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Examining The Relationship Between Peer Bullying And Communication Skills Of Secondary School Students

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Abstract

In this study, the relational screening method, one of the general screening designs, was used to reveal the relationship between secondary school students' tendencies to be bullies or victims and their communication skill levels, and the relationship correlation between the two variables was examined. The study group of the research consists of 512 secondary school students (5-6-7-8th grade) in the Central District of Bolu Province, studying in the 2023-2024 academic year. In the study, data were collected through "Personal Information Form", "Peer Bullying Identification Scale Adolescent Form" and "Communication Skills Inventory". It was observed that the answers given to the "Peer Bullying Identification Scale Adolescent Form" did not show a normal distribution in both the total score and its sub-dimensions. For this reason, non-parametric tests were used in independent analyses. Mann–Whitney U test and Kruskal Wallis-H tests were performed. Spearman Correlation Test was used to evaluate correlations between subscales. Since the total score of the "Communication Skills Inventory" showed a normal distribution, ANOVA and t Test were used in independent tests of this scale. Students' communication skills showed a significant difference in favor of girls in terms of gender. It has been found that peer bullying is most common in males in terms of gender. It was determined that there was a significant negative relationship between communication skills and peer bullying and its sub-dimensions.

Keywords:
Peer bullying, communication skills, communication, peer, bully, victim.

1. Introduction

The science we have been working on today has emerged due to human socialization. From the moment humans are born, they begin to socialize by communicating with others. The stable continuation of societies is a key aspect of the socialization process (Linton, 1945). Of course, the family environment is where the socialization process, that is, the transmission of societal values and norms to the individual, first takes place (Yazgan İnanç et

al., 2019). The institution that follows this in second place is schools. Since the dawn of humanity, individuals have always strived for socialization and have worked to establish, manage, and maintain societies. Creating an environment necessary for managing society will be more feasible with the acquisition of desired behaviors by the individuals who make up that society. According to the functional approach, schools serve as institutions that educate individuals and instill desired behaviors to maintain social order and prosperity (Erdoğan, 2017). For this reason, when seeking solutions to social problems, the family, school, and environment in which the individual is involved in the socialization process are the focus of many studies. In light of this information, when solving problems that arise in society, it would be correct to focus on the source of the problem, namely the individual's family life and development (education is a long part of this process). One of the important problems today is the problem of violence, which has become a threat to humanity in terms of its vital struggle. Research and statistical data show that the rate of violence is increasing every year. This situation requires societies and the world as a whole to find solutions to the problem of violence, ensuring the healthy transmission of humanity to future generations. Any scientific work done in this area is of great importance to humanity.

Violence is a result of human aggression. Therefore, the first issue we must address is aggression. According to the dictionary definition, aggression is characterized as symbolic, verbal, or physical behaviors that arise when an individual feels fear, harbors hostile feelings, enters into competition, is obstructed, becomes angry, or defends themselves (Budak, 2005). Many different theories have interpreted aggressive behavior within their own frameworks. For example, Freud, a proponent of the psychoanalytic approach, initially argued that aggression arose as a result of the inhibition of libido. However, with the increase in wars, he changed his view, arguing that aggression arose from the death instinct in humans and that it was an energy that needed to be released. According to the evolutionary view, aggression is seen as an effort to survive, while the behavioral school explains it as a response to stimuli. The fact that multiple attitudes have been developed toward aggression indicates that it is a complex problem requiring solutions across various dimensions (Karslı, 2020). The concept of peer bullying, which is part of this multidimensional structure of aggression, has emerged in recent years, particularly in schools, and has become an increasingly significant risk factor in our lives, negatively affecting children's psychosocial development and academic life, and consequently, society, despite the studies conducted on the subject. Dan Olweus has been a prominent figure in the international literature on the concept of peer bullying, which is referred to as "bullying" or "peer bullying." The OECD (Organization for Economic Cooperation and Development) reported in its research that 24% of children in our country are exposed to bullying several times a month (OECD, 2023). According to the Ministry of National Education's 2021-2022 statistics, approximately 20 million students are enrolled in preschool, primary, and secondary education (MEB, 2022). When we consider the rates that place us at the top of the global rankings—those who are exposed to bullying, those who bully, and those who remain silent—the seriousness and importance of the situation becomes clear once again.

The characteristic that distinguishes peer bullying from aggression is that it is intentional and repetitive. Power imbalance is also defined as a contributing factor in peer bullying. The actors in the concept of peer bullying are categorized into four groups: the bully, the victim, the bully-victim (who both bullies and is bullied), and neutral students who remain silent in the face of the incidents they witness. Physical and verbal bullying are the main factors of peer bullying, followed by exclusion, spreading rumors, and, in the final stage, damaging property and sexual bullying (Pişkin & Ayas, 2011). Following the addition of these final dimensions, the scope of aggression in the concept of peer bullying has expanded and now shares more commonalities with behavioral disorders. Aggression is recognized as a criterion for conduct disorder in the DSM-IV, a reference book published by the American Psychiatric Association that classifies behavioral disorders (this source is updated at regular intervals). The most important aspect of conduct disorder is the individual's failure to respect the rights of others, along with physical, verbal, covert, or overt aggression, destructive behavior, overt sexual behavior, and fearless behavior toward others. (Butcher et al., 2013).

When looking at different societies, the most common symptoms of conduct disorder are aggression and violent behavior. When examining the effect of socialization on this situation, it is thought that in cultures where individualism is at the forefront, the likelihood of violence is higher due to the prevalence of a competitive environment. In contrast, the likelihood is lower in authoritarian cultures where social cohesion is at the forefront (Cooke, 1996). We see that individuals who exhibit behavioral disorders at a young age often develop antisocial personality disorder as they grow older, and that despite many tried and tested methods, treatment is not always successful. They continue to exhibit behaviors that disrupt social order. In the early 1990s, a ten-year study was conducted with 891 students exhibiting aggressive behavior in high-risk schools. In this study, the students were divided into a control and an experimental group. The students in the experimental group received training in parent behavior management, children's social-cognitive skills, reading, home counseling, and a universal classroom curriculum. At the end of the study, significant changes were observed in the aggressive behavior of students in the control group (Dodge, 2007). Numerous studies in the literature indicate that children exhibiting aggressive behavior often struggle to express themselves and resort to destructive behavior. Like adults, young children usually exhibit tantrums, anger, and damage objects when they are unable to express themselves effectively.

In this case, aggressive behavior, a negative form of interpersonal communication, can be reduced by teaching individuals the skills to express themselves effectively. Communication, in simple terms, is the art of conveying information. However, upon closer examination, this art reveals many subtleties. The qualities that the person transmitting the information must possess, the qualities that the information must possess during transmission, and the qualities of the person receiving the information are all subtleties that illustrate the importance of the communication process. Every individual must communicate effectively as part of society and possess strong communication skills for a healthy relationship with others. Individuals who cannot adapt to society are more likely to have problems that pose a risk to society, such as antisocial personality disorder.

1.1. The Present Study

In conclusion, individuals are organisms that can survive in society. While participating in this social process, they communicate with their surroundings. Individuals who lack the necessary communication skills in interpersonal relationships often struggle to express themselves and socialize effectively. Aggression, which is one of the main social problems, and therefore peer bullying behavior, is exhibited by individuals who cannot express themselves, do not know how to manage their anger, and lack empathy. In general, it is believed that individuals who are involved in peer bullying in some way lack communication skills. This study examines the communication skill levels of peer bullying actors and aims to offer a different solution to this type of aggression experienced in schools. The main objective of this study is to examine the relationship between peer bullying and communication skills among 5th, 6th, 7th, and 8th-grade students in the second stage of primary education (middle school). In addition to this objective, the sub-objectives were determined as the differences in peer bullying and communication skills according to demographic characteristics. In line with these objectives, the study sought answers to the following questions:

1. Is there a significant relationship between communication skills and perpetration of or exposure to physical bullying?
2. Is there a significant relationship between communication skills and perpetration of or exposure to verbal bullying?
3. Is there a significant relationship between communication skills and perpetration of or exposure to bullying through social exclusion?
4. Is there a significant relationship between communication skills and perpetration of or exposure to bullying through rumor-mongering and spreading gossip?
5. Is there a significant relationship between communication skills and perpetration of or exposure to bullying through damaging others' property?
6. Is there a significant relationship between communication skills and perpetration of or exposure to sexual bullying?

In summary, aggressive behaviors that begin at an early age are classified as conduct disorder according to the DSM-IV and, if left untreated, may persist into antisocial personality disorder. Research has shown that cognitive-behavioral interventions are particularly effective in reducing aggressive and antisocial behaviors among adolescents (Özbek & Taneri, 2022). Since treatment becomes more difficult and costly in later years, and because such behaviors pose a threat to society, early intervention is essential. Therefore, it is crucial to address aggressive tendencies and bullying behaviors during middle school, a developmental period when social adaptation and communication skills can be effectively strengthened to prevent future violent incidents. This study is significant because it examines the relationship between peer bullying and communication skills in middle school students, offering a new perspective on preventive intervention.

2. Methodology

This section discusses the research model, study group, scales used for data collection, the data collection process, and the analysis.

2.1. Research Model

In this study, which examines the relationship between middle school students' communication skills and peer bullying, I have used a correlational survey model. There are two primary designs in quantitative research: surveys and experiments. In the experimental model, the researcher produces data to reveal the cause-and-effect relationship. The survey model aims to describe a situation related to the population by selecting a sample from the population and using the sample group as a basis. The correlational survey model reveals the existence and extent of changes in two or more variables. In doing so, it uses comparison and correlation methods (Creswell, 2014). In this study, the correlational survey method was employed among the general survey designs to investigate the relationship between middle school students' tendencies to be bullies or victims and their communication skill levels. The correlation between the two variables was also examined.

2.2. Research Sample

The study sample consists of 512 middle school students (grades 5–6–7–8) enrolled in the 2023–2024 academic year in the Central District of Bolu Province. The schools participating in the study were selected using

a simple random sampling method, and students' voluntary participation was considered while completing the questionnaires. The demographic characteristics of the participants are presented in Table 1, which shows the frequency and percentage distributions.

Table 1.

Findings Related to Demographic Characteristics of Middle School Students

Student Gender	Frequency (N)	Percentage (%)
Gender		
Female	278	54.3
Male	234	45.7
Total	512	100
Student Age		
11 Age	140	27.3
12 Age	134	26.2
13 Age	146	28.5
14 and above	92	18
Total	512	100
Class Level		
5. Grade	102	19.9
6. Grade	134	26.2
7. Grade	150	29.3
8. Grade	126	24.6
Total	512	100
School Type		
Private Middle School	119	23.2
Public Middle School	256	50
Official Imam Hatip Middle School	137	26.8
Total	512	100

According to the findings in Table 1, 278 (54.3%) of the 512 middle school students are female, and 234 (45.7%) are male. There are 140 (27.3%) students aged 11, 134 (26.2%) aged 12, 146 (28.5%) aged 13, and 92 (18%) aged 14 and above. There are 102 (19.9%) students in 5th grade, 134 (26.2%) in 6th grade, 150 (29.3%) in 7th grade, and 126 (24.6%) in 8th grade. Of the students, 119 (23.2%) are enrolled in private middle schools, 256 (50%) in public middle schools, and 137 (26.8%) in public Imam Hatip middle schools.

2.3. Data Collection Tools

In the study, data were collected using the "Personal Information Form," "Peer Bullying Identification Scale Adolescent Form (PBISAF)," and "Communication Skills Inventory (CSI)."

2.3.1. Personal Information Form

The personal information form, prepared to collect demographic information about the study's students, includes questions about their age, gender, grade level, type of school they attend, parents' education levels, mothers' employment status, number of siblings, and whether they receive sports training.

2.3.2. Peer Bullying Identification Scale Adolescent Form

The Peer Bullying Scale developed by Ayas and Pişkin (2015) consists of two parallel instruments: the Bully Scale and the Victim Scale. Confirmatory factor analysis conducted during development demonstrated adequate model fit, indicating that the scales are suitable for students in grades 6 through 12. The goodness-of-fit indices reported in the original study were χ^2 = 5981.01 (df = 1316, p = .0000), χ^2/df = 4.54, RMSEA = 0.043, GFI = 0.89, AGFI = 0.88, CFI = 0.97, NFI = 0.96, and NNFI = 0.97, all of which fall within acceptable and good fit ranges, confirming the structural validity of the instrument. Each scale includes 53 items distributed across six subdimensions: Physical, Verbal, Exclusion, Rumor-Mongering, Damage to Property, and Sexual Bully/Victim. The "I Did It" column represents bullying behavior, whereas the "It Was Done to Me" column represents victimization. Total scores range from 53 to 265, with higher scores indicating a greater tendency toward bullying or victim behavior. Subdimension scores can be evaluated separately for a more detailed understanding of behavioral characteristics. In the present study, the Cronbach's alpha coefficients were found to be 0.92 for the Bully Scale

and 0.93 for the Victim Scale, demonstrating excellent internal consistency. Subdimension reliability coefficients were Physical (0.83 for Bully / 0.82 for Victim), Verbal (0.74 / 0.75), Exclusion (0.75 / 0.77), Rumor-Mongering (0.66 / 0.75), Damage to Property (0.79 / 0.80), and Sexual (0.88 / 0.88). According to Uzunsakal and Yıldız (2018), Cronbach's alpha values between 0.60 and 0.80 indicate moderate reliability, while values between 0.80 and 1.00 indicate high reliability. Based on these findings, and consistent with the original validation study, the Peer Bullying Scale demonstrates high reliability and satisfactory model fit.

2.3.3. Communication Skills Inventory

The Communication Skills Inventory, developed by Ersanlı and Balcı (1998), was initially designed to assess the communication skill levels of university students and later adapted for different age groups to confirm its reliability and validity across broader populations. The inventory comprises three subdimensions: Cognitive (Z), Emotional (D), and Behavioral (T), each consisting of 15 items, totaling 45 items. The Cognitive dimension includes items 1, 3, 6, 12, 15, 17, 18, 20, 24, 28, 30, 33, 37, 43, and 45; the Emotional dimension includes items 5, 9, 11, 19, 26, 27, 31, 34, 35, 36, 38, 39, 40, 42, and 44; and the Behavioral dimension includes items 2, 4, 7, 8, 10, 13, 14, 16, 21, 22, 23, 25, 29, 32, and 41. Each item is rated on a five-point Likert scale ranging from 1 (Never) to 5 (Always). Scoring can be computed separately for each subdimension, or as a total score; in the present study, total scores were used to assess general communication skill levels. The possible total score ranges from 45 to 225, and each subdimension ranges from 15 to 75, with higher scores indicating higher communication skills. Items 2, 3, 5, 9, 10, 11, 19, 22, 23, 24, 27, 31, 34, 35, 37, 41, and 42 are reverse-scored. Reliability analyses of the final version of the scale showed strong internal consistency. Correlations between subscale scores and total scores were 0.83 for the Cognitive dimension, 0.73 for the Emotional dimension, and 0.82 for the Behavioral dimension, indicating high homogeneity among items. In addition, the test–retest reliability coefficient was found to be .68, the split-half reliability coefficient was .64, and the Cronbach's alpha coefficient was .72, all suggesting satisfactory reliability. These results demonstrate that the Communication Skills Inventory is a psychometrically sound and reliable tool for measuring communication competence across diverse populations and contexts, supporting its use in research and applied educational settings.

2.4. Data Analysis

Each data set was first numbered during the analysis of the study's data, and a scoring table was created for the Personal Information Form. For the Peer Bullying Identification Scale Adolescent Form and the Communication Skills Inventory, scoring tables obtained from the scale owners were used. Data entries were processed in Microsoft Excel 2016 according to the scoring tables. During data entry, 96 forms containing missing information or incorrect markings were discarded and excluded from the study. The statistical results of the study were obtained using IBM SPSS Statistics 25. A total of 512 error-free data points were transferred to the SPSS program. The frequency percentages of the demographic data were first examined in the analyses. Then, the normal distribution of the sub-factors and total scores of the scales was checked. It was observed that the responses to the "Peer Bullying Identification Scale Adolescent Form" did not show a normal distribution in either the total score or the sub-dimensions. For this reason, non-parametric tests were used in the independent analyses. Mann–Whitney U tests and Kruskal-Wallis H tests were conducted. The Spearman Correlation Test was used to evaluate the correlations between the sub-dimensions. Since the total score of the "Communication Skills Inventory" showed a normal distribution, ANOVA and t-tests were used in the independent tests of this scale

3. Findings

This study examines the relationship between middle school students' communication skills and peer bullying. In the first stage of the analysis, demographic characteristics included in the Personal Information Form were determined using descriptive statistics. Since both scales used in the study were based on total scores, the total scores of the Peer Bullying Identification Scale Adolescent Form subscales and the Communication Skills Inventory scores were included in the analysis as variables. As a result of normality tests, it was observed that the Peer Bullying Scale Adolescent Form did not show a normal distribution. In contrast, the Communication Skills Inventory showed a normal distribution. Although the values vary depending on different experts, we can accept that the Skewness and Kurtosis values of the scales indicate a normal distribution within the ±3 limits (Jondeau & Rockinger, 2003). The results of the normality test are shared in Table 2.

Table 2.

Normal Distribution Test Results of the Peer Bullying Identification Scale Adolescent Form and Communication Skills Inventory

	N	$\bar{x}$	SS	Skewness	Kurtosis
Peer Bullying Identification Scale	512	160.6953	18.53924	-.422	.611
Sacrifice Total	512	88.6328	34.00596	1.688	2.077
Bully Total	512	72.1465	25.55053	2.476	2.230

According to the expected distribution test results in Table 2, the skewness and kurtosis values of all scales fall within the acceptable range for normality (±3), indicating that the data distribution does not significantly deviate from normal. Specifically, the Peer Bullying Identification Scale Adolescent Form (PBISAF) total score (skewness = −0.422; kurtosis = 0.611) shows a distribution close to normal, while the Sacrifice (Victim) total score (skewness = 1.688; kurtosis = 2.077) and the Bully total score (skewness = 2.476; kurtosis = 2.230) exhibit a moderate positive skewness, suggesting a slight clustering of scores toward lower values. Nevertheless, since all skewness and kurtosis coefficients remain within the criterion, the dataset can be considered approximately normally distributed (Tabachnick & Fidell, 2019). Therefore, it was deemed appropriate to proceed with parametric statistical analyses in subsequent stages of the study.

The first sub-problem of the study focuses on the relationship between students' communication skills and their involvement in physical bullying behavior and exposure to physical bullying. Table 3 presents the findings regarding this relationship.

Table 3.

Findings of Spearman Correlation Analysis Between Communication Skills and Physical Bullying and Exposure to Bullying

Variables	Communication Skills	Physical Bullying	Exposure to Bullying
Communication Skills	1		
Physical Bullying	-.335 **	1	
Exposure to Bullying	-.265**	.708**	1

*p<0.05 **p<0.01

According to the findings in Table 3, a moderate negative correlation (r = -0.335, p < 0.01) was observed between students' communication skills and physical bullying. Similarly, there appears to be a weak negative correlation (r = -.265, p < 0.01) between students' communication skills and their exposure to physical bullying.

The second sub-problem of the study focuses on the relationship between students' communication skill levels and engaging in verbal bullying behavior and being exposed to verbal bullying. The findings regarding this relationship are presented in Table 4.

Table 4.

Findings of Spearman Correlation Analysis Between Communication Skills and Verbal Bullying and Exposure to It

Variables	Communication Skills	Verbal Bully	Verbal Victim
Communication Skills	1		
Verbal Bully	-.305 **	1	
Verbal Victim	-.264**	.618**	1

*p<0.05 **p<0.01

Table 4 shows a moderate negative correlation (r = -0.305, p < 0.01) between students' communication skills and verbal bullying. Similarly, a weak negative correlation (r = -.264, p < 0.01) is observed between students' communication skill levels and their exposure to verbal bullying.

The third sub-problem of the study focuses on the relationship between students' communication skill levels and engaging in bullying behavior through exclusion and being exposed to exclusion. The findings regarding this relationship are presented in Table 5.

Table 5.

Findings of Spearman Correlation Analysis Between Communication Skills and Bullying and Exposure Through Exclusion

Variables	Communication Skills	Bullying	Exposure Through Exclusion
Communication Skills	1		
Bullying	-.233 **	1	
Exposure Through Exclusion	-.195**	.450**	1

*p<0.05 **p<0.01

According to the findings in Table 5, a weak negative correlation (r = -0.233, p < 0.01) was found between students' communication skills and bullying through exclusion. Similarly, there appears to be a weak negative correlation (r = -0.195, p < 0.01) between students' communication skills and their exposure to bullying through exclusion.

