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**Emotion Regulation Strategies as a Mediating
Factor in the Relationship between Proactive
Personality and Learning Agility
in Talented Students**

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Abstract

Introduction. Although previous research has separately addressed proactive personality and emotion regulation, the combined effect of these variables on learning agility – particularly among talented students – remains underexplored. This study fills this gap by focusing on how specific emotion regulation strategies mediate this relationship. In today's rapidly evolving educational landscape, learning agility has emerged as a crucial meta-competency for adapting to new challenges. This study investigates how emotion regulation strategies mediate the relationship between proactive personality and learning agility among talented students. With the increasing recognition of the role of personality traits and emotion regulation in effective learning, understanding these dynamics is essential for supporting students in navigating academic and social demands.

Materials and Methods. The research sample comprised 297 talented students from the University of Isfahan, Isfahan University of Medical Sciences, and Isfahan University of Art. Participants completed three assessments: the Gravett and Caldwell Learning Agility Questionnaire, Gross and John's Emotion Regulation Questionnaire, and the condensed Bateman and Crant Proactive Personality Questionnaire. Data analysis included statistical methods to determine both direct and mediating effects of proactive personality and emotion regulation strategies on learning agility.

Results. The analysis revealed that proactive personality significantly affects learning agility, and emotion regulation strategies – specifically reappraisal and suppression – mediate this relationship. Students who effectively manage their emotions are better equipped to exhibit higher levels of learning agility, indicating a stronger ability to adapt and thrive in academic environments.

Discussion and Conclusion. This study highlights the pivotal role of emotion regulation in enhancing learning agility, emphasizing that effective emotion management can significantly influence academic success. The findings suggest that interventions focusing on emotion regulation could improve learning outcomes for talented students. Future research should further explore additional factors influencing learning agility and develop targeted strategies to support student adaptation in diverse educational settings.

Keywords: learning agility, emotion regulation, reappraisal, suppression, proactive personality, talented students

Conflict of interest: The authors declare no conflict of interest.

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Стратегии регуляции эмоций как опосредующий фактор взаимосвязи проактивной личности и гибкости обучения у талантливых студентов

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Аннотация

Введение. В контексте трансформации образовательных систем ключевой метакомпетенцией для адаптации к новым вызовам выступает гибкость в обучении. С учетом растущего признания роли личностных качеств и регуляции эмоций в эффективном обучении понимание этих динамик имеет решающее значение для поддержки студентов в условиях академических и социальных требований. Несмотря на наличие исследований проактивной личности и регуляции эмоций, их совместное влияние на гибкость в обучении, в частности среди одаренных студентов, остается малоизученным. Цель исследования – проанализировать опосредование стратегиями регуляции эмоций во взаимосвязи между проактивной личностью и гибкостью в обучении среди одаренных студентов.

Материалы и методы. В выборку вошли 297 одаренных студента. Участники заполнили три опросника: гибкости в обучении Граветта и Колдуэлла, регуляции эмоций Гросса и Джона, а также сокращенную версию анкеты проактивной личности Бейтмана и Кранта. Данные были проанализированы с использованием статистических методов для выявления прямых и опосредующих эффектов.

Результаты исследования. Полученные результаты отмечают влияние проактивной личности на гибкость в обучении и посредническую роль стратегий регуляции эмоций – переоценки и подавления. Студентами, умеющими управлять своими эмоциями, демонстрируется высокий уровень гибкости в обучении, что указывает на их способность адаптироваться и добиваться успеха в академической среде.

Обсуждение и заключение. Настоящее исследование подчеркивает ключевую роль регуляции эмоций в повышении гибкости в обучении, подтверждая значительное воздействие управления эмоциями на академическую успешность. В дальнейшем следует дополнительно изучить факторы влияния на гибкость в обучении и разработать целевые стратегии для поддержки адаптации студентов в различных образовательных условиях.

Ключевые слова: гибкость в обучении, регуляция эмоций, переоценка, подавление, проактивная личность, одаренные студенты

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Introduction

Learning agility is widely recognized as one of the most crucial factors for success in modern environments [1] and is indispensable for personal growth, competence and progress [2]. It acts as a meta-competence within individuals, serving as a prerequisite for the development of other competencies, enabling rapid learning, adaptability, and personal advancement [3]. This concept refers to an individual's capacity to adapt swiftly to new situations, remain flexible, and embrace change. It encompasses the ability to learn from experiences, integrate new information, and modify behavior

accordingly [4]. Hence, it can be described as the inclination and capability to learn from experience and creatively apply that knowledge in novel situations¹ [5].

Learning agility holds substantial importance in today's world for several reasons. First, Individuals possessing learning agility can readily acquire new skills,

¹ Megawaty M., Mahmuddin V.F., Hendriadi H. Learning Agility of Human Resources at State-owned Banks in the City of Makassar. In: Proceedings International Economics and Business Conference. 2023. p. 267–276. Available at: <https://proceedings.goodwoodconferences.com/index.php/IECON/article/view/158> (accessed 27.07.2024).



knowledge, and experience continuous improvement in the face of swift changes. Second, the rapidly changing business and technological landscape necessitate learning agility for successful adaptation. Third, the widespread global impact of the COVID-19 virus has exposed individuals, organizations, and communities to the challenging realities of an unstable, uncertain, complex, and ambiguous world [6] and changes in learning methods have become inevitable. Accordingly, this Construct has gained significant attention in scholarly research, particularly in studies centered on talented students, which explore their learning strategies and proficiency levels across diverse academic contexts.

Talented students in Iran consist of those university applicants who meet one or more of the following criteria:

- their scores in the national university entrance exam are significantly higher than the average (at least 2.5 standard deviations above the mean);

- they have ranked among the top three students in their previous educational stage or they are among the top 10 percent of students in their cohort;

- they have demonstrated exceptional work in national scientific festivals such as the Khwarizmi and Sheikh Baha'i festivals.

