




Structural Equation Modeling of the Relationship Between Parents' Religious Orientation and Adolescents' Tendency Towards Critical Thinking and Happiness with the Mediating Role of Cognitive Flexibility

Neda. Eshagh Neymvari¹, Shahnam. Abolghasemi^{2*}, Tahereh. Hamzeh Poor Haghighi³

¹ PhD Student General Psychology, Department of Psychology, Tonekabon Branch, Islamic Azad University, Tonekabon, Iran

² Associate Professor, Department of Psychology, Tonekabon Branch, Islamic Azad University, Tonekabon, Iran

³ Assistant Professor, Department of Psychology, Lahajan Branch, Islamic Azad University, Lahajan, Iran

* Corresponding author email address: sh.abolghasemi@toniau.ac.ir

Article Info

Article type:

Original Research

How to cite this article:

Eshagh Neymvari, N., Abolghasemi, S., & Hamzeh Poor Haghighi, T. (2024). Structural Equation Modeling of the Relationship Between Parents' Religious Orientation and Adolescents' Tendency Towards Critical Thinking and Happiness with the Mediating Role of Cognitive Flexibility. *Applied Family Therapy Journal*, 5(1), 97-107.

<http://dx.doi.org/10.61838/kman.aftj.5.1.11>



© 2024 the authors. Published by KMAN Publication Inc. (KMANPUB), Ontario, Canada. This is an open access article under the terms of the Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

ABSTRACT

Objective: The present study aimed to determine the model fit based on the relationship between parents' religious orientation and the tendency towards critical thinking and happiness with the mediating role of cognitive flexibility in female high school students.

Method: This descriptive correlational study was conducted with a population of teenage girls from public high schools in the city of Chalus. A sample of 319 participants was selected using cluster random sampling. Data collection tools included the Ricketts Critical Thinking Questionnaire (2003), the Dennis and Vander Wal Cognitive Flexibility Inventory (2010), the Allport and Ross Religious Orientation Questionnaire (1967), and the Oxford Happiness Inventory (Argyle et al., 1989).

Findings: Results showed a significant positive relationship between religious orientation and critical thinking tendency ($r = 0.45, p < 0.05$), happiness ($r = 0.41, p < 0.05$), and cognitive flexibility ($r = 0.68, p < 0.05$). There was also a significant positive relationship between cognitive flexibility and the tendency towards critical thinking ($r = 0.73, p < 0.01$) and happiness ($r = 0.69, p < 0.01$).

Conclusions: Based on the results of structural equation modeling, the model based on the relationship between parents' religious orientation and the tendency towards critical thinking and happiness with the mediating role of cognitive flexibility among students is adequately fitted. The application of promoting religious duties and training in cognitive flexibility to enhance happiness and critical thinking tendency in students could be considered in experimental studies by researchers, educational planners, and counselors.

Keywords: Parents' religious orientation, Tendency towards critical thinking, Happiness, Cognitive flexibility

1. Introduction

Achieving the educational objectives that schools regard as fundamental requires ensuring the mental health of students. Numerous studies have demonstrated a relationship between students' mental health and their academic progress, with students suffering from mental health issues or lacking proper mental hygiene often facing academic decline. Thus, it seems essential to implement suitable methods to secure mental health in schools to achieve educational and developmental goals and ensure individuals' health in society at different ages (Parsakia, 2023).

One of these strategies includes fostering critical thinking in students. Critical thinking implies thoughtful and logical reasoning focused on decision-making for actions (Tajarod et al., 2014). Critical thinking is considered a fundamental cognitive process for growth and leveraging knowledge and is applicable for progress and problem-solving (Gul et al., 2010). Critical thinking encompasses both the skill of critical thinking and the disposition towards it. The skill aspect focuses on cognitive strategies, while the disposition towards critical thinking emphasizes the attitudinal components of thinking and a persistent intrinsic motivation for problem-solving (Bagheri et al., 2019). Without a positive disposition towards critical thinking, the emotional dimension of this type of thinking does not occur or performs below standard, making the disposition towards critical thinking a vital part of critical thinking (Fikriyati et al., 2022). Individuals with critical thinking traits exhibit openness to new ideas, flexibility, willingness to change, creativity, analytical skills, high energy, risk-taking, knowledge acquisition, and observational skills (Popil, 2011). Critical thinking is a fundamental basis in education for adapting to personal, social, and professional needs of the present century and beyond. Adolescents employing this cognitive strategy possess deep and clear viewpoints and exhibit higher performance in various academic dimensions, such as problem-solving (Parsakia, 2023; Ulaş et al., 2012).

Another strategy for securing mental health in schools is happiness. Happy people control their lives, are responsible, goal-oriented, have a positive outlook on life, are forward-looking, and hopeful, and do not falter in the face of difficulties and hardships (Adibi & Gorji, 2017; Argyle et al., 1989). Happiness is a necessity and need in today's world and serves as a driving force that motivates activity, capability, and hope in individuals, being a central element of a good life (Luhmann et al., 2016). According to Argyle,

happiness has emotional, cognitive, and emotional dimensions (Argyle & Lu, 1990; Argyle et al., 1989).

In this context, some studies have shown that the religious orientation of parents is associated with positive affect, the absence of negative affect, and overall satisfaction with life in their children and can impact the psychological health of their offspring (Khoshnevis & Dejakam, 2018). According to Erikson (1975), parents directly influence the first stage of ego development, the stage of trust versus mistrust. He believes that trust in childhood forms the basis of faith in adulthood. Faith, as a vital need, leads an individual towards accepting religion, and establishing trust or mistrust in children directly impacts their religious orientation and style in the future (Khalilifar et al., 2014). According to Allport (1950), religious orientation is a combination of religious beliefs, behaviors, and motivations and includes two types. In extrinsic religious orientation, acquiring personal benefits, maintaining social status, and satisfying selfish desires are the primary goals of individuals in religious practices, while in intrinsic religious orientation, individuals act based on internal values and beliefs, seeking meaning and value for their beliefs and actions (Sadri Demirchi et al., 2019). Findings have shown that there is a relationship between intrinsic and extrinsic religious orientation and happiness (Akbarian, 2016; Anand & Singh, 2015; Atashafrouz et al., 2015; Jafari, 2015; J. Mohammadi et al., 2016; M. Mohammadi et al., 2016).