The fourth sub-problem of the study focuses on the relationship between students' communication skill levels and engaging in bullying behavior through spreading rumors and being exposed to rumors being spread about them. The findings regarding this relationship are presented in Table 6.

Table 6.

Findings of Spearman Correlation Analysis Between Communication Skills and Bullying and Being Bullied Through Rumor-Mongering and Spreading Rumors

Variables	Communication Skills	Rumor Bully	Rumor Victim
Communication Skills	1		
Rumor Bully	-.192 **	1	
Rumor Victim	-.180**	.482**	1

*p<0.05   **p<0.01

According to the findings in Table 6, a weak negative correlation (r = -0.192, p < 0.01) was found between students' communication skills and bullying through rumor spreading. Similarly, a weak negative correlation (r = -0.180, p < 0.01) is observed between students' communication skill levels and their exposure to bullying through rumor spreading and dissemination.

The fifth sub-problem of the study focuses on the relationship between students' communication skill levels and their involvement in bullying behavior, including damaging property and being exposed to damage to their own property. The findings regarding this relationship are presented in Table 7.

Table 7.

Findings of Spearman Correlation Analysis Between Communication Skills and Bullying and Being Bullied by Damaging Property

Variables	Communication Skills	Property Bully	Sacrifice of Possessions
Communication Skills	1		
Property Bully	-.233 **	1	
Sacrifice of Possessions	-.193**	.609**	1

*p<0.05   **p<0.01

According to the findings in Table 7, a weak negative correlation (r = -0.233, p < 0.01) was found between students' communication skills and bullying involving property damage. Similarly, a weak negative correlation (r = -0.193, p < 0.01) is observed between students' communication skills and their exposure to bullying through property damage.

The ninth sub-problem of the study focuses on the relationship between students' communication skill levels and engaging in sexual bullying behavior, and being exposed to sexual bullying. The findings regarding this relationship are presented in Table 8.

Table 8.

Findings of Spearman Correlation Analysis Between Communication Skills and Perpetration and Exposure to Sexual Bullying

Variables	Communication Skills	Perpetration	Exposure to Sexual Bullying
Communication Skills	1		
Perpetration	-.214 **	1	
Exposure to Sexual Bullying	-.192**	.635**	1

*p<0.05   **p<0.01

According to the findings in Table 8, a weak negative correlation (r=-214, p<0.01) was found between students' communication skills and sexual bullying. Similarly, there appears to be a weak negative correlation (r = -0.192, p < 0.01) between students' communication skills and their exposure to sexual bullying.

4. Discussion and Conclusion

According to the study's findings, there was a moderate negative correlation between students' communication skills and physical bullying behavior, as well as a weak negative correlation between communication skills and exposure to physical bullying. This finding indicates that as communication skills improve, students are less likely to resort to physical violence or become targets of such behavior. Similarly, Sönmezay (2010) found in his study of high school students that bullying and victimization behaviors decreased as communication skills increased. Hisar (2018) also emphasized that individuals with strong family communication have better anger control and fewer aggressive behaviors. These results indicate that effective communication skills are a crucial protective factor in regulating individuals' impulsive behaviors and managing aggression. The fact that physical bullying is mostly seen in individuals with poor anger control and low empathy skills (Demir, 2022) supports this finding. Therefore, in this study, the fact that students with high communication skills are less involved in physical bullying can be explained by their developed emotional expression and problem-solving skills. Students who express their emotions verbally can resolve conflicts without resorting to physical violence and behave more constructively in their social relationships.

According to the research findings, a moderate negative correlation was found between students' communication skills and verbal bullying behaviors. In contrast, a weak negative correlation was found between exposure to verbal bullying. This finding suggests that students with high communication skills are less likely to engage in verbal aggression and are less likely to be targets of such behaviors. A nonviolence education program study conducted by Yıldırım (2012) also found that students with improved communication and empathy levels exhibited reduced tendencies toward aggression. Similarly, Demir (2022) found that sports spectators with strong communication skills exhibited lower levels of physical and verbal aggression. Verbal bullying often stems from misunderstanding, insufficient empathy, and impulsive reactions (Olweus, 2013). Therefore, developing communication skills enables individuals to express their feelings appropriately, listen effectively, and understand others. In this context, the inverse relationship between verbal bullying and communication skills in this study may stem from students adopting communication styles based on mutual understanding and compromise rather than self-centered reactions.

The study found a weak negative correlation between students' communication skills and bullying through exclusion. This finding suggests that as communication skills improve, students tend to move away from behaviors that exclude others or result in being excluded from social groups. Aytaç (2020) noted that as family dialogue increased, students' levels of cyberbullying and victimization decreased, revealing that social exclusion is also closely related to communication quality. Furthermore, Şevkin (2008) found that students who received problem-solving and mediation training had decreased levels of aggression and increased social adjustment. Exclusionary behavior is generally fueled by a lack of empathy and communication breakdown (Rigby, 2017). Therefore, students with strong communication skills should exhibit a more inclusive and conciliatory attitude in group relationships. The findings indicate that factors underlying exclusionary behavior, such as "fear of not being understood" and "concern about status within the group," can be reduced through effective communication.

Another study finding is a weak negative correlation between students' communication skills and bullying through gossip and rumors. Similarly, Aytaç (2020) found that students' cyberbullying behaviors decreased when family communication was strong, while Bıyık (2016) found that communication skills decreased as computer usage time increased. This situation illustrates that gossip-based bullying often stems from a lack of effective communication and weak social interaction. Özdemir (2014) also stated that athletes with high communication skills tend to exhibit lower levels of destructive aggression. Gossip is a form of indirect aggression (Crick & Grotpeter, 1995) and reflects a search for social approval, as well as low empathy levels. Therefore, the decrease in the rate of resorting to bullying through gossip, which stems from the development of students' communication skills, is attributed to their ability to express their feelings openly, directly, and constructively. As communication competence increases, individuals resolve social problems through dialogue rather than rumors.

The findings indicate a weak negative correlation between students' communication skills and bullying behaviors involving property damage. Demircioğlu (2020) found that students with low communication skills are prone to aggression and social isolation. Similarly, Aytekin (2015) noted that aggression levels increase with age among middle school students and that communication skills weaken this tendency. Damaging property is usually an indirect expression of suppressed anger (Bandura, 1973). Therefore, individuals with underdeveloped communication skills may direct their emotional tension toward physical objects when they are unable to express it. In this study, the lower tendency to damage property among students with high communication skills is attributed to their more developed strategies for coping with anger and stress. Communication skills enable individuals to express their emotions verbally rather than through destructive actions; thus, students develop self-control mechanisms that reduce aggression.

The study found a weak negative correlation between students' communication skills and sexual bullying behaviors. This finding indicates that as communication skills improve, students are less likely to engage in sexual bullying and less likely to be exposed to such behaviors. Aytaç (2020) stated that as the dialogue dimension in communication increases, cyberbullying and victimization decrease, and internet addiction also declines. This suggests that sexually-based bullying in the digital environment also stems from communication deficiencies. Yıldırım (2015) emphasized that athletes with high communication skills tend to exhibit lower levels of aggression and possess stronger social interaction skills. Sexual bullying generally stems from boundary violations, lack of empathy, and misinterpretation of social role patterns (Espelage & Swearer, 2010). Therefore, students with developed communication skills are expected to be more respectful, aware of their boundaries, and able to express their feelings appropriately in their relationships with the opposite sex. In this context, the results indicate that communication education plays a crucial role in fostering social gender sensitivity and ethical awareness.

5. Recommendations

This study examined the relationship between peer bullying behavior and communication skills among 5th to 8th-grade middle school students. Based on the findings, several recommendations can be made to improve research and practice in this field. The study was conducted in middle schools in the central district of Bolu Province; therefore, extending similar studies to students from different socio-cultural backgrounds would provide more comprehensive data and contribute to the generalizability of the results. Since the Peer Bullying Identification Scale Adolescent Form used in the research includes two parallel subscales—bully and victim—comprising a total of 106 items, it was observed that students tended to lose interest or become fatigued during the process. To address this, researchers should design clearer instructions and create more engaging administration environments to maintain student motivation. Additionally, incorporating more diverse demographic variables may expand the scope of future studies and yield deeper insights into the dynamics of bullying. It was also observed that many students have difficulty identifying and labeling bullying behaviors they experience or witness, which underscores the need to raise awareness about bullying in schools through preventive and educational programs. Aggression, violence, and bullying are all forms of behavior that violate others' rights; therefore, fostering social and moral values in students should be a fundamental educational priority. Families play a key role in establishing these values, while schools reinforce them as children grow older. Although social culture and values are partially addressed within the life skills and social studies curricula, these efforts remain insufficient, and teachers, counselors, and experts should collaborate to design more effective learning environments. School counseling units can play an essential role by administering screening tools to identify students at risk of bullying or victimization and providing systematic interventions supported by regular follow-up records. Developmental report cards can be implemented for students identified as bullies to monitor behavioral improvements over time. Furthermore, communication skills training has been shown to reduce aggressive tendencies among students; thus, communication-focused courses led by experts could be integrated into the curriculum from an early grade level. Parent education seminars organized by the Ministry of National Education should also be structured regionally and systematically to strengthen collaboration between schools, families, and students. Finally, as sports participation fosters communication and self-discipline, encouraging children to engage in sports activities and protecting them from harmful online content will support their holistic development and reduce tendencies toward aggression and bullying.

6. Declarations

All articles must be submitted with a "Declaration" section that includes the following headings. Under this heading, the points that authors should pay attention to are stated.

Ethics Approval and Consent to Participation. This study was approved by the Ethics Committee of Istanbul Sabahattin Zaim University (Approval No: 2025/08, dated 30.07.2025). All procedures were conducted in accordance with the ethical standards of the institutional and national research committees, as well as the principles outlined in the Declaration of Helsinki. Participation in the study was entirely voluntary, and informed consent was obtained from all participants before data collection. As the participants were middle school students, permission was obtained from the relevant school administrations and parents/legal guardians before administering the questionnaires.

Approval for Publication. All authors have read and approved the final version of the manuscript and consent to its publication.

Availability of Data and Materials. The data supporting this study's findings are available from the corresponding author upon reasonable request.

Competing Interests. The authors declare that they have no competing interests.

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An Examination of the Relationship Between Cognitive Flexibility and Big Five Personality Traits in Adults

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Article Info

Abstract

The primary objective of this study is to examine the associations between cognitive flexibility and the dimensions of the Big Five Personality Model in adult individuals. Conducted within a quantitative research design, data were collected from a sample of 424 participants. The Cognitive Flexibility Scale and the Big Five Personality Inventory were utilized as data collection instruments. Correlational analyses indicated that cognitive flexibility was positively and significantly associated with emotional stability, openness to experience, conscientiousness, and agreeableness. Multiple regression analysis identified emotional stability as the strongest predictor of cognitive flexibility. Additionally, demograpfhic and behavioral variables such as age, gender, frequency of reading, participation in artistic activities, and engagement with individuals holding different beliefs were found to yield significant differences in both cognitive flexibility and personality traits. These findings suggest that personality structure and socio-contextual variables play a critical role in shaping cognitive flexibility in adults.

Keywords:
Cognitive flexibility, the big five personality model, emotional stability

1. Introduction

Today's rapidly changing social, technological, and cultural structures require individuals to adapt swiftly and effectively to complex and unpredictable environmental conditions. This adaptation process is not limited to behavioral responses but also involves the capacity for cognitive and emotional flexibility, which enables

individuals to think from different perspectives, regulate emotions, and generate alternative solutions when faced with challenges. According to the Turkish Language Association (2025), flexibility is the ability to remain open to various interpretations and modify one's opinions or attitudes when necessary. In this sense, flexibility represents a multidimensional construct encompassing openness, adaptability, and psychological resilience. Within the psychological framework, flexibility is conceptualized not merely as a personality trait but as a core cognitive skill that determines how individuals process information, cope with change, and interact effectively with their social and environmental surroundings.

Different researchers have explored the concept of cognitive flexibility from various perspectives. Cognitive flexibility refers to an individual's ability to employ alternative strategies in various situations (Martin & Rubin, 1995). It also includes the capacity to organize information processing strategies against new situations (Cañas et al., 2003). This characteristic encompasses the individual's awareness of alternative paths, adaptability to changing circumstances, and sense of self-efficacy (Aslan & Türk, 2022). Flexibility is also considered the brain's capacity to adapt to changing situations (Öztaş, 2022). In this context, it is also expressed as the ability to alter cognitive structures in response to new situations (Dennis et al., 2010). The ability to develop cognitive organization suitable for personal needs in understanding and problem-solving processes is also within the scope of flexibility (Spiro & Jehng, 1990). Additionally, the ability to distinguish between different options for events in one's life and to modify one's mental ideas is a crucial indicator of this skill (Zabelina & Robinson, 2010). These definitions demonstrate that cognitive flexibility is an important psychological resource that enables individuals to adapt to various conditions that may arise in their lives.

The relationship between cognitive flexibility, psychological resilience, and coping skills has been extensively emphasized in recent literature, highlighting its importance for adaptive functioning and mental health. Cognitive flexibility enables individuals to reframe negative events and develop alternative coping strategies, thereby strengthening their ability to recover from stress or adversity (Çelikkaleli, 2014). Research indicates that individuals with low cognitive flexibility experience more severe depressive symptoms and lower emotional well-being (Kaçar Başaran et al., 2023), emphasizing its critical role in maintaining psychological balance. Moreover, it facilitates readiness for change and openness to new experiences, essential for effective adjustment in dynamic life contexts (Ekinci Özhan, 2024). Empirical studies have also revealed significant correlations between cognitive flexibility and various positive psychological constructs, such as self-regulation (Tuncer & Tanaş, 2022), boundaryless and versatile career orientations (Söner, 2023), and life satisfaction (Söner et al., 2023). Through these relationships, cognitive flexibility is a psychological mechanism that enhances adaptability, motivation, and self-efficacy. Enabling individuals to cope constructively with stress, regulate emotions, and develop multiple perspectives contributes to resilience and overall well-being. These findings demonstrate that cognitive flexibility is central to mental health and personal growth.

It is evident that an individual's personality structure also influences cognitive flexibility. Personality traits, especially openness to experience and self-control dimensions, effectively adapt to environmental changes (Kara et al., 2023). There is a significant relationship between cognitive flexibility and openness to experience personality trait; it has been stated that individuals with this trait are more easily integrated into unexpected situations (Dennis et al., 2010). Personality dimensions such as extraversion, emotional stability, and conscientiousness were also reported to be positively related to cognitive flexibility (Martin & Rubin, 1995). According to the American Psychological Association, personality is a structure comprising permanent behaviors and traits that are specific to an individual's life (American Psychological Association, 2023). Personality is also considered a fundamental structure that defines the way one thinks, feels, and behaves (Encyclopædia Britannica, 2025). In addition, personality includes permanent characteristics that form the individual's unique harmony (Taymur & Türkçapar, 2012) and reflects the whole of innate and acquired qualities that distinguish the individual from others (Özdemir et al., 2012). The Five-Factor Personality Model provides an important theoretical framework for explaining individual differences, with its dimensions of openness, conscientiousness, extraversion, agreeableness, and emotional stability (McCrae & Costa, 1999). Among these dimensions, openness is strongly related to cognitive flexibility (DeYoung et al., 2005). It is stated that individuals with high levels of openness tend to develop creative thinking skills and therefore exhibit greater flexibility (Silvia & Beaty, 2012). On the other hand, high levels of neuroticism may negatively affect resilience in the face of stress (John et al., 2008). Extraversion and agreeableness can increase cognitive flexibility by facilitating the development of different perspectives through social relationships (Wilkowski & Robinson, 2010). However, it is also suggested that high levels of responsibility may limit cognitive flexibility by causing excessive planning and rigidity in some cases (Kashdan & Rottenberg, 2010). In summary, cognitive flexibility is closely linked to personality structure, with openness, extraversion, emotional stability, and agreeableness enhancing adaptability and creative thinking. At the same time, excessive conscientiousness and neuroticism may hinder the ability to respond flexibly to changing situations.

These theoretical and empirical findings reveal that cognitive flexibility interacts dynamically with emotional and behavioral processes, as well as fundamental personality traits. Individuals' ability to adapt, generate alternative solutions, and cope effectively with change appears closely linked to dispositional characteristics such as openness, conscientiousness, and emotional stability. However, despite increasing recognition of this connection, empirical studies examining cognitive flexibility and personality traits remain

limited, particularly in adult populations. Most previous research has focused on cognitive mechanisms or personality dimensions in isolation, leaving a significant gap in understanding how these constructs mutually influence one another. The present study addresses this gap by examining the relationship between cognitive flexibility and the Big Five personality traits in adults. The study aims to offer a more integrative view of individual adaptability by examining how stable personality tendencies contribute to flexible cognitive processes. This perspective is essential for understanding the internal psychological resources that enable individuals to navigate complex social and emotional environments. Therefore, the study provides empirical evidence and makes an original contribution to the literature by bridging the fields of personality psychology and cognitive science. From this standpoint, the main research questions were formulated accordingly. From this point of view, the questions of the study were determined as follows;

1. Do the dimensions of the Five Factor Personality Types have a significant relationship with cognitive flexibility?

2. Do the levels of cognitive flexibility and personality types show significant differences according to the variables of age, gender, educational status, frequency of reading books, participation in artistic activities, giving importance to other people's needs and feelings, and the excitement of communicating with people with different thoughts and beliefs?

2. Methodology

2.1. Research Model

This study examined the relationship between the cognitive flexibility levels of adult individuals and the Five Factor Personality traits. In this context, an attempt was made to explore the possible relationships between individuals' personality structures and their flexibility levels in responding to environmental stimuli. A correlational survey model, a quantitative research approach, was employed to investigate the relationship between the variables in question. The correlational survey model is a method that aims to determine the current level of relationship between two or more variables and to reveal the extent to which these variables predict each other (Karasar, 2022). In this model, the aim is not to establish a cause-and-effect relationship between variables, but to analyze whether there is a meaningful link between these variables. This study aims to examine the degree, direction, and significance of the relationship between cognitive flexibility and personality traits, and to scientifically evaluate individuals' capacity to think and behave flexibly in accordance with their personality structures.

2.2. Research Sample

In this study, data were collected from a sample of individuals from different age and gender groups living in various provinces of Turkey, within the scope of maximum variation sampling, based on its heterogeneous structure and voluntary nature. This method is based on the assumption that individuals selected to represent diversity in terms of certain variables (such as age, gender, and geographical distribution) can provide insight into a larger universe (Patton, 2002). This type of sampling is frequently preferred in the social sciences, especially in studies that aim to explore different aspects of a phenomenon through groups with high demographic diversity. In this context, the study sample consisted of 424 individuals, comprising 71.23% females (n = 302) and 28.77% males (n = 122). When the age distribution is analyzed, it is seen that 10.61% (n=45) are between the ages of 18-24, 12.5% (n=53) between the ages of 25-30, 23.11% (n=98) between the ages of 31-36, and 53.77% (n=228) between the ages of 37 and above. Examining the participant profile, it can be observed that the broad age range and gender distribution offer diversity, aligning with the study's content and enhancing inclusiveness in the interpretation of the research findings. In addition, this sampling method enabled the collection of more in-depth and generalizable results, providing a deeper understanding of the relationship between individual differences and psychological variables, such as cognitive flexibility.

2.3. Data Collection Tools and Procedure

The researcher prepared Google Forms to obtain and reveal the participants' demographic information. In the demographic information form, questions such as age, gender, education level, reading habits, level of participation in artistic activities, level of excitement in communicating with people with different thoughts and beliefs, and level of caring about other people's needs and feelings were included

2.3.1. Quick Big Five Personality Inventory

This measurement tool was developed by Vermulst and Gerris (2005) to assess five basic personality traits of individuals. The scale was structured based on 30 adjectives selected among 100 personality adjectives identified by Goldberg (1992). The instrument is based on the Five Factor Model of Personality and consists of five sub-dimensions: Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness to Experience. Each sub-dimension consists of six items, and there are a total of 30 items. Participants rate each item between 1 ("Completely false") and 7 ("Completely true"). Items 2, 3, 4, 7, 9, 11, 13, 16, 21, 24, 26, and 29 are reverse-coded. The scores obtained from each sub-dimension range from 6 to 42. The validity of the scale was tested with both exploratory and confirmatory factor analysis (EFA and CFA). According to the CFA results, the five-factor structure of the scale demonstrated a good fit [χ^2/df = appropriate, RMSEA = 0.05, CFI = 0.96]. These values

reveal that the construct validity of the scale is at a sufficient level. Additionally, the variance ratios and item loadings of each factor in the EFA results were explained at the levels specified in the literature. The internal consistency of the scale was evaluated with Cronbach's Alpha coefficients and calculated according to the sub-dimensions as follows: Openness to Experience (α = 0.73), Emotional Balance (α = 0.78), Conscientiousness (α = 0.86), Agreeableness (α = 0.80), and Extraversion (α = 0.81). It is seen that the overall reliability level of the scale is high. In this study, all sub-dimensions of the scale were used. In the analysis process, the scores obtained from each sub-dimension were evaluated separately (Morsümbül, 2014).

