the structural relationships of academic procrastination based on problem-solving styles with the mediating role of academic persistence. *Jayps. 4*(10), 233-245.

Introduction

One of the most important objectives of the education system in any country is to enhance the scientific level and academic ability of students. Some students face challenges in the educational process that hinder their academic success. Academic procrastination is one of the fundamental challenges most students and university students face (Pourabdol et al., 2015). Procrastination is a complex phenomenon with behavioral and cognitive elements, involving the intentional delay of actions despite awareness of potential negative outcomes, which means postponing a task that one has decided to do (Steel, 2007). Procrastination, due to its complexity and cognitive, emotional, and behavioral components, has various manifestations: academic procrastination, decision-making procrastination, neurotic procrastination, and obsessive procrastination. The most common form of delay is academic procrastination (Jones & Blankenship, 2019). Academic procrastination has three components: the first is preparing for exams, the second relates to preparing assignments, and the third is preparing for end-of-year academic tasks (Solomon & Rothblum, 1984). Men are more likely to procrastinate in public and academic tasks than women, and the tendency to procrastinate does not differ based on demographic social situations, including socio-economic status, multiculturalism, nationality, family size, and educational background (Lu et al., 2021). In Iran, about 60% of 305 students surveyed reported different levels of academic procrastination, of which about 19% had severe procrastination (Khorshidi et al., 2019).

The prevalence of academic procrastination among students and university students is concerning because academic procrastination behavior causes students to delay their academic activities and ultimately leads to poor academic progress, physical problems, anxiety, disorder, confusion, and lack of responsibility. It also causes individuals to feel helpless and unsuccessful in dealing with their surroundings, impacting various aspects of education, health, and their future careers. Students who procrastinate academically experience higher levels of stress and anxiety than others (Motlagh & Tarabinejad, 2018). Procrastination tends to be a disorganized behavior that may become entrenched with age and, as a form of disorder, limits the personal growth of students, negatively impacting their independence and well-being (Valenzuela et al., 2020).

Regarding the factors influencing academic procrastination, numerous studies have been conducted, including emotional intelligence and self-efficacy (Azizi et al., 2021); mental health and defense styles (Vlachopanou & Karagiannopoulou, 2022); media and technology use (Türel & Dokumaci, 2022); self-esteem and motivation for advancement (Avazian et al., 2011); general academic support (Hen, 2018); life satisfaction and family cohesion (Uzun et al., 2022); teacher-learner relationship (Wang, Xin, et al., 2022); hope and academic progress (Azari et al., 2017); negative emotions (Wang, Kou, et al., 2022); mindfulness (Qasba et al., 2021); anxiety, time management, and self-control (Unda-López et al., 2022); academic buoyancy (Pourabdol et al., 2015); teamwork (Koppenborg & Klingsieck, 2022); task value (Mohammadi et al., 2017); organizational justice (Ghanbari & Moajuni, 2021); educational goals (Rastegar et al., 2016); addiction to social networks (Suárez-Perdomo et al., 2022).

A significant factor that appears to play a role in academic procrastination is problem-solving styles. Problem-solving styles are a cognitive-social process through which individuals identify and discover effective ways to confront and cope with problematic situations in everyday life (D'Zurilla et al., 2002). D'Zurilla (Gharibi et al., 2017) defines problem-solving as a useful tool for dealing with situational problems, offering various potentially effective responses to problematic situations and increasing the likelihood of choosing the most effective response among these different solutions. Problem-solving training began in the late 1960s as part of the cognitive-behavioral movement for behavior modification, with Goldfried emphasizing the need to teach problem-solving skills as part of individual skills training programs (Jafarzadeh Ghadimi et al., 2013). Using problem-solving strategies increases an individual's belief in their abilities (Gharibi et al., 2017). According to Cassidy and Long (1996), problem-solving styles can influence academic procrastination. Cassidy and Long introduced six problem-solving styles: creative, confident, approach, helplessness, control, and avoidance. The creative problem-solving style indicates planning and considering various solutions based on the problematic

situation. The confident style in problem-solving represents the individual's belief in their ability to solve problems. The approach style shows a positive attitude towards problems and the desire to confront them head-on. The helplessness style indicates an individual's helplessness in problematic situations. The control style in problem-solving refers to the influence of external and internal controllers in the problematic situation, and finally, the avoidance style indicates the tendency to ignore problems instead of confronting them (Zarean et al., 2018). Moreover, problem-solving styles are related to academic procrastination (Yurtseven & Dogan, 2019; Narimani et al., 2015; Khormaei & Zaboli, 2018). Farhadi and Gholamnazari (2021) showed a positive correlation between helplessness, avoidance, approach, and perceived stress from COVID-19, while control, creativity, and confidence are negatively correlated with perceived stress. Problem-solving skills significantly impact academic procrastination, suggesting that academic procrastination is a function of problem-solving skills and academic motivation, emphasizing that academic procrastination behavior is related to problem-solving skills and offers a different perspective that should be considered in addressing academic procrastination behaviors (Yurtseven & Dogan, 2019). Flores, Ojeda, and Hong (2006) proved the positive impact of problem-solving assessment on self-efficacy among Mexican-American high school students. Constructive problem-solving skills increase individuals' resilience and self-efficacy, while unconstructive problem-solving styles (helplessness, control, avoidance) not only reduce individuals' activity levels but also lead to indifference to complex issues and situations (Nazari et al., 2018). Also, Kant, D'Zurilla, and Maydeo-Olivares (1997) found that lacking appropriate problem-solving skills is related to a number of emotional and behavioral problems in adulthood. Overall, problem-solving is an important predictor variable for well-being and mental health (Aghayousefi & Sharif, 2011).