Furthermore, cognitive flexibility is an important factor in educational environments and enhances students' learning ability. The theory of cognitive flexibility focuses on the nature of learning in complex and ill-structured domains. According to this theory, a successful learner (i.e., cognitively flexible) is someone who can easily reorganize knowledge in response to various situational demands and apply it. Learners need to understand the full complexity of problems and frequently examine the problem space to see how changes in variables and goals can alter the space (Haghighati et al., 2019). How an individual can accomplish this depends on the method of representing knowledge (for example, multiple conceptual dimensions instead of a single dimension) and the processes that act on these mental representations (for example, constructing schemas instead of retrieving complete schemas) (Carvalho & Moreira, 2005). Cognitive flexibility is a prerequisite for other mental functions and a significant factor in performing high-level cognitive tasks (Diamond, 2013). The study by Guner and Gokce (2021) and De Dreu et al. (2011) showed that there is a relationship between cognitive flexibility and the

inclination towards critical thinking (De Dreu et al., 2011; Güner & Gökçe, 2021). Additionally, based on the opinion of Anis (2002), critical thinking is flexible thinking focused on decision-making regarding what beliefs an individual should hold and how they should behave (Abdollahi et al., 2022; Parsakia, 2023). Findings showed that there is a relationship between cognitive flexibility and happiness (Koesten et al., 2009). The study by Khairi et al. (2021) also showed that there is a relationship between religious orientation and cognitive flexibility (Khairi et al., 2022).

As the conducted studies and theoretical literature of the upcoming study show, the religious orientation of parents, derived from the Iranian-Islamic teachings of Iranian families, and, on the other hand, fostering cognitive flexibility in children can lead to increased psychological well-being in them, bringing about two significant outcomes; an emotional outcome that creates happiness in children, which also inspires academic enthusiasm, and a cognitive outcome, the inclination towards critical thinking. Both of these results lead to growth and excellence in the field of education and mental health in children and consequently, the future builders of society. Therefore, the upcoming study poses the question of whether there is a relationship between the religious orientation of parents and family communication patterns with the inclination towards critical thinking and happiness with the mediating role of cognitive flexibility in students? If the proposed model fits, it can be hoped that factors such as parents' religious orientation and cognitive flexibility can be considered in effectiveness and experimental studies to increase happiness and the inclination towards critical thinking in students by researchers, educational planners, and counselors.

2. Methods

2.1. Study design and Participant

The population of this study consisted of female high school students in the second stage of public schools in Chalus city. Eligibility criteria included being enrolled in public schools in Chalus, aged 15 to 19 years, female, and studying at the second stage of high school. The sampling method was cluster random. Among 9 public high schools for girls in Chalus at the secondary level, seven schools were randomly selected. From each school, one class from each grade was randomly selected, totaling 3 classes per school and 21 classes across seven schools. Students from each class were then randomly selected based on a list of student names. These students completed the research

questionnaires and all questionnaires in this study were anonymous, and participants were assured that their information would remain confidential and would only be used for research purposes.

2.2. Measures

2.2.1. Critical Thinking

To assess the tendency towards critical thinking, the Critical Thinking Tendency Inventory (Ricketts, 2003) was used, which includes 33 items. This scale was designed after Moore, Raad, and Penfield (2002) achieved significant and varied results regarding the California Critical Thinking Tendency Questionnaire previously developed by Facione (1990). Ricketts aimed to create a shorter, more impactful, and reliable scale. This self-report instrument measures the inclination or tendency towards critical thinking and includes three subscales: creativity, cognitive maturity, and engagement or commitment. Respondents rate their agreement or disagreement with each statement on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The questionnaire has a total score. Ricketts (2005) reported reliability coefficients for the creativity subscale as 0.76, engagement as 0.85, and cognitive maturity as 0.59. Since this scale was based on the original work of Facione (1990), its construct validity is confirmed, and its reliability in Iran has been reported as satisfactory in several studies. Ghanbari Hashem Abadi et al. (2012) reported reliability coefficients for the total score, creativity, cognitive maturity, and engagement as 0.79, 0.71, 0.80, and 0.57, respectively. In the research by Ghodumizadeh and Fuladchang (2014), Cronbach's alpha method was used to assess reliability. The Cronbach's alpha coefficient for the total test score was 0.73, and for the subscales of creativity, cognitive maturity, and engagement, it was 0.74, 0.56, and 0.75, respectively. Furthermore, factor analysis using the principal component method with orthogonal rotation was used to confirm the construct validity and factor structure of the mentioned scale for use in Iran (Fouladchang & Ghodoumi Zadeh, 2016).

2.2.2. Happiness

Happiness Questionnaire: The Oxford Happiness Inventory was developed in 1989 by Argyle et al. This questionnaire consists of 29 four-option questions where individuals assess their feelings ranging from unhappiness to extreme happiness. The questionnaire was revised by Argyle and Lu (1990) and evaluates psychological constructs

related to social interests, extraversion, kindness, agreeableness, humor, sense of purpose, self-sufficiency, self-esteem, self-acceptance, physical health, autonomy, locus of control, and aesthetic feeling. This questionnaire is directly scored on a Likert scale, where answer a scores 0, answer b scores 1, answer c scores 2, and answer d scores 3. The score range is from 0 to 87, and scores below 43 indicate happiness below average; thus, this questionnaire has a total score. Regarding construct validity, since happiness is known to have three components: positive affect, satisfaction, and absence of negative affect, this questionnaire's correlation with the Positive Affect Scale by Bradburn (1963) was 0.32, and with the Beck Depression Inventory (1961), it was -0.52. The reliability of this scale in the study by Argyle et al. (1989) on 347 subjects using Cronbach's alpha was 0.90, and with the retest method, it was 0.78. In the study by Adibi and Gorji (2015), reliability using Cronbach's alpha was calculated as 0.92 (Adibi & Gorji, 2017; Argyle, 2000; Argyle & Lu, 1990; Argyle et al., 1989).