2.3.2. The Cognitive Flexibility Scale

The Cognitive Flexibility Inventory was developed to assess individuals' cognitive flexibility levels and consists of 20 items. A 5-point Likert-type scale was used. The internal consistency coefficient of the inventory was reported as 0.90 in the validity and reliability studies conducted by Gülüm and Dağ (2012). This value indicates that the scale offers a high level of reliability and yields consistent measurements. Exploratory and confirmatory factor analyses supported the construct validity of the scale. In the confirmatory factor analysis results, generally accepted values for model fit were obtained; for example, the χ^2/df ratio was 1.5-3.0, the RMSEA value was below 0.05, and the CFI value was above 0.90. These results suggest that the scale effectively represents the construct it aims to measure. According to the explanatory factor analysis, the literature states that the two sub-dimensions of the scale account for approximately 40-45% of the total variance. Regarding internal consistency, the Cronbach Alpha value was found to be 0.87 in the analyses conducted in this study. High scores obtained from the scale indicate that individuals have high levels of cognitive flexibility

2.4. Data Analysis

The application was conducted through a 57-item form consisting of 7 questions created to collect demographic information, a 20-item BEE, and a 30-item HBBKT. This form was created through Google Forms and applied to the participants. Before the application, the scales and demographic information form were explained in detail to the participants via Google Forms. The participants were given the necessary information about the subject and the confidentiality of the research. It was not observed that the participants encountered any difficulties during the process. The SPSS 25 program was used for statistical analysis of the findings obtained in the study. The normality test of the total scores obtained from the Cognitive Flexibility Inventory was performed, and it was initially observed that the data were not normally distributed. Subsequently, extreme values that violated normality were identified and removed from the dataset, and the normality test was performed again. In the second normality test, the kurtosis value of the Cognitive Flexibility Inventory was found to be between -0.209 and 0.237, and the skewness value was between 0.176 and 0.119. The normality test was performed on the total scores of the sub-dimensions of the Five Factor Personality scale, and the kurtosis values were found to be between .389 and .237. The skewness value was found between -.639 and .119, the kurtosis value of the responsibility sub-dimension was found between .738 and .237, and the skewness value was found between -.745 and .119, the kurtosis value of the extraversion sub-dimension was found between -. 285 to .237 and the skewness value was found between .183 and .119, the kurtosis value of the emotional balance sub-dimension was found between .244 and .237 and the skewness value was found between .349 and .119, and finally, the kurtosis value of the openness to experience sub-dimension was found between -.101 and .237 and the skewness value was found between -.230 and .119. According to Jondeau and Rockinger (2003), it is stated that the assumption of normal distribution is met if the values are within ±3 standard deviations. This study employed this approach to support the finding that the data conformed to a normal distribution. The relationship between the scores obtained from the Cognitive Flexibility Inventory and the Five-Factor Personality scales was assessed using the Pearson Product-Moment Correlation coefficient. Multiple Regression Analysis was used to predict the effect of the Five Factor Personality Test Subscales on Cognitive Flexibility.

3. Findings

The descriptive statistical values for cognitive flexibility and the five-factor personality of the findings obtained from data collected from adult individuals are presented in Table 1.

Table 1.

Descriptive statistics of the cognitive flexibility inventory and the quick big five personality test

Scales		Min.	Max.	Mean	Std.
Cognitive flexibility		52,00	100,00	77.8278	9.78425
Fast Big Five Personality	Agreeableness	21,00	42,00	35,3868	4,39013
	Extraversion	8,00	42,00	24,6061	6,44732
	Responsibility	9,00	42,00	32,0849	6,51620
	Emotional stability	6,00	42,00	22,9976	6,48566

Opennessto experience	16,00	42,00	31,6321	4,80804

When Table 1 is examined, the minimum score obtained from the cognitive flexibility scale was 52, the maximum score was 100, the arithmetic mean was 77.82, and the standard deviation was 9.78. The lowest score from the agreeableness sub-dimension of the Five Factor personality scale was 21, the highest score was 42, the arithmetic mean was 35.38, and the standard deviation was 4.39. The lowest score obtained from the extraversion sub-dimension was 8, the highest score was 42, the arithmetic mean was 24.60, and the standard deviation was 6.44. The lowest score from the Responsibility sub-dimension was 9, the highest score was 42, the arithmetic mean was 32.08, and the standard deviation was 6.51. The lowest score from the emotional balance sub-dimension was 6, the highest score was 42, the arithmetic mean was 22.99, and the standard deviation was 6.48. Finally, the lowest score obtained from the openness to experience sub-dimension was 16, the highest score was 42, the arithmetic mean was 31.63, and the standard deviation was 4.80.

Table 2.

Correlation Table Examining the Relationship Between Cognitive Flexibility Inventory and Fast Big Five Personality Test Scores

Variables	1	2	3	4	5	6
1. Cognitive Flexibility	1					
2. Compatibility	.38**	1				
3. Extraversion	.17**	.16**	1			
4. Responsibility	.40**	.41**	.04	1		
5. Emotional balance	.44**	.15**	.38**	.24**	1	
6. Openness to experience	.39**	.55**	.18**	.38**	.09	1

*p<.05   **p<.01

As seen in Table 2, there is a significant positive relationship between cognitive flexibility and the agreeableness sub-dimension of the five-factor personality test (r=.38, *p*<.01), there is a significant positive relationship between cognitive flexibility scale scores and extraversion sub-dimension (r= .17, *p*<.01), there is a significant positive relationship between cognitive flexibility scale scores and the responsibility sub-dimension of the five-factor personality test (r=. 40, *p*<.01), there was a significant positive relationship between cognitive flexibility scale scores and the emotional balance sub-dimension of the five-factor personality test (r= .44, *p*<.01). There was a significant positive relationship between cognitive flexibility scale scores and the openness to experience sub-dimension of the five-factor personality test (r= .39, *p*<.01).

Standard multiple regression analysis was performed to determine the predictive levels of adults' Big Five personality traits for cognitive flexibility levels, and the results are presented in Table 3.

Table 3.

Multiple Regression Analysis on the Prediction of the Effect of Fast Big Five Personality Test Subscales on Cognitive Flexibility

Variable	B	SH	ß	T	p	Binary r	Partial R
(Constant)	32.909	3.43		9.5	<0.01		
Agreeableness	.300	.108	.135	2.7	.006	.379	.135
Extraversion	-.067	.065	-.044	-1.0	.308	.168	-.050
Responsibility	.262	.067	.175	3.89	<.001	.405	.187
Emotional stability	.567	.066	.376	8.63	<.001	.442	.389
Openness to experience	.458	.097	.225	4.7	<.001	.391	.224

R=.607, R²=.368, *p*<.05

Table 3 presents the results of the standard multiple regression analysis to determine the predictive power of the Fast Big Five Personality Test sub-dimensions on adult individuals' cognitive flexibility levels. The model was significant, and the variables made statistically significant contributions in predicting cognitive flexibility (R = .607, R^2 = .368). This indicates that personality traits account for approximately 37% of cognitive flexibility. According to the regression coefficients, emotional stability (β = .376, *p* < .001), openness to experience (β = .247, *p* < .001), conscientiousness (β = .175, *p* < .001) and agreeableness (β = .135, *p* < .01) variables significantly predicted cognitive flexibility. In contrast, the extraversion variable was not a significant predictor (β = -.044, *p* = .308). The strongest predictor variable was emotional stability, suggesting that emotionally stable individuals tend to be more cognitively flexible. Binary and partial correlation values also support these results; for example, the partial correlation between the openness to experience variable and cognitive flexibility is notable, with a value of .224. These findings reveal that certain personality traits of individuals, especially dimensions such as emotional stability and openness to experience, strengthen their flexible thinking and adaptive capacities.

4. Discussion and Conclusion

Recent studies have revealed significant relationships between cognitive flexibility and the Five Factor Personality Traits. Among these traits, openness to experience, conscientiousness, emotional stability, and extraversion are strong predictors of cognitive flexibility. Nair et al. (2022) found positive and significant correlations between these personality dimensions and cognitive flexibility among university students. Similarly, Odacı and Çıkrıkcı (2019) highlighted that cognitive flexibility mediates the relationship between the Five Factor Personality Traits and life satisfaction, emphasizing that openness strengthens cognitive processes. Neuroimaging research further supports this link, showing that openness enhances the flexibility of connections between brain networks and improves adaptability to new information (Abu Raya et al., 2023). These findings suggest that individuals who are open, conscientious, emotionally stable, and extraverted are more likely to engage in adaptive thinking and effective problem-solving when faced with change. Their ability to regulate positive emotions and exhibit curiosity toward novelty may facilitate flexible cognitive responses in uncertain or complex situations. Thus, personality traits fostering emotional balance and openness to experience appear to provide a psychological foundation for higher cognitive flexibility.

Age and demographic factors also influence cognitive flexibility. Studies by Martin and Rubin (1995) and Kramer (2000) indicate that lifelong learning and experience enhance cognitive flexibility in adulthood. However, Park and Reuter-Lorenz (2009) noted that age may contribute to the decline of specific cognitive functions, suggesting a complex, context-dependent relationship. Gender differences have been reported inconsistently, with some studies showing higher cognitive flexibility in men (Wang et al., 2022; Cánovas & Cimadevilla, 2023). However, cultural factors may also influence these patterns (Nolen-Hoeksema, 2012). These findings imply that cognitive flexibility develops dynamically across the lifespan, reflecting the combined effects of biological aging, social roles, and cultural expectations. The variability in gender findings may stem from differences in socialization processes, educational opportunities, and the types of tasks used to assess flexibility. The influence of age and demographics underscores that innate capacities and lifelong contextual and experiential factors shape cognitive flexibility.

Lifestyle factors, such as reading habits and participation in artistic activities, may indirectly support cognitive flexibility. Although no direct link between reading and cognitive flexibility has been consistently found, reading fosters openness and intellectual curiosity, enhancing cognitive flexibility (Kaufman, 2013; Mar et al., 2006). Artistic engagement also promotes creative problem-solving and cognitive control flexibility, though effects vary depending on interest, duration, and motivation (Zabelina & Robinson, 2010; Fayn et al., 2018; Kaufman, 2014; Catterall, 2009). Exposure to diverse beliefs and thought structures further supports cognitive flexibility, enhancing social adaptation, though negative social attitudes may persist in some contexts (Maddux & Brewer, 2012; Leung & Chiu, 2010; Tajfel & Turner, 1986). These findings indicate that engagement in intellectually and creatively stimulating activities may strengthen the mental adaptability underlying cognitive flexibility. Individuals who regularly read or engage in artistic practices are likely to develop richer cognitive schemas and a greater tolerance for ambiguity, which facilitates flexible thinking. Consequently, diverse experiences that challenge existing beliefs or encourage perspective taking seem to cultivate the neural and psychological conditions essential for flexible cognition.

Recent research also emphasizes the multidimensional and context-dependent relationship between personality and cognitive flexibility. Koivisto et al. (2024) found that openness and emotional stability have a positive influence on cognitive flexibility, highlighting that personality traits play a significant role in individuals' adaptability to environmental changes. These findings underscore that cognitive flexibility is shaped not only by personality but also by experience, demographic factors, lifestyle, and cultural context. These results suggest that personality traits provide a stable psychological foundation for cognitive flexibility, while contextual and experiential variables determine how it manifests in real-life situations. Individuals with higher openness and emotional stability may be better equipped to integrate new information and regulate emotions under changing

conditions. Therefore, understanding cognitive flexibility requires a holistic approach incorporating dispositional tendencies with environmental, developmental, and sociocultural influences.

The findings of this study suggest that cognitive flexibility is closely related to the Five-Factor Personality Traits. Among these traits, openness to experience and emotional stability emerged as the strongest predictors of cognitive flexibility, highlighting the decisive role of personality in shaping adaptive cognitive processes. Individuals who score higher in these traits tend to demonstrate greater ability to shift perspectives, consider alternative solutions, and respond effectively to novel or complex situations. An increase in cognitive flexibility was observed with age, suggesting that life experiences and accumulated knowledge contribute to the development of adaptive thinking. However, this effect is influenced by individual differences and contextual conditions, indicating that age-related changes in cognitive flexibility are not uniform across all populations. Similarly, gender differences were noted, with men scoring higher on measures of cognitive flexibility, yet these findings may vary depending on cultural norms, methodological approaches, and sample characteristics. Lifestyle and experiential factors also appear to play an important role. Although reading frequency was not directly related to cognitive flexibility, it may indirectly foster openness to experience, imagination, and intellectual curiosity. Participation in artistic activities and engagement with diverse ideas were also found to enhance cognitive flexibility, complementing the influence of personality traits such as extraversion and openness to experience. These findings suggest that personal interests and active engagement with novel experiences can reinforce adaptive cognitive processes. The study demonstrates that a complex interplay of individual characteristics, personality traits, demographic variables, and environmental factors shapes cognitive flexibility. The results highlight the importance of considering multiple determinants to understand or enhance cognitive flexibility in adults. Future research could further investigate these interactions, particularly in diverse cultural contexts, to better understand how personality and experience jointly influence adaptive cognition.

5. Recommendations

The results of this study offer important implications for both theoretical and practical fields. First, considering the close relationship between cognitive flexibility and personality traits, interventions aimed at enhancing emotional stability and fostering openness to experience can be developed in educational settings, psychological counseling, and personal development programs. For instance, structured activities promoting creative thinking, problem-solving, and perspective-taking may enhance cognitive flexibility while supporting adaptive personality development. Encouraging engagement in artistic activities and cultivating reading habits further contribute to cognitive flexibility by indirectly nurturing imagination, intellectual curiosity, and empathy. Future research should test the generalizability of these findings across diverse populations and cultural contexts, as individual and contextual factors can influence the relationships between personality traits and cognitive flexibility. Longitudinal designs would be particularly valuable in examining the long-term effects of age, life experiences, and personality development on cognitive flexibility. Additionally, qualitative studies could provide more in-depth insights into how reading habits, artistic pursuits, and social interactions shape individuals' cognitive flexibility, uncovering nuanced patterns that quantitative methods might overlook. This study has several limitations that should be taken into consideration. The cross-sectional design restricts the ability to draw causal inferences regarding the relationships between variables. The use of self-report scales may introduce response biases, and the sample, consisting of a specific age group and cultural background, limits the generalizability of the findings. Future research should address these limitations by employing diverse methodological approaches, including experimental designs, multi-method assessments, and culturally heterogeneous samples. Such studies would strengthen the evidence base and provide more robust recommendations for interventions to enhance cognitive flexibility.

6. Declarations

All articles must be submitted with a "Declaration" section that includes the following headings. Under this heading, the points that authors should pay attention to are stated.

7. References

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The Mediating Role of Cognitive Control and Flexibility in the Effect of Adult Individuals' Career Adaptability on Psychological Resilience

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Article Info

Abstract

This study aims to determine the mediating role of cognitive control and flexibility in the effect of adult individuals' career adaptability on psychological resilience. Today, in Türkiye, the multitasking of individuals, especially in the adult group, during their developmental period, is a significant determinant of their psychological resilience. Career adaptability emerges as a significant career factor that can influence psychological resilience. Cognitive control and flexibility are important capacities that enable individuals to generate alternatives in the face of situations. The study sample consisted of 244 adults (125 women, 119 men) ranging in age from 22 to 63 years. The instruments used in the research were the "Brief Resilience Scale", the "Cognitive Control and Flexibility Scale", and the "Career Adapt-Abilities Scale Short Form", along with the "Personal Information Form" developed by the researchers. Pearson correlation analysis and structural equation modeling were used in the data analysis. Analyses revealed that career adaptability, and cognitive control and flexibility explained psychological resilience at an $R2=0.59$ rate. Furthermore, the structural model constructed to determine the mediating role of cognitive control and flexibility was found to fit well. Based on the results, recommendations for researchers are presented.

Keywords:
Cognitive control and flexibility, career adaptability, psychological resilience, adults

1. Introduction

Career development processes are closely linked to individuals' mental health. Career adaptability, a key concept within career development, is significantly related to individuals' optimism, hope, and psychological resilience (Buyukgoze-Kavas, 2016). In Turkey, the adult population between the ages of 20 and 64 is approximately 55 million (Turkish Statistical Institute Population Portal, 2024). This large working-age adult population highlights the importance of occupational factors and career-related processes in individuals' psychological resilience. Furthermore, the Turkey Mental Health Profile 2 Final Report (2023) revealed that one in six people in society has a mental health problem. Both working conditions and challenges in other areas of life are significant stressors for adults. Aydın (2012) states that individuals face multiple factors, both positive and negative, that impact their psychological resilience during adulthood, such as establishing and maintaining close relationships, marriage, establishing and maintaining a job, having children, and experiencing the loss of a parent. Based on this, this study aimed to reveal the role of career adaptability, cognitive control, and flexibility in explaining the psychological resilience of adult individuals.

1.1. Career Adaptability

Career adaptability is a psychosocial construct that encompasses an individual's readiness and resources to effectively cope with current and future career challenges (Savickas, 2013; Savickas & Porfeli, 2012). It also represents the self-regulatory capacity individuals can utilize in challenging situations (Savickas, 2002). Career adaptability has four dimensions: concern, control, curiosity, and confidence. Concern refers to the extent to which individuals are positioned for the future and the value they place on it. Control encompasses individuals' responsibility, self-discipline, and autonomy in their career decision-making processes. Curiosity is an exploratory orientation aimed at determining the extent to which individuals' personal characteristics align with the characteristics of the work environment. Finally, confidence reflects individuals' confidence in their competence and their expectations of success in facing a challenge (Savickas, 2005; Savickas, 2013). Young people with significant career adaptability skills appear to be more focused on their future, perceive fewer career-related problems, and are more effective at translating their career goals into action (Soresi et al., 2012). Career adaptability can help individuals achieve job and life satisfaction (Fiori et al., 2015). At the same time, career adaptability is a crucial factor that enhances individuals' career commitment (Söner et al., 2023). Research has shown that career adaptability is significantly related to employees' well-being (Johnston et al., 2013; Maggiori et al., 2013). Career adaptability also plays a critical role in individuals' personal life planning (Ginevra et al., 2018). Individuals' readiness for adaptation reflects their flexibility and willingness to change (Savickas & Porfeli, 2012). Career adaptability is a crucial resource that enables individuals to act autonomously, demonstrate flexibility, tolerate uncertainty, and overcome personal challenges (Nota & Rossier, 2015; Savickas & Porfeli, 2012; Rossier, 2015). Research by Ginevra et al. (2018) has demonstrated a relationship between career adaptability and resilience. As can be seen, career adaptability encompasses multiple skills and competencies due to its multidimensional structure. Individuals' flexibility in the face of career and other life events, as well as their resilience in the face of challenges, depend on their career adaptability. Therefore, this study examines the relationships between career adaptability, cognitive control, flexibility, and resilience.

1.2. Cognitive Control and Flexibility

Cognitive flexibility refers to the ability to generate different explanations for experienced events and to adjust responses accordingly (Dennis & Vander Wal, 2010; Friederich & Herzog, 2011). It is the ability of individuals to consider challenging life events and situations as controllable, to generate solutions in these situations, and to perceive different paths for behavior (Dennis & Vander Wal, 2010; Karakuş, 2024). Ionescu (2012) defines cognitive flexibility as the ability of cognitive processes to adapt to changes in environmental demands. It is an important mental ability for adapting to changing tasks and demands (Deák, 2003). Cognitive flexibility encompasses an individual's awareness of different solutions and options in the face of stressful situations, their willingness to adapt to existing flexible situations, and self-efficacy (Asıcı & İkiz, 2015; Wolf et al., 2017). Cognitive control, on the other hand, is a concept that encompasses cognitive flexibility and operates in parallel or sequentially with it (Zaehringer et al., 2018). An individual's ability to prioritize information relevant to a specific goal while disregarding information unrelated to that goal can be defined as cognitive control (Morton et al., 2011). Demirtaş and Kara (2019) demonstrated that career adaptability is significantly positively correlated with cognitive control and flexibility. Aydıntuğ Myrvang (2022) similarly found that these two concepts are related. When examining the content of cognitive control and flexibility, it becomes apparent that they share an overlapping structure with career adaptability. Career adaptability refers to an individual's ability to cope with challenges, demonstrate mental flexibility when necessary, and maintain resilience in the face of adversity. Cognitive flexibility, on the other hand, enables individuals to generate options and adjust their behaviors in the face of situations. In this study, we hypothesize that individuals' career adaptability will explain their cognitive flexibility.

