



Relationships between Metacognitive Beliefs, Personal-Social Adaptation, and Happiness in High School Students

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ARTICLE INFO

Article history:

Received:
25/05/2024

Accepted:
13/12/2024

Available
online: Winter
2024

Keyword:

Metacognitive
Beliefs,
Personal-Social
Adaptation,
Happiness,
Adolescence.

Abstract

This study investigates the relationship between metacognitive beliefs and personal-social adaptation and happiness among high school students. Using a descriptive-correlational design, 373 high school students from Robat Karim city were selected via convenience sampling. Data was collected using the Metacognitive Beliefs Questionnaire short form by Wells & Cartwright-Hatton (2004), the California Psychological Inventory by Clark et al. (1939), and the Oxford Happiness Inventory by Argyle et al. (1995). Statistical analysis involved Pearson correlation and regression. The study identified significant correlations between metacognitive beliefs and personal-social adaptation and happiness. Positive correlations were noted between beliefs about concern and personal adaptation (0.245), and uncontrollability and danger and personal adaptation (0.520). Cognitive confidence also correlated positively with personal adaptation (0.383), while the need for control of thoughts showed a negative correlation (-0.361). Social adaptation displayed similar trends with substantial correlations linked to positive beliefs about concern (0.741) and cognitive confidence (0.471). The need for control of thoughts showed a strong negative correlation (-0.798). Happiness correlated positively with metacognitive beliefs (0.518), with these beliefs predicting a 0.118 unit change in happiness. Metacognitive beliefs significantly affect personal-social adaptation and happiness among students. Workshops involving parents on metacognitive beliefs are recommended to enhance student outcomes.

Hashemi, M., & Abdollah-Parikhani, S., (2024). Relationships between Metacognitive Beliefs, Personal-Social Adaptation, and Happiness in High School Students, *Journal of School Administration*, 12(4), 1-15.

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Introduction

Schooling is one of the pivotal stages in growth where the foundation of an individual's personality in adulthood is formed. The majority of psychological and social abnormalities in adulthood are caused by neglect of emotional and behavioral issues during this period. This developmental phase is not only an opportunity for academic advancement but also an essential time for emotional and social development. In recent years, significant attention has been paid to prevention, understanding problems, and acquiring certain skills such as adaptation during childhood and adolescence, and throughout the school years (Salmani et al., 2023). Among the factors that recent scientific reports suggest may influence the psychological and emotional well-being of students in various environments is adaptation (Mu et al., 2023; Rossato et al., 2024).

Adaptation is a very important mechanism in adjusting to the demands of the environment, academics, and social life during adolescence—a period of unique and complex challenges. Adolescents are under increasing pressures of academic expectations, social dynamics, and emotional transitions that require robust adaptive skills. Rogobete et al. (2024) noted that over the past decades, there has been an increase in problematic behavior, academic failure, and family problems among students, but these have been buffered by the ability to adapt. Likewise, research in Iran shows the significance of adaptation for students, as it has been related to a variety of academic, social, and emotional behaviors (Sajjadian, 2023). These findings in their entirety indicate that nurturing adaptive capacities through adolescence is required for enhancing wellbeing and reducing the prevalence of maladaptive outcomes. Adaptation is a mechanism that enables individuals to cope with problem-solving and utilize emotional information. It also enables them to regulate their emotions harmoniously with the context and environment. Adaptation, especially social adaptation, plays a considerable role in ensuring individuals' psychological well-being (Nadri, 2024). Social adaptation, by definition, involves the regulation of emotions and valuable assets in order to achieve self and others' understanding abilities (Adeyemo, 2005). This process of social adaptation includes emotional control and the capacity to navigate through intricate social dynamics, considerably impacting mental health and overall life satisfaction.

Park et al., (2024) also consider social adaptation as a psychological process encompassing components such as social roles, social skills, lack of social interests, family relationships, educational relationships, and more. Findings indicate a widespread prevalence of disorders related to adaptation in contemporary society. When individuals exhibit emotional or behavioral symptoms such as depression, anxiety, school and university performance problems, academic motivation decline, conflicts with family and friends, and physical complaints in response to specific environmental or personal stressors, they experience behavioral maladjustment (Ding et al., 2023).