2.2.3. Cognitive Flexibility

The Cognitive Flexibility Inventory was created by Dennis and Vander Wal (2010) and is a short 20-item self-report instrument used to measure a type of cognitive flexibility essential for individual success in challenging and replacing inefficient thoughts with more effective ones. This questionnaire is used to assess individual progress in clinical and non-clinical settings and to evaluate the ability to foster flexible thinking in therapy. It attempts to measure three aspects of cognitive flexibility: 1) the willingness to perceive challenging situations as controllable (Control), 2) the ability to understand multiple alternative explanations for life events and human behaviors (Alternatives for Human Behaviors), and 3) the ability to generate multiple alternative solutions for difficult situations (Alternatives). The questions are set on a seven-point Likert scale (from 1 strongly disagree to 7 strongly agree). The higher an individual scores on this questionnaire, the greater their cognitive flexibility. Dennis and Vander Wal (2010) demonstrated that this questionnaire has a suitable factor structure, convergent validity, and concurrent validity. The concurrent validity of this questionnaire with Beck's Depression was -0.39, and its convergent validity with the Martin and Rubin Cognitive Flexibility Scale was 0.75. Dennis and Vander Wal (2010) also obtained the reliability of this questionnaire using Cronbach's alpha for the entire

scale, Control, and Alternatives, respectively, as 0.91, 0.84, and 0.91, and with the retest method, respectively, as 0.81, 0.75, and 0.77. In Iran, unlike the original scale, which yielded only two subscales, the Cognitive Flexibility Inventory has three subscales: Control, Alternatives, and Alternatives for Human Behaviors. Dennis and Vander Wal (2010) showed that the two subscales, Alternatives for Human Behaviors and Alternatives, are significant, and the Control was considered the second subscale (Dennis & Vander Wal, 2010). Sharahi, Farmani, and Soltani (2014) reported the retest reliability and Cronbach's alpha coefficients for the entire scale as 0.71 and 0.90, respectively. They also reported the retest reliability coefficients for the subscales of Control, Alternatives, and Alternatives for Human Behaviors as 0.55, 0.72, and 0.57, respectively, and Cronbach's alpha coefficients for the above subscales as 0.87, 0.89, and 0.55, respectively (Soltani et al., 2013). In the study by Khoshsorur and Mikaeli (2021), the reliability of the entire test using Cronbach's alpha was calculated as 0.88 (Khoshsorour & Mikaeili, 2021).

2.2.4. Religious Orientation

Religious orientation in this study was measured using the Religious Orientation Questionnaire by Allport and Ross (1967), which was initially proposed by Allport and Ross in 1950. This scale includes 21 statements that examine intrinsic and extrinsic religious orientations. This scale is scored on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) and does not have a total score. In the initial studies based on the 20-question Religious Orientation Questionnaire by Allport and Ross (1967), the correlation between extrinsic and intrinsic orientations was 0.21. Fiegen in 1964, in addition to including all options by Allport and Ross (1950), added another option to the scale: "Religion does what my membership in the group of friends, citizens, and other groups does; it helps to keep my life balanced and stable," making the questionnaire include 21 statements. This option had a high positive correlation ($r = 0.61$) with the Extraversion Scale. In the study by Fiegen (1964), the correlation between intrinsic and extrinsic religious orientations was 0.20, very close to the correlation calculated by Allport and Ross (1967). Despite the fact that Fiegen's questionnaire (1964) was published three years earlier than Allport and Ross's (1967), the latter study was more widely accepted. To assess the validity of this test in Iran, the Allport and Ross Religious Orientation Scale (1967) was translated into Persian, and the accuracy of the

translation was corrected by back-translation by other specialists and multiple rewrites to ensure the scale was compatible with the Iranian cultural and religious context (Allport & Ross, 1967). Janbozorgi in 1999 obtained the internal consistency using Cronbach's alpha as 0.71 and the retest reliability as 0.74 ((J. Mohammadi et al., 2016). Shafiei et al. (2012) in assessing the reliability of the mentioned scale, reported Cronbach's alpha for extrinsic religious orientation as 0.71 and for intrinsic orientation as 0.62 (Shafii et al., 2013). In the research by Mohammadi et al. (2016), Cronbach's alpha for intrinsic religious orientation was 0.85 and for extrinsic religious orientation was 0.78 (J. Mohammadi et al., 2016).

2.3. Data Analysis

Data analysis was conducted using Pearson correlation and structural equation modeling with SPSS and LISREL software.