1.3. Psychological Resilience

Psychological resilience can be defined as the ability to recover quickly from adversity and stressors in life, overcome challenges, adapt to new situations, and rebound rapidly after adversity (Doğan, 2015; Norris et al.,

2009; Smith et al., 2008). In other words, resilience is an individual's ability to recover from negative experiences (Norris et al., 2009). Masten (2001) stated that psychological resilience has two aspects. One is the experience of individuals facing critical challenges in their lives. The other is adapting positively to these challenges (Masten, 2001). From a career development perspective, resilience encompasses individuals' ability to overcome personality challenges, utilize their existing resources to achieve their goals, and develop new strategies by incorporating their emotional capacities into the process (Bimrose & Hearne, 2012). Psychological resilience is essential for effectively responding to unexpected career-related events and developing various behavioral strategies (Seibert et al., 2016). Studies have shown that individuals with psychological resilience are more motivated, more likely to explore alternative solutions, and possess greater coping skills (Bockting et al., 2013; Suárez-Soto et al., 2019). Career adaptability is significantly associated with psychological resilience (Ginevra et al., 2018; Santilli et al., 2020). Psychological resilience is a crucial adaptive response influenced by an individual's adaptability and ability to cope with stressful situations (Rossier, 2015). A literature review has demonstrated that career adaptability plays a crucial role in explaining psychological resilience (García et al., 2021). Yalçın et al. (2022) concluded that psychological resilience mediates the relationship between career adaptability and life satisfaction. Individuals with high career adaptability have been found to adapt more easily to challenges and recover more easily (Yalçın et al., 2022). As can be seen, psychological resilience is a concept closely related to career adaptability, encompassing coping and adaptability, as well as cognitive control and flexibility in generating alternative paths, options, and solutions.

1.3. The Present Study

Adults' psychological resilience and ability to maintain their well-being are crucial in a constantly changing and transforming world. Rapid economic changes in Turkey impact all aspects of individuals' lives, causing them to struggle in multiple areas. Identifying the factors that enhance adult resilience is crucial for protecting and maintaining mental health, as well as supporting career development. Therefore, this study aims to investigate the mediating role of cognitive control and flexibility in the relationship between career adaptability and psychological resilience in adults. The hypotheses of the study are as follows:

H1. Adult individuals' career adaptability is significantly related to their cognitive control and flexibility, as well as psychological resilience.

H2. Adult individuals' cognitive control and flexibility play a mediating role between their career adaptability and psychological resilience.

2. Methodology

2.1. Research model

This study tested a model that incorporates the mediating roles of cognitive control and flexibility to understand the impact of career adaptability on psychological resilience in adult individuals. Career adaptability was considered the independent variable, and psychological resilience was considered the dependent variable. Cognitive control and flexibility were constructed as mediating factors in the relationship between these variables. The model examines how individuals' career adaptability affects cognitive control skills, how these skills connect with flexibility, and ultimately, their contribution to psychological resilience. The mediation method proposed by Hayes (2013) analyzed direct and indirect effects between variables. Furthermore, the structural validity of the model was tested using structural equation modeling (SEM), and the significance of the relationships between variables was assessed (Kline, 2015).

2.2. Participants

The study participants were adults aged 22-63 living in two different cities in Türkiye. Convenience sampling was used in the study. Convenience sampling is a type of non-probability sampling in which the researcher selects individuals who are most easily accessible (Büyüköztürk et al., 2024; Creswell, 2014). Data for the study were collected online from individuals who volunteered to participate in the study. Of the adults participating in the study, 125 (51.2%) were female, and 119 (48.8%) were male. The average age of the adults participating in the study was 36.41.

2.3. Data Collection Instruments

The data for the study were collected using three measurement tools: the 'Career Adaptability Scale', the 'Psychological Resilience Scale', and the 'Cognitive Control and Flexibility Scale'. The validity and reliability information for these tools is provided below.

2.3.1. Brief Psychological Resilience Scale

Developed by Smith et al. (2008) and adapted into Turkish by Doğan (2015), this measurement tool aims to assess the psychological resilience individuals can display in the face of challenges. The scale consists of 6 items with responses on a 5-point Likert-type scale (1 = Strongly disagree, 5 = Strongly agree). The exploratory factor analysis of the Turkish adaptation study revealed that the scale had a unidimensional structure, with an explained variance of 49.42%. Confirmatory Factor Analysis (CFA) results showed that the scale provided a good level of model fit (χ^2/df = 1.83, NFI = 0.99, NNFI = 0.99, CFI = 0.99, IFI = 0.99, RFI = 0.97, GFI = 0.99, AGFI = 0.96, RMSEA =

0.05, SRMR = 0.03). The internal consistency coefficient (Cronbach's alpha) of the scale was found to be 0.81, and item-total correlations ranged from 0.30 to 0.63. In the reliability analysis conducted within the scope of this study, Cronbach's alpha was calculated to be 0.721.

2.3.2. Cognitive Control and Flexibility Scale

In this study, the "Cognitive Control and Flexibility Scale", developed by Gabrys et al. (2018) and adapted to Turkish by Demirtaş (2019), was used to measure teachers' cognitive control and flexibility levels. In Demirtaş's adaptation study, data were collected from 47 participants (66% female, 34% male) in the first stage to evaluate the linguistic equivalence of the scale. In the second stage, construct validity and reliability analyses were conducted with 241 individuals (65% female, 35% male). In the third stage, internal consistency, item analysis, and relationships with other constructs were examined using data obtained from 352 participants. Thus, a comprehensive psychometric evaluation was conducted on a total sample of 640 people. The scale consists of 18 items and two subscales: "Cognitive Control over Emotions" and "Appraisal and Coping Flexibility." Cronbach's alpha reliability coefficients, calculated by Demirtaş (2019), were 0.85 and 0.91, respectively. The overall reliability coefficient of the scale was reported as .91. Fit indices based on confirmatory factor analysis of the two-factor structure of the scale were also found to be good (χ^2/df = 2.63; NFI = .94; CFI = .96; GFI = .86; AGFI = .82; IFI = .96; SRMR = .07; RMSEA = .08). The Cognitive Control and Flexibility Scale (CCFS) was used as a total score in the study. Although the scale has two subscales, namely "Cognitive Control over Emotions" and "Appraisal and Coping Flexibility," these two subdimensions are highly related conceptually. These subscales are viewed as distinct aspects of a higher-order structure known as executive functions. Since our study aimed to investigate the general role of this cognitive resource in facilitating career adaptability and psychological resilience, the total score was considered the most appropriate measure to capture the individual's broad capacity in this domain. In the reliability analysis conducted in the current study, the overall Cronbach's alpha value for the scale was calculated to be 0.887.

2.3.3. Career Adaptability Scale Short Form

Developed by Savickas and Porfeli (2012), this scale was adapted to 12 items by Maggiori et al. (2015) and subsequently translated into Turkish by Erdoğmuş Zorver and Yeşilyaprak (2021). This measurement tool, which features a five-point Likert-type response format, comprises four subscales with three items each: involvement, control, curiosity, and trust. The total variance explained was 60%, and the overall internal consistency coefficient (Cronbach's alpha) of the scale was reported as .88. The reliability coefficient of the scale used in this study was also calculated as .88. Confirmatory Factor Analysis (CFA) findings indicate that the four-factor structure of the scale offers an acceptable level of model fit (χ^2/df = 5.38; RMSEA = 0.08; SRMR = 0.057; CFI = 0.928; TLI = 0.905). The Cronbach alpha internal consistency coefficient obtained in this study was .923.

2.4. Data Collection and Analysis

The online survey form was sent to adults living in two different metropolitan cities in Türkiye using voluntary participation forms. The average time required for participants to complete all surveys was 15 minutes. The online survey form was sent to 452 individuals, and feedback was received from 285. After removing 41 outliers from the analysis using Z-scores, the remaining 244 data points were used for further analysis. Assumptions of normality were tested during the data analysis process, and the skewness/kurtosis values , as well as the Z-score distribution, were examined. Morgan et al. (2004) state that a skewness/kurtosis value between -1 and +1 indicates a normal distribution. Descriptive statistics, correlation analyses, structural equation modeling (SEM), and bootstrap methods were used in the data analysis process. First, the mean, standard deviation, and correlation coefficients for career adaptability, psychological resilience, and cognitive control/flexibility were calculated, and the relationships between the variables were examined using Pearson correlation analysis. Significant and positive relationships were identified among all variables. Next, a structural equation model was constructed using the AMOS program to test the mediating role of cognitive control and flexibility in the relationship between career adaptability and psychological resilience. Gender was added as a control variable in the model. Regression analyses revealed that career adaptability had a positive and significant effect on cognitive control and flexibility, and that this construct strongly predicted psychological resilience. Interestingly, the direct effect of career adaptability on psychological resilience was found to be negative, highlighting the importance of mediating effects. The model's fit was evaluated using various fit indices and found to be acceptable. Furthermore, bootstrap analyses with 5,000 samples at a 95% confidence interval confirmed the statistical significance of the direct and indirect effects. The findings revealed that cognitive control and flexibility are important mediating mechanisms in the relationship between career adaptability and psychological resilience.

3. Findings

Pearson Correlation Product-Moment Analysis was conducted to find the relationship between career adaptability, psychological resilience, and cognitive control and flexibility of adult individuals, and the results are presented in Table 2.

Table 2.

Descriptive Statistics and Correlational Values

	N	M	Std. Deviation	Skew.	Curt.	Cronbach Alfa	1	2	3
1. Career Adaptability	244	52.99	6,49	-,934	,352	0,923	1		
2. Psychological Resilience	244	22,36	3,66	,419	-,713	0,721	,266**	1	
3. Cognitive Control and Flexibility	244	97	14,51	,028	-,721	0,887	,497**	,612**	1

**. p<.01

Table 2 examines the relationships among adult individuals' career adaptability, psychological resilience, and cognitive control and flexibility levels using descriptive statistics and Pearson correlation analysis. The sample size for each of the three variables was 244. The mean (M) values were 52.99 for career adaptability, 22.36 for psychological resilience, and 97 for cognitive control and flexibility, respectively. Correlation analysis revealed a weak but significant positive relationship between career adaptability and psychological resilience ($r = .266$, $p < .01$). The relationship between cognitive control and flexibility and career adaptability was stronger ($r = .497$, $p < .01$). Furthermore, a highly positive and significant correlation was found between psychological resilience and cognitive control and flexibility ($r = .612$, $p < .01$). These results indicate that psychological resilience and cognitive flexibility are important variables affecting individuals' career adaptability.

After determining the relationship between psychological resilience and other variables, a model was constructed using AMOS, and regression analyses were conducted to determine the predictive value of each variable. The regression weights and significance levels of these analyses are presented in Table 3.

Table 3.

Regression Weights

			Estimate	S.E.	C.R.	p	S.R.W. Estimate
Cognitive Control and Flexibility	<---	Career Adaptability	2,464	0,341	7,224	***	.655
Cognitive Control and Flexibility	<---	Gender	1,989	0,854	2,329	0,02	.158
Psychological Resilience	<---	Cognitive Control and Flexibility	0,091	0,018	4,969	***	.989
Psychological Resilience	<---	Career Adaptability	-0,147	0,05	-2,92	0,003	-0,424
Psychological Resilience	<---	Gender	-0,222	0,088	-2,531	0,011	-0,192

When the regression weights regarding structural equation modeling are examined, it is seen that career adaptability has a positive and significant effect on cognitive control and flexibility ($\beta = 2.464$, $p < .001$, SRW = .655). Gender also significantly and positively affects cognitive control and flexibility ($\beta = 1.989$, $p = .02$, SRW = .158). The effect of cognitive control and flexibility on psychological resilience is quite strong and significant ($\beta = 0.091$, $p < .001$, SRW = .989). On the other hand, career adaptability was found to have a significant but negative

effect on psychological resilience (β = -0.147, p = .003, SRW = -0.424). Similarly, the effect of gender on psychological resilience is also significant and negative (β = -0.222, p = .011, SRW = -0.192). These findings suggest that cognitive control and flexibility may play a crucial mediating role in psychological resilience. Furthermore, gender influences cognitive control/flexibility and psychological resilience.

Based on these findings, the results of the structural equation modeling conducted to determine the mediating role of cognitive control and flexibility in the effect of career adaptability on psychological resilience are presented in Figure 2.
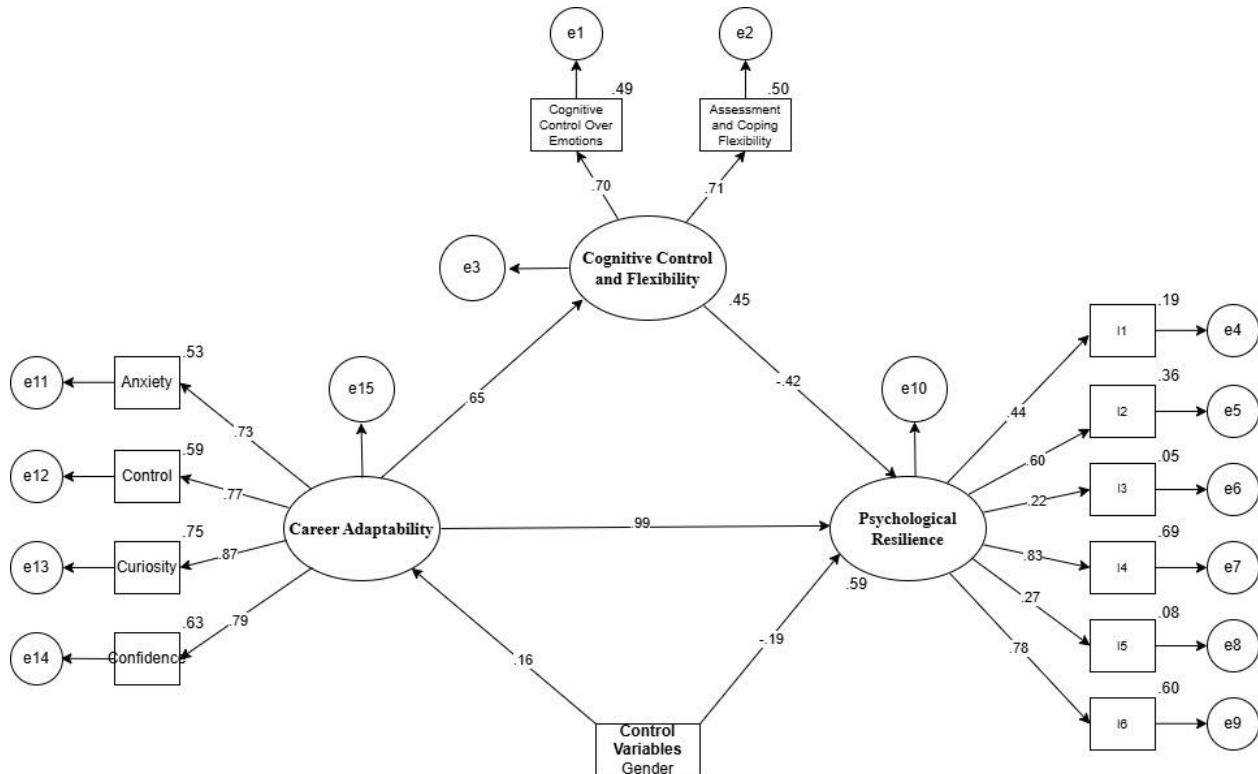

Figure 2. *Structural Equation Modeling for Variables*

According to the presented structural equation model, the career adaptability variable has a strong and positive effect on cognitive control and flexibility (β = .65); this construct significantly predicts and exerts a strong effect on psychological resilience (β = .59). In the model, career adaptability also directly predicts psychological resilience. However, this relationship is negative (β = –.19), indicating that cognitive control and flexibility may play a mediating role. Gender, as a control variable, appears to impact cognitive control, flexibility, and psychological resilience. The observed variables are associated with high loadings on the latent constructs in the model (e.g., career adaptability → curiosity: λ = .87; cognitive control → coping flexibility: λ = .71; psychological resilience → I4: λ = .83), indicating that the measurement models have sufficient validity. The goodness of fit values of the paths in the diagram of the developed model are presented in Table 4:

Table 4.

Fit Values of the Structural Equation Model Tested

	Obtained Variables	Good Fit	Acceptable Fit	Reference
x^2/**sd**	3,708	≤3	≤4-5	(Carmines & McIver, 1981)
RMSEA	.058	≤.05	.06-.08	(Browne & Cudeck, 1992)
SRMR	.06	≤.05	.06-.08	(Hu & Bentler, 1999)
GFI	.90	≥.95	.90-.94	(Joreskog & Sorbom, 1984)
CFI	.92	≥.95	.90-.94	(McDonald & Marsh, 1990)

As shown in Table 4, the structural equation model examining the mediating effect of cognitive control and flexibility on the relationship between career adaptability and psychological resilience was found to be statistically significant and met the fit criteria.

The coefficients of the direct and indirect effects, determined with 95% confidence intervals for the mediating effect of cognitive control and flexibility on the effect of career adaptability on psychological resilience and gender as a control variable on the effect of future employability on emotional intelligence, are presented in Table 5.

Table 5.

Bootstrapping for The Model

<div align="center">

Direct Effects

</div>

Parameter			Coefficient	Lower	Upper	p
Cognitive Control and Flexibility	<---	Career Adaptation	2,464	1,906	3,233	0,002
Cognitive Control and Flexibility	<---	Gender	1,989	0,415	3,932	0,017
Psychological Resilience	<---	Cognitive Control and Flexibility	0,091	0,055	0,153	0,003
Psychological Resilience	<---	Career Adaptation	-0,147	-0,329	-0,058	0,002
Psychological Resilience	<---	Gender	-0,222	-0,473	-0,064	0,004

<div align="center">

Indirect Effects

</div>

Parameter					Coefficient	Lower	Upper	p
Psychological Resilience	<---	Cognitive Control and Flexibility	<---	Career Adaptation	0,225	0,122	0,391	0,002

The direct and indirect effects, as determined by the bootstrap analysis in Table 5, indicate that the model contains significant and strong relationships. Career adaptability had a significant and positive effect on cognitive control and flexibility (β = 2.464, 95% CI [1.906, 3.233], p = .002), and this construct significantly predicted psychological resilience (β = 0.091, 95% CI [0.055, 0.153], p = .003). The direct effect of career adaptability on psychological resilience was negative and significant (β = −0.147, 95% CI [−0.329, −0.058], p = .002), indicating the presence of indirect effects. Indeed, the indirect effect of career adaptability on resilience is positive and significant through cognitive control and flexibility (β = 0.225, 95% CI [0.122, 0.391], p = .002). Gender was treated as a control variable in the model. It was found to have significant effects on both cognitive control and flexibility (β = 1.989, 95% CI [0.415, 3.932], p = .017) and psychological resilience (β = −0.222, 95% CI [−0.473, −0.064], p = .004). This suggests that gender may determine individuals' cognitive regulation capacity and psychological resilience levels, and may impact the relationships observed in the model.

4. Discussion and Conclusion

This study employed structural equation modeling to determine the mediating role of cognitive control and flexibility in the relationship between career adaptability and psychological resilience in adults. First, career adaptability was found to have a strong and positive effect on cognitive control and flexibility, indicating that individuals' vocational orientations support mental regulation skills. The results clearly demonstrate that cognitive control and flexibility serve as mechanisms to enhance psychological resilience. However, it is noteworthy that the direct effect of career adaptability on psychological resilience was found to be negative, indicating the decisive role of indirect pathways. Indeed, the positive and significant indirect effect of career adaptability on psychological resilience, mediated by cognitive control and flexibility, highlights the importance of these mediating mechanisms. Furthermore, the significant effects of gender, controlled for in the model, on both cognitive control and flexibility, as well as psychological resilience, demonstrate the need to consider individual differences. This result suggests that gender may be a moderating factor in the functioning of psychological resources.