Given these qualifications, the identification, recruitment, and development of these students are of significant importance to universities across the country. In both major public and private universities in Iran, a specific division, known as the Center for Talented Students, operates under the supervision of the university's academic affairs office. These centers are responsible for identifying students with high potential, attracting talented individuals, and guiding their academic progress throughout their studies. The objective of this study is to investigate the mediating role of emotion regulation strategies in the relationship between proactive personality and learning agility among talented students. Given the increasing importance of learning agility for success in dynamic and uncertain educational environments, and considering that proactive personality traits and emotion regulation abilities significantly affect learning processes, this research aims to clarify how emotional self-regulation

can enhance adaptive learning behaviors. By focusing on talented university students in Iran, the study addresses a critical gap in understanding how internal personality factors and emotional mechanisms contribute to academic and personal development in high-achieving populations.

The selection of these individuals in the present research is due to the substantial value placed on them by universities, society, and scholars, for several compelling reasons. According to A. Heydarzadeh et al., talented students are considered valuable assets to society, and it is the collective responsibility of educational authorities in each country to give them proper attention and prevent the depletion of this invaluable resource [7]. Accordingly, J. Gheidar-Kheljani highlights that universities have a fundamental mission of fostering comprehensive development and nurturing individuals who possess knowledge, intellectual prowess, specialization, commitment, and a cultured outlook [8]. Z. Tazakori et al. also believe that these individuals are capable of effectively managing their behavior and emotions, which leads to academic, professional, and social success [9]. This is because they possess agile learning abilities.

Furthermore, the recent progress in Information and Communication Technology (ICT) has helped easy access to information and educational materials, enabling individuals with learning agility to leverage these resources and stay abreast in the digital era. Accordingly, learning agility is acknowledged as a driving force for innovation and the reevaluation of work procedures. Because those who possess the ability to learn rapidly and adapt can use fresh ideas and inventive approaches to accomplish objectives and resolve intricate issues [4]. With this perspective in mind, and considering the fact that neglecting talented students may even result in their migration from the country, focusing on the concept of learning agility among these individuals, its related aspects, the evolution of this construct, and the variables influencing it, represent valuable areas for research.

Learning agility comprises four key components: people agility, results agility, mental agility, and change agility. Among these, change agility reflects individuals'



openness to new experiences and their willingness to engage in unfamiliar activities in order to acquire new skills. It also indicates their ability to remain calm and flexible when facing challenges, as well as their capacity to continuously update their methods and approaches in response to change [10]. Results agility refers to individuals' capability to set clear objectives and strive towards achieving them. Those individuals demonstrate proficiency in assessing and evaluating learning outcomes, making necessary adjustments for improvement². People agility emphasizes individuals' aptitude for establishing effective relationships, collaborating, and coordinating with others in the learning process³. Lastly, mental agility pertains to individuals' capacity to accelerate the learning process, exhibit flexibility in their thinking, possess creative thinking skills, and be willing to challenge existing beliefs and assumptions. It also includes adaptability in adjusting thought patterns⁴ [11].

In addition to learning agility, there are various other factors that influence the learning process of individuals. For instance, S. Karimi et al. propose that personal and personality traits, along with proximal factors like perceived attitudes and behavioral control, play a notable role in shaping individuals' learning and training experiences [12]. In other word, to enhance learning outcomes, it is essential to consider the learner's level of proactiveness and the dynamism of their personality [12]. Individuals with active and dynamic personalities differ from others in some ways.

As per the perspective of A. Alikaj et al. [13], proactive individuals are not molded by environmental forces, but instead, they shape their surrounding environment. A proactive individual uses proactive language, favoring positive sentences

and phrases like "I can", "I want", and "I prefer"⁵. Proactive individuals adopt an active approach, seeking knowledge through self-study and anticipating potential opportunities in their environment⁶. They perceive future risks, desires, and opportunities but do not consider them as threats, harm, or losses⁷. Accordingly, S.K. Parker and C.G. Collins believe that embracing proactivity offers a substantial competitive edge in contemporary societies [14].

A proactive personality is a character trait that nurtures robust internal motivation, driving proactive actions to achieve desired goals and acting as a potent catalyst for creativity, innovation, resilience, growth, and long-term development [15]. This trait characterizes individuals who transcend situational constraints, actively initiating and manifesting meaningful changes in their environment [16].

According to S.K. Parker and C.G. Collins, a proactive personality is characterized by self-initiative, transformative change, and future orientation [14]. These traits lead individuals to respond differently to various events. K.R. Scherer further suggests that personality differences are likely to influence how events are appraised and explain why some individuals exhibit stronger emotional reactions in specific situations⁸. This, in turn, results in the adoption of diverse strategies for rapid learning and adaptation to new circumstances. In essence, the self-regulating behaviors, strategies, and habits employed by these individuals enable them to engage in agile learning. This, in turn,

² Thomas J.B., Clark S.M., Gioia D.A. Strategic Sense Making and Organizational Performance: Linkages among Scanning, Interpretation, Action, and Outcomes. *Academy of Management Journal*. 1993;36(2):239–270. Available at: <https://sci-hub.ru/10.5465/256522> (accessed 27.07.2024).

³ Edmondson A. Psychological Safety and Learning Behavior in Work Teams. *Administrative Science Quarterly*. 1999;44(2):350–383. <https://doi.org/10.2307/2666999>

⁴ Joiner B., Josephs S. Leadership Agility. San Francisco: Wiley; 2007.

⁵ Parker S.K., Bindl U.K. Proactivity at Work: A Big Picture Perspective on a Construct that Matters. In: Parker S.K., Bindl U.K. (eds) Proactivity at Work: Making Things Happen in Organizations. London: Routledge; 2017. p. 1–30.

⁶ Iqbal A.H. Impact of Proactive Personality on Project Innovativeness with Mediating Role of Mindfulness and Moderating Role of Organizational Agility. Columbus: Capital University; 2022.