Table 1

Descriptive Characteristics of Research Variables

Variable	Mean	Standard Deviation	Skewness	Kurtosis
Religious Orientation	82.33	1.72	-0.475	-0.324
Extrinsic Religious Orientation	44.30	1.76	-0.622	0.334
Intrinsic Religious Orientation	38.03	2.05	-0.436	-0.336
Tendency Towards Critical Thinking	129.68	1.92	-0.546	0.664
Creativity	43.06	3.14	-0.552	0.679
Cognitive Maturity	35.58	1.53	-0.383	-0.178
Engagement with Commitment	52.03	3.79	-0.573	0.697
Happiness	112.79	1.20	-0.419	-0.331
Cognitive Flexibility	77.82	1.82	-0.423	-0.329
Alternatives	39.16	1.58	-0.349	0.630
Control	31.099	2.28	-0.621	0.358
Alternatives for Human Behaviors	7.65	1.73	-0.610	-0.294

As observed in Table 1, the highest mean for religious orientation was for extrinsic religious orientation (44.30), and the lowest was for intrinsic religious orientation (38.03); for the tendency towards critical thinking, the highest mean was for engagement with commitment (52.03) and the lowest for cognitive maturity (35.58); in the variable of

3. Findings and Results

The descriptive findings related to 319 female high school students from public schools in Chalus during the 2022-2023 academic year indicated that the most significant sample volume consisted of 80 seventeen-year-olds (25.08%), while the smallest sample volume included 48 nineteen-year-olds (15.05%). First-born students accounted for the largest sample volume with 140 students (43.89%), and third-born students were the least with 54 students (16.93%). Twelfth graders formed the largest group with 113 students (35.42%), while tenth graders were the smallest group with 105 students (32.91%). Table 1 presents the descriptive characteristics of the research variables.

cognitive flexibility, the highest mean was for alternatives (39.16), and the lowest was for alternatives for human behaviors (7.65). Moreover, the mean happiness score reported was 112.79.

Subsequently, the Pearson correlation coefficients for the research variables are presented in Table 2.

Table 2

Pearson Correlation Coefficient Results Between Research Variables

Variables	1	2	3	4	5
1. Extrinsic Religious Orientation	1				
2. Intrinsic Religious Orientation	.734	1			
3. Cognitive Flexibility	.575	.597	1		
4. Tendency Towards Critical Thinking	.649	.635	.820	1	
5. Happiness	.685	.768	.680	.938	1

Pearson correlation results showed that there was a significant positive relationship between extrinsic religious orientation and intrinsic religious orientation ($r = .734, p < .01$); between extrinsic religious orientation and the tendency towards critical thinking ($r = .649, p < .01$); between intrinsic religious orientation and the tendency towards critical thinking ($r = .635, p < .01$); between extrinsic religious orientation and happiness ($r = .685, p < .01$); between intrinsic religious orientation and happiness ($r = .768, p < .01$); between extrinsic religious orientation and cognitive flexibility ($r = .575, p < .01$); between intrinsic religious orientation and cognitive flexibility ($r = .597, p < .01$); between cognitive flexibility and the tendency towards critical thinking ($r = .820, p < .01$); between cognitive flexibility and happiness ($r = .680, p < .01$); and between critical thinking and happiness ($r = .938, p < .01$).

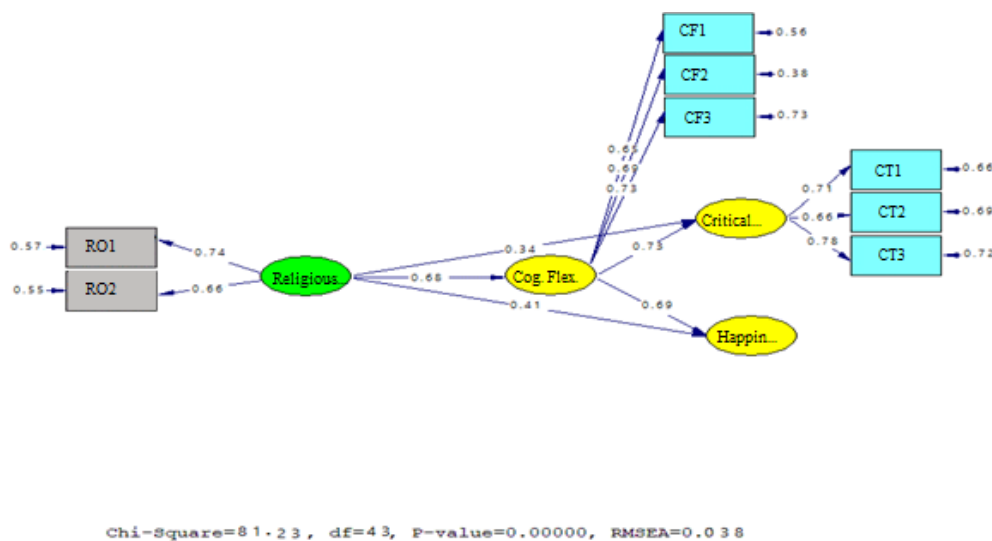
Prior to data analysis using the statistical method of path analysis, assumptions of multivariate normality, linearity, absence of multicollinearity, and error independence were confirmed. Normality of the data was assessed using

skewness and kurtosis tests (Table 1). Since all skewness and kurtosis statistics for the research variables ranged between -2 and +2, the assumption of data normality was confirmed. To examine multicollinearity, tolerance statistics and variance inflation factors were used, showing that all variables had variance inflation factors less than 10 and tolerance statistics greater than 0.1; hence, the assumption of no multicollinearity was met. Additionally, the independence of errors assumption was tested using the Durbin-Watson test. The obtained value in this study was 2.29, which, being within the range of 1.5 to 2.5, indicates adherence to the assumption of error independence. Given these conditions, the fit of the proposed model can be assessed based on fit indices. Path analysis was used to evaluate the proposed model of the study.

The proposed model for developing a structural model explaining the structural model for parents' religious orientation with the tendency towards critical thinking and happiness with the mediating role of cognitive flexibility in students is presented in Figure 1.

Figure 1

The Final Model in Standard Form



In this study, the χ^2 value was 81.23 with 43 degrees of freedom. The χ^2/df ratio of 1.89, being less than 3, indicates an excellent model fit. The Goodness of Fit Index (GFI) was 0.917, demonstrating an acceptable model fit. The Adjusted Goodness of Fit Index (AGFI) was 0.863, which is greater than 0.85, thus the model is considered to have a good fit. The Root Mean Square Error of Approximation (RMSEA) was 0.038, and since it is less than 0.1, it is considered

favorable and confirms the research model. The Normed Fit Index (NFI) was 0.920, the Tucker-Lewis Index (TLI) was 0.929, the Comparative Fit Index (CFI) was 0.923, and the Relative Fit Index (RFI) was 0.934, all of which indicate a satisfactory model fit and support the research model.