On the other hand, some findings in adult populations suggest that adaptation is a significant predictor of happiness (Gyasi et al., 2023). Additionally, (Kermani Mamazandi et al., 2021) examined a model to explain happiness, and the results of this study indicated the positive role of social adaptation in fostering happiness. A look at previous research in the field of happiness reveals that happiness denotes mental pleasure in individual life as a whole. (Veenhoven, 2005) defines happiness as the amount of positive value an individual attributes to themselves (Zaei et al., 2021). Enhancing social and personal adaptation may improve individuals' ability for positive self-evaluation a crucial element of overall happiness.

Happiness is defined as having positive emotions, enthusiasm for life, and finding meaning in life. More specifically, happiness is described as excitement, contentment, and joy, as well as a sense of positivity, meaning, and worthiness in life. Such individuals are typically cheerful, healthy, and optimistic, finding satisfaction in their existence and perceiving life as valuable, peaceful, and tranquil (Shetty et al., 2024). Evidence suggests that individuals who experience greater happiness have better academic outcomes than their peers. Additionally, happy individuals experience higher self-compassion and adaptation compared to their peers (Rahimzade & Mirzasadeghi, 2023; Shadkam et al., 2021). (Sadri et al., 2021) also found in their research that positive attitude and happiness significantly influence students' optimism and academic meaning.

The study and identification of psychological associations between adaptation and happiness has

resulted in many findings. There are still many unanswered questions, particularly about the dimensions of personal-social adaptation and the roles of these constructs. Nevertheless, despite the considerable number of studies on adaptation skills and feelings of happiness in students, psychological, behavioral, and academic impairments that these researchers believe may stem from a lack of adaptation skills remain significant issues in the educational and social system (Imamgholivand et al., 2019). A crucial aspect that may affect both adaptability and happiness is metacognitive beliefs, which have been insufficiently explored in the context of adolescent development.

Metacognitive beliefs are a significant factor in both adaptation and happiness. This concept was first introduced by Flavell (1979), referring to the individual's ability to understand and control their cognitive system. The individual is aware of their cognitive processing abilities and knows the obstacles and limitations they face in achieving a cognitive goal and how to address these limitations (Rafoth et al., 1993). Metacognitive skills play a critical role in adolescents' development, particularly in enhancing interpersonal adaptation and self-efficacy, which positively influence social outcomes. This is especially evident among adolescents with learning disorders, where improved metacognitive skills contribute to better social interactions and personal effectiveness (Commodari et al., 2022). Conversely, rigid metacognitive beliefs, particularly in anxious adolescents, are associated with reduced cognitive flexibility and heightened emotional distress, emphasizing the importance of interventions aimed at fostering resilience and adaptability (Sereda, 2022). Moreover, negative metacognitive beliefs have been linked to maladaptive behaviors such as emotional eating, suggesting that cognitive restructuring interventions can be effective in promoting healthier coping strategies (Limbers et al., 2021). Research also highlights the relationship between self-efficacy, supportive relationships, and happiness, where metacognitive awareness fosters positive interactions and emotional well-being (Mürtezaoğlu & Çikrikci, 2022).

In therapeutic contexts, targeting metacognitive beliefs has proven to decrease anxiety even in cases where the beliefs themselves did not change much directly, thereby showing the indirect positive effect of such an intervention. Moreover,

research has pointed out that metacognitive awareness serves to predict social-emotional skills, enabling adaptability, emotional intelligence, and academic achievements, particularly in gifted adolescents who need more heightened states of cognitive and emotional regulation (Yazgı Yanık & Afat, 2022).