⁷ Greenglass E.R. Proactive Coping and Quality of Life Management. In: Frydenberg E. (eds) Beyond Coping: Meeting Goals, Visions, and Challenges. Oxford: Oxford University Press; 2002. p. 37–62. <https://doi.org/10.1093/med:psych/9780198508144.003.0003>

⁸ Scherer K.R. The Role of Culture in Emotion-Antecedent Appraisal. *Journal of Personality and Social Psychology*. 1997;73(5):902–922. <https://doi.org/10.1037/0022-3514.73.5.902>



facilitates better adaptation to changing conditions and leads to improved overall performance⁹.

Based on this, it can be argued that having suitable emotional and affective conditions and the capability to regulate them are substantial factors during the learning process. This importance is particularly significant for individuals such as talented students, who have the potential to become highly effective members of society. Consequently, in this study, dynamic personality has been identified as a predictor variable.

Emotion regulation, as described by P.E. Flores-Kanter et al., refers to the capacity to influence emotions, including stress, either automatically or consciously, with the aim of maintaining emotional equilibrium and achieving specific objectives [17]. Z. Lin views emotion regulation as a crucial internal mechanism for personal development [18], while D. Goleman suggests that the skill of managing and regulating emotions can enhance cognitive performance¹⁰. In summary, emotional regulation encompasses the processes by which individuals influence their emotions, particularly in terms of modifying emotional responses to achieve desired outcomes¹¹.

The reason this study prioritizes emotional regulation over cognitive regulation is due to the direct and pervasive impact emotions have on key learning components such as motivation, attention, and cognitive engagement [19]. Positive emotions, for example, have been shown to boost motivation and focus, while negative emotions like anxiety can impair cognitive performance and decrease engagement with learning tasks [20].

In the context of learning agility, emotional regulation becomes crucial because individuals often need to adapt to new information, unexpected challenges, or changes in their environment. J.J. Gross and O.P. John demonstrated that people who are able to regulate their emotions – whether

through cognitive reappraisal (reinterpreting a negative situation in a more positive light) or expressive suppression (managing outward emotional responses) – tend to show better psychological adjustment, which directly contributes to their learning effectiveness [21]. In contrast to cognitive regulation, which involves direct manipulation of thought processes, emotional regulation modulates the underlying emotional state that influences how learning is processed and retained. For instance, L. Linnenbrink-Garcia et al. argue that managing emotions such as frustration or excitement directly impacts goal setting, task persistence, and information processing during learning activities [22].

Although cognitive regulation (i.e., the self-management of thought processes) is essential in learning, emotional regulation plays a foundational role in setting the stage for successful learning. According to A.R. Damasio, emotions are deeply intertwined with decision-making and the cognitive processes involved in learning¹². Without emotional stability, cognitive self-regulation might not function optimally. Emotional regulation can enhance cognitive self-regulation by maintaining a stable emotional state, which in turn improves cognitive flexibility and problem-solving abilities.

Moreover, R.L. Leahy et al. assert that individuals with strong emotional regulation are better able to manage stress, remain resilient in the face of challenges, and maintain higher levels of working memory performance and attention control—both of which are critical for learning new skills or concepts¹³. Emotional regulation, therefore, sets the emotional foundation necessary for cognitive processes such as self-reflection and metacognition (higher-order thinking processes that help individuals assess and adjust their learning strategies).

High levels of emotional regulation often go hand in hand with enhanced cognitive self-regulation. P.R. Pintrich defines cognitive self-regulation as the ability to control cognitive processes such as planning,

⁹ Harvey V.S., Oelbaum Y., Prager R. *Leadership Assessment: The Backbone of a Strong Leadership Pipeline*. Lincolnshire: Aon Hewitt. 2015.

¹⁰ Goleman D. *Emotional Intelligence*. New York: Bantam Publication; 1995.

¹¹ Gross J.J. The Emerging Field of Emotion Regulation: An Integrative Review. *Review of General Psychology*. 1998;2(3):271–299. <https://doi.org/10.1037/1089-2680.2.3.271>

¹² Damasio A.R. *Descartes' Error: Emotion, Reason, and the Human Brain*. New York: Putnam Publishing; 1994.

¹³ Leahy R.L., Tirch D., Napolitano L.A. *Emotion Regulation in Psychotherapy: A Practitioner's Guide*. New York: Guilford Press; 2012.

monitoring, and evaluating one's learning strategies¹⁴. While cognitive regulation helps learners manage how they think and process information, emotional regulation helps them manage how they feel while doing so.

In their research, D.H. Schunk and B.J. Zimmerman emphasize that self-regulated learners are adept at both cognitive and emotional regulation, often using emotional regulation strategies to keep frustration in check, which helps maintain cognitive control¹⁵. By effectively managing their emotional state, learners are more likely to engage in deep learning, persevere through difficulties, and apply problem-solving strategies.

Given the above, the key factors in learning influenced by emotional regulation include:

1. **Motivation and Persistence:** As outlined by R.M. Ryan and E.L. Deci, emotional regulation boosts intrinsic motivation, helping learners persist in challenging tasks by maintaining positive emotional states [23].

2. **Cognitive Engagement:** Emotional regulation supports sustained cognitive engagement, which is vital for in-depth learning and knowledge retention [19].

3. **Working Memory and Focus:** Emotional regulation minimizes the disruptive effects of stress and anxiety on working memory and attention¹⁶.

4. **Problem Solving and Flexibility:** Emotionally regulated learners are better able to approach complex problems with flexibility and adaptability, key components of learning agility [24].

In conclusion, emotional regulation plays a pivotal role in supporting learning agility by influencing key factors such as motivation, cognitive engagement, and flexibility. When paired with cognitive self-regulation, emotional regulation leads

to improved overall learning performance. Given these dynamics, the decision to focus on emotional regulation in this study aligns with the broader objective of understanding how proactive personalities manage learning in uncertain and dynamic environments. Additionally, the study is conducted within the context of three public universities in Isfahan—namely, the University of Isfahan, Isfahan University of Medical Sciences, and Isfahan University of Art—which admit high-ranking students which is crucial for this research focused on talented individuals. Full-time in-person education provided by these institutions fosters a structured and immersive learning environment, essential for understanding the dynamics of learning agility and emotion regulation. This approach ensures that the sample reflects a homogeneous educational context, facilitating more accurate analyses and interpretations of the research findings. and provide full-time in-person education. This context is essential for understanding the implications of the findings.