Given the quantitative fit indices, it can be concluded that the theoretical model of the research is acceptable. For testing the research hypothesis, the p-value index was used,

and the condition for a relationship to be considered significant is that this index for the intended relationship is less than 0.05. Therefore, the primary hypothesis of the research that the model based on the relationship between

parents' religious orientation and the tendency towards critical thinking and happiness with the mediating role of cognitive flexibility in students is adequately fitted is confirmed.

Table 3

Indirect Path Estimates in the Model Using Bootstrap

Path	Estimate	Upper Bound	Lower Bound	Significance Level
Religious Orientation → Cognitive Flexibility → Tendency Towards Critical Thinking	0.474	0.354	0.105	0.001
Religious Orientation → Cognitive Flexibility → Happiness	0.448	0.384	0.121	0.001

Based on Figure 1 and Table 3, for the effect of parents' religious orientation on the tendency towards critical thinking mediated by cognitive flexibility, an indirect effect coefficient of 0.474 has been estimated, which is significant at the 99% confidence level; this is because the bootstrap test results for the indirect effect showed that the lower and upper bounds of this path coefficient do not include zero (95% CI: 0.105 to 0.354). Therefore, the mediating role of cognitive flexibility in this hypothesis is confirmed. Similarly, for the

effect of parents' religious orientation on happiness mediated by cognitive flexibility, an indirect effect coefficient of 0.448 has been estimated, which is significant at the 99% confidence level; this is because the bootstrap test results for the indirect effect showed that the lower and upper bounds of this path coefficient do not include zero (95% CI: 0.121 to 0.384). Therefore, the mediating role of cognitive flexibility in this research hypothesis is confirmed.

Table 4

Estimates of Direct Effects Among Model Variables

Path	Standardized Coefficients	Standard Error	Critical Ratio	Significance Level
Religious Orientation → Tendency Towards Critical Thinking	0.45	0.456	5.43	0.0005
Religious Orientation → Happiness	0.41	0.390	5.40	0.0005
Cognitive Flexibility → Tendency Towards Critical Thinking	0.73	0.231	7.18	0.0005
Cognitive Flexibility → Happiness	0.69	0.245	6.77	0.0005
Religious Orientation → Cognitive Flexibility	0.68	0.232	6.67	0.0005

Based on Figure 1 and Table 4, the direct effect power of parents' religious orientation on cognitive flexibility in students was calculated as 0.68, indicating a favorable correlation. The t-test statistic of 6.67 is also greater than the critical t-value at the 0.05 error level, i.e., 1.96, indicating that the observed correlation is significant. Therefore, it can be stated that parents' religious orientation has a direct effect on students' cognitive flexibility and is statistically significant.

In conclusion, the findings confirm the significant direct effects of parents' religious orientation on students' cognitive flexibility, critical thinking tendencies, and happiness. The mediating role of cognitive flexibility is also substantiated in enhancing these psychological attributes in students.

4. Discussion and Conclusion

The current study aimed to determine the fit of a model based on the relationship between parents' religious orientation and the inclination towards critical thinking and happiness, mediated by cognitive flexibility in students. The findings estimated the indirect effect coefficient of religious orientation on the inclination towards critical thinking mediated by cognitive flexibility to be 0.474, significant at the 99% confidence level. Similarly, the indirect effect of religious orientation on happiness, mediated by cognitive flexibility, was estimated at 0.448, also significant at the 99% confidence level.

The results showed a positive relationship between intrinsic religious orientation and the inclination towards critical thinking; as intrinsic religious orientation increases,

so does the inclination towards critical thinking. This finding is consistent with the study by Ghodumizadeh and Fuladchang (2015), which demonstrated that internalized religious orientation positively predicts the inclination towards critical thinking (Fouladchang & Ghodoumi Zadeh, 2016).

Findings indicated a positive relationship between extrinsic religious orientation and the inclination towards critical thinking, which increases with higher levels of extrinsic religious orientation. This finding contrasts with the result of the study by Ghodumizadeh and Fuladchang (2015), which indicated that extrinsic religious orientation negatively predicts the inclination towards critical thinking. However, other researchers found that individuals with supernatural (non-religious) beliefs are weak in critical thinking skills, and a global correlation exists between supernatural beliefs and weak critical thinking (Fikriyati et al., 2022). Kirby (2008) also found in his study that extrinsic religious orientation leads to a decrease in some critical thinking skills such as inductive reasoning and hypothesis formulation in arguments (Fouladchang & Ghodoumi Zadeh, 2016). Extrinsic religious orientation negatively predicts the inclination towards critical thinking because individuals with an extrinsic orientation act according to external pressures and existing rules, which do not require much reasoning or decision-making about how to behave or what beliefs to hold.

The findings showed a relationship between cognitive flexibility and the inclination towards critical thinking, which aligns with the study by Guner and Gokce (2021) indicating that the inclination towards critical thinking and cognitive flexibility in students positively and significantly affect each other. Critical thinking includes creativity as one of its components (Güner & Gökçe, 2021). According to Diamond (2013), cognitive flexibility is a prerequisite for other mental functions and a significant factor in performing high-level cognitive tasks such as creativity. Other terms and components of cognitive flexibility include mental flexibility, mental set shifting, cognitive shifting, task switching, and attention shifting, all essential for creativity (Diamond, 2013). De Dreu et al. (2011) suggest that fostering creative thinking through cognitive flexibility involves setting aside the dominant background and utilizing extensive hierarchical associations, occurring in divergent thinking using extensive cognitive categorizations and shifting between them (De Dreu et al., 2011). Cognitive flexibility involves examining a problem from different perspectives, considering various solutions, and choosing

the best one, which can foster commitment and creativity skills in students. Engagement or commitment, as behavior based on responsibility and obligation, is more often seen in individuals who possess self-directed cognitive abilities, inhibition, and impulse control. In relation to creativity, it can be emphasized that this component of critical thinking forms when characteristics associated with cognitive flexibility, such as considering simultaneous contradictory representations of an object or an event and adapting to changing environmental stimuli, dominate an individual's thinking.