The context of schools and other educational fields is such that challenges, difficulties, pressures, and stresses are realities of the everyday academic life of students, and empirical data also confirm this reality (Ahmadi et al., 2021). Ahmad et al. (2021) proposed the concept of academic buoyancy as a construct related to academic resilience in the context of positive psychology. According to Martin & Marsh (2008), academic buoyancy is the learner's ability to overcome problems, obstacles, and challenges that typically occur in their daily academic life. Academic buoyancy means the ability of students to face academic barriers and challenges in such a way that when an individual performs a task spontaneously, they not only do not feel tired but also feel an increase in energy and power, which is a prerequisite for academic buoyancy. Academic resilience is relevant in the face of anxiety and chronic failures, but academic buoyancy is associated with reduced motivation and enthusiasm for study and poor grades (Dehghani et al., 2020). Some research has also shown that academic buoyancy can be predicted by variables such as hope, motivation, and positivity (Mahmoudabadi & Hassan, 2017). Academic buoyancy leads to higher academic self-efficacy and better academic performance (Lei et al., 2022). Exam performance is higher when academic anxiety is low and academic buoyancy is high (Putwain et al., 2022). Academic buoyancy is associated with higher levels of academic achievement and both controlled and autonomous motivational orientations (Datu & Yang, 2021). Research by Pourabdol et al. (2015) showed that high academic buoyancy reduces the extent of academic procrastination. Academic buoyancy is one of the important indicators that affect effective education and learning and manifests abilities in individuals. According to Martin & Marsh (2008), skills, attitudes, capabilities, and values of individuals are internal resources of academic buoyancy that can be effective in academic procrastination.

Since academic procrastination can affect various aspects of personal and social life; educational, economic, mental, and physical health, research in this area can identify factors related to academic procrastination to design necessary interventions to reduce or eliminate them. Therefore, the aim of the present research was to present a structural model of academic procrastination based on problem-solving styles with the mediating role of academic buoyancy.

Research hypothesis:
1. Problem-solving styles have a direct effect on academic procrastination.
2. Academic buoyancy has a direct effect on academic procrastination.

3. Problem-solving styles affect academic procrastination through the mediating role of academic buoyancy.

Method

The present study was examined and analyzed using a correlational method of structural equation modeling. Problem-solving styles were considered as exogenous (predictive) variables, academic procrastination as endogenous (criterion) variables, and academic buoyancy as a mediating variable. The statistical population of the present study included all high school students in Hamedan who were studying in the 2020-2021 academic year. Participants were selected from high schools using a multi-stage cluster sampling method. Initially, a district of Hamedan city was selected, a list of high schools in that district was prepared, and then 6 schools (3 girls' schools and 3 boys' schools) were selected; in total, 102 tenth-grade students, 123 eleventh-grade students, and 79 twelfth-grade students (304 students in total) responded to the questionnaires individually.

Materials

1. Academic Procrastination Questionnaire:
This questionnaire was developed by Solomon and Rothblum (1984) and named the Academic Procrastination Questionnaire. Dehghani and Hosseinchari (2008) was the first to use this questionnaire in Iran. The scale consists of 27 items that examine three components: the first component is preparing for exams, comprising 8 items; the second component is preparing for assignments, comprising 11 items; and the third component is preparing for end-of-term assignments, comprising 8 items. Scoring of the items in this tool ranges from 1 point for "Never" to 5 points for "Always." In the current study, the construct validity of the Academic Procrastination Questionnaire was assessed using confirmatory factor analysis, with fit indices indicating the appropriateness of the tool's construct validity (GFI=0.94, AGFI=0.90, SRMR=0.04, CFI=0.95, NFI=0.93, NNFI=0.94, X2/df=2.71, PNFI=0.66, RMSEA=0.06). The reliability of the questionnaire in this study was 0.86 using Cronbach's alpha. Namiyan and Hosseinchari (2011) in a study titled "Explaining the Academic Procrastination of Students Based on Religious Beliefs and Locus of Control" obtained a Cronbach's alpha reliability coefficient of 0.73 for the scale. Dolati (2012) also obtained a Cronbach's alpha reliability coefficient of 0.91 for the scale in another study. The validity of the scale in the research by Jokar and Delavarpour (2007) was calculated using factor analysis, indicating the desirable validity of the scale.

2. Problem-Solving Styles Questionnaire:
This tool was developed by Cassidy and Long (1996). It consists of 24 items measuring six factors, with each factor comprising four items. The factors include: helplessness in problem-solving (1-4), controlling or inhibitory problem-solving (5-8), creative style (9-12), confidence in problem-solving (13-16), avoidance style (17-20), and approach or proximity style (21-24). Helplessness, avoidance, and control are non-constructive styles, while approach, creativity, and confidence are sub-scales of constructive problem-solving. Responses to this scale are given as "Yes, No, Don't Know." The options "No and Don't Know" are scored zero, and "Yes" is scored one. In the current study, the construct validity of the Problem-Solving Styles Questionnaire was assessed using confirmatory factor analysis, with fit indices indicating the appropriateness of the tool's construct validity (GFI=0.95, AGFI=0.92, SRMR=0.02, CFI=0.96, NFI=0.95, NNFI=0.96, X2/df=2.52, PNFI=0.69, RMSEA=0.07). The reliability of the questionnaire in this study was 0.74 using Cronbach's alpha. Cassidy and Long () obtained Cronbach's alpha coefficients for the questionnaire in a study for the styles of helplessness, control, creativity, confidence, avoidance, and approach, respectively, as 0.86, 0.60, 0.66, 0.66, 0.51, 0.53.