This study fills this gap by focusing on how specific emotion regulation strategies mediate this relationship. The purpose of this study is to clarify the underlying mechanisms through which proactive personality and emotional regulation strategies interact to affect learning agility in high-potential learners.

Literature Review

Hypothesis 1. There is a relationship between proactive personality and learning agility among talented students at selected public universities in Isfahan.

Individuals with high learning agility exhibit a range of qualities or behaviors that enable them to effectively handle unexpected situations, embrace new challenges, and arrive at conclusions faster than others. Thus, learning agility can be linked to an individual's adaptability and willingness to navigate new circumstances in the future¹⁷. This holds particular significance in organizational settings, where both individuals and organizations must proactively respond and adapt to evolving situations [25]. These

¹⁴ Pintrich P.R. The Role of Goal Orientation in Self-Regulated Learning. In: Boekaerts M., Pintrich P.R., Zeidner M. (eds) Handbook of Self-Regulation. New York: Academic Press; 2000. p. 451–502. <https://doi.org/10.1016/B978-012109890-2/50043-3>

¹⁵ Schunk D.H., Zimmerman B.J. Motivation and Self-Regulated Learning: Theory, Research, and Applications. London: Routledge; 2012.

¹⁶ Leahy R.L., Tirch D., Napolitano L.A. Emotion Regulation in Psychotherapy: A Practitioner's Guide.

¹⁷ Gravett L.S., Caldwell S.A. Learning Agility: The Impact on Recruitment and Retention. New York: Palgrave Macmillan; 2016. <https://doi.org/10.1057/978-1-137-59965-0>

behavioral attributes reflect an individual's proactive personality [14]. Previous research has highlighted a significant association between proactive personality traits and individuals' capacity for adaptive learning. Proactive individuals often exhibit enhanced self-directed learning, resilience in the face of change, and a strong tendency toward goal-oriented behaviors—qualities that are closely aligned with the concept of learning agility [26]. Recent research indicates a significant association between proactive personality traits and learning agility, which in turn influences students' academic performance and adaptability. Individuals exhibiting proactive tendencies often demonstrate enhanced self-directed learning, resilience in the face of change, and a strong inclination toward goal-oriented behaviors – qualities that are closely aligned with the concept of learning agility. Moreover, learning agility encompasses the capacity to effectively adjust to dynamic environments, seize learning opportunities, and continuously develop one's skills. Students with higher learning agility are better equipped to identify and leverage learning experiences that facilitate their academic progress¹⁸.

Exhibit personality traits such as conscientiousness and openness to experience, which are linked to higher levels of intrinsic motivation and academic success. These traits contribute to a greater ability to adapt to new learning environments and effectively capitalize on learning opportunities, which is consistent with the concept of learning agility. Thus, students who display these characteristics are better able to adjust and improve more rapidly in response to new challenges and learning experiences [27]. The research revealed that exceptionally talented students excel in adapting to the learning environment and consistently seek to maximize learning opportunities. Building on these previous findings, our hypothesis posits a positive relationship between proactive personality and learning agility among exceptionally

talented students. In simpler terms, our hypothesis suggests that the more proactive the personality of an exceptionally talented student is, the greater their learning ability and perception will be.

Hypothesis 2. The reappraisal strategy mediates the relationship between proactive personality and learning agility among talented students.

Reappraisal is the process of reinterpreting a situation to lessen its emotional impact, making it an effective strategy for regulating emotions and avoiding negative emotional experiences¹⁹. Cognitive reappraisal, a potent technique, enables diverse interpretations of a situation, influencing one's thoughts, behaviors, and emotions, rather than merely the event itself. Engaging in reappraisal not only reduces negative emotions like anger and hopelessness but also enhances a sense of control, empowering the individual [28].

This research has shown that reappraisal plays a crucial role in enhancing students' ability to regulate and improve their performance. Through reappraising their performance, students can learn from past mistakes, develop more effective strategies, and subsequently experience an improvement in their performance, thereby boosting their self-confidence and motivation for progress. Additionally, G. Schraw found that reappraisal encourages students to engage in deeper analysis and reconsideration of learning concepts and issues [29]. Moreover, research studies have discovered a significant positive correlation between reappraisal and learning agility. By reviewing and reappraising experiences and performance during the learning process, individuals can identify and improve ineffective patterns while exploring new solutions. This ultimately results in increased learning agility and a better ability to adapt to changing circumstances [30].

The combination of a proactive personality and reappraisal is likely to have a substantial impact on an individual's ability to learn quickly and effectively

¹⁸ Sari S.M., Suharso P.L. The Relationship between Proactive Personality and Self-Directed Learning among Undergraduate Students. In: Ariyanto A. et al. (eds) Diversity in Unity: Perspectives from Psychology and Behavioral Sciences. London: Routledge; 2017. p. 311–316. <https://doi.org/10.1201/9781315225302-39>

¹⁹ Gross J.J., Thompson R.A. Emotion Regulation: Conceptual Foundations. In: Gross J.J. (eds) Handbook of Emotion Regulation. New York: The Guilford Press; 2007. p. 3–24. Available at: https://www.researchgate.net/publication/303248970_Emotion_Regulation_Conceptual_Foundations (accessed 27.07.2024).



when confronted with new challenges and pressures. In this context, it is hypothesized that the component of emotional regulation reappraisal serves as a mediating variable, transferring the influence of a proactive personality on learning agility through the changes observed in students' performance reappraisal.

Hypothesis 3. The relationship between proactive personality and learning agility is mediated by the suppression strategy among talented students.