Findings indicated a relationship between religious orientation and cognitive flexibility. This finding is consistent with the study by Khairi et al. (2021), which showed that religious attitudes affect cognitive flexibility (Khairi et al., 2022). Khayri et al. (2021) found that individuals with strong religious beliefs use positive religious coping strategies such as forgiveness, seeking spiritual connection with God, befriending religious people, receiving spiritual and social support, having hope, recognizing God as a kind benefactor, and positively interpreting life's stressful events. It seems that religious attitudes are employed in a flexible manner that enables individuals to accept and consider other perspectives. In other words, the religious system plays a vital role in human society. Cognitive mechanisms, including extensive cultural and religious assumptions, are flexible and enable humans to adapt to diverse conditions (Khairi et al., 2022).

Findings also showed a relationship between intrinsic religious orientation of parents and the happiness of their children, which increases with the parents' intrinsic religious orientation. This finding is in line with the studies (Akbarian, 2016; Anand & Singh, 2015; Atashafrouz et al., 2015; Khoshnevis & Dejakam, 2018) demonstrated a positive and significant relationship between the intrinsic religious orientation of parents and the components of positive affect, absence of negative affect, and overall life satisfaction, thus mental well-being of children. The study by Atashafrouz et al. (2015) showed that the component of intrinsic religious orientation has a significant positive relationship with the variable of happiness (Atashafrouz et al., 2015). Anand (2015) also reported a significant positive correlation between intrinsic religious orientation and happiness. In explaining this finding, it can be said that in a person with an intrinsic religious orientation, solid personal beliefs are central and significant; while the social aspects of religion are not important (Anand & Singh, 2015). When religious beliefs are at a high level, happiness also increases; because

belief in God empowers humans, and thus, followers of many religions feel that they are not alone in facing difficulties and that God is their helper. Myers (2000) also believes that religious faith greatly affects the level of happiness. Therefore, religion serves as a source for positive interpretation of events and cognitive evaluation and environmental control source. In other words, religion, as a rich source of meaning and purpose, brings about internal control. Individuals with an intrinsic religious orientation are more resilient and happier than those with an extrinsic religious orientation (Atashafrouz et al., 2015). In intrinsic religious orientation, faith is valuable and beneficial for its own sake, not as a means to achieve goals. In fact, true happiness is in the soul, and this joy can be achieved through beliefs and religious orientations. Especially in the noble religion of Islam, which considers joy and happiness as part of human nature, and its soul-refreshing laws bring joy and happiness to its followers. Islam, considering the basic needs of humans, has praised and approved joy and happiness; such that the Quran, one of the best and most robust sources of Islam, considers a joyful and happy life as a blessing and mercy of God and considers a life always accompanied by crying, lamenting, and moaning against God's mercy and blessing.

Findings also demonstrated a positive relationship between extrinsic religious orientation of parents and the happiness of their children, which increases with the parents' extrinsic religious orientation. This finding aligns with the studies (Jafari, 2015; M. Mohammadi et al., 2016) found that religious orientation and participation in religious rituals, even if for superficial purposes, lead to an increase in self-care in patients. Additionally, Mohammadi et al. (2016) reported that there is a positive correlation between extrinsic religious orientation and mental health components (Jafari, 2015; M. Mohammadi et al., 2016). In explaining this finding, according to Allport (1967), extrinsic religious orientation is an external and instrumental affair used to satisfy individual needs such as status and security. Individuals with an extrinsic religious orientation prioritize their personal benefits and use their religious beliefs as a means to achieve their desires; therefore, extrinsic religious orientation may bring about short-term happiness (Allport & Ross, 1967).

Findings indicated a relationship between cognitive flexibility and happiness. This finding is consistent with the prior studies (Koesten et al., 2009). Koesten et al. (2009) demonstrated that there is a relationship between cognitive flexibility and well-being. Indeed, cognitive flexibility is one

of the components of cognitive communication skills and may be a key determinant for understanding the self-efficacy needed for decision-making in a healthy lifestyle, decisions that can ultimately impact an individual's well-being and happiness. Individuals who are cognitively flexible may be better equipped to manage and cope with personal problems and stress. Such coping abilities, in turn, lead to more positive outcomes for physical and mental health and happiness. Individuals with cognitive flexibility, by considering and employing various coping strategies to solve problems and reduce distress, show optimal performance (Koesten et al., 2009). They are aware of cognitive alternatives, perceive difficult situations as controllable, challenge these situations successfully, change maladaptive thoughts to adaptive thinking, enjoy higher psychological well-being, and as a result, experience greater happiness.

5. Suggestions and Limitations

The present study provides valuable insights into the relationships between parents' religious orientation, critical thinking tendency, happiness, and cognitive flexibility among female high school students. However, several limitations should be considered. Firstly, the reliance on self-report measures, such as questionnaires, introduces the possibility of response bias and social desirability bias, potentially affecting the accuracy of the reported data. Additionally, the study's cross-sectional design prevents establishing causality and understanding the direction of the relationships observed. Longitudinal studies would offer more robust evidence of the temporal relationships between these variables. Furthermore, the study's focus solely on female high school students from public schools in a specific city limits the generalizability of the findings to other populations, such as male students or those from different educational settings or cultural backgrounds. Finally, while the structural equation modeling suggests a satisfactory fit of the proposed model, the complexity of human behavior and the multitude of factors influencing critical thinking and happiness imply that other variables not considered in this study may also play significant roles, warranting further investigation.