3. Academic Buoyancy Questionnaire:
Developed by Martin and March (2008), it comprises six items rated on a five-point Likert scale from strongly agree to strongly disagree. On this scale, each item scores a maximum of 5 and a minimum of 1. A higher score indicates greater academic buoyancy. The reliability of the scale in the research by Martin and Marsh (2008) was estimated at 0.89 using Cronbach's alpha. In the current study, the construct validity of the Academic Buoyancy Questionnaire was assessed using confirmatory factor analysis, with fit indices indicating the appropriateness of the tool's construct validity (GFI=0.95, AGFI=0.92, SRMR=0.04, CFI=0.95, NFI=0.92, NNFI=0.94, X2/df=1.89, PNFI=0.70, RMSEA=0.06). The reliability of the questionnaire in this study was 0.82 using Cronbach's alpha. Dehghani and Hosseinchari (Dehghani, 2008) showed that this scale is

stable in terms of internal consistency and retest (Cronbach's alpha 0.80 and retest 0.67). Sadeghi and Khalili (2015) used Cronbach's alpha for the entire scale in a study to examine reliability, which was calculated as 0.70 and 0.86, respectively.

Implementation

Finally, the sample consisted of 124 girls and 180 boys. The mean and standard deviation of the participants' age were 16.2 and 0.97 years, respectively. Participants were also informed that their responses would be used for research purposes and would remain confidential without names, as per the researcher's consideration.

Results

The analysis of the research data was conducted using mean, standard deviation, skewness, kurtosis, Pearson correlation coefficient, structural equation modeling, and the bootstrap method for examining mediating paths, using SPSS-25 and Amos-24 statistical software. Research Hypothesis: The structural modeling of the relationships of academic procrastination based on problem-solving styles with the mediating role of academic buoyancy is fit. Structural equation modeling allows examining the relationships between latent variables and the items measuring each variable with the related variable. To test the proposed model of the research, several assumptions of structural equation modeling, including missing data, normality, and multicollinearity, were examined. In this study, missing data (3 cases) were replaced with the mean, and skewness and kurtosis indices were used to check the normality of variables. The range of skewness coefficient values was from -0.79 to 0.73, and the range of kurtosis coefficient values was from -1.23 to 1.43. Overall, the values related to all observed variables indicate that none of the variables' distributions differ significantly from a normal distribution. Multicollinearity among predictor variables was examined using the tolerance statistic. The obtained tolerance values for the variables were greater than 0.10 and ranged from 0.79 to 0.92, indicating the absence of multicollinearity among the predictor variables.

Table 1. Descriptive Indices and Correlation Coefficients										
Variable	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Buoyancy	1									
Exams	-0.19*	1								
Assignments	-0.51**	0.41**	1							
End-of-Year	-0.46**	0.24**	0.51**	1						
Approach	0.65**	-0.54**	-0.44**	-0.61**	1					
Avoidance	-0.17	0.18	0.28**	0.22**	-0.69**	1				
Confidence	0.45**	-0.44**	-0.53**	-0.47**	0.61**	-0.35**	1			
Creativity	0.40**	-0.43**	-0.27**	-0.50**	0.64**	-0.41**	0.30**	1		
Control	-0.23**	0.20*	0.22*	0.14	-0.51**	0.64**	-0.62**	-0.57**	1	
Helplessness	-0.53**	0.33**	0.41**	0.21*	-0.47**	0.55**	-0.59**	-0.43**	0.38**	1
Mean	3.95	2.79	3.31	2.29	0.65	0.54	0.62	0.71	0.31	0.40
SD	0.79	0.45	0.60	0.32	0.42	0.38	0.34	0.38	0.25	0.29
Skewness	-0.33	-0.18	-0.50	-0.79	-0.26	-0.16	-0.10	-0.16	0.17	0.73
Kurtosis	0.07	-0.31	-0.66	-0.51	-0.98	1.43	-1.23	-0.97	-0.22	-0.29

**: Significant at the 0.01 level. *: Significant at the 0.05 level. N=304

Based on the results in Table 1, the components of approach, confidence, and creativity have a significant positive relationship with academic buoyancy (p = 0.01). However, the components of control and helplessness have a significant negative relationship with academic buoyancy (p = 0.01). There is a significant negative relationship between academic buoyancy and procrastination in assignments, exams, and end-of-year tasks (p = 0.01). The components of approach, confidence, and creativity have a significant negative relationship with procrastination in assignments, exams, and end-of-year tasks (p = 0.01). However, the components of control, avoidance, and helplessness have a significant positive relationship with academic procrastination components (assignments, exams, and end-of-year tasks) (p = 0.05).

Table 2. Fit Indices Resulting from Data Analysis and Variables			
Index	Acceptable	Initial	Final
χ2/df	> 3	3.09	2.68
SRMR	> 0.05	0.01	0.03

RMSEA	> 0.08	0.04	0.05
GFI	< 0.9	0.89	0.91
AGFI	< 0.8	0.89	0.94
PNFI	< 0.60	0.59	0.68
NNFI	< 0.9	0.91	0.94
NFI	< 0.9	0.88	0.93
CFI	< 0.9	0.93	0.91