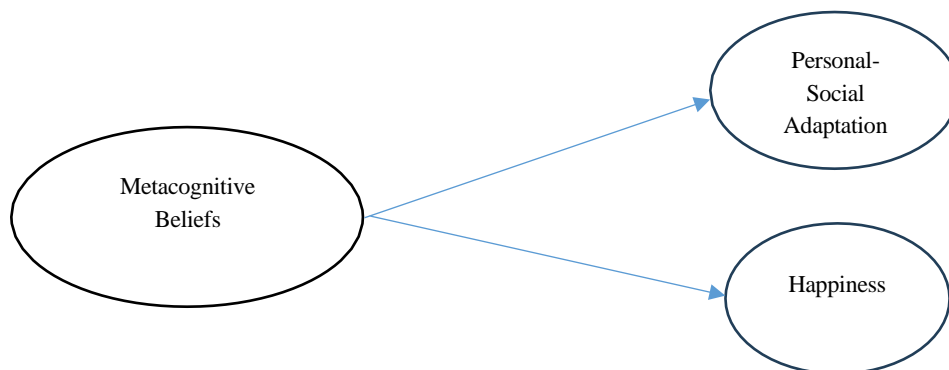
Numerous studies demonstrate the efficacy of metacognition for education and upbringing, highlighting humans' ability to foster their own mental growth (Faradiba et al., 2023). Metacognitive beliefs provide students with scientific engagement, internal locus of control, positive self-perceptions, increased motivation for progress, creativity, responsibility, and confidence in life matters. Furthermore, they enable students to identify problems, try out their activities, act independently, and provide the best solutions in various endeavors (Bae & Kwon, 2021). Findings indicate that in diverse populations, metacognitive beliefs have meaningful correlations with psychological resilience and flexibility (Pourfaraj & Mahmoudian, 2020), stress perception, and suicidal ideation among male students (Aghajani & Samadifard, 2020), as well as increased resilience and tolerance for ambiguity (Syed Mirzaei et al., 2022). The importance of specific educational strategies in enhancing student outcomes has been highlighted by recent research. According to a study, learning approaches, studying strategies, and metacognitive strategies have a significant impact on students' academic achievements (Shahrakipour, 2021). In another study, it was discovered that implementing Gagne's Learning Hierarchy has a significant impact on the cognitive and metacognitive skills of junior high school students, demonstrating the effectiveness of structured learning frameworks (Jadidi Mohammadabadi & Ahmadi Deh Ghotbaddini, 2023). Interpersonal adaptation, self-efficacy, and metacognitive skills were explored by adolescents with and without specific learning disorders. According to the findings, students who have higher metacognitive skills exhibit better interpersonal adaptation and self-efficacy, which are essential for academic and personal development (Commodari et al., 2022). This evidence suggests that fostering metacognitive skills should be an integral part of educational and psychological interventions aimed at preparing adolescents for the complex demands of life and society.

Theoretical and research underpinnings confirm that attending to behavioral and emotional

health, including students' adaptation and happiness, would become inevitable. Adolescents, as a significant part of the society, are soon to be at the frontier of important social and occupational responsibilities, yet their psychological vulnerabilities are hampering their achievement of optimum personal, social, psychological, and educational functioning.

Despite the considerable amount of research underlining the importance of adaptation and happiness among student populations, not many studies have looked into the role of metacognitive beliefs in these relationships. Most research addresses either adaptation or happiness separately and fails to show the connection between them through the perspective of metacognitive beliefs. Moreover, previous studies have mostly focused on adult populations and failed to take into consideration the unique developmental challenges of adolescence.

The present study attempts to fill the literature gaps by examining the relationship between metacognitive beliefs, personal-social adaptation, and happiness among high school students. Based on the theoretical and empirical rationale presented above, the following hypotheses are advanced: There is a significant relationship between metacognitive beliefs and personal-social adaptation. There is a significant relationship between metacognitive beliefs and happiness. Through the testing of these hypotheses, this study aims at a deeper understanding of the role of metacognitive beliefs in crucial aspects of adolescents' psychological and social development. This will add to the mounting evidence on how metacognitive processes can influence well-being and adaptability. By identifying these associations, this study hopes to provide actionable insights for educators, policymakers, and mental health practitioners and inform the development of effective interventions to improve students' psychological well-being.