Suppression refers to the attempt to hide, manage, or lessen the continual display of emotions [21]. While some researchers argue that suppression is linked to adverse health consequences and that reappraisal is a more effective approach, it is crucial for a discerning individual to recognize that emotional suppression may not always be detrimental and can serve as a useful strategy in specific situations [31]. According to T. English and O.P. John, individuals who frequently engage in emotional suppression may experience an increase in negative emotions, a decrease in positive emotions, reduced social functioning, heightened depression, lower life satisfaction, impaired interpersonal skills, elevated stress and anxiety, as well as diminished working memory and learning abilities²⁰. Accordingly, individuals dealing with significant life challenges and situations where their emotions do not align with their life circumstances may be prone to psychological difficulties, leading to considerable psychological strain and a decrease in

self-confidence. Therefore, it becomes important for them to regulate their emotions effectively to avoid experiencing negative emotions and to foster greater adaptability to life's demands. According to Z. Lin, emotional regulation is a crucial internal mechanism for personal growth [18]. In this study, emotional suppression, as a mechanism of emotion regulation, is hypothesized to serve as a mediating variable, examining how proactive personality impacts learning agility by influencing changes in students' emotional regulation strategies.

Despite the several research conducted on proactive personality, learning agility, and emotional regulation, several unresolved questions remain. One of the main challenges identified in the existing literature is the lack of a unified framework that consistently links these variables. Furthermore, despite the significant role that talented students play in the growth and development of countries, there has been little research on them. Many studies primarily focus on individual factors without considering the complex interaction of these psychological traits and their impact on learning and adaptability in academic settings. Notably, the relationship and performance of learning agility with proactive personality and emotional regulation strategies among talented students has not been explored so far.

These gaps highlight the need for further research on how these variables function together in different educational environments and how external factors might mediate these relationships.

Figure 1 illustrates the theoretical framework developed to investigate the relationships among proactive personality, emotion regulation strategies, and learning agility in talented students.

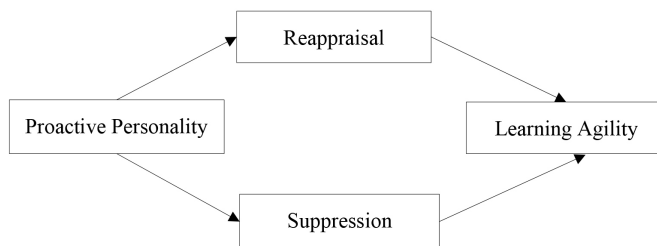


Fig. 1. Theoretical model

Source: Compiled by the authors.

²⁰ English T., John O.P., Gross J.J. Emotion Regulation in Close Relationships. In: Simpson J.A., Campbell L. (eds) The Oxford Handbook of Close Relationships. Oxford: Oxford University Press; 2013. p. 500–513. <https://doi.org/10.1093/oxfordhb/9780195398694.013.0022>

Material and Methods

Sample and Procedures. The statistical population of this study included all talented students from the University of Isfahan, Isfahan University of Medical Sciences, and Isfahan University of Art during the academic year 2021–2022, totaling 1,247 students. A sample size of 297 was determined using Krejcie and Morgan's table²¹, and the participants were selected through proportional stratified random sampling.

In accordance with international research standards, all participants were informed about the purpose of the study and voluntarily agreed to take part. Participation was entirely voluntary, and confidentiality and privacy of respondents were strictly respected throughout the research process.

Measures. The data collection tools used in this study included the Learning Agility Questionnaire by L.S. Gravett and S.A. Caldwell²², the Emotional Regulation Questionnaire by J.J. Gross and O.P. John [21], and the Proactive Personality Questionnaire by T.S. Bateman and J.M. Crant²³, along with a researcher-administered demographic questionnaire. All items were rated on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

Learning Agility. Learning agility was assessed using a 25-item Likert-scale questionnaire adapted from L.S. Gravett and S.A. Caldwell's research²⁴. The questionnaire evaluates four key dimensions: mental agility, change agility, results agility, and people agility. Higher scores in these dimensions reflect a greater degree of learning agility. Additionally, three items in the questionnaire were reverse-scored to control for response bias.

Emotion Regulation. Emotion regulation was assessed using a 10-item

Likert-scale questionnaire adapted from J.J. Gross and O.P. John [21]. This questionnaire measures two key aspects of emotion regulation: cognitive reappraisal and expressive suppression. The items are designed to capture two dimensions of emotional experiences. The first dimension focuses on emotional perception, assessing an individual's internal emotional states, while the second dimension pertains to emotional expression, evaluating how emotions are communicated through speech and behavior. Although certain items may appear similar, they are designed to capture distinct elements of emotion regulation.

Proactive Personality. To assess proactive personality in talented students, the short form of the T.S. Bateman and J.M. Crant questionnaire was used²⁵. This questionnaire comprised 5 items and aimed to evaluate and measure proactive personality traits, with the results aggregated into an overall score.

Analytic Strategies. For data analysis descriptive and inferential statistics were used. At description level, frequency, mean, and standard deviation were used. At the inferential statistical level, correlation coefficient testing and structural equation modeling were employed. Finally, data analysis was conducted using SPSS 23 and Amos 22 software.

Results

The demographic analysis of the sample revealed that the majority of participants were female students, comprising 85.3% (250 individuals), while male students accounted for 7.1% (43 individuals). In terms of age distribution, the largest group (85%) was aged between 20 and 30 years (249 individuals), followed by 6.1% (34 individuals) in the 31 to 40 age group, and 4.3% (10 individuals) were above 40 years old. Regarding the educational level, 69.7% of the participants (204 individuals) were pursuing a master's degree, 10.9% (32 individuals) were bachelor's students, and 19.4% (57 individuals) were doctoral students. The decision to combine different age groups (20–30, 31–40, and above 40) in this study was a result of the stratified sampling

²¹ Krejcie R.V., Morgan D.W. Determining Sample Size for Research Activities. *Educational and Psychological Measurement*. 1970;30(3):607–610. <https://doi.org/10.1177/001316447003000308>

²² Gravett L.S., Caldwell S.A. Learning Agility: The Impact on Recruitment and Retention.