After conducting structural equation modeling, the fit of the model was examined. As Table 2 shows, the final model has an appropriate fit according to fit indices.
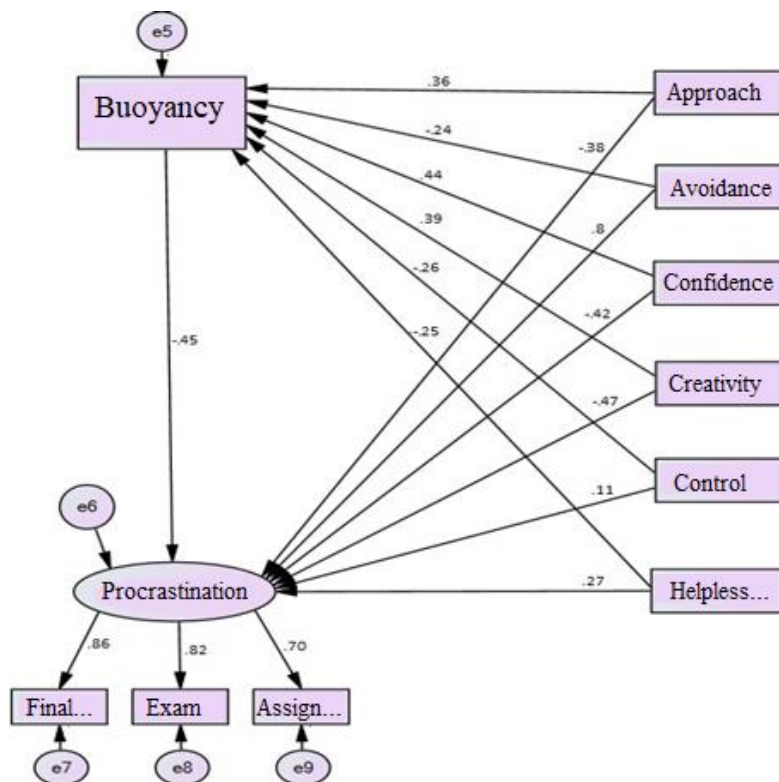

Figure 1. Research Model

Table 3. Estimation of Direct Effects in the Model						
From Variable	To Variable	B	β	R²	t	p
Buoyancy	Procrastination	-0.49	-0.45	0.24	-3.82	0.001
Approach	Procrastination	-0.43	-0.38	0.19	-3.53	0.001
Avoidance	Procrastination	0.20	0.08	0.10	1.32	0.069
Confidence	Procrastination	-0.49	-0.42	0.24	-3.60	0.001
Creativity	Procrastination	-0.41	-0.47	0.27	-3.84	0.001
Control	Procrastination	0.24	0.11	0.07	1.41	0.061
Helplessness	Procrastination	0.36	0.27	0.13	2.59	0.009
Approach	Buoyancy	0.39	0.36	0.24	2.63	0.006
Avoidance	Buoyancy	-0.38	-0.24	0.14	-2.20	0.014
Confidence	Buoyancy	0.51	0.44	0.26	3.79	0.001
Creativity	Buoyancy	0.34	0.39	0.30	2.88	0.004
Control	Buoyancy	-0.35	-0.26	0.12	-2.58	0.008
Helplessness	Buoyancy	-0.31	-0.25	0.09	-2.43	0.011

Table 3 presents the coefficients of direct effects between the variables of the research and their significance levels. Based on the results of Figure 2 and Table 3, findings regarding the research hypothesis show that academic buoyancy (p = 0.001, β = -0.45), approach styles (p = 0.001, β = -0.38), creative (p = 0.001, β = -0.47), and confidence (p = 0.001, β

= -0.42) have a direct and negative effect on academic procrastination, and helplessness (p = 0.001, β = 0.009) has a direct and positive effect on academic procrastination. The direct effects of avoidance styles (p = 0.069, β = 0.08) and control (p = 0.061, β = 0.11) on procrastination were not significant. Approach styles (p = 0.006, β = 0.36), creative (p = 0.004, β = 0.39),

and confidence (p = 0.001, β = 0.44) have a direct and positive effect on academic buoyancy. Additionally, avoidance styles (p = 0.014, β = -0.24), control (p = 0.008, β = -0.26), and helplessness (p = 0.011, β = -0.25) have a direct and negative effect on academic buoyancy.

Table 4. Estimation of Indirect Paths in the Model Using Bootstrap							
From Variable	Mediator	To Variable	β	Upper Limit	Lower Limit	p	Confidence Interval
Approach	Buoyancy	Procrastination	-0.17	-0.32	-0.08	0.001	0.95
Avoidance	Buoyancy	Procrastination	0.11	0.25	0.04	0.001	0.95
Confidence	Buoyancy	Procrastination	-0.20	-0.31	-0.10	0.001	0.95
Creativity	Buoyancy	Procrastination	-0.18	-0.28	-0.09	0.001	0.95
Control	Buoyancy	Procrastination	0.12	0.19	0.06	0.001	0.95
Helplessness	Buoyancy	Procrastination	0.11	0.22	0.04	0.001	0.95

The results of the above table indicate that approach styles (p = 0.001, β = -0.17), creative (p = 0.001, β = -0.18), and confidence (p = 0.001, β = -0.20) with the mediating role of academic buoyancy have a negative effect on academic procrastination. Avoidance styles (p = 0.001, β = 0.11), helplessness (p = 0.001, β = 0.11), and control (p = 0.001, β = 0.12) with the mediating role of academic buoyancy have a positive effect on academic procrastination.

Conclusion

The present study aimed to model the structural relationships of academic procrastination based on problem-solving styles with the mediating role of academic buoyancy in high school students in Hamedan. The results indicated that the final model of the study has a good fit. According to the findings, the styles of approach, confidence, and creativity negatively and directly affect academic procrastination, while the style of helplessness has a positive and direct effect. Recent research has shown that problem-solving styles are related to the academic procrastination of students (Tarazi et al., 2020). Problem-solving skills have a significant impact on academic procrastination. Academic procrastination, rather than being a result of internal or external motivation, is a function of problem-solving skills and academic motivation. This suggests that academic procrastination behavior is related to problem-solving skills and presents a different perspective that should be considered in addressing academic procrastination behaviors (Yurtseven & Dogan, 2019). Furthermore, problem-solving training can be an effective intervention to moderate academic difficulties.