Savickas's career construction theory explains career adaptability through the concepts of concern, control, curiosity, and confidence, demonstrating the functional role of these constructs in managing transitions (Savickas, 2013). Meta-analyses examining the relationship between career adaptability and adaptive responses and adaptation outcomes also indicate positive outcomes such as job and life satisfaction, performance, and employment quality. This finding aligns with our research findings, which support indirect effects (Guan & Wang, 2020; Rudolph et al., 2017). Studies with university students suggest that career adaptability predicts job search self-efficacy and the employment transition process. This strengthens the theoretical basis for the mediating mechanism operating through cognitive control and flexibility (Hou et al., 2012; Koen et al., 2012). Findings that cognitive control and flexibility enhance psychological resilience by supporting mental transitions under stressful conditions also support the current study's mediation model (Diamond, 2013; Shields et al., 2016). Furthermore, research on psychological resilience demonstrates that cognitive mechanisms play a crucial role in individuals' adaptation to challenging life events, and this relationship is supported by reliable measurements (Connor &

Davidson, 2003; Masten, 2014). Research within the framework of emotion regulation theory also suggests that cognitive flexibility facilitates recovery by increasing positive emotions through reappraisal strategies (Gross, 2015; Troy & Mauss, 2011). However, it is noteworthy that the direct effect of career adaptability on psychological resilience was adverse, which contradicts some findings in the literature. In particular, findings that excessive compliance demands can trigger anxiety and burnout in individuals can be considered a possible mechanism that could explain this situation (Neureiter & Traut-Mattausch, 2017; Johnston, 2018). Furthermore, some studies emphasize that career adaptability is primarily associated with positive outcomes; however, contextual demands and individual differences can alter the direction of this relationship (Tolentino et al., 2014; Hirschi, 2009). In this respect, the findings in the current study indicate that career adaptability does not always serve a protective function. Furthermore, the gender effects observed in our study are consistent with those reported in the literature. It has been reported that executive functions exhibit different patterns by gender under acute stress, and there are differences in cognitive control processes between men and women (van den Bos et al., 2009; Grissom & Reyes, 2019). Furthermore, the literature also suggests that gender moderates the relationship between psychological resilience and cognitive functions (Rutter, 2012). The significant indirect effect of career adaptability on psychological resilience, mediated by cognitive control and flexibility, is consistent with most studies in the literature, supporting the role of these skills as mediators in enhancing individuals' adaptive capacity. However, the negative direct effect of career adaptability on psychological resilience suggests that this relationship is not always positive and that contextual or individual differences may negatively shape the process. Therefore, the findings suggest that the relationship between career adaptability and psychological resilience involves supportive indirect mechanisms and limiting direct effects. The observation that the negative direct effect between career adaptabilities and psychological resilience coexists with the positive indirect effect mediated by cognitive control and flexibility indicates a complex relationship structure. This suggests that individuals with high levels of career adaptability may experience a temporary reduction in their psychological resilience due to the intense usage of their cognitive resources in environments that constantly demand control and flexibility. Furthermore, the influence of gender on cognitive control and flexibility, as well as on psychological resilience, may be related to the known differences between men and women in terms of executive functions and coping strategies.

In conclusion, this study has demonstrated that career adaptability is a crucial personal resource that both directly and indirectly impacts individuals' psychological resilience. The findings suggest that career adaptability has a strong and positive impact on cognitive control and flexibility, and that these processes serve as a mediating mechanism that enhances psychological resilience. However, the direct negative effect of career adaptability on psychological resilience suggests that this relationship is not always unidirectional and positive, and that contextual and individual factors may complicate the process. The significant effects of gender on both cognitive control and flexibility, as well as psychological resilience, underscore the importance of considering individual differences in adaptation processes. Overall, the findings suggest that understanding the multilayered relationships among career adaptability, cognitive mechanisms, and psychological resilience can significantly contribute to theoretical and applied fields.

5. Recommendations

The findings of this study demonstrate that understanding the multilayered relationships among career adaptability, cognitive control, flexibility, and psychological resilience has significant implications for both theory and practice. Theoretically, the results demonstrate that career adaptability is linked to individuals' self-regulation skills, as predicted by career construction theory, and that these skills serve as a mediator in the process leading to psychological resilience. This suggests that career adaptability should be considered for professional development and as a personal resource that strengthens individuals' psychological resilience. From a practical perspective, these findings offer important implications for career counselors and educators. In particular, supporting career counseling programs with activities to enhance individuals' cognitive control and flexibility can strengthen their psychological resilience. Furthermore, the finding that gender may play a moderating role in these relationships underscores the importance of designing interventions that take into account individual differences. Within this framework, it is recommended that personalized strategies be developed in career guidance services and that individuals' cognitive and emotional regulation capacities be supported, particularly during high-stress transition periods. This will enable more sustainable adaptation processes in both academic and professional life. Interventions related to problem-solving and decision-making strategies can be planned to enhance individuals' cognitive control and flexibility. Furthermore, considering the effect of gender differences found in this study, future studies can develop career planning programs that are tailored to individual differences.

While the findings of this study offer important contributions, some limitations should be considered. First, the fact that data were collected through self-report measures introduces limitations that may arise from social desirability bias and subjective assessments. Future studies could enhance the validity of the findings by using behavioral measures, qualitative interviews, or multiple data collection methods. Second, the study's cross-sectional design precludes definitive causal inferences regarding the direction of the relationships among career adaptability, cognitive control, flexibility, and resilience. Using longitudinal or experimental designs could contribute to understanding the temporal and developmental dynamics of these relationships. Third, the sample's limitation to a specific cultural and educational context reduces the generalizability of the findings. Comparative

studies across cultural groups, occupational fields, and life stages could test the model's universality. Furthermore, the finding of a direct negative impact of career adaptability on resilience could be explained by excessive adaptive demands or the influence of contextual stressors, and these factors should be further investigated in the future. Ultimately, the emergence of gender as a significant variable underscores the need to evaluate individual differences through more comprehensive and intersectional analyses.

6. Declarations

All articles must be submitted with a "Declaration" section that includes the following headings. Under this heading, the points that authors should pay attention to are stated.

Ethics Approval and Consent to Participation. This study was approved by the Ethics Committee of Bursa Uludag University (Approval No: 2025/07, dated 29.08.2025). All procedures were conducted in accordance with the ethical standards of the institutional and national research committees, as well as the principles outlined in the Declaration of Helsinki.

Approval for Publication. All authors have read and approved the final version of the manuscript and consent to its publication.

Availability of Data and Materials. The data supporting this study's findings are available from the corresponding author upon reasonable request.

Competing Interests. The authors declare that they have no competing interests.

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Mapping The Scientific Landscape of Rumination: A Bibliometric Analysis in Web of Science

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Abstract

This study conducted a comprehensive bibliometric analysis of 1,967 academic publications released in the Web of Science database between 1983 and 2026 to examine the development process of the literature on the concept of rumination. Within the scope of the current study, performance analysis, conceptual mapping, co-word and co-citation networks, historiography, and thematic trend analyses were performed on September 26, 2025. The findings revealed a significant increase in the number of publications on the concept of rumination, particularly after 2005, with the peak occurring in 2024. According to the analysis results, Personality and Individual Differences, Journal of Affective Disorders, and Frontiers in Psychology stood out as the most prolific publications on this topic. The University of Pittsburgh made the most contributions, followed by the University of Columbia, Leiden University, University of Exeter, and Vanderbilt University. When examining the authors, researchers such as Nolen-Hoeksema, Watkins, Treynor, and McLaughlin are recognized for their contributions to the formation of the field's infrastructure. The results of the thematic analysis showed that the concept of rumination has shifted from historical research focusing on depression and cognitive processes to contemporary themes of psychological flexibility, stress regulation, and well-being. These findings revealed that rumination has gained increasing importance in the psychology literature and has evolved into a multidisciplinary construct associated with different psychosocial dimensions.

Keywords:
Rumination, scientific mapping, bibliometric analysis.

1. Introduction

Rumination is defined as cognitive processes characterized by thoughts or themes that persistently and repetitively arise to a degree that prevents the functioning of an individual's mental processes (American

Psychological Association [APA], 2023). This process typically involves a continuous mental cycle of thinking about negative past events, emotional experiences, or personal failures (Watkins, 2008). In the Response Styles Theory developed by Nolen-Hoeksema (1991), rumination is explained as the cognitive response patterns individuals exhibit in the face of depressive mood states. Previous studies indicate that individuals' responses to negative experiences are not a one-dimensional phenomenon but a multi-dimensional structure (Trapnell & Campbell, 1999). In this context, the concept of rumination is addressed in two sub-dimensions: reflective thinking, which is considered adaptive, and preoccupied thinking, which is regarded as maladaptive (Shaw et al., 2021; Treynor et al., 2003). Reflective thinking occurs when an individual consciously turns inward to make sense of negative experiences, develop insight, and generate solutions. This enables the individual to engage in cognitive problem-solving efforts to reduce negative emotions and develop a more functional coping strategy (Joormann et al., 2006). On the other hand, brooding refers to a more passive and self-critical form of thinking in which individuals focus on the causes and consequences of their negative experiences without actively attempting to change the situation. This leads individuals to sustain their negative emotions and causes psychological distress to become chronic (Nolen-Hoeksema & Morrow, 1991). Some studies claim that reflective thinking is the beginning of rumination and can turn into ruminative thinking over time (Kim & Kang, 2022; Miranda & Nolen-Hoeksema, 2007).

Individuals' response styles to the events they experience affect both the intensity and duration of depressive symptoms and reduce attention-directing, emotion-regulating, and problem-solving skills (Nolen-Hoeksema, 1991; Nolen-Hoeksema et al., 2008; Shaw et al., 2021). Therefore, rumination is considered not only a consequence of depression but also an effective cognitive mechanism in the formation and maintenance of psychopathology (Nolen-Hoeksema et al., 2008). Rumination also affects individuals' levels of life satisfaction (Kim & Kang, 2022). In recent years, rumination has been approached as a transdiagnostic concept (Aldao & Nolen-Hoeksema, 2010; du Pont et al., 2018; Nolen-Hoeksema & Watkins, 2011; Nolen-Hoeksema et al., 2008; Shaw et al., 2021). It has been noted that adolescents who respond to stressful situations with ruminative behavior are at increased risk of developing depressive disorders in later life (Shaw et al., 2021). Furthermore, it has been observed that there are significant relationships between rumination and depression and that rumination has a significant effect on depression (Hankin, 2008; Roley et al., 2015; Rood et al., 2010). However, it has been noted that rumination is associated with various internalized problems, such as anxiety rather than depression alone (Cox et al., 2001; Muris et al., 2004; Schäfer et al., 2017; Shaw et al., 2021). Alloy et al. (2012) found that rumination has a meaningful and strong relationship with both depression and anxiety symptoms. At the same time, a meaningful relationship between rumination and post-traumatic stress disorder has also been observed (Moğulkoç, 2014; Roley et al., 2015). In a study conducted by Jostmann et al. (2011), a negative relationship was found between rumination and emotion regulation, and it was found that individuals with low emotion regulation skills ruminated more. Satıcı et al. (2022) study also observed that rumination increases negative cognition and depressive mood and negatively affects psychological well-being in the face of traumatic and uncertain situations. Furthermore, a study conducted by Nolen-Hoeksema (2007) found that rumination affects depression, bulimia nervosa, and substance use in adolescent girls. Bugay and Erdur-Baker (2011) evaluated rumination according to gender and age. They found that rumination plays a mediating role between gender and psychological problems and that female students ruminate more than male students. However, no significant difference was found in age. This finding was explained by Nolen-Hoeksema (1991) in terms of gender roles, stating that women ruminate more when they are depressed, while men ruminate more when they are angry. Recent findings also show that anger and depressive rumination are distinct thought patterns that relate to psychological problems in different ways. Depressive rumination is more strongly linked to both internalizing and externalizing symptoms, whereas anger rumination shows gender-specific effects—for example, it shows externalizing behaviors in women (du Pont et al., 2018). Consistent with this gender-related pattern, Stelmach-Lask et al. (2024) also reported that women show higher levels of overall rumination and brooding than men, while no gender difference was found in reflective pondering.

This study aims to systematically reveal the increasing conceptual diversity in the field of rumination, the intellectual structure of the literature, its thematic orientations, and the dynamics of scientific development. In this regard, the research aims to comprehensively evaluate the conceptual development of the rumination concept over the years, the authors and institutions that have contributed most to the field, the collaboration networks that shape knowledge production, the themes that stand out in the literature, and the positioning of rumination in different disciplines such as clinical psychology, psychiatry, and behavioral sciences. This objective is important both in presenting existing studies in the literature as a whole and in shedding light on future research on rumination. Within this framework, the study seeks answers to the following questions:

1. What is the distribution of scientific production and publication trends related to rumination over the years?

2. Which authors, institutions, and countries contribute most to the development of rumination research?

3. How is the field structured regarding its intellectual structure, common citation networks, and author collaborations?

4. What are the prominent conceptual themes, keyword clusters, and thematic trends in the rumination literature?

5. In an interdisciplinary context, how is the concept of rumination positioned in applied fields such as clinical psychology, psychiatry, and behavioral sciences?

2. Methodology

2.1. Research Model

In this study, a bibliometric mapping approach combining performance analysis with science mapping techniques was adopted to enable a systematic examination of scientific output on rumination. Bibliometric mapping was preferred because it allows for a comprehensive assessment of the structural and conceptual landscape of a research field, facilitating the identification of publication trends, leading authors and institutions, collaboration networks, and thematic changes over time (Cobo et al., 2011; Zupic & Čater, 2015). This approach is considered a suitable method, particularly for large data sets, and provides a comprehensive assessment at both descriptive and relational levels.

2.2. Data Collection

The data collection process was performed on September 26, 2025, by searching the Web of Science (WoS) database using the keyword "rumination." Within this scope, studies published between 1983 and 2026 were examined, and only publications directly related to the concept of rumination were included in the data set. Details of the analyzed data are presented in the table below (Table 1).

Table 1. *Descriptive Statistics of the Dataset*

Description	Results	Description	Results
Main Information About Data		*Document Types*	
Timespan	1983:2026	Article	1967
Sources (Journals, Books, etc.)	759	Article; Book Chapter	7
Documents	2190	Article; Early Access	61
Annual Growth Rate %	1.63	Article; Proceedings Paper	5
Document Average Age	6.62	Correction	2
Average citations per doc	30.46	Editorial Material	3
References	79742	Editorial Material; Book Chapter	1
Document Contents		Letter	2
Keywords Plus (ID)	3889	Meeting Abstract	20
Author's Keywords (DE)	4145	Note	2
Authors		Proceeding Paper	5
Authors	9029	Reprint	2
Authors of single-authored docs	83	Review	109
Authors Collaboration		Review: Book Chapter	1
Single-authored docs	86	Review: Early Access	3
Co-Authors per Doc	5.09		
International co-authorships %	21.6		

The study's main objective is to examine the bibliometric characteristics of academic publications addressing rumination. In this regard, 1,967 academic studies were identified due to an online search conducted in the WoS database. The studies obtained were evaluated through various indicators within the scope of bibliometric analysis. These indicators include Source Production Over Time, Author Production Over Time, Co-citation Network, Historical Citation Analysis, Most Relevant Links, Authors' Countries, Trending Topics, International Collaboration, Thematic Map, and Annual Scientific Output. The findings are discussed in detail in the relevant section.

2.3. Procedure

Four basic criteria were established for selecting studies to be included in the analysis: (i) the study must focus directly on the concept of rumination, (ii) it must be indexed in the Web of Science (WoS) database, (iii) it must have been published between 1983 and 2026, and (iv) it must be classified as an article or review.

Accordingly, a search was conducted in the WoS database using the keyword "rumination," irrelevant results were filtered out, and only publications meeting the specified criteria were included in the dataset.

Two main approaches stand out in preparing bibliometric datasets (Zupic & Čater, 2015). In the first approach, databases are searched using specific keywords or concept groups, and only studies that meet the criteria are selected after a detailed review. This method is generally used in topic-focused bibliometric reviews. The second approach involves selecting one or more specific journals and including in the analysis all studies published in these journals that are determined to be relevant following the reviews. This second approach is preferred, especially when the goal is to map a specific field comprehensively. In the current study, the first approach was preferred.

2.4. Data Analysis

The bibliometric data analyses conducted in this study were obtained by examining and filtering 1,967 publications listed under the keyword "rumination" in the Web of Science (WoS) database according to the specified criteria. The data were downloaded in BibTeX format and processed using the bibliometrix package (Aria & Cuccurullo, 2017) in the R Studio environment. Data cleaning steps were first applied during the analysis process. In this context, author and institution names were standardized to resolve author name ambiguities. Furthermore, keywords were combined, and synonymous concepts and singular and plural words were grouped under a single term to preserve semantic integrity. Studies were conducted at different levels using basic bibliometric indicators and network-based relational analyses. The basic analyses evaluated scientific production by year (Annual Scientific Production), the productivity level of journals (Production of Sources Over Time), the most productive authors, and citation performance (Author Production and Citation Analysis). In correlational analyses, co-authorship networks, co-citation networks, co-word networks, and clustering structures were visualized. Furthermore, trend topic analysis was applied to identify the most frequently used concepts according to years and time of entry into the literature. Thematic map analysis was performed to reveal the distribution of concepts according to their level of development and importance; in this regard, concepts were divided into four categories: "core themes," "driving themes," "niche themes," and "declining themes." Historical citation networks (historiography) were used to identify landmark studies and authors in the field literature.

3. Results

This study presents a bibliometric analysis of academic publications on rumination. The analysis findings are presented by categorizing the distribution by publication years and journals, authors and citation performance, higher education institutions and countries producing publications on rumination, and the most frequently used concepts and their distribution.

3.1. Distribution of studies by publication year and journal

The results of the analysis conducted to determine the annual scientific productivity of the studies are presented in Figure 1.
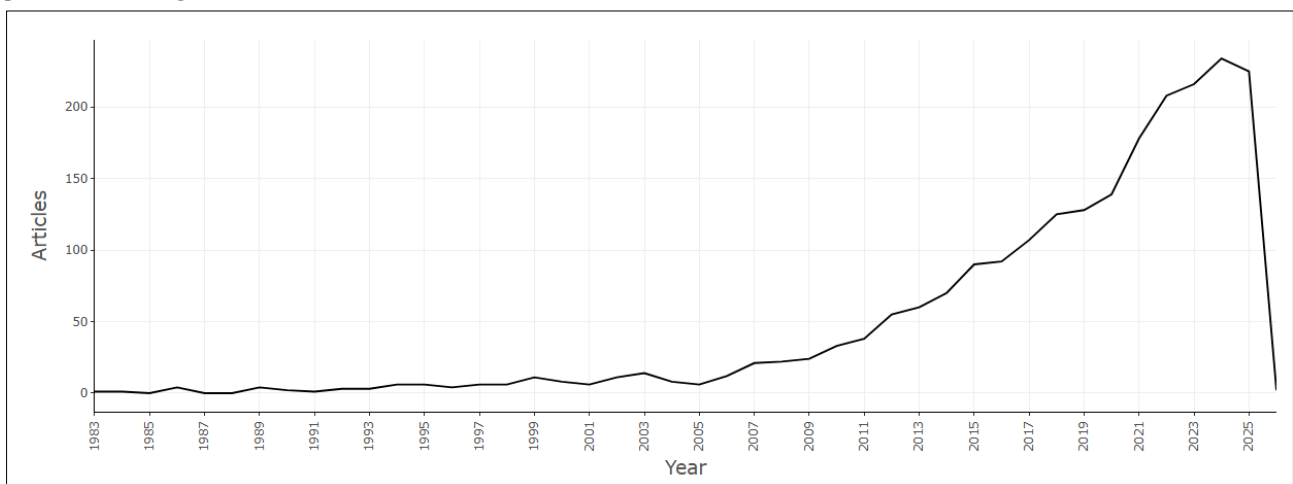

Figure 1. *Annual Scientific Production*

Figure 1 shows that academic studies on rumination began in 1983 and have continued to the present day. Notably, production remained at low levels and fluctuated between 1983 and 2000, but has shown a steady upward trend since the mid-2000s. A more pronounced rise in production occurred after 2010, and by the 2020s, the number of articles reached its highest level. However, a gradual decline in production has been observed since 2023, and by 2025, there has been a significant drop in the number of articles.