²³ Bateman T.S., Crant J.M. The Proactive Component of Organizational Behavior: A Measure and Correlates. *Journal of Organizational Behavior*. 1993;14(2):103–118. <https://doi.org/10.1002/job.4030140202>

²⁴ Gravett L.S., Caldwell S.A. Learning Agility: The Impact on Recruitment and Retention.

²⁵ Bateman T.S., Crant J.M. The Proactive Component of Organizational Behavior: A Measure and Correlates.



method used. This method ensured that the sample distribution accurately reflected the population's composition in terms of age, gender, and educational level. Thus, it provided a representative view of the target population. Moreover, it is important to note that despite differences in age, all participants shared common characteristics as talented students, selected based on similar academic performance and achievements. Therefore, they faced similar academic challenges and educational environments, making it relevant to combine these age groups in one sample.

From an academic perspective, talented students across different age groups often exhibit similar levels of engagement, motivation, and cognitive abilities when it comes to learning. This similarity, combined with the shared academic environment, supports the decision to include students from various age groups in the same analysis. Furthermore, learning agility, the key variable of this study, is a meta-competency that can be influenced by factors beyond age, such as personality traits and emotion regulation strategies. Hence, including a broad age range allows the study to explore how these factors interact in different stages of life, while still focusing on a population with shared characteristics.

Therefore, this sample composition allows the study to comprehensively examine the relationships between proactive personality, emotion regulation strategies, and learning agility across a diverse yet academically similar group of students.

Table 1 summarizes the distribution of participants by gender, age, and educational level.

According to table 2, the mean scores for learning agility, proactive personality,

reappraisal, and suppression in talented students were 86.86, 80.18, 30.21, and 80.10, respectively. The findings indicated that learning agility has a positive and significant relationship with proactive personality and reappraisal, while it has a negative and significant relationship with suppression. Furthermore, the normality of the data was assessed through the examination of skewness and kurtosis indices. The skewness and kurtosis values for each of the four variables fell within the range of -2 to $+2$. This suggests that all four variables displayed a symmetrical distribution and met the criteria of normality in relation to skewness. Additionally, they demonstrated normal kurtosis, implying an absence of significant tailing. The analysis of tolerance and VIF demonstrates the absence of collinearity, and the Cronbach's alpha coefficients affirm the satisfactory reliability of all four scales.

Path Analysis. In order to examine the conceptual model of the research, we used Amos-23 software with the maximum likelihood estimation technique. We chose the SEM approach due to its ability to simultaneously estimate various indirect pathways and model fit indices²⁶. Before conducting hypotheses testing and scrutinizing the relationships between research variables, we assessed the adequacy and fit of the hypothesized research model.

²⁶ Anderson J.C., Gerbing D.W. Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach. *Psychological Bulletin*. 1988;103(3):411–423. <https://doi.org/10.1037/0033-2909.103.3.411>; Hair J.F., Black W.C., Babin B.J., Anderson R.E. Multivariate Data Analysis. Harlow: Pearson; 2010; Kline R.B. Principles and Practice of Structural Equation Modeling. New York: The Guilford Press.

Table 1. Demographic Distribution of Participants

Variables	Category	Frequency (n)	Percentage (%)
Gender	Female	250	85.30
	Male	43	7.14
Age	20–30 years	249	85.00
	31–40 years	34	6.11
	Above 40 years	10	4.30
Educational Level	Bachelor's	32	10.90
	Master's	204	69.70
	Doctoral	57	19.40

Note: $n = 297$.

Source: Compiled by the authors based on SPSS 23 output.

Following the recommendation of J.C. Anderson and D.W. Gerbing²⁷, we first tested our proposed measurement model and subsequently compared the fit of the baseline model with several alternative models. Upon reviewing table 3, it becomes evident from the results of the path analysis conducted on the theoretical four-factor model that IFI, NFI, CFI, TLI, and RFI all exceed the threshold of 0.90. Also, we obtained a P-value greater than 0.05, RMSEA below 0.08, and χ^2/df less than 3. Based on these findings, we can conclude that the assumed four-factor model demonstrates a strong fit with the data²⁸, and it exhibits superior alignment with the data compared to all alternative models.

Hypothesis Testing. The results presented in figure 2 and table 3 demonstrate the significant coefficients within the proposed four-factor research model, both direct and indirect. In other words, there is a positive and significant relation between proactive personality and reappraisal (as a constructive emotional regulation strategy) ($\beta = 0.33$; $p < 0.01$), while its link with suppression (as a maladaptive emotional regulation strategy) displayed a significant and negative relation ($\beta = -0.17$;

$p < 0.01$). Moreover, both variables of reappraisal ($\beta = 0.27$; $p < 0.01$) and suppression ($\beta = -0.16$; $p < 0.01$) demonstrated positive and negative associations, respectively, with learning agility. Moreover, when considering the presence of reappraisal and suppression, the path between proactive personality and learning agility showed a positive and significant relationship ($\beta = -0.54$; $p < 0.01$).

To further investigate the proposed mediating influences, we employed bootstrapping techniques using the Monte Carlo simulation approach [32; 33]. Through 20,000 iterations, we established that the indirect effect of proactive personality on students' learning agility, mediated by reappraisal, amounted to 0.07. The corresponding 95% bootstrap confidence interval was [0.121, 0.038], which does not include zero. Hence, the supporting evidence underscores the mediating role of reappraisal in the interplay between personality proactivity and learning agility.

Moreover, after conducting 20,000 resampling iterations, it became evident that the indirect effect of proactive personality on students' learning agility through reappraisal was 0.021, with a 95% bootstrap-adjusted confidence interval of [0.044, 0.007] that once again excluded zero. As a result, the mediating significance of suppression was also validated within the indirect association between proactive personality and learning agility. The SEM outcomes affirmed the support for all of our hypotheses (Table 4).