The research by Khoramai and Zaboli (2018) indicated that there is a relationship between the styles of helplessness, creativity, and academic procrastination in students. The styles of approach to problem-solving and confidence in problem-solving also influence students' academic procrastination. Therefore, by identifying students' problem-solving styles, actions can be taken to improve students' academic procrastination. Kant and colleagues (Kent & D'Zurilla, 1997) found that lacking appropriate problem-solving skills is associated with emotional and behavioral problems. This aligns with the findings of Kim and colleagues (2018), which showed that students with problem-solving skills exhibit less procrastination. Problem-solving is an important coping strategy that increases personal and social capability and progress while reducing academic problems. Constructive problem-solving styles are determinants in facing academic problems. Students who employ constructive problem-solving styles can demonstrate other competencies such as creativity, logical behavior, flexibility, critical thinking, and strong willpower. When learners use constructive problem-solving styles, they achieve a greater understanding of concepts and greater interest in academic activities. Additionally, Abutalebi Ahmadi (2012) showed that problem-solving styles are effective in improving anxiety and motivation. These studies emphasize that excessive use of non-constructive problem-solving styles such as helplessness, control, and avoidance is associated with a high level of academic problems. In other words, using non-

constructive problem-solving styles predisposes students to procrastination in assignments, exams, and end-of-year tasks, leading to confusion and anxiety in response to stressful and challenging situations. Using Seligman's (1975) learned helplessness theory, this finding can be explained. Seligman suggests that learned helplessness leads to negative cognitive construction. In the theory of learned helplessness, helplessness leads to motivational, cognitive, and emotional deficiencies. Motivational deficiency occurs because when it is learned that behavior and outcome are independent, the expectation of change decreases; therefore, the likelihood of voluntary response to a situation decreases. Cognitive deficiency means that learning the uncontrollability of outcomes makes subsequent learning about the issue difficult to respond to the outcome. Thus, in subsequent situations, the individual does not learn that their responses affect outcomes. Emotional deficiency refers to the negative emotions created by helplessness, all of which are related to passivity and distancing from academic activities. Therefore, when learned helplessness is formed in students, it blocks any effort and hope and leads to repeated failures in the mind (Tyler, 2008). Also, students become ineffective because they believe that the results obtained have no connection to their efforts and no matter how much they try, they cannot achieve success. Thus, the more students use the problem-solving style of helplessness in dealing with stress, the more evident their academic procrastination becomes, preventing them from using their creativity to solve problems. The creative style indicates planning and considering various solutions based on the problematic situation. Both the problem-solving style of helplessness and the controlling style are methods for avoiding the problem. If students perceive themselves as incapable of confronting and dealing with the problem, they become helpless, and the feeling of helplessness becomes their way out of the problem. The feeling of helplessness, as a non-constructive problem-solving strategy, makes the use of rational and psychological resources impossible in the face of complex external situations. This feeling confronts psychological and physical capabilities with a level of inhibition and gradually creates the conditions for the emergence of various psychological and physical disorders. Therefore, it can be said that the feeling of helplessness not only reduces the level of physical activity, which is a provider of physical health, but also causes indifference to complex situations to become part of the individual's psychological structure and directs their psychological profile towards a pathological level (Karami, 2018).

Regarding the impact of the confidence style on students' academic procrastination, it can be said that the confidence style in problem-solving reflects students' belief in their ability to solve problems. Confronting and dealing appropriately with problematic situations brings a sense of efficacy and effectiveness and is an important factor in preventing potential failures; failures that can easily lead to mood changes. In other words, students who are not afraid of confronting problems, strive to solve problems, and have a high level of confidence in solving problems, compared to students who avoid confrontation, enjoy greater social support. This brings confidence when facing problems and consequently, will be the result of employing this style by students. It seems that constructive styles, which provide the best "substitute" solutions among various solutions for students, and non-constructive styles, which are the most immediate responses, respectively cause the establishment and expansion of significant adaptive and pathological behaviors in students. In any case, to the same extent that adopting constructive problem-solving methods leads to the establishment and advancement of general health, employing non-constructive styles gradually breaks down the structure of the psychological and physical framework.

The results of this research demonstrate that the styles of confidence, approach, and creativity positively impact academic buoyancy, while non-constructive styles (avoidance, control, and helplessness) negatively affect it. This relationship is beyond being attributed to coincidence or chance. This finding aligns with the results of other studies (Shivandi et al., 2020). Problem-solving training, as part of student and educational stakeholder empowerment programs, influences the increase in students' academic buoyancy (Shivandi et al., 2020). The findings of research by Maleki and Rezaei (2016) showed a significant relationship between problem-solving ability and academic buoyancy. Students face various problems during their education, and problem-solving

ability is one of the most important skills for them. These students, if they use constructive problem-solving strategies in the face of educational difficulties and challenges, will lead to feelings of satisfaction and buoyancy. Similarly, students who use constructive problem-solving styles can be expected to demonstrate greater buoyancy as constructive problem-solving is a very important factor in dealing with stressful situations (Flores et al., 2006). On the other hand, the higher the problem-solving ability of students, the more motivation, capability, and hope for success they feel in responding to educational challenges, thereby exhibiting more buoyancy and vice versa. Non-constructive styles (avoidance, control, and helplessness) have a direct negative effect on academic buoyancy. According to the theory of Martin and Marsh (2008), buoyancy refers to an individual's capacity for constructive and logical responses to major challenges and obstacles. As a result, students who respond constructively to educational challenges can experience greater buoyancy. A student's problem-solving skills are among the internal sources of academic buoyancy. The attitudes and skills of students and, consequently, the habits they choose make a difference. Therefore, problem-solving styles are an important construct that affects students' academic buoyancy.