After examining the changes over the years, the productivity of sources related to rumination over time was evaluated, and the findings are presented in Figure 2.
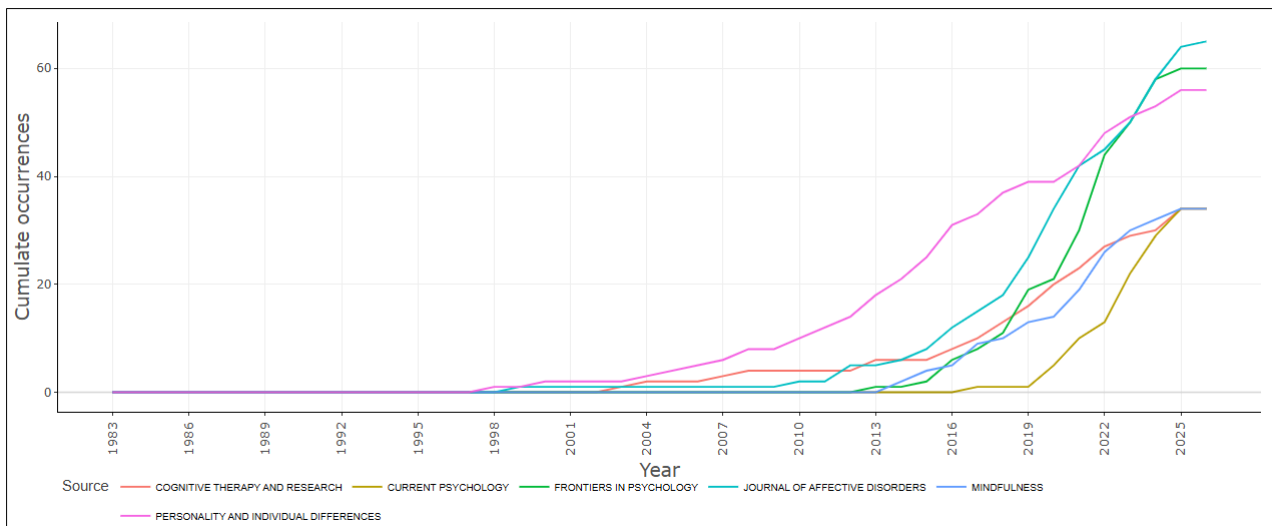
Figure 2. *Sources' Production over Time*

When examining Figure 2, it is evident that rumination studies are increasingly being published in various academic journals. The journal "Personality and Individual Differences" has shown a marked increase in production since the 2010s and has achieved the most stable growth curve. The journal "Journal of Affective Disorders" has shown a remarkable rise since 2015 and has become one of the leading journals since the 2020s. The journals "Frontiers in Psychology" and "Current Psychology" have also steadily increased, especially after 2018. In addition, although the journal "Cognitive Therapy and Research" showed more limited production in the early years, it has gained momentum in recent years.

3.2. Authors Working on the Research Topic and Citation Distribution

Authors contributing to the research topic and the citation distribution for these authors were analyzed, and then the authors' scientific production levels were evaluated by year. The findings are visualized in Figure 3.
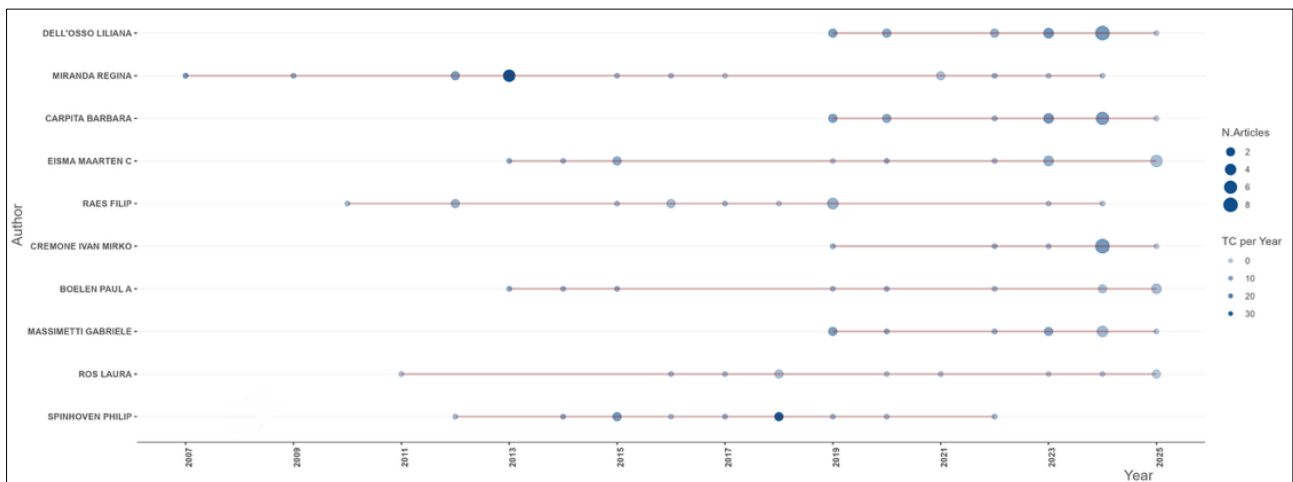

Figure 3. *Authors' Production over Time*

Figure 3 shows the productivity levels and citation counts of authors involved in research on the subject according to year. A significant increase in the number of publications is noticeable between 2013 and 2025. The acceleration observed in research production since the early 2000s peaked, particularly after 2024. Although there was a relative decrease in the number of articles in 2021, the general trend continued to be upward. The intensity of studies published between 2007 and 2025, in particular, contributes significantly to the scientific accumulation in the field.

After examining the authors' production over time, the simultaneity network was discussed, and the findings are presented in Figure 4.
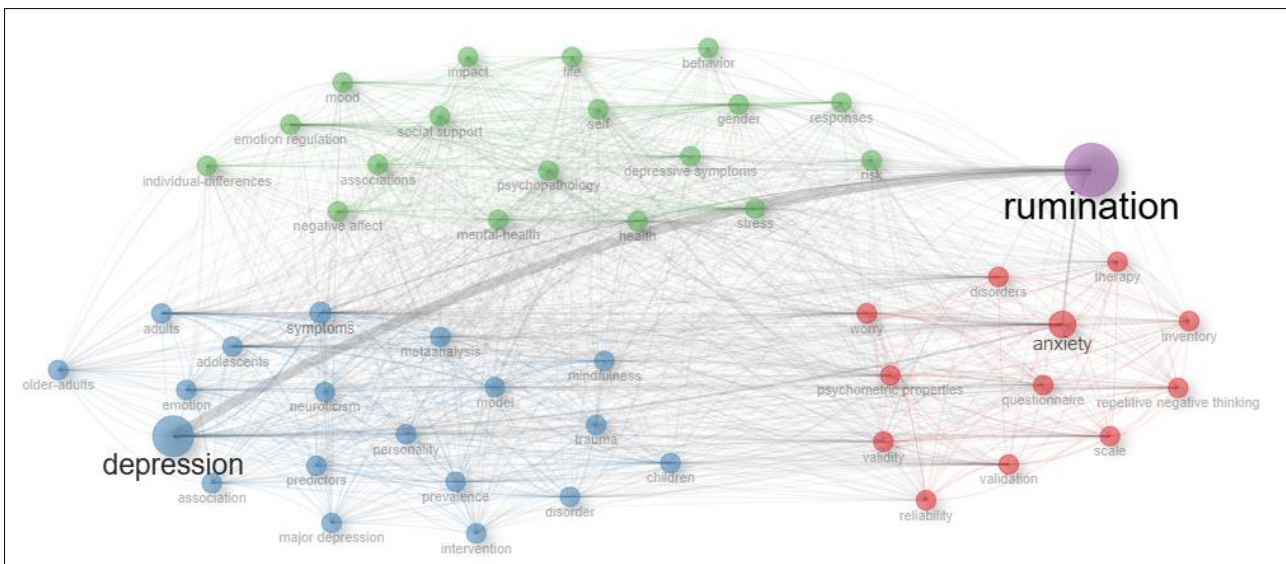
Figure 4. *Concurrency Network*

Figure 4 shows the co-occurrence network, showing the connections between the terms most frequently associated with the concept of rumination. The network map shows that the idea of "rumination" occupies a central position and has particularly strong connections with the concepts of 'depression' and "anxiety." This finding indicates that rumination is a psychological phenomenon closely linked to both depressive and anxiety-related processes. On the left side of the network, terms clustered around "depression" (e.g., symptoms, emotion, neuroticism, intervention) are notably associated with depressive symptoms, emotional responses, and personality factors. The "anxiety" cluster on the right side is represented by concepts such as "worry," "therapy," "validation," and "repetitive negative thinking," focusing on cognitive processes and anxiety-based studies. The green clusters at the top, grouped around themes such as "stress," "mental health," "self," and "behavior," point to psychological functioning, stress, and self processes. Overall, the network structure reveals that rumination is closely related to depression, anxiety, and stress; these concepts are addressed in an integrated structure with psychological health, emotion regulation, and cognitive processes.

After examining the co-occurrence network, the co-reference network was analyzed, and the findings are presented in Figure 5.
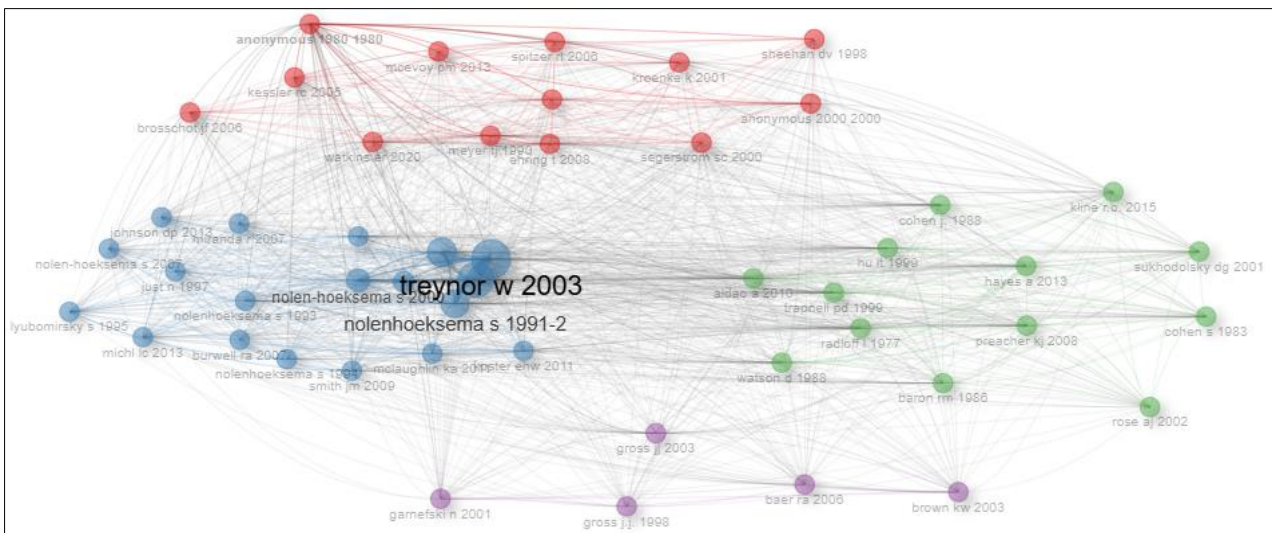
Figure 5. *Co-citation Network*

The co-citation network presented in Figure 5 represents the intellectual structure of the rumination field and the fundamental studies upon which it is based. The network reveals distinct clusters formed by authors who have guided the development of the field. The blue cluster centers on the work of Nolen-Hoeksema, S., and Treynor, W. (2003), representing the most frequently cited foundational sources in the literature on conceptualizing and measuring rumination. This cluster brings together theoretical approaches that address the relationship between rumination and psychopathology, particularly in the context of depression and cognitive processes. The red cluster includes the work of researchers such as Kroenke K., Spitzer R.L., and Watkins E.R., focusing on the development of measurement tools and the implications of rumination in the context of clinical psychology. This group

emphasizes rumination's relationship with psychiatric symptoms and its role in diagnostic assessments. The green cluster includes the work of authors such as Watson D., Trapnell P.D., and Aldao A., and focuses on research on emotion regulation, personality traits, and stress processes. Gross J.J. and Baer R.A., who are in the purple cluster, represent research examining the cognitive foundations of rumination in the context of mindfulness and emotion regulation strategies.

After examining the common citation network, the extent to which the authors influenced each other was examined, and the findings are presented in Figure 6.

Figure 6. *Historical network of references in the field of rumination*

The historical citation network in Figure 6 shows the citation relationships between studies in the rumination literature. The network structure reveals that Nolen-Hoeksema's (1994, 1999) studies form the theoretical foundation of the field and that these studies have largely influenced subsequent research. Researchers such as Miranda (2007), Garnefski (2007), McLaughlin (2011), and Michl (2013) have expanded on these basic approaches, examining rumination's relationship with cognitive processes and psychopathology. However, studies conducted by Amarnath (1986), O'Brien (1995), and Chial (2003) have been identified as representing early theoretical contributions independent of the leading network. The network generally reveals that scientific development in rumination has been shaped along the Nolen-Hoeksema line.

3.3. Distribution of broadcasting organizations and countries

Analyses of the connections between the countries of broadcasting organizations and authors are presented in Figures 7 and 8.
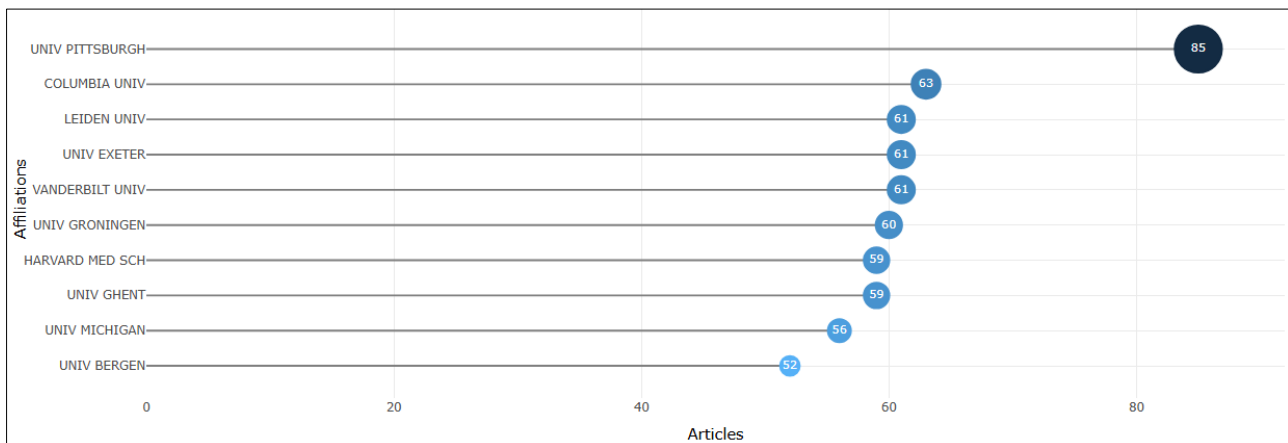
Figure 7. *Most Relevant Affiliations*

Figure 7 shows the productivity status of different higher education institutions. According to the data, the institution with the most publications in this field is the University of Pittsburgh, the most influential institution in the literature, with 85 articles. This institution is followed by the University of Colombia (63 articles), Leiden University (61), the University of Exeter (61), and Vanderbilt University (61). Other institutions in the top ten include the University of Groningen (60), Harvard Medical School (59), the University of Ghent (59), the University of Michigan (56), and the University of Bergen (52).

Figure 8. *Corresponding Author's Countries*

Note. SCP = Single Country Publication, MCP = Multiple Country Publication

Figure 8 shows the country distribution of lead authors publishing in the relevant field and the types of collaboration (single-country publication - SCP and multi-country publication - MCP). The data reveals that the United States (US) contributes the most publications and is far ahead of other countries. The United Kingdom, China, Australia,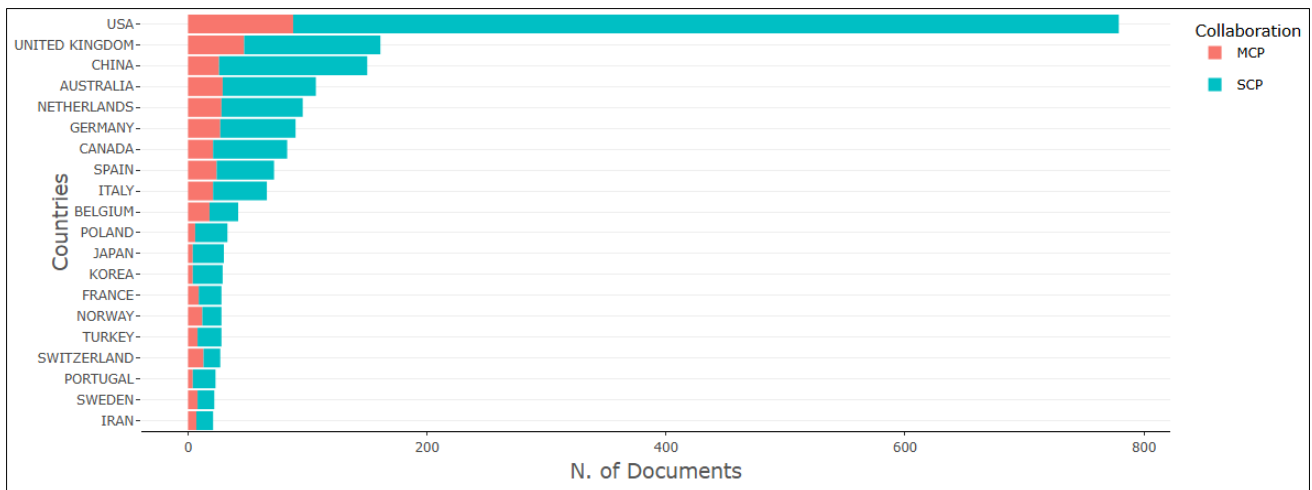 the Netherlands, and Germany follow the United States. The color coding in the graph distinguishes single-country collaboration (SCP) from multinational collaboration (MCP) publications. It is particularly noticeable that the MCP ratio is relatively high in countries such as the United Kingdom, the Netherlands, and Australia. In contrast, it is remarkable that single-country publications (SCP) are more dominant in the US and China.

After examining the countries of the relevant authors, the collaboration between countries was discussed, and the findings are presented in Table 2.

Table 2. Countries' Collaboration World Map

Australia	New Zealand	171,4849235
Canada	New Zealand	171,4849235
Italy	New Zealand	171,4849235
Korea	New Zealand	171,4849235
Netherlands	New Zealand	171,4849235
Sweden	New Zealand	171,4849235
Türkiye	New Zealand	171,4849235
United Kingdom	New Zealand	171,4849235
USA	New Zealand	171,4849235
Australia	Japan	138,0308956

Table 2 shows that New Zealand has academic collaborations with many countries. Australia, Canada, Italy, Korea, the Netherlands, Sweden, Türkiye, the United Kingdom, and the USA are among the countries that collaborate with New Zealand. At the same time, joint studies have been conducted between Japan and Australia.