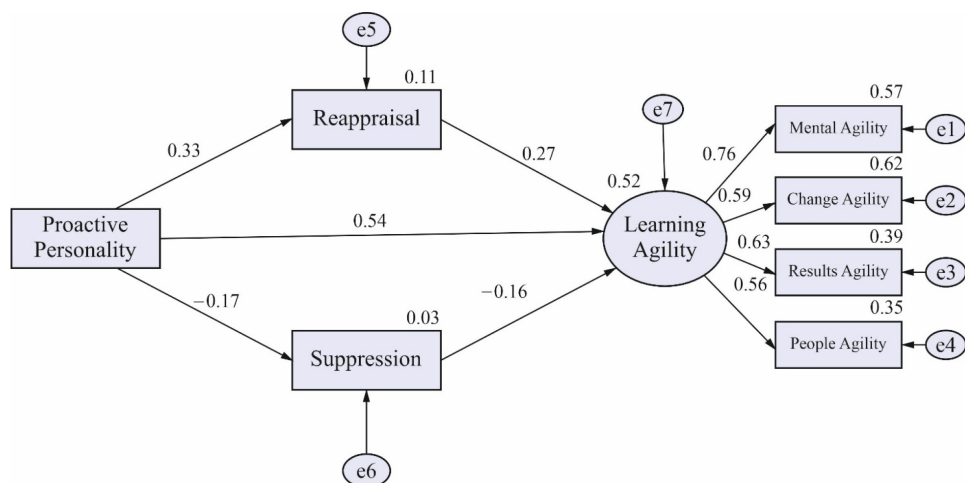


Fig. 2. The relationship between research variables

Source: Compiled by the authors using AMOS 23.



Table 2. Correlations and Statistical Characteristics of the Variables

Variables	1	2	3	4	5	6	7	8
1. Learning agility	–	–	–	–	–	–	–	–
2. Proactive Personality	0.579**	–	–	–	–	–	–	–
3. Reappraisal	0.395**	0.333**	–	–	–	–	–	–
4. Suppression	–0.313**	–0.176**	–0.087	–	–	–	–	–
5. Gender	0.091	0.088	–0.040	0.101	–	–	–	–
6. Age	0.201**	–0.025	–0.021	–0.048	0.063	–	–	–
7. Education level	0.118*	0.104	0.111	–0.080	–0.008	0.331**	–	–
8. Fields	–0.158**	–0.106	–0.029	–0.013	–0.048	–0.093	–0.116*	–
Indicators								
M	86.86	18.80	21.30	10.80	–	–	–	–
SD	9.74	2.72	3.31	3.76	–	–	–	–
Skewness	0.254	–0.438	–0.503	0.434	–	–	–	–
Kurtosis	–0.073	0.559	1.146	–0.781	–	–	–	–
Tolerance	–	0.845	0.857	0.964	–	–	–	–
VIF	–	1.193	1.167	1.037	–	–	–	–
Cronbach's α	0.891	0.780	0.745	0.920	–	–	–	–

Notes: Learning agility is the main dependent variable of the research; thus, tolerance and VIF were not reported for it; $n = 293$; * $p < 0.05$; ** $p < 0.01$; M = Mean; SD = Standard Deviation; VIF = Variance Inflation Factor.

Source: Compiled by the authors.

Table 3. Structural Equation Model of the Fit Indexes

Variable	χ^2	df	p-value	χ^2/df	RMSEA	CFI	IFI	NFI	RFI	TLI
Hypothesized Model (four-factor model)	14.990	10	0.132	1.499	0.041	0.992	0.992	0.976	0.950	0.983
Three-factor model (Reappraisal and Suppression combined into one factor)	72.093	12	0.000	6.008	0.131	0.902	0.904	0.887	0.802	0.829
Two-factor model (Reappraisal, Suppression and Proactive Personality combined into one factor)	72.445	13	0.000	5.573	0.125	0.904	0.905	0.886	0.816	0.844
One-factor model	73.541	14	0.000	5.253	0.121	0.903	0.904	0.885	0.827	0.855

Notes: RMSEA – Root-mean-square error of approximation (RMSEA values equal to or < 0.05 indicates good fit; RMSEA values between 0.05 and 0.08 indicates fair fit); CFI – Comparative fit index; NFI – Normed fit index; IFI – Incremental fit index; RFI – Relative fit index; TLI – Tucker-Lewis index (CFI, NFI, IFI, RFI and TLI values > 0.90 indicates good fit); p-value equal to or > 0.05 indicates good fit).

Source: Compiled by the authors using AMOS 23.

Table 4. Estimate of The direct and Indirect Effects

Standardized Direct Effects				
Path	Estimate	Critical Ratio		P-value
Proactive Personality – Learning agility	0.535	8.857		0.000
Proactive Personality – Reappraisal	0.333	6.043		0.000
Proactive Personality – Suppression	−0.167	−2.928		0.003
Reappraisal – Learning agility	0.275	4.971		0.000
Suppression – Learning agility	−0.157	−3.006		0.003
Standardized Indirect Effect				
Path	Estimate	95% Confidence Interval of the Difference		P-value
		Lower Bounds	Upper Bounds	
Proactive Personality – Reappraisal – Learning agility	0.072	0.038	0.121	0.000
Proactive Personality – Suppression – Learning agility	0.021	0.007	0.044	0.003

Source: Compiled by the authors using AMOS software.

The results of the structural equation modeling showed that the direct and indirect effects were statistically significant. The model demonstrated an acceptable fit, indicating that the hypothesized relationships among the variables were supported.