The findings of this study indicate that academic buoyancy directly and negatively predicts academic procrastination. This finding is consistent with the results of other studies (Lei et al., 2022; Putwain et al., 2022; Datu et al., 2021). When students feel incapable of overcoming stressful situations, they postpone their academic tasks, and it is not surprising that this condition leads to academic procrastination. As this situation continues in students, it manifests as apathy and ultimately negative evaluation and low efficacy, leading to ineffectiveness in education. Students with high academic buoyancy succeed in dealing with obstacles, challenges, various levels of stress, and the like. Therefore, students with higher academic buoyancy overcome stressful situations and develop a sense of self-efficacy, prompting them to complete their academic tasks. Academic buoyancy creates a positive feeling in learners about themselves, leading to greater interest in academic matters and motivation. This factor provides the necessary impetus to successfully complete tasks and achieve goals. Students with high academic buoyancy show more interest in education and make more efforts to achieve their goals. Conversely, students with low academic buoyancy show little interest in education and academic activities (Pourabdol et al., 2016).

In indirect pathways, results show that creative, confident, and approach styles, with the mediating role of academic buoyancy, negatively affect academic procrastination, while avoidance, control, and helplessness styles, with the mediating role of academic buoyancy, positively affect it. These findings are consistent with the results of other studies (Narimani et al., 2015; Farhadi & Gholam Nazari, 2021). Constructive problem-solving plays a very important role in reducing stress and thus mental health. Constructive problem-solving styles enable students to rely on themselves in dealing with problems, have a positive attitude towards educational problems, and have a greater desire to face these problems (Narimani et al., 2015). Individuals who use constructive problem-solving styles achieve higher levels of growth and aspirations, exerting considerable effort to achieve superior achievements and self-actualization. Students who use constructive problem-solving styles take responsibility for their learning and can take intelligent actions. These learners believe in solving their problems and have resilience against educational challenges. With their problem-solving skills, they can overcome academic procrastination. The relationship of approach, confidence, and creativity with academic procrastination can be explained by the fact that constructive problem-solving ability strengthens students' educational behaviors and directs them towards academic buoyancy. According to the theory of Martin and Marsh (Martin & Marsh, 2008), skills, attitudes, capabilities, and values of individuals are internal sources of academic buoyancy. Students with high academic buoyancy have more ability in their educational matters and make more efforts in dealing with educational challenges. When they have the necessary skills in educational activities and dealing with issues and challenges, they are more capable. They strive to achieve their goals and, by managing situations, facilitate circumstances and confront pressures and challenges. Students with high problem-solving ability, by transferring their

skills to new situations, have more control over their academic tasks and also monitor their actions. Therefore, problem-solving styles are important constructs that indirectly affect academic procrastination through the mediating role of academic buoyancy.

Suggestions:

1. Students should be aware of their problem-solving style status, as problem-solving styles are related to academic procrastination. On the other hand, improving students' academic buoyancy can lead to a reduction in academic procrastination.

2. Educational authorities should consider organizing training courses related to these constructs in their planning and policymaking.

3. Given that multiple factors play a role in academic procrastination, it is recommended that future research investigate other psychological constructs related to it.

Conflict of Interest

According to the authors, this article has no financial sponsor or conflict of interest.

References

Abutalebi-Ahmedi, T. (2011). The Effectiveness of Problem-Solving Education in Improving Stress, Anxiety, and Motivation for Academic Achievement in Tehran's Teacher Students. Education Quarterly, 30(1), 115-134.

Aghaie-Yousufi, A., & Sharif, N. (2011). The Relationship between Problem-Solving Styles and Individual Well-Being in Students. Thought and Behavior, 6(22), 8-15.

Ahmadi, R., Hosseini-Nasab, D., & Azmoudeh, M. (2021). The Comparative Effectiveness of Training Motivational Self-Regulation Skills and Emotional-Social Skills on Academic Persistence, Resilience, and Academic Engagement in Middle School Students with Low Academic Performance. Journal of Educational and Assessment, 14(53), 59-82.

Azizi, F., Amiri, A., Rouhani-Nasab, M., & Parand, M. (2020). Investigating the correlation between academic procrastination, emotional intelligence, and self-efficacy in operating room students of Shiraz University of Medical Sciences in 2019. Journal of Medical Education, 15(7), 498-507.

Bandura, A. (1997). Self-Efficacy: The Exercise of Control. New York: W.H. Freeman & Co.

Cassidy, T., & Long, C. (1996). Problem-solving style, stress, and psychological illness: Development of a multifactorial measure. British Journal of Clinical Psychology, 35, 265-277.

Datu, J. A. D., & Yang, W. (2021). Academic Buoyancy, Academic Motivation, and Academic Achievement Among Filipino High School Students. Current Psychology, 40(8), 3958-3965. [Published online, no doi available]

Davalit, M., & Azarniyaz, A. (2012). The Role of Academic Self-Efficacy and Dimensions of Academic Procrastination in Predicting Internet Addiction. Media Journal, 8(11).

Dehghani, M., & Rostamavaghefi, Z. (2020). Predicting Academic Persistence Based on Perceived Learning Environment and Hope for Employment in Physical Education Students. Journal of Educational Psychology Studies, 17(38), 158-173.

Dehghani, Y., & Hosseinchari, M. (2009). Research in Educational Systems, 2(5), 12-24.

Dehghani, Y., & Hosseinchari, M. (2009). Research in Educational Systems, 2(5), 12-24.