The findings of this study indicated that cognitive flexibility mediates the relationship between parents' religious orientation and the inclination towards critical thinking and happiness in students. It is recommended that encouragement in religious practices and education in

cognitive flexibility be considered to enhance happiness and inclination towards critical thinking in students by researchers, educational planners, and counselors.

Authors' Contributions

All authors have contributed significantly to the research process and the development of the manuscript.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

Acknowledgments

We would like to express our gratitude to all individuals helped us to do the project.

Declaration of Interest

The authors report no conflict of interest.

Funding

This research was carried out independently with personal funding and without the financial support of any governmental or private institution or organization.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. This article is derived from the first author's doctoral thesis at the Tonkabon Branch, Islamic Azad University, Tonkabon, Iran. The thesis was approved on October 26, 2021, by the Educational and Postgraduate Committee of the Faculty of Humanities, Tonkabon Branch, under tracking number 162534309 by the specialized committee of the relevant group.

References

Abdollahi, M., Darbani, S. A., & Parsakia, K. (2022). Structural equations the effect of logical-critical thinking style with academic achievement with the mediating role of action control in high school students [Original Research]. *Journal*

- of Assessment and Research in Applied Counseling*, 4(3), 64-78. <https://doi.org/10.52547/jarac.4.4.64>
- Adibi, M., & Gorji, Y. (2017). The Positive Effects of the Solution-Oriented Group Approach on Happiness among Fatherless Female Adolescents in 2015. *Community Health Journal*, 10(3), 1-10. https://chj.rums.ac.ir/article_45790_9eb2a9fa00f8c078b7a070d1dff40066.pdf
- Akbarian, F. (2016). On the relationship between religious attitude and happiness and self-efficacy of high school students. *Journal of School Psychology*, 5(2), 7-19. https://jsp.uma.ac.ir/article_437_7a0f00421c661cdb0f767c98a190fcc7.pdf
- Allport, G. W., & Ross, J. M. (1967). Personal religious orientation and prejudice. *Journal of personality and social psychology*, 5(4), 432-443. <https://doi.org/10.1037/h0021212>
- Anand, P. V., & Singh, S. (2015). Religious orientation, self-esteem and happiness among undergraduate students. *Indian Journal of Positive Psychology*, 6(4). <https://search.ebscohost.com/login.aspx?direct=true&profile=ehost&scope=site&authtype=crawler&jml=22294937&AN=115097173&h=dILO%2FFBT%2FmbWsf7rBZG6oInxFvUMap%2Fnt9sHjKREUobV5o5drPaF1aIt7bb22taUe2vPbTZSML8pgC%2FYJWGDA%3D%3D&crI=c>
- Argyle, M. (2000). *Psychology and Religion: An Introduction*. Routledge. <https://books.google.com/books?id=N3R770pxNksC>
- Argyle, M., & Lu, L. (1990). The happiness of extraverts. *Personality and individual differences*, 11(10), 1011-1017. [https://doi.org/10.1016/0191-8869\(90\)90128-E](https://doi.org/10.1016/0191-8869(90)90128-E)
- Argyle, M., Martin, M., & Crossland, J. (1989). Happiness as a function of personality and social encounters. *Recent advances in social psychology: An international perspective*, 189-203. <https://www.scirp.org/reference/ReferencesPapers?ReferenceID=1343179>
- Atashafrouz, A., Azemi, K., & Amini, M. (2015). The relationship of spiritual intelligence and religious orientation with happiness Among students of Kharazmi University [Research]. *Islam and Health Journal*, 2(3), 7-14. <http://iahj.ir/article-1-135-en.html>
- Bagheri, M., Omid, A., Kohan, M., & Mohamadi kia, s. A. (2019). The Relationship between Critical Thinking Disposition and Clinical Reasoning in Medical Residents of Medical University of Isfahan [Original research article]. *Iranian Journal of Medical Education*, 19(0), 259-270. <http://ijme.mui.ac.ir/article-1-4675-en.html>
- Carvalho, A. A., & Moreira, A. (2005). Criss-crossing Cognitive Flexibility Theory based research in Portugal: an overview. *Interactive Educational Multimedia*, 1-26. <https://revistes.ub.edu/index.php/IEM/article/view/11795>
- De Dreu, C. K. W., Nijstad, B. A., Bechtoldt, M. N., & Baas, M. (2011). Group creativity and innovation: A motivated information processing perspective. *Psychology of Aesthetics, Creativity, and the Arts*, 5(1), 81-89. <https://doi.org/10.1037/a0017986>
- Dennis, J. P., & Vander Wal, J. S. (2010). The Cognitive Flexibility Inventory: Instrument Development and Estimates of Reliability and Validity. *Cognitive therapy and research*, 34(3), 241-253. <https://doi.org/10.1007/s10608-009-9276-4>
- Diamond, A. (2013). Executive Functions. *Annual review of psychology*, 64(Volume 64, 2013), 135-168. <https://doi.org/10.1146/annurev-psyach-113011-143750>
- Fikriyati, A., Agustini, R., & Suyatno, S. (2022). Pre-service science teachers' critical thinking dispositions and critical thinking skills. Eighth Southeast Asia Design Research (SEA-