Discussion and Conclusion

Considering the scarcity of researches addressing the relation between proactive personality and learning agility, as well as the absence of investigations into the mediating role of emotional regulation within this relationship, especially concerning highly talented students, our study stands as a pioneering endeavor in this field. The findings obtained allow us to assert that remarkably talented students characterized by proactive personalities tend to demonstrate a heightened propensity for identifying and capitalizing on novel opportunities, embracing challenges, and striving for elevated achievements. Additionally, these individuals commonly exhibit an enhanced aptitude for communication and collaboration—attributes pivotal for streamlining the learning journey and navigating crucial transformations. Therefore, our study emphasizes a positive association between proactive personality and learning agility.

Individuals marked by a proactive personality often exhibit superior skills in emotional regulation, enabling them to adeptly navigate stressful and demanding circumstances while effectively managing adverse emotions. This adeptness in emotional regulation contributes to enhancing their adaptability and flexibility when faced with intricate learning environments. Proficiency in emotion regulation assists exceptionally talented students in maximizing the advantages of their proactive personality attributes, thus streamlining the learning process and facilitating adaptation to novel circumstances. Those who skillfully manage negative emotions and regulate their emotional responses possess the ability to effectively cope with stress and motivate themselves to embrace further learning, consequently enhancing their learning agility. As a result, our study illuminates the intermediary role of emotion regulation strategies, specifically reappraisal and suppression.

Theoretical Contributions. First and foremost, delving into the correlation between proactive personality and learning agility contributes to the existing body of knowledge on talent development and individual disparities. Characterized by a penchant for futurism and a pursuit of opportunities, proactive personality has demonstrated a positive link to favorable outcomes within work environments [34; 35]. However, its relationship with learning agility—defined as the ability to rapidly comprehend and adapt to new and challenging circumstances—especially in the context of talented students, remains underexplored [36; 37].

This study initially highlights a positive relation between proactive personality and the ability to learn quickly, underscoring how individual traits play a pivotal role in fostering effective learning and adaptation. Also, the inclusion of emotional regulation elements, specifically reappraisal and suppression, as intervening factors, provides a deeper understanding of the fundamental mechanisms connecting proactive personality and learning agility. Emotional regulation is closely tied to the capacity to manage and reshape experiences and convey emotions²⁹ [38], with reappraisal involving the alteration or reinterpretation of the significance of emotional experiences and suppression entailing the control of outward emotional expressions [39].

This study investigates how emotional regulation strategies are employed by talented students in relation to proactive personality and learning agility, taking these specific strategies into account. Moreover, our research enriches the existing literature on talent development by underscoring the significance of emotional regulation in the learning process of talented students [36].

Furthermore, this research underscores the importance of emotional regulation as a potential mechanism through which proactive personality may influence learning agility. Gaining insight into how exceptionally talented students manage their emotions in response to their dynamic inclinations offers valuable perspectives for optimizing

²⁹ Gross J.J. The Emerging Field of Emotion Regulation: An Integrative Review.

their learning effectiveness and adaptability. By leveraging emotional regulation strategies as mediators between proactive personality traits and learning agility, this study advances not only current theories and models in talent development and individual differences but also explores novel facets within this context. This exploration contributes to our understanding of the interplay between proactive personality, emotional regulation, and the learning agility of talented students, thereby expanding the boundaries of our knowledge.

Conclusion. Based on the findings of this study, it can be inferred that a significant and positive correlation exists between a proactive personality and learning agility. This observation highlights that individuals possessing a proactive personality also demonstrate markedly elevated levels of learning agility. Furthermore, the outcomes reveal a noteworthy and adverse impact of suppression on this correlation, suggesting that heightened levels of suppression correspond to a reduction in the association between proactive personality and learning agility. These discoveries have the potential to guide researchers, psychologists, and individuals passionate about learning and personal growth toward emphasizing proactive personality traits and mitigating the effects of suppression within the learning process.

Additionally, within educational programs, prioritizing the enhancement of individual agility while mitigating suppressive

elements could yield significant improvements in both performance and learning outcomes. This research enhances our understanding of the intricate interplay between dynamic personality, learning agility, and mediating factors. This newfound understanding holds valuable implications for the development of educational curricula, personal growth initiatives, and the enhancement of learning and individual accomplishments. Moreover, this research can serve as a foundation and template for future investigations in the discussed subject domain.

This study's insights are crucial for education, focusing on the significant role of learning agility in contemporary contexts, particularly among talented students. The research establishes a direct connection between proactive personality and learning agility, stressing the pivotal role of emotion regulation in shaping this relationship. Notably, the study introduces innovative aspects by examining the mediating impact of emotion regulation strategies, like reappraisal and suppression. These findings highlight the importance of cultivating proactive personalities in talented students, emphasizing their ability to navigate challenges, communicate effectively, and achieve heightened learning outcomes. Practically, educators can leverage this knowledge to tailor educational approaches, fostering a more effective learning environment for talented students.

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M. Nasr Esfahani Karladani – formulation or evolution of overarching research goals and aims; conducting a research and investigation process; development or design of methodology; specifically visualization; specifically writing the initial draft; specifically critical review.

S. H. Davarpanah – application of formal techniques to analyse or synthesize study data; implementation of the computer code and supporting algorithms; validation; management activities to produce metadata for initial use and later re-use; specifically critical review.



Availability of data and materials. The datasets used and/or analysed during the current study are available from the authors on reasonable request.

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С. Х. Р. Шаваран – наставничество в процессе планирования и проведения исследования; формулирование замысла исследования; критический анализ черновика рукописи; предоставление доступа к необходимым для исследования материалам; административное управление планированием и проведением исследования.

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С. Х. Даварпанах – применение формальных методов для анализа данных исследования; написание программного кода и реализация вспомогательных алгоритмов; проверка воспроизводимости результатов экспериментов и исследования в рамках основных или дополнительных задач работы; деятельность по созданию метаданных для первоначального и повторного использования; критический анализ черновика рукописи.

Доступность данных и материалов. Наборы данных, использованные и/или проанализированные в ходе текущего исследования, можно получить у авторов по обоснованному запросу.

Все авторы прочитали и одобрили окончательный вариант рукописи.

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