D'Zurilla, T. J., Nezu, A. M., & Maydeu-Olivares, A. (2002). Social Problem-Solving Inventory-Revised (SPSI-R): Technical manual. Multi-Health Systems, Inc., North Tonawanda, NY.

Farhadi, S., & Gholamnejad, H. (2021). Predicting Psychological Stress During the COVID-19 Pandemic in Families: The Role of Problem-Solving Styles and Psychological Capital. Applied Family Therapy, 2(1), 46-64.

Flores, L. Y., Ojeda, L., Huang, Y.-P., Gee, D., & Lee, S. (2006). The relation of acculturation, problem-solving appraisal, and career decision-making self-efficacy to Mexican American high school students' educational goals. Journal of Counseling Psychology, 53(2), 260-266.

Ghanbari, S., & Mojouni, H. (2020). The role of destructive leadership in occupational burnout with the mediating role of organizational justice and procrastination. Strategic Research on Social Issues in Iran, 10(3), 69-98.

Gharibi, H., Javanmardi, R., & Rostami, J. (2018). The effectiveness of problem-solving training on attitudes and irrational beliefs of female students in secondary school in Sanandaj. Journal of Educational and Assessment, 10(38), 114-134.

Hen, M. (2018). Academic procrastination and feelings toward procrastination in LD and non-LD students: Preliminary insights for future intervention. Journal of Prevention and Intervention in the Community, 46(2), 199-212.

Homayon, H. (2008). Structural Equation Modeling Using AMOS. 2nd Edition, SAMT Publications.

Jafarzadeh-Ghodimi, A., Emamipour, S., Sepah-Mansour, M., & Jafarzadeh-Ghodimi, R. (2013). A comparative study of problem-solving styles and self-efficacy in exemplary and normal students. Journal of Education and Assessment, 6(22), 99-110.

Jokar, B., & Delavarpour. (2008). The Relationship between Academic Procrastination and Achievement Goals. New Ideas in Education, 3(3-4), 61-80.

Jones, I. S., & Blankenship, D. C. (2019). The effect of procrastination on academic performance of online students at a Hispanic serving institution. The Journal of Business Diversity, 19(2), 10-15.

Kant, G. L., D'Zurilla, T. J., & Maydeu-Olivares, A. (1997). Social problem solving as a mediator of stress-related depression and anxiety in middle-aged and elderly community residents. Cognitive Therapy and Research, 21(1), 73-96.

Karmi, M. (2018). Investigating the Relationship between Personality Traits and Problem Solving Styles with Aggression in Students. Educational Growth Research Journal, 52, 52-68.

Khormaei, F., & Zaboli, M. (2018). The Relationship between Problem-Solving Styles and Academic Procrastination in High School Students: The Mediating Role of Academic Self-Efficacy. Journal of Cognitive Strategies in Learning, 6(10), 17-38.

Koppenborg, M., & Klingsieck, K. B. (2022). Group work and student procrastination. Learning and Individual Differences, 94, Article 102117.

Lei, W., Wang, X., Dai, D. Y., Guo, X., Xiang, S., & Hu, W. (2022). Academic Self-Efficacy and Academic Performance Among High School Students: A Moderated Mediation Model of Academic Buoyancy and Social Support. Psychology in the Schools. [Published online, no doi available]

Lu, D., He, Y., & Tan, Y. (2021). Gender, socioeconomic status, cultural differences, education, family size, and procrastination: A sociodemographic meta-analysis. Frontiers in Psychology, 12, Article 719425.

Maleki, M., & Rezaei, A. (2016). Investigating the Relationship between Problem-Solving Ability and Academic Persistence. Studies in Educational Psychology, 8(2), 13-25.

Martin, A. J., & Marsh, H. W. (2008). Academic buoyancy: Towards an understanding of students' everyday academic resilience. Journal of School Psychology, 46(1), 53-83.

Mohammadi, D., Fathi, A., Badri, R., & Ebrahimzadeh, A. (2017). Predicting academic procrastination based on task-related importance and cost beliefs. Journal of Educational and Assessment, 10(39), 95-108.

Mohammadi, F., & Sahabi, A. (2001). Investigating the Problem-Solving Styles of Depressed Individuals and Comparing Them with Normal Individuals. Journal of Psychology, 11, 24-42.

Namian, S., & Hosseinchari, M. (2011). Explaining Academic Procrastination in Students Based on Religious Beliefs and Locus of Control. Educational Studies, 8(14), 99-126.

Narimani, M., Aminizarear, M., Zahed, A., & Abolghasemi, A. (2015). The Effectiveness of Self-Regulated Learning and Problem-Solving Instruction on Academic Motivation of Procrastinating Students. Journal of School Psychology, 4(1), 139-155.

Nazari-Kamal, M., Moradi-Pour, M., & Sarafzadeh, S. (2018). The Relationship Between Personality Traits, Self-Efficacy, and Problem-Solving Styles with Resilience in Emergency Responders of 112. Journal of Emergency and Rescue Scientific, 7(2), 38-53.

Owzian, F., Badri, R., Sarandi, P., & Ghasemi, Z. (2011). Investigating the relationship between procrastination and self-esteem with motivation for achievement in female high school students in Kashan. Journal of Educational and Assessment, 4(14), 151-164.

Pourabdol, S., Sobhi-Gharamaleki, N., & Abbasi, M. (2016). A comparison of academic procrastination and academic persistence in students with and without specific learning disabilities. Journal of Learning Disabilities, 19(3), 22-38.

Pourabdol, S., Sobhi-Gharamaleki, N., & Abbasi, M. (2016). A comparison of academic procrastination and academic persistence in students with and without specific learning disabilities. Journal of Learning Disabilities, 19(3), 22-38.