Materials and Methods

The present research was descriptive and correlational in nature. It should be noted that the current study falls within the category of applied research in terms of its objective, and the type of research data was quantitative. The statistical population of the study consisted of all high school students in Robat Karim city, numbering 3452 individuals in the academic year of 2022-2023. In this research, in order to determine the sample size, 373

individuals were selected from the statistical population based on Morgan's table. The sampling method was convenience sampling. The sample was selected from several high schools in the area, and the selection was made based on the students' accessibility and the approval of school authorities. Ultimately, after receiving the questionnaires and due to some of them being incomplete and the lack of cooperation from some students, and with significant effort and reminders from the researcher, a total of 364 questionnaires were included in the final analysis.

In this study, a combination of library and field methods was used for data collection, with standardized questionnaires being the primary data collection tool. The formal and content validity of the questionnaires was confirmed through consultation with the supervisors, advisors, and experts in the field.

The California Personality Inventory (CPI)

This test measures individual and social adaptability characteristics (Crites, 1964). This test has 5 levels: preschool, elementary, guidance, and adult levels. In this study, the high school guide was used. This test has two main subscales: personal adaptation and social adaptation. The total number of questions is 180. This test is true/false, with incorrect answers scored as "zero" and correct answers as "one," and scores for each topic are summed. Also, the reliability of the questionnaire in Iran was confirmed by (ATEF et al., 2006). The range of Cronbach's alpha coefficients was from 0.30 for the femininity-masculinity scale to 0.83 for the 3V trait achievement scale, with a mean Cronbach's alpha of 0.60 across the subscales. The overall reliability of the test was found to be 0.95, indicating excellent internal consistency for the entire instrument (ATEF et al., 2006).

In this study, the overall reliability of the Social Adaptation Questionnaire was calculated using the Cronbach's alpha method as 0.69, and the reliability of each of the subsidiary components was respectively calculated as 0.69 for social problems, 0.71 for social skills, 0.67 for antisocial interests, 0.66 for family relationships, 0.68 for school relationships, and 0.73 for social relationships.

Wells and Cartwright-Hatton's (2004) Metacognitive Beliefs Questionnaire

The questionnaire used in this study is a 30-item self-report scale that measures individuals' metacognitive beliefs about their thinking, developed by (Wells & Cartwright-Hatton, 2004). Wells and Cartwright-Hatton in 2004. Responses in this scale are calculated on a four-point Likert scale ranging from "Strongly Disagree (1)" to "Strongly Agree (4)". Therefore, the score range is between 30 and 120, with higher scores indicating more unfavorable metacognitive beliefs. The Cronbach's alpha coefficient range for the sub-scales is reported from 0.72 to 0.93, and the test-retest reliability for the total

score after a 22 to 118-day interval is reported as 0.75, and for the sub-scales from 0.59 to 0.87 (Wells & Cartwright-Hatton, 2004). In Iran, (Sherinzadehdastgiri, 2006) reported the Cronbach's alpha coefficient for the overall scale as 0.91, and for the sub-scales in the range of 0.71 to 0.87, with a test-retest reliability for the entire test of 0.73 after a four-week interval, and for its sub-scales from 0.59 to 0.83. The reliability of the scale through the retest method with a four-week interval ranged from 0.70 to 0.93. Internal consistency via the Cronbach's alpha method was also reported as 0.88.

Oxford Happiness Questionnaire

A study in Iran demonstrated sufficient reliability and validity for the Oxford Happiness Questionnaire (after translation) in 1021 high school students. The test-retest reliability coefficient was 0.78 with a significant level of 0.001. The Cronbach's alpha was 0.84, indicating the reliability of the questionnaire. Content validity was confirmed by psychology experts, and it showed a high correlation with all five factors of the NEO personality test. Factor analysis confirmed seven factors, which accounted for 48% of the variance, but a second analysis showed that the questionnaire could be used as a one-dimensional structure for measuring happiness. The initial version of the questionnaire was compiled by Argyle et al. In 1989, many studies have been conducted on this questionnaire in various countries, introducing it as a powerful and reliable tool for measuring happiness. The revised and improved version of the questionnaire consists of 29 questions answered on a 6-point Likert scale. The questionnaire includes eight dimensions: rewarding life, mental readiness, self-satisfaction, aesthetic appreciation, life satisfaction, time organization, attractiveness, and happy memories (Hadinejad, 2009).