- DR) & the Second Science, Technology, Education, Arts, Culture, and Humanity (STEACH) International Conference (SEADR-STEACH 2021).
- Fouladchang, M., & Ghodoumi Zadeh, F. (2016). The Mediation of Students' Religious Orientation in Relation to Family Communication Patterns and Critical Thinking Dispositions [Research]. *Applied Issues in Quarterly Journal of Islamic Education*, 1(1), 107-132. <https://doi.org/10.29252/qaie.1.1.107>
- Gul, R., Cassum, S., Ahmad, A., Khan, S., Saeed, T., & Parpio, Y. (2010). Enhancement of critical thinking in curriculum design and delivery: A randomized controlled trial for educators. *Procedia - Social and Behavioral Sciences*, 2(2), 3219-3225. <https://doi.org/10.1016/j.sbspro.2010.03.491>
- Güner, P., & Gökçe, S. (2021). Linking critical thinking disposition, cognitive flexibility and achievement: Math anxiety's mediating role. *The Journal of Educational Research*, 114(5), 458-473. <https://doi.org/10.1080/00220671.2021.1975618>
- Haghighati, F., Pak, R., & Bafandeh, H. (2019). Comparing the executive function and cognitive flexibility and theory of mind in foster and non-foster children [Research]. *Rooyesh-e-Ravanshenasi Journal (RRJ)*, 8(3), 29-36. <http://frooyesh.ir/article-1-899-en.html>
<http://frooyesh.ir/article-1-899-en.pdf>
- Jafari, Y. R., Jamila; Take a look, Samia; Lashkardoost, Hossein; Mohaddes Hakak, Hamidreza and Mousavi Jajermi, Seyyed Morteza. (2015). The relationship between religious orientation and Self-care practice in patients with type 2 diabetes. *Journal of North Khorasan University of Medical Sciences*, 7(2), 453-463. <https://www.magiran.com/paper/1449197>
- Khairi, Y., Shalchi, B., & Kazemi, S. A. (2022). The relationship between mindfulness and religious attitude with forgiveness: the mediating role of cognitive flexibility. *Quarterly Journal of Psychology and Religion*, 14(4), 133-149. <https://www.magiran.com/paper/2415190>
- Khalilifar, M., Kazemi, S., & Javidi, H. (2014). Mediating Role of Religious Orientation for Parenting Styles and Meaning of Life in Junior High School Students in Shiraz. *Psychological Models and Methods*, 4(15), 59-73. https://jpm.m.marvdasht.iau.ir/article_448_29e4e70392b292740691ccaa91c2042f.pdf
- Khoshnevis, E., & Dejakam, F. (2018). Relationship Between Parent's Religious Orientation and Their Parenting Styles with the Children's Mental Well-Being. *Iranian Journal of The Knowledge Studies in The Islamic University*, 22(75), 241-260. <https://www.magiran.com/paper/1882474>
- Khoshsorour, S., & Mikaeili, N. (2021). The Role of Social Comparison, Interpersonal Sensitivity and Cognitive Flexibility in Predicting Disordered Eating Attitudes in Female Students. *Social Psychology Research*, 11(43), 141-166. <https://doi.org/10.22034/spr.2021.277112.1629>
- Koesten, J., Schrodt, P., & Ford, D. J. (2009). Cognitive Flexibility as a Mediator of Family Communication Environments and Young Adults' Well-Being. *Health Communication*, 24(1), 82-94. <https://doi.org/10.1080/10410230802607024>
- Luhmann, M., Necka, E. A., Schönbrodt, F. D., & Hawkley, L. C. (2016). Is valuing happiness associated with lower well-being? A factor-level analysis using the Valuing Happiness Scale. *Journal of research in personality*, 60, 46-50. <https://doi.org/10.1016/j.jrp.2015.11.003>
- Mohammadi, J., Gholamrezaee, S., & Azizi, A. (2016). The Relationship between Religious Orientation and Mental Health among female nurses working in public hospitals of Tabriz in 2014. *Journal of Sabzevar University of Medical Sciences*, 22(6), 1080-1087. https://jsums.medsab.ac.ir/article_794_4d94306446b11900f5afd5de8d1b3d32.pdf
- Mohammadi, M., Danesh, E., & Taghilou, S. (2016). Predicting hope based on religious orientation and time perspective. *Applied Psychology*, 10(3), 157-174. https://apsy.sbu.ac.ir/article_96589_00c0a26722f781136fdd582e12b87c7e.pdf
- Parsakia, K. (2023). The Effect of Chatbots and AI on The Self-Efficacy, Self-Esteem, Problem-Solving and Critical Thinking of Students. *Health Nexus*, 1(1), 71-76. <https://doi.org/10.61838/hn.1.1.14>
- Popil, I. (2011). Promotion of critical thinking by using case studies as teaching method. *Nurse Education Today*, 31(2), 204-207. <https://doi.org/10.1016/j.nedt.2010.06.002>
- Sadri Demirchi, I., Mojarradi, A., & Pirqoli Kiwi, M. (2019). A Comparison of the Locus of Control, Unreasonable Beliefs and Religious Orientation in Divorce and Ordinary Women in Ardabil in 2016. *Journal of Pizhuhish dar din va salamati*, 5(4), 73-87. <https://www.magiran.com/paper/2066340>
- Shafii, N., Shahabizadeh, F., & Pourshafei, H. (2013). Religious Orientation and External Control Center; Introducing a Model for Achieving Happiness for Students. *Ravanshenasi Va Din*, 5(4), 105. <https://www.magiran.com/paper/1111128>
- Soltani, I., Shareh, H., Bahrainian, S. A., Majid, & Farmani, A. (2013). The mediating role of cognitive flexibility in correlation of coping styles and resilience with depression [Original]. *Pajoohande*, 18(2), 88-96. <http://pajoohande.sbm.ac.ir/article-1-1518-en.html>
- Tajarod, A., Fazel, A., & Ghasemi, F. (2014). The Effects of Creative and Critical Thinking Skills on Psychological Well-Being of High School Students in Jahrom. *Thinking and Children*, 5(9), 21-37. https://fabak.ihcs.ac.ir/article_1247_d04d78885b84be75ef585e14e40f4c7c.pdf
- Ulaş, A. H., Koçak, B., & Karabacak, H. (2012). Examination of critical thinking levels of fifth grade students in primary education in terms of their success in the Turkish language course. *Procedia - Social and Behavioral Sciences*, 31, 880-885. <https://doi.org/10.1016/j.sbspro.2011.12.161>