3.4. Most Frequently Used Concepts, Their Distribution and Thematic Map

After examining the productivity levels of different higher education institutions, the most frequently used concepts related to the research topic and their distribution over the years were analyzed. The findings regarding trending topics are presented in Figure 9.
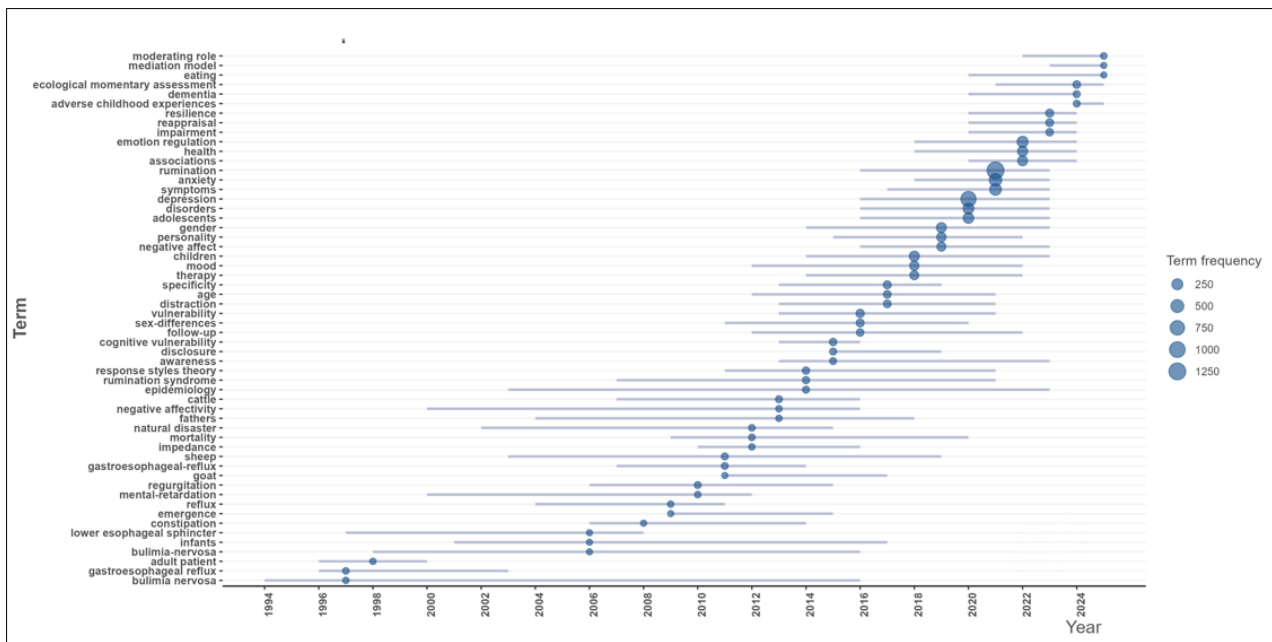
Figure 9. *Trend Topics*

Figure 9 shows the trends of concepts that stand out in research over the years and the periods in which these concepts were used intensively in the literature. At the beginning of the 2000s, studies were shaped more around clinical and physiological terms such as "bulimia nervosa," "gastroesophageal reflux," and "adult patient." It is understood that the concepts of this period focused on topics at the intersection of psychiatric and medical perspectives. After 2005, a distinct conceptual transformation occurred in the literature, and themes related to psychological processes such as "emotion regulation," "mood," "therapy," and "vulnerability" began to emerge. This change indicates that the research focus in the field has shifted from physiological themes to cognitive-emotional processes.

Since the 2010s, a marked increase in the use of the concepts "depression," "anxiety," "rumination," and "health" has been observed. During this period, with the increase in studies conducted, particularly on the axes of depression and anxiety, themes such as "resilience," "emotion regulation," and "cognitive vulnerability" have also come to the fore. The term frequencies represented by the balloon sizes reveal that the concepts of "depression," "anxiety," and "rumination" have become dominant in the literature in recent years. In the post-2020 period, concepts such as "mental health," "stress," "resilience," and "adverse childhood experiences" are seen to be used more frequently. This trend indicates that research on mental health, traumatic life experiences, and individual coping mechanisms has intensified in recent years.

After examining the trending topics, the thematic map was reviewed, and the findings are presented in Figure 10.
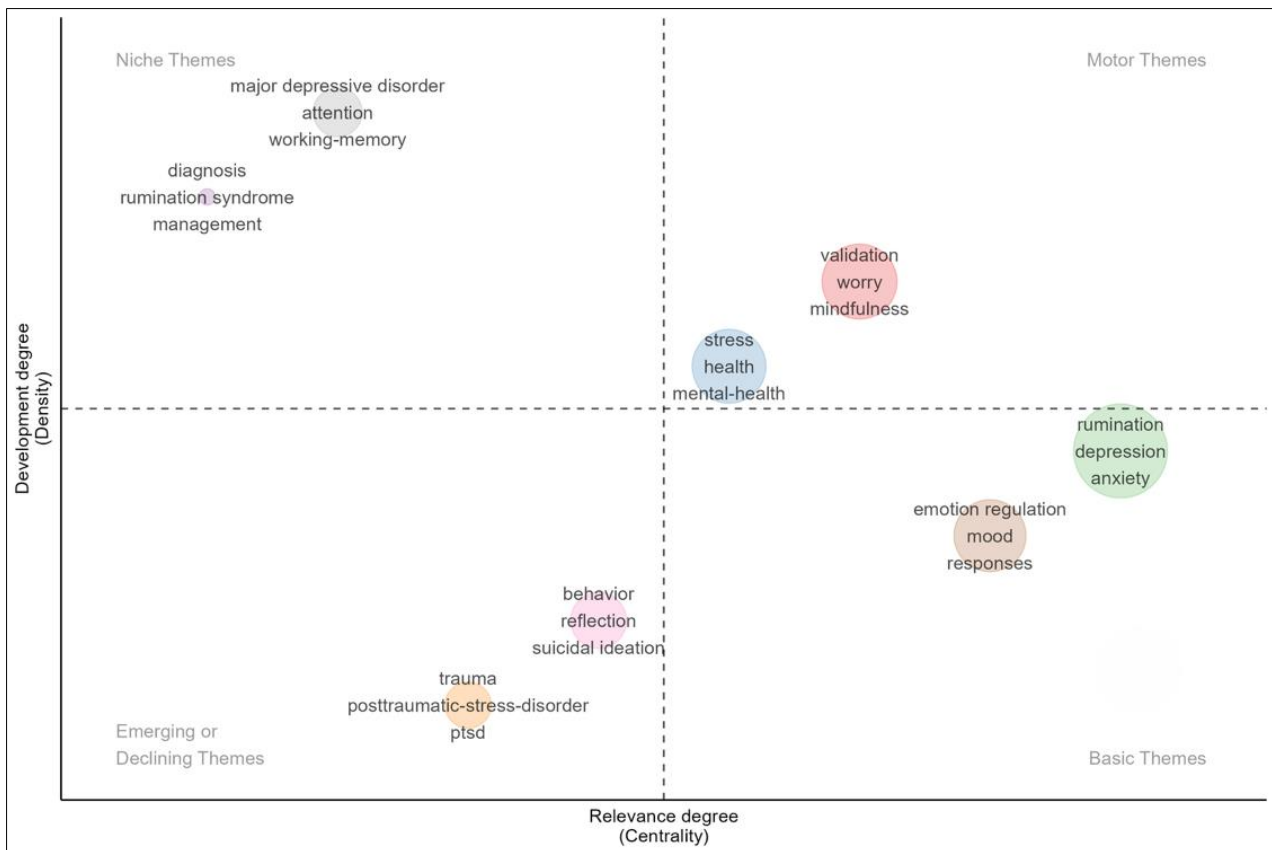
Figure 10. *Thematic Map*

The thematic map in Figure 10 shows the distribution of concepts in the research field according to their centrality (relevance degree/centrality) and density (development degree/density) levels. Upon examining the map, it can be seen that each theme reveals its relative importance and level of maturity in the field.

• *Niche Themes (Upper Left Section):* This area, which includes concepts such as "major depressive disorder," "attention," and "working memory," represents topics that are intensively studied in specific subfields but have limited interaction with the general research field. This indicates that these themes have been studied in depth but lack broad coverage in the literature.

• *Motor Themes (Upper Right Section):* No distinct cluster of motor themes has emerged in this area. However, this gap in the map indicates that central and highly developed themes may concentrate in this region in the future. Such topics are expected to determine the direction of the field in future research.

• *Core Themes (Lower Right Section):* The cluster formed by the concepts of "rumination," "depression," and "anxiety" stands out with its high level of centrality. These themes represent the core of research in the field and constitute the fundamental theoretical framework. However, it is also evident that these concepts need further development from a methodological or applied perspective.

• *Emerging or Declining Themes (Lower Left Section):* This section, which includes the themes of "posttraumatic stress disorder (PTSD)," "trauma," and "suicidal ideation," contains themes with low centrality and intensity levels. This indicates that these topics are either emerging research areas or are gradually losing their importance.

• *Intermediate Cluster (Middle Section):* This cluster, which includes the themes of "stress," "health," and "mental health," exhibits moderate centrality and intensity. Although these topics are frequently addressed in the literature, they are still considered themes with potential for development and are expected to become more prominent. Furthermore, the group formed by the concepts of "mindfulness," "validation," and "worry" is thematically connected and represents contemporary research trends related to mental health.

Overall, this thematic map shows that depression, anxiety, and rumination occupy a central position in the research field; that themes such as stress, health, and awareness support this core area; and that such issues as trauma and PTSD continue to develop within a more limited context. This situation reveals that studies on mental health and cognitive processes form dominant trends in the field.

4. Discussion

The current study examines the scientific evolution, intellectual background, and thematic orientations of rumination literature using bibliometric methods, revealing the field's current state. The findings indicate that the

literature, which has been ongoing since 1983, gained significant conceptual expansion, especially after 2005, and reached its highest publication level in 2024. This increase aligns with the growing interest in cognitive and emotional processes in psychological studies, suggesting that rumination has taken on a more central role and evolved from being primarily associated with depressive symptoms to becoming a transdiagnostic framework. This conceptual shift corresponds to the literature's transition toward understanding rumination as a core cognitive process underlying multiple forms of psychopathology (du Pont et al., 2018; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Shaw et al., 2021). In this sense, the expansion of rumination research parallels broader developments in clinical psychology, where maladaptive cognitive mechanisms are increasingly conceptualized as general vulnerability factors rather than disorder-specific correlates. The rapid growth after 2005 may therefore reflect both advances in measurement approaches (e.g., multidimensional rumination scales) and the integration of rumination into emerging models of emotion regulation, metacognition, and repetitive negative thinking.The increase in publication trends over the years indicates that current research examines rumination's relationship with broader concepts such as psychological flexibility, stress regulation, and well-being. Recent studies exploring rumination's effects on psychological well-being (Satici et al., 2022; Stelmach-Lask et al., 2024) reveal that this cognitive tendency influences individuals' coping styles and self-regulation capacities. This tendency can be considered one of the factors explaining the increase in publications observed in the field. Moreover, the thematic expansion observed in recent years—particularly the integration of rumination into research on mindfulness, acceptance-based interventions, trauma recovery, and resilience—suggests that the construct is being examined not only as a risk factor but also in relation to mechanisms that may buffer or moderate its impact. This diversification reflects a methodological shift toward multi-component models that examine rumination within broader networks of cognitive, emotional, and behavioral processes. The findings also suggest a partial decline in publications after 2023. Still, this decline may indicate thematic saturation and conceptual diversification in the literature. Rather than signaling decreased interest, the slight decline may reflect a redistribution of research efforts toward newer constructs (e.g., repetitive negative thinking, perseverative cognition), which build upon but extend beyond traditional rumination models. Thus, the trend points to an evolving field undergoing refinement rather than contraction.The analysis of the most productive authors, institutions, and countries indicates that rumination research initially developed within a predominantly U.S.-centered academic structure. Institutions such as the University of Pittsburgh, Columbia University, Leiden University, the University of Exeter, and Vanderbilt University have made seminal contributions to shaping the field. Main work by scholars, including Nolen-Hoeksema (1991), Treynor et al. (2003), and Watkins (2008), was instrumental in conceptualizing rumination as a maladaptive cognitive response style. Their influence is evident, underscoring their pivotal role in shaping the intellectual base of the field. While cultural diversity in early studies was limited, cognitive models explaining rumination's links to depression, anxiety, and maladaptive emotion regulation processes dominated the global literature and reinforced a primarily Western conceptualization of the construct. This early phase, therefore, positioned rumination as a largely uniform maladaptive cognitive style, with limited consideration of sociocultural variability. In recent years, contributions from European and Asian institutions have grown substantially, particularly from universities in the Netherlands, the United Kingdom, and China. This shift indicates a broader internationalization and diversification of rumination research. Alongside this expansion, new findings suggest that rumination may function differently across cultural contexts, influenced by social norms, relational expectations, and emotion regulation practices. Studies from East Asian countries, for example, propose that rumination may sometimes serve adaptive functions—such as fostering relational sensitivity or preparing for problem solving—challenging the traditional Western notion of rumination as inherently harmful. Moreover, the increasing density of international collaboration networks points to an emerging multi-centered research ecosystem, prompting a reassessment of rumination's universality and its culturally specific mechanisms.

Findings regarding the intellectual structure of the field's literature, evaluated through common citation networks and historical citation analyses, reveal that the theoretical line initiated by Nolen-Hoeksema (1991, 1999) has been expanded upon by subsequent research. This line has evolved from the Response Styles Theory, which focuses on explaining rumination's sustaining and intensifying effects on depressive symptoms, to models based on the reciprocal interaction of cognitive and emotional processes. Watkins (2008) advanced the understanding of rumination as a hierarchical process involving abstract and concrete thinking styles, while Gross (2015) and Aldao et al. (2010) situated rumination within the broader emotion regulation framework. Integrating cognitive psychology, neuroscience, and clinical psychology has enabled a more comprehensive understanding of rumination as both a cognitive vulnerability and an emotion regulation strategy. Co-cited authors such as Watson, Trapnell, and Aldao have further contributed to bridging rumination research with personality traits and stress reactivity, reflecting an ongoing effort to position rumination within transdiagnostic and dimensional models of psychopathology. In particular, the growing reliance on network-based conceptualizations, cognitive control theories, and metacognitive models has strengthened the field's shift away from disorder-specific explanations toward a multidimensional approach that captures rumination's role across anxiety, depression, trauma-related disorders, and even externalizing behaviors. This structural network reinforces the field's interdisciplinary nature while also revealing the development of a strong integration between cognitive psychology, neuropsychiatry, and clinical psychology. Such integration not only solidifies rumination as a key mechanism in contemporary

psychopathology models but also underscores the field's transition toward unified frameworks that aim to explain repetitive negative thinking as a broader class of maladaptive cognitive phenomena.

Trend analyses showing concept change over the years reveal a thematic shift in the rumination literature. Earlier studies before 2010 predominantly focused on clinical and physiological aspects—such as their associations with bulimia nervosa or somatic symptoms—while more recent research after 2010 emphasizes psychological well-being, mindfulness, and self-regulation. The thematic mapping results also support that while "depression," "anxiety," and "rumination" continue to form the conceptual core of the field, emerging clusters such as "stress," "emotion regulation," and "mental health" represent expanding domains of inquiry. This thematic evolution indicates a broader conceptual repositioning of rumination from a narrow symptom-maintaining mechanism toward a multidimensional construct embedded within contemporary emotion regulation theories. These findings show that rumination is increasingly conceptualized as a dynamic cognitive-emotional process influencing psychological flexibility rather than just as psychopathology. Moreover, the rise of themes related to mindfulness, resilience, and acceptance-based processes suggests that the literature is moving toward integrative models that examine both the maladaptive and potentially modifiable aspects of repetitive negative thinking (Russel, 2021). Such a shift aligns with the growing interest in transdiagnostic frameworks and allows rumination to be analyzed within preventive, developmental, and positive psychology contexts, marking a substantial expansion of the field's conceptual boundaries.

The findings suggest that rumination as a transdiagnostic construct may contribute to understanding standard cognitive mechanisms across different psychiatric disorders. Specifically, examining rumination as a typical pattern of cognitive dysfunction across clinical presentations such as depression, anxiety, and post-traumatic stress disorder (PTSD) offers a new framework from both theoretical and therapeutic perspectives (Shaw et al., 2021). Furthermore, the increasing prominence of contemporary themes such as "mindfulness" and "validation" in the literature suggests that cognitive awareness-based approaches may be considered potential intervention strategies for reducing maladaptive rumination. This shift reflects a broader movement toward process-based therapeutic models, in which rumination is treated not simply as a symptom but as a modifiable regulatory pattern that may respond to interventions targeting attentional flexibility, metacognitive awareness, and experiential acceptance (Watkins & Roberts, 2020). From an interdisciplinary perspective, rumination is addressed in clinical psychology, psychiatry, behavioral sciences, education, health psychology, and neuroscience (Stelmach-Lask et al., 2024). This multidisciplinary approach allows for examining the concept's neurocognitive foundations and social and cultural dimensions. Such cross-disciplinary engagement also highlights rumination's relevance beyond clinical disorders, extending to everyday stress reactivity, academic functioning, interpersonal dynamics, and occupational well-being. This trend necessitates the development of comprehensive models in the future to understand rumination's impact on stress coping and psychological resilience processes at the societal level. Accordingly, future frameworks may benefit from integrating biological stress markers, sociocultural risk factors, and context-dependent cognitive processes to clarify how rumination shapes both individual and collective adaptive functioning.

5. Conclusion

Current research results indicate that literature on rumination has demonstrated significant conceptual and methodological development over the past four decades. Bibliometric analysis results reveal that research productivity in this field has steadily increased from 1983 to the present, with a noticeable rise after 2010. Prominent institutions such as the University of Pittsburgh, Columbia University, the University of Leiden, the University of Exeter, and Vanderbilt University have significantly contributed to rumination research. The United States remains a leading contributor, although researchers from Europe and Asia have increasingly enriched the field in recent years.

Researchers such as Nolen-Hoeksema, Watkins, and Treynor have established the core framework for understanding rumination as a key cognitive and emotional process. More recently, a new generation of researchers has broadened this framework by exploring rumination's neuropsychological, mental, and cultural dimensions. Thematic analysis results indicate that rumination, which was traditionally conceptualized as a maladaptive cognitive style associated with depression and anxiety, has evolved into a multidimensional construct involving both maladaptive (brooding) and adaptive (reflective pondering) aspects. It now encompasses emotion regulation, mindfulness, and psychological resilience processes.

The findings suggest that rumination is not merely a repetitive thought pattern but a dynamic psychological construct that influences coping strategies, resilience, and overall well-being. These results highlight the need for future research to approach rumination from an interdisciplinary perspective that integrates clinical psychology, cognitive neuroscience, and cultural psychology, thereby enhancing theoretical understanding and practical applications in mental health research.

6. Limitations and Recommendations

Although this study provides a comprehensive bibliometric overview of rumination research, several limitations must be acknowledged. First, the analysis was restricted to data extracted solely from the Web of Science (WoS) database. Consequently, studies indexed in other major databases such as Scopus, PsycINFO, or

PubMed were not included, which may have limited the comprehensiveness of the findings. Future studies are encouraged to integrate multiple databases to enhance data coverage and validate bibliometric indicators across sources. Second, the current analysis was based exclusively on citation metrics, co-authorship structures, and thematic relationships. This quantitative focus precluded a qualitative assessment of methodological diversity or theoretical depth in individual studies. Subsequent research could combine bibliometric mapping with qualitative content analysis to holistically capture conceptual trends. Third, the inclusion of articles was determined by the presence of rumination-related keywords, which may have led to the exclusion of relevant works that conceptualize rumination implicitly or under alternative terminologies. Future studies should consider text-mining approaches and semantic analyses to broaden term identification and improve recall. Lastly, the temporal scope of this research (1983–September 2025) renders the results cross-sectional. As the rumination literature expands, future bibliometric studies should update the dataset periodically, complementing it with systematic reviews or meta-analyses to track theoretical and methodological evolution. Despite these limitations, this study provides valuable insights into rumination research's intellectual structure and developmental trajectory. Moving forward, greater emphasis on interdisciplinary collaboration, cross-cultural inquiry, and exploring emerging domains such as digital addiction, social isolation, and emotional resilience will enrich the theoretical and applied understanding of rumination.

7. Declarations

Ethics Approval and Consent to Participation. No human or animal data were used; ethical approval was not required. The data analyzed in this research were obtained from secondary sources in the Web of Science (WoS) database.

Approval for Publication. Not applicable.

Availability of Data and Materials. The datasets generated and analyzed during the current study are available in the Web of Science (WoS) Core Collection database. The corresponding author can obtain processed bibliometric data and analysis outputs upon reasonable request.

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Authors' Contributions. The author conducted all stages of the research process.

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PsyCraft Journal

Romantic Loneliness Scale for Adults: Development and Psychometric Examination

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Article Info

Abstract

Romantic loneliness is defined as a subjective experience of loneliness and dissatisfaction that arises when an individual's need for emotional closeness, attachment, and reciprocity is not sufficiently met within a romantic relationship, despite the presence of a physical partner. Although theoretical and empirical studies show that romantic loneliness is a critical concept in developmental, emotional, and relational terms, there are limited valid and reliable measurement tools that can directly measure romantic loneliness in adults. This study aims to develop the Romantic Loneliness Scale for Adults and to examine the scale's factor structure, validity, reliability properties, and measurement invariance across genders. A 26-item draft form, created based on a literature review and expert opinions, was revised to 24 items. The scale was then administered to three independent samples (N = 265, N = 247, N = 192). Exploratory factor analysis revealed that the scale has a single-factor structure, accounting for 59% of the variance, with factor loadings ranging from 0.675 to 0.853. Confirmatory factor analysis showed that the unidimensional model provided acceptable fit (χ^2/df = 2.977, CFI = .948, GFI = .901, SRMR = .051). In reliability analyses, Cronbach's alpha coefficients ranged from 0.922 to 0.933, while McDonald's ω values ranged from 0.925 to 0.935; CR (0.936–0.938) and AVE (0.505–0.561) values supported the convergent validity of the scale. Measure invariance analyses conducted by gender showed that the scale has invariance at the scalar level. The findings suggest that the Romantic Loneliness Scale is a valid and reliable instrument for measuring romantic loneliness in adults.