Results

Data analysis was conducted at both descriptive and inferential levels. Descriptive statistics, such as mean and standard deviation, were used to measure research variables at the descriptive level, while Pearson correlation coefficient and regression were used at the inferential level to examine the relationships between variables.

Table 1. Mean and Standard Deviation of Metacognitive Beliefs Variables and Standard Deviation Mean Subscales of Metacognitive Beliefs Variables

Subscales of Metacognitive Beliefs Variables		Mean	Standard Deviation	
Positive Beliefs About Worry		12.5938	4.57776	
Irrepressibility and Danger Control		15.6836	4.64563	
Cognitive Assurance		12.8320	4.59317	
Need for Thought Control		16.3711	4.05644	
Cognitive Self-Consciousness		17.5859	3.71753	
Overall Metacognitive Beliefs	Minimum	Mean	Maximum	Standard Deviation
Composite Score	33.00	75.0664	120.00	15.47824

As shown in Table 2, the mean scores for Positive Beliefs About Worry are 12.593, with a standard deviation of 4.577. For Irrepressibility and Danger Control, the mean is 15.683, with a standard deviation of 4.645. Cognitive Assurance has a mean of 12.832, with a standard deviation of 4.593. The mean for Need for Thought Control is 16.371, with a mean of 4.056. Lastly, Cognitive Self-Consciousness has a

mean of 17.585, with a standard deviation of 3.717. The lowest score on the Metacognitive Beliefs questionnaire is 33, and the highest score is 120.

Table 2 presents the descriptive statistics of happiness variables among the respondents and their components.

Table 2. Descriptive Statistics of Mean, Standard Deviation Values of Happiness and Its Components

Happiness Components	Mean	Standard Deviation
Self-esteem	62.2	654.0
Life Satisfaction	45.2	705.0
Psychological Readiness	52.2	688.0
Enjoyment	50.2	838.0
Aesthetic Appreciation	71.2	661.0
Self-efficacy	50.2	748.0
Hopefulness	66.2	804.0
Total Questionnaire	58.2	590.0

Table 2 provides information on the mean and standard deviation of scores for each of the happiness components. Based on this data, the highest mean is related to Aesthetic Appreciation, and the lowest mean is related to Life Satisfaction. Since the variability of

the happiness variable and its components is less than 3, it can be said that the happiness variable and its components among the respondents are in a relatively moderate condition.

Table 3. Mean and Standard Deviation of Individual-Social Compatibility Variable

Compatibility Type	Mean (Time 1)	Standard Deviation (Time 1)	Mean (Time 2)	Standard Deviation (Time 2)
Personal Compatibility	44.70	9.91	45.05	10.11
Social Compatibility	44.70	7.33	45.50	8.43

To use linear regression, the data must be on an interval scale, and the normality of the data distribution is essential. Therefore, to investigate this

matter, the Kolmogorov-Smirnov test was conducted on the data, and the result is presented in Table 4:

Table 4. Kolmogorov-Smirnov Test Results

Variable	P-Value
Personal-Social Compatibility	0.096
Metacognitive Beliefs	0.084
Happiness Variable	0.051

As observed in Table 4, the P-values for all variables are greater than 0.05, indicating that the result of this test is not significant. Hence, the data have a normal distribution, and therefore, the possibility of using parametric tests exists.

Furthermore, to examine the independence of errors, which is an assumption of linear regression, the Durbin-Watson test is used. The Durbin-Watson statistic ranges from 0 to 4. If there is no correlation between errors, this statistic should be close to 2. In general, if this statistic ranges from 1.5 to 2.5, there is no concern about the independence of errors. By performing the Durbin-Watson test, a value of 1.733 was obtained, which falls within the range of 1.5 to 2.5, indicating that the assumption of independence of errors holds.