Putwain, D. W., Wood, P., & Pekrun, R. (2022). Achievement Emotions and Academic Achievement: Reciprocal Relations and the Moderating Influence of Academic Buoyancy. Journal of Educational

Psychology, 114(1), 108-126. [Published online, no doi available]

Rasouli-Khorshidi, F., Sangani, A., & Jangi, P. (2019). The relationship between academic procrastination, locus of control, and motivation with academic achievement in nursing students. Nursing Education, 8(1), 21-28.

Rastegar, A., Mozloomian, S., Seif, M., & Ghorbani-Jahromi, R. (2016). Investigating the mediating role of achievement goals in the relationship between need deprivation and academic procrastination. New Approaches in Educational Psychology, 10(2), 41-60.

Sadeghi, M., & Khalili, Z. (2016). The Role of Self-Regulated Learning Styles in Predicting Academic Persistence in Medical Sciences Students. Research in Medical Education, 8(2), 13-25.

Sayadi, M., & Moqaddar, L. (2021). The effectiveness of mindfulness training on achievement motivation and academic procrastination in students. Journal of Educational and Assessment, 14(54), 113-135.

Seligman, M. E. P. (1975). Helplessness. San Francisco: Freeman.

Shafiepour-Motlagh, A., & Torabi-Nehad, M. (2018). The relationship between academic stress, academic apathy, and negative academic self-concept with the mediating role of academic hopelessness. Journal of Educational and Assessment, 11(43), 45-68.

Shivandi, K., Nafar, Z., Hasannovand, F., & Mousavi, A. (2020). The Effectiveness of Life Skills and Problem-Solving Skills Education on Teacher-Student Relationships, Academic Persistence, and Academic Well-Being in Sixth-Grade Boys. Journal of Applied Psychological Research, 11(4), 21-27.

Sjutaku, M. (2015). Inventing the Identity of Modern Korean Architecture, 1904-1929. McGill University (Canada). ProQuest Dissertations Publishing.

Solomon, L. J., & Rothblum, E. D. (1984). Academic procrastination: Frequency and cognitive-behavioral correlates. Journal of Counseling Psychology, 31(4), 503–509.

Staeishi-Adzhari, M., Mohabbi-Mina, M., & Mohabbi-Mina, M. (2017). The relationship between hope and academic achievement with the mediating role of academic procrastination in students. Journal of Educational and Assessment, 10(37), 125-142.

Steel, P. (2007). The nature of procrastination: A meta-analytic and theoretical review of quintessential self-regulatory failure. Psychological Bulletin, 133(1), 65-94.

Suárez-Perdomo, A., Ruiz-Delgado, Z., & Garcés-Delgado, Y. (2022). Profiles of undergraduates' networks addiction: Differences in academic procrastination and performance. Computers and Education, 181, Article 104459.

Türel, Y. K., & Dokumaci, Ö. (2022). Use of media and technology, academic procrastination, and academic achievement in adolescence. Participatory Educational Research, 9(2), 481-497.

Türel, Y. K., & Dokumaci, Ö. (2022). Use of Media and Technology, Academic Procrastination, and Academic Achievement in Adolescence. Participatory Educational Research, 9(2), 481-497. [Published online, no doi available]

Tyler, A. (2008). The Relationship between Optimism and Depression in Women: A Longitudinal Study. International Journal of Educational Research, 48(1), 21-29.

Unda-López, A., Osejo-Taco, G., Vinueza-Cabezas, A., Paz, C., & Hidalgo-Andrade, P. (2022). Procrastination during the COVID-19 Pandemic: A Scoping Review. Behavioral Sciences, 12(2), Article 38.

Valenzuela, R., Codina, N., Castillo, I., & Pestana, J. V. (2020). Young university students' academic self-regulation profiles and their associated procrastination: Autonomous functioning requires self-regulated operations. Frontiers in Psychology, 11, Article 354.

Vlachopanou, P., & Karagiannopoulou, E. (2022). Defense styles, academic procrastination, psychological well-being, and approaches to learning: A person-oriented approach. Journal of Nervous and Mental Disease, 210(3), 186-193.

Wang, Q., Kou, Z., Du, Y., Wang, K., & Xu, Y. (2022). Academic Procrastination and Negative Emotions Among Adolescents During the COVID-19 Pandemic: The Mediating and Buffering Effects of Online-Shopping Addiction. Frontiers in Psychology, 12, Article 789505.

Wang, Q., Xin, Z., Zhang, H., Du, J., & Wang, M. (2022). The Effect of the Supervisor–Student Relationship on Academic Procrastination: The Chain-Mediating Role of Academic Self-Efficacy and Learning Adaptation. International Journal of Environmental

Research and Public Health, 19(5), Article 2621.

Yurtseven, N., & Dogan, S. (2019). Structural Relationships among Academic Procrastination, Academic Motivation, and Problem Solving Skill in Prep Class College Students. Pegem Journal of Education and Instruction, 9(3), 849-876.

Zarean, M., Asadollahpour, A., & Bakshipour, A. (2018). The relationship between emotional intelligence and problem-solving styles with general health. Iranian Journal of Psychiatry and Clinical Psychology, 13(2), 166-172.

Zareei-Mahmoudabad, H. (2017). The Effectiveness of Positive Couple Therapy on Marital Intimacy and Hope for Life in Ordinary Women in Bafgh City. Yazd Health Promotion Journal, 16(2), 98-109.

Zarei, A., Mirzaii, M., & Sadeghifard, M. (2018). Presenting a Model for Explaining the Role of Communication Skills and Problem-Solving Skills in Preventing Social and Psychological Damages with the Mediation of Family Conflicts. Counseling and Psychotherapy Culture (Counseling Culture), 9(35), 1-26.