In this study, Pearson correlation coefficient and multiple linear regression have been utilized. The Pearson correlation coefficient measures the linear

correlation between two random variables, with a range of values from -1 to +1. A value of 1 indicates perfect positive correlation, -1 indicates perfect negative correlation, and 0 indicates no correlation between the variables.

Multiple regression analysis is used to determine the contribution of independent variables in predicting the dependent variable. In multiple regression analysis, the aim is to predict changes in the dependent variable based on changes in the independent variables. By using multiple regression, the existing relationships between independent variables are also considered. Therefore, multiple regression is a method for analyzing the collective and individual contribution of two or more independent variables in the changes of a dependent variable. Hence, in the present study, multiple regression with the simultaneous entry method has been used to test the main hypothesis.

Table 5. *Pearson Correlation Coefficients between Metacognitive Beliefs and Personal-Social*

Dependent Variable	Independent Variable	Correlation Coefficient	Significance Level
Family Harmony	Positive Beliefs about Anxiety	-0.245	0.001
	Uncertainty and Risk Control	-0.520	0.001
	Cognitive Assurance	0.383	0.001
	Need for Cognitive Control	-0.361	0.001
	Self-Cognitive Awareness	0.151	0.015
Social Harmony	Positive Beliefs about Anxiety	-0.741	0.000
	Uncertainty and Risk Control	-0.369	0.037
	Cognitive Assurance	0.471	0.023
	Need for Cognitive Control	-0.798	0.000
	Self-Cognitive Awareness	0.818	0.000

Considering the obtained significance level in Table 5, it can be stated that there is a relationship between the components of metacognitive beliefs and personal-social compatibility.

The intensity of correlation between Positive Beliefs about Anxiety and Personal Harmony is -0.245, between Uncertainty and Risk Control and Personal Harmony is -0.520, Cognitive Assurance and Personal Harmony is 0.383, Need for Cognitive Control and Personal Harmony is -0.361, and Self-Cognitive Awareness is 0.151, all at a significance level less than 0.005. Therefore, the hypothesis regarding the relationship between metacognitive

beliefs and personal compatibility is confirmed. Additionally,

The intensity of correlation between Positive Beliefs about Anxiety and Social Harmony is -0.741, between Uncertainty and Risk Control and Social Harmony is -0.369, Cognitive Assurance and Social Harmony is 0.471, Need for Cognitive Control and Social Harmony is -0.798, and Self-Cognitive Awareness is 0.818, all at a significance level less than 0.005. Hence, the hypothesis regarding the relationship between metacognitive beliefs and social compatibility is confirmed.

Table 6. *Pearson Correlation Coefficients between Metacognitive Beliefs and Well-Being*

Independent Variable	Dependent Variable	Correlation Coefficient	Significance Level	Test Result
Positive Beliefs about Anxiety	Well-Being	0.442	0.034	Significant Relationship
Uncertainty and Risk Control	Well-Being	0.697	0.001	Significant Relationship
Cognitive Assurance	Well-Being	0.231	0.042	Significant Relationship
Need for Cognitive Control	Well-Being	0.497	0.002	Significant Relationship
Self-Cognitive Awareness	Well-Being	0.612	0.002	Significant Relationship
Total Score	Well-Being	0.518	0.001	Significant Relationship

As evident from the data in Table 6, the significance level of the test for each relationship between metacognitive beliefs and well-being is less than 0.05. Therefore, the relationship between metacognitive beliefs and well-being is significant at a

95% confidence level. Additionally, from the last row of the table above, it is evident that the correlation coefficient between metacognitive beliefs and well-being is 0.518. Therefore, the relationship between the two variables is positive and significant.

Table 7. *Regression Analysis Results for Independent Variables Affecting Personal-Social Compatibility*

Model	R Squared (R)	Adjusted R-Squared	Standard Error of the Estimate	Adjusted R2
1	0.649	0.421	10.15698	0.416

The value of R represents the correlation between the variables. As per Table 8, the R value is 0.649, indicating a good and reasonable correlation between the independent variables (metacognitive beliefs and personal-social compatibility) and the dependent variable (metacognitive beliefs). The adjusted R-squared value (R2 Adjusted) is 0.416,

indicating that 41.6% of the total variation in the dependent variable, namely personal-social compatibility, is explained by the independent variables, i.e., metacognitive beliefs. In other words, the independent variables predict and estimate approximately 42% of the variance in personal-social compatibility.

Table 8. *Analysis of Variance Results for Independent Variables Affecting Personal-Social Compatibility*

Source	Sum of Squares	Degrees of Freedom	Mean Squares	F Value	Significance Level
Regression	18982.683	1	9491.342	92.002	0.001
Residual	26100.532	353	164.103		
Total	45083.215	354			

Table 8 examines the overall significance of the regression model. The statistical test's value (F) is equal to 92.002, and considering the significance level of 0.001, which is less than 0.05, the null hypothesis is rejected with a probability of 95%. This means that the

current model is significant at 95% confidence, indicating that metacognitive beliefs and anxiety sensitivity predict exam anxiety well. Therefore, based on the available data, this model can explain changes in personal-social compatibility.

Table 9. *Coefficients Obtained from Metacognitive Beliefs and Personal-Social Compatibility*

Model	Unstandardized Coefficients B	Standard Error	Standardized Coefficients Beta	T Value	Significance Level
Constant Value	25.628	3.491		7.341	0.001
Metacognitive Beliefs	-0.874	0.202	-0.306	4.320	0.001

The examination of variables based on Table 9 indicates that the effect of the independent variable on the dependent variable is significant. The t-value for

metacognitive beliefs is 4.320, indicating that metacognitive beliefs can predict personal-social compatibility.

Table 10. *Coefficient of Determination from Happiness Regression Analysis*

Model	R-Squared	Adjusted R-Squared	Standard Error	Durbin-Watson
1	0.742	0.443	0.129	1.936

The results show that the independent variables in total were able to explain 44.3% of the variance in happiness. Moreover, since the Durbin-

Watson statistic obtained is between 1.1 to 1.2, it indicates that the use of regression analysis is unimpeded.

Table 11. *Variance Analysis Related to Happiness Variable*

Source	Sum of Squares	Degrees of Freedom	Mean Squares	F Value	Significance Level
Regression	341.85	8	42.731	375.103	0.000
Residual	108.36	180	0.602		
Total	389.147	188			

Regression analysis results in the analysis of variance (Table 12) showed that considering the high values of the Fisher F statistic (375.103) and the

resulting significance level (0.000), it can be said that the results of the regression are valid and significant.

Table 12. Standardized and Unstandardized Coefficients from Happiness Regression Analysis

Variables	Unstandardized Coefficients B	Standard Error	Standardized Coefficients Beta	T Value	Significance Level
Constant Value	215.0	129.0		3.121	0.203
Metacognitive Beliefs	-318.0	63.0	-0.118	7.154	0.000

Discussion and conclusion

The findings of this study establish significant relationships between metacognitive beliefs, personal-social adaptation, and happiness among high school students, validating the research hypotheses. Positive dimensions of metacognitive beliefs, such as cognitive confidence and positive beliefs about worry, showed strong positive correlations with personal and social adaptation. Conversely, negative beliefs, including uncontrollability and danger and the need for thought control, exhibited significant negative correlations with these dimensions. Regression analysis further demonstrated that metacognitive beliefs significantly predict both personal-social adaptation and happiness, accounting for a considerable portion of their variance.

In support of Hypotheses 1, respectively, which had proposed that metacognitive beliefs significantly relate to personal and social adaptation, findings are in line with the metacognitive model presented by Wells and Simons (2009). Their model argues that metacognitive processes regulate cognitive activities and modulate the effectiveness of emotional and social regulation. In the context of metacognitive beliefs, as Fisher and Wells (2005) categorized these beliefs into positive beliefs about worry, cognitive confidence deficits, and cognitive self-consciousness dimensions, results from this study confirm the important role these factors play in the determination process. For example, one kind of deficit in cognitive flexibility can be seen as driven by negative ideas about the self that engender less social adaptability and interpersonal difficulty-findings consistent with Commodari et al. (2022) and Jadidi Mohammadabadi and Ahmadi Deh Ghotbaddini (2023). Similarly, Mohseni et al. (2018), consistent with the present findings, showed that metacognitive beliefs and feelings of hopelessness are correlated with maladaptive and risky behaviors in adolescents. The results are consistent with the other research (Shahrakipour, 2021).

These findings also resonate with the results of Teng and Yang (2023), who reported that motivational development and social adjustment were related to metacognitive development. Mohseni et al. (2018) also found that maladaptive metacognitive beliefs predict risk behaviors in adolescents; this further supports the claim that negative metacognitive patterns hinder personal and social adjustment. Moreover, educational interventions aimed at metacognitive beliefs further improve problem-solving skills and social compatibility, as demonstrated by Terneusen et al. (2023), which also strengthens the practical implications of the present study.

Concerning Hypotheses 2, which investigated the relationship between metacognitive beliefs and happiness, this study proved that happiness is significantly predicted by metacognitive dimensions. These findings are in line with Gholipour (2018), who found metacognitive beliefs and self-efficacy as predictors of students' emotional well-being. Correspondingly, Kajka and Kulik (2023) observed a strong relationship between metacognitive beliefs and psychological well-being during the COVID-19 pandemic, which proves that such beliefs act as a stabilizer even in stressful situations. The results of the present study are also in agreement with Rashmi and Vanlalhruii (2023), who indicated the relation of metacognitive patterns with mood regulation. Additional support comes from Gyasi et al. (2023), who found that adaptation is a strong predictor of happiness, and Kermani Mamazandi et al. (2021), whose study confirmed the significant role of social adaptation in fostering positive emotional outcomes.

These findings also are supported by the study conducted by Shahrakipour (2021), where he established that metacognitive strategies result in improved academic and emotional outcomes. In addition, according to Commodari et al. (2022), deficits in metacognitive skills relate to poor interpersonal

relationships and reduced psychological well-being. These findings point out the importance of metacognitive beliefs for adolescents' cognitive and emotional development. It is also in line with Limbers et al. (2021), who related negative thinking to maladaptive behaviors, such as emotional eating, which one could cope better with upon restructuring of these beliefs. Also, Mürtezaoğlu and Çikrikçi (2022) have documented that metacognitive awareness contributes to positive interaction and emotional well-being, hence also proving that happiness is associated with metacognitive processes.

The metacognitive model by Wells provides a theoretical explanation for the findings above, indicating that individuals with dysfunctional metacognitive beliefs are more likely to use maladaptive coping strategies, leading to negative emotional experiences such as hopelessness and reduced happiness. This perspective is supported by the self-regulatory executive function model, which purports that maladaptive metacognitions perpetuate negative thinking patterns, leading to emotional distress and impairments in personal and social functioning.

Although this study offers much-needed insights, it is not without its limitations. Convenience sampling may limit the generalization of findings. Cultural and contextual differences between public and private schools further limit the applicability of the results to broader populations. Factors such as gender and socioeconomic status, which were not explicitly controlled, may also have influenced the results. Future studies should overcome these shortcomings by using longitudinal designs and exploring moderating variables like socioeconomic status and educational background. Research done across different cultural and geographical spectra would also help in better understanding the generalizability of these results. Short-form questionnaires could also be used in the future to keep participants more engaged and reduce fatigue.

The findings of this study provide further evidence of the fundamental role of metacognitive beliefs in shaping adolescents' personal-social adaptation and happiness. By incorporating metacognitive training into educational curricula and engaging parents through awareness-raising activities,

serious positive changes can be expected with regard to the enhancement of emotional resilience and the students' social adaptability. In this way, results allow for a base to establish prospective interventions that could strengthen constructive metacognitive beliefs with the aim of improving psychological adjustment and development among high school students. Also, it is recommended that future studies utilize structural equation modeling (SEM) to provide a more comprehensive analysis of the structural relationships among metacognitive beliefs, personal-social adaptation, and happiness.

Ethical considerations

The study was approved by the Ethics Committee of the University of Danesh Alborz. The authors avoided from data fabrication and falsification.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of interest

The authors declare no conflict of interest.

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