Keywords:
Romantic, loneliness, adult, scale development

1. Introduction

Humans are social beings who, by nature, need to form relationships with others, feel a sense of closeness, and belong to a community. As Baumeister and Leary (1995) point out, the tendency to form social bonds is one of the fundamental motivations that guide human behavior. When this need is not met, individuals may experience a negative emotional state, commonly referred to as loneliness. Sullivan (1953) defined loneliness as a painful emotion that creates dissatisfaction and negatively affects individual functioning. Loneliness is considered a

significant problem area that can emerge at any age due to the effects of contemporary living conditions and threatens individuals' emotional well-being (Salimi & Bozorgpour, 2012). Recent large-scale and meta-analytic studies further indicate that loneliness is not only a psychological concern but also a significant public health issue, associated with increased risks of depression, anxiety, and mortality (Holt-Lunstad et al., 2018). In this context, loneliness is viewed as a multidimensional structure that can be experienced with varying contents and intensities, rather than as a one-dimensional emotion (Murphy, 2006). When examining theoretical definitions of loneliness in the literature, Peplau and Perlman's (1982) definition, which highlights the dissatisfaction caused by the mismatch between an individual's current social relationships and their desired relationships, is considered one of the most widely accepted explanations of loneliness. Weiss (1973) stated that loneliness can arise not only from a lack of relationships but also from relationships that are not sufficiently emotionally nourishing or close. This view is consistent with approaches that describe loneliness as a cognitive, emotional, and behavioral process (Armağan, 2014; Horowitz & French, 1979; Rubin et al., 1985; Sermat, 1978; Ünlü, 2015). More recent empirical work supports this perspective by demonstrating that individuals' expectations regarding intimacy, responsiveness, and emotional validation play a central role in the experience of loneliness (Hawkley & Cacioppo, 2018). At this point, various explanations of loneliness suggest that individuals' perceptions and expectations regarding relationship quality play a crucial role in the formation of this emotion.

One of the most important models contributing to a deeper understanding of the structure of loneliness is Weiss's (1973) distinction between social and emotional loneliness. Weiss (1973) defined social loneliness as a state of mind arising from deficiencies in an individual's social network, and emotional loneliness as a state of mind arising from the inability to achieve emotional satisfaction in close relationships. This theoretical framework was later expanded by the work of DiTomasso and Spinner (1993, 1997), who proposed that emotional loneliness should be examined in two sub-dimensions: emotional loneliness in family relationships and emotional loneliness in romantic relationships. In this context, romantic loneliness refers to a specific type of loneliness that arises when an individual's needs for emotional closeness, attachment, and support within a romantic relationship are not adequately met (Yüksel & Söner, 2024). Individuals experiencing romantic loneliness may feel lonely despite being physically present with a partner in a romantic relationship, due to a lack of desired emotional sharing, closeness, and reciprocity. Research indicates that romantic loneliness is associated with factors such as individuals' dating frequency, romantic relationship status, and relationship harmony, and that levels of romantic attachment are a significant determinant of this type of loneliness (DiTomasso & Spinner, 1997). Despite growing empirical attention in recent years, direct measurement tools specifically designed to assess romantic loneliness remain limited, with many studies still relying on indirect indicators or broader constructs of loneliness (Segrin et al., 2021). It is noted that individuals who are unable to establish sufficient emotional attachment in romantic relationships experience higher levels of romantic loneliness. On the other hand, since romantic loneliness is related not only to the presence of a relationship but also to the quality of that relationship, individuals in relationships can experience romantic loneliness just as much as those who are not in a relationship.

When the literature is examined, romantic loneliness is a phenomenon that significantly affects individuals' psychological well-being and is associated with various mental health problems such as depression, anxiety, low self-esteem, and social isolation. For example, a study conducted by Hasan and Clark (2016) with university students demonstrated that individuals experiencing higher levels of social isolation in romantic relationships developed greater dependence on their romantic partners, which in turn increased their experience of loneliness. Similarly, Rotenberg et al.'s (2001) research revealed that the relationship between jealousy and loneliness in romantic relationships gains meaning in the context of romantic loneliness, and that a lack of emotional satisfaction can intensify jealousy responses. Recent longitudinal and cross-cultural studies have further demonstrated that romantic loneliness is associated with emotional dysregulation, reduced life satisfaction, and heightened vulnerability to internalizing symptoms throughout adulthood (Mund et al., 2020). As expressed in Weiss's (1973) model, the level of emotional support, closeness, empathy, and reciprocity in romantic relationships is among the key determinants of romantic loneliness. Insufficient empathic communication, emotional distance, unmet needs, and feelings of not being valued in romantic relationships can contribute to the development of romantic loneliness. This emotional state can negatively affect not only the quality of the romantic relationship but also the individual's other social relationships, self-esteem, and capacity to develop trust in future relationships. Erikson's (1968) psychosocial development theory regarding early adulthood also emphasizes that an individual's inability to form close relationships during this period can lead to feelings of isolation and loneliness. Therefore, romantic loneliness is considered a multidimensional construct at the intersection of developmental, emotional, and relational processes. However, a review of the literature reveals that studies directly addressing the concept of romantic loneliness are limited, with research being conducted through indirect concepts such as loneliness, intimacy, emotional disclosure, and relational adjustment (Öksüz, 2005; Yüksel & Söner, 2024).

1.1. The Present Study

This study addresses the need for a psychometrically robust measurement tool that specifically presents romantic loneliness in adulthood as a distinct experiential construct. While research in the literature has generally examined loneliness through broader or indirectly related constructs such as general loneliness, intimacy,

emotional openness, or relational harmony, these approaches do not allow for a direct assessment of romantic loneliness as a unique subjective experience. Given the central role of emotional intimacy, perceived reciprocity, and attachment expectations in adult romantic relationships, a targeted and empirically validated instrument is essential in both research and applied settings. Accordingly, the primary aim of this study is to develop and validate the Romantic Loneliness Scale for Adults by examining its factor structure, reliability, and cross-gender measurement invariance. Although various studies in the literature have examined concepts related to romantic loneliness (Hasan & Clark, 2016; Öksüz, 2005; Rotenberg et al., 2001), there have been few attempts to develop scales that specifically address romantic loneliness as a distinct construct. This situation hinders a deep understanding of the multidimensional nature of the concept in adult populations. Furthermore, it leads to measurement gaps in the design of preventive and intervention programs targeting romantic loneliness. Indeed, individuals' perceptions of emotional intimacy, trust, esteem, and reciprocity in romantic relationships are among the most important determinants of relational satisfaction and emotional well-being. Therefore, scientifically valid and reliable measurement of romantic loneliness is a critical requirement for understanding both relational dynamics and the psychological adjustment processes of adults. In this context, this study aims to develop a novel measurement tool to determine levels of romantic loneliness in adults, to elucidate the factor structure of the scale, and to examine its psychometric properties. It is believed that the study will fill a significant gap in the literature, contribute to the theoretical knowledge base in the field of romantic loneliness, and provide a reliable measurement tool for future research. At the same time, it will make a significant theoretical, methodological, and practical contribution to scientific efforts aimed at understanding the reflections of romantic loneliness in adult relationships. Based on this, the research questions were determined as follows.

1. What are the levels of exploratory factor analysis values for the Romantic Loneliness Scale for Adults?

2. Does the structure of the Romantic Loneliness Scale for Adults, tested with confirmatory factor analysis, show sufficient model fit and valid psychometric properties in adult samples?

3. Does the Romantic Loneliness Scale for Adults demonstrate that it is a valid and reliable measurement tool in terms of reliability (internal consistency, composite reliability) and measurement invariance (gender)?

2. Methodology

This section provides information on the research model, the study group, the measurement tools used, the data collection process employed, and the analysis methods applied.

2.1. Research Model

This study employed a methodological research design to evaluate the psychometric properties of the developed Romantic Loneliness Scale. Methodological studies are research focused on the development of measurement tools, conducting validity and reliability analyses, and validating measurement models (Boateng et al., 2018; DeVellis, 2017). Accordingly, the research was conducted within a sequential design that included exploratory factor analysis (EFA) to determine the scale's factor structure, confirmatory factor analysis (CFA) to test structural validity, and multi-group analyses to assess measurement invariance.

2.2. Study Group

In this study, Table 1 presents the demographic characteristics of the study group, showing the distribution of gender and educational status among the adult participants who participated in the data collection processes conducted within the scope of Studies 1, 2, and 3.

Table 1.

Demographic Information

		Study 1		Study 2		Study 3	
		f	%	*f*	%	*f*	%
Gender							
	Male	106	40	111	44.9	104	45,2
	Female	159	60	136	55.1	88	45,8
Educational Status							
	Bachelor	175	66	170	68,8	138	71,9
	Master's Degree	90	34	77	31.2	54	28,1

Table 1 shows that the demographic characteristics of the three study groups exhibit a similar distribution. In Study 1, 40% of participants were male (n = 106) and 60% were female (n = 159). When examined by educational level, 66% had a bachelor's degree (n = 175) and 34% had a postgraduate degree (n = 90). In Study 2, 44.9% of participants were male (n = 111) and 55.1% were female (n = 136). In this group, 68.8% (n = 170) had a bachelor's degree, and 31.2% (n = 77) had a graduate degree. In the Study 3 sample, the ratio of male and female

participants is quite close, with 45.2% of participants being male (n = 104) and 45.8% being female (n = 88). In this group, 71.9% (n = 138) were graduates with a bachelor's degree, while 28.1% (n = 54) were graduates with a graduate degree. Looking at the age distributions, the age range in Study 1 is 18–61 with an average age of 28.48; in Study 2, the age range is 18–64 with an average age of 26.73; and in Study 3, the age range is 18–64 with an average age of 28.47.

2.3. Data Collection Tools and Procedure

This section provides explanations regarding the personal information form created by the researcher and the Romantic Loneliness Scale developed in the study.

2.3.1 Personal Information Form

The personal information form prepared by the researchers aims to determine specific demographic characteristics. This form includes variables such as gender, age, and education level.

2.3.2. Romantic Loneliness Scale

In the development and adaptation process of the Romantic Loneliness Scale used in this study, the relevant literature was examined in detail, and the basic theoretical frameworks and psychosocial components that explain the concept of romantic loneliness were identified. Accordingly, in the first stage, a broad item pool was created, and a 26-item draft form was prepared to represent the theoretical structure, including items such as "I feel incomplete when I don't have a romantic relationship" and "I feel like my life becomes meaningless when I don't have a romantic relationship. The prepared form was submitted to expert review to assess its content validity. As DeVellis (2016) states, expert evaluation is a critical stage that strengthens the conceptual content of the measurement tool and increases item suitability. In this context, opinions were obtained from three academics specializing in Psychological Counseling and Guidance, Clinical Psychology, and Measurement and Evaluation, as well as a Turkish language expert, to evaluate the linguistic accuracy of the statements. In line with the expert feedback, structures with grammatical issues were corrected, items that were repetitive or insufficient in reflecting the target behavior were eliminated, and the form was reduced to 24 items in its final version. Specifically, items were excluded at this stage if experts identified them as conceptually overlapping with other items or as insufficiently representative of the core experiential aspects of romantic loneliness. Subsequently, a small pilot group consisting of university students was used to assess the comprehensibility of the scale; adjustments were made regarding statement clarity, comprehensibility, and response time based on student feedback. The literature emphasizes that pilot studies in scale development processes are critical for understanding how items are cognitively perceived, especially in young adult samples (Boateng et al., 2018). Following the pilot study, the scale was administered to three separate study groups, and comprehensive validity and reliability analyses were conducted on the obtained data sets. AFA results showed that a single-factor structure adequately represented the theoretical framework; subsequently, DFA was performed on a different dataset to test the validity of this structure. During the transition from exploratory to confirmatory factor analysis, items were removed based on low factor loadings and conceptual overlap, resulting in a final unidimensional structure consisting of 12 items. Factor loadings, item-total correlations, CR, and AVE values were examined; the scale reached its final form with 12 items in a single dimension after removing items with low factor loadings or statistically weak items. Furthermore, measurement invariance analyses were conducted at the configural, metric, and scalar levels to determine whether the scale measured the same structure across genders, confirming that the scale achieved measurement equivalence across genders. These findings collectively demonstrate that the Romantic Loneliness Scale is a psychometrically valid and reliable measurement tool grounded in a theoretical foundation.

2.4. Data Collection and Analysis

In this study, data were collected through an online survey system, and participation was based on voluntary informed consent. The scale forms were distributed electronically to adult participants using secure online data collection platforms, and all responses were collected anonymously. Before participation, individuals were informed about the purpose of the study, confidentiality principles, and their right to withdraw at any time. Only participants who provided informed consent were allowed to proceed to the survey. Three separate data collection processes were carried out with independent samples within the scope of the study.

In this study, the data analysis process was conducted using SPSS, AMOS, and JASP software, and three separate data collection processes were carried out within the scope of the study. In the first stage, each data set was examined in detail for missing values, outliers, and inconsistencies, and the necessary adjustments were made. Subsequently, statistical analyses were performed to evaluate the validity and reliability properties of the scale. The KMO coefficient and Bartlett's Sphericity Test were applied to determine the suitability of the data for factor analysis; valid findings were obtained for factor analysis in all three data sets. Subsequently, item factor loadings and eigenvalues were calculated to show the relationship between the items and the factors. To examine the extent to which the items could distinguish the level of romantic loneliness, upper and lower 27% groups were formed, and the item means of these groups were compared using an independent samples t-test. All items were found to be significantly discriminative. All procedures related to this stage were performed using SPSS. To assess the

internal reliability of the scale, McDonald's ω, Cronbach's Alpha, and Guttman's Lambda coefficients were calculated for each study group. Furthermore, CR and AVE values were evaluated to examine construct reliability and convergent validity, and the results were found to be acceptable across all three datasets. Since the single-factor structure obtained from the exploratory factor analysis was deemed sufficient, confirmatory factor analysis was applied to a different dataset to test the validity of the structure. The DFA results indicated that the model's fit indices fell within the reference ranges. In the final stage, to test whether the scale measured the same structure across genders, multi-group analyses were conducted in AMOS, examining configural, metric, and scalar invariance levels. It was concluded that the scale achieved measurement equivalence between gender groups in all three datasets. Measurement invariance decisions were based on commonly accepted criteria in the literature, with particular emphasis on changes in comparative fit indices. In line with the $\Delta CFI \leq .010$ criterion recommended for multi-group analyses, the observed changes in model fit supported configural, metric, and scalar invariance across gender groups (Byrne, 2012; Cheung & Rensvold, 2002).

3. Findings

3.1. Findings regarding exploratory factor analysis and construct validity

Findings regarding the KMO, Bartlett's test, item factor loadings, and eigenvalues of the Romantic Loneliness Scale are presented in Table 2.

Table 2.

Item Factor Loadings, Eigenvalues, KMO, and Bartlett Test Results for the Romantic Loneliness Scale

Previous Article No	New Item No	Item Factor Load Value	Item Total Correlation	Eigenvalue	Variance	KMO	Barlett's Sphericity Test	
							$\bar{x}$	p
1	1	0,821	0,777					
2	2	0,832	0,779					
3	3	0,801	0,743					
4	4	0,853	0,804					
5	5	0,847	0,809					
7	6	0,721	0,658	7,056	59	0,926	2233,144	.000
12	7	0,679	0,627					
14	8	0,819	0,764					
15	9	0,675	0,619					
16	10	0,757	0,723					
17	11	0,674	0,622					
18	12	0,684	0,622					

As shown in Table 2, the results of the factor analysis conducted to evaluate the single-factor structure of the Romantic Loneliness Scale indicate that the scale exhibits a psychometrically robust structure. The factor loadings for the items range from .675 to .853, demonstrating that all items in the scale adequately represent the relevant factor. The item-total correlations, ranging from 0.619 to 0.809, indicate that the items establish consistent relationships with the construct they measure and that their discriminant validity is high. The fact that the eigenvalue of the single-factor structure is 7.056 and explains 59% of the total variance supports that the measurement tool comprehensively reflects the structure of romantic loneliness. Furthermore, the KMO coefficient of .926 indicates that the sample size is quite appropriate for factor analysis. At the same time, the significant Bartlett's sphericity test (χ^2 = 2233.144, $p < .001$) shows that the correlations between variables are suitable for factor analysis. When these findings are evaluated together, it is concluded that the scale has a strong factor structure that supports its construct validity.

3.2. Findings Regarding Item Discrimination

At this stage, item discriminant analyses were conducted to determine the ability of the scale items to distinguish levels of romantic loneliness. A comparison of the mean item scores of the upper and lower 27% (f = 72) groups using an independent t-test revealed that all items were significantly discriminative, and the relevant findings are presented in Table 3.

Table 3.

Findings related to substance discrimination

Previous Article No	New Item No	Groups	$\bar{x}$	Ss	t	p
1	1	Under Group	1,4583	,69073	21.102	.000
		Upper Group	5,1667	1,32154		
2	2	Under Group	1,2361	,54367	17.932	.000
		Upper Group	4,5694	1,48064		
3	3	Under Group	1,1250	,37294	15.449	.000
		Upper Group	4,1111	1,59714		
4	4	Under Group	1,1111	,31648	17.330	.000
		Upper Group	4,5139	1,63581		
5	5	Under Group	1,2917	,61524	25.255	.000
		Upper Group	5,4167	1,24188		
7	6	Under Group	1,0278	,16549	10.016	.000
		Upper Group	3,1944	1,82810		
12	7	Upper Group	4,5139	1,92092	12.469	.000
		Under Group	1,1667	,44405		
14	8	Upper Group	4,1667	1,79200	13.788	.000
		Under Group	1,1528	,36230		
15	9	Upper Group	3,5417	1,95684	10.186	.000
		Under Group	1,2917	,51560		
16	10	Upper Group	5,2222	1,43617	21.857	.000
		Under Group	1,5000	,78722		
17	11	Upper Group	5,3611	1,69760	17.508	.000
		Under Group	1,0417	,20123		
18	12	Upper Group	2,8056	1,60667	9.243	.000
		Under Group	1,4583	,69073		

Table 3 shows the item discrimination coefficients for the single-factor, 12-item scale. The statistically significant and acceptable correlations between the items and the total score indicate that each item establishes consistent relationships with the construct being measured. This finding suggests that the scale functions effectively for its intended purpose of measuring romantic loneliness and that the items possess sufficient representativeness within the targeted construct. Furthermore, the fact that the unidimensional structure exhibits a coherent and consistent pattern within itself indicates that the internal structure of the scale is supported. When all results are evaluated together, the scale offers reliable and robust psychometric properties in terms of construct validity.

3.3. Reliability Analyses

To determine the internal reliability of the measurement tool, Cronbach's Alpha, McDonald's ω, and Guttman's Lambda coefficients were calculated for each sub-dimension. Additionally, CR and AVE values were calculated to assess construct reliability and convergent validity. The results obtained are presented in Table 4.

Table 4.

Reliability Information for the Romantic Loneliness Scale

	Study 1 (N=265)	Study 2 (N=247)	Study 3 (N=192)
McDonald's ω	.935	.925	.926

Cronbach's Alpha	.933	.922	.924
Guttman's Lambda	.936	.928	.929
CR	.936	.938	.938
AVE	.505	.558	.561

Table 4 shows that the Romantic Loneliness Scale exhibits high internal reliability across all study groups. Cronbach's alpha coefficients, ranging from 0.922 to 0.933, McDonald's omega values, ranging from 0.925 to 0.935, and Guttman's lambda coefficients, ranging from 0.928 to 0.936, indicate that the scale has a consistent and stable internal structure. Indeed, in the literature, alpha and omega values of .70 and above are considered adequate, while values above .90 are regarded as excellent reliability levels (Nunnally & Bernstein, 1994; McDonald, 1999). Furthermore, the fact that the CR values, which serve as an indicator of composite reliability, fall within the range of .936–.938 in all samples indicates that the factor structure of the scale is strongly supported. The AVE values related to convergent validity range from 0.505 to 0.561, and the fact that they are above the 0.50 threshold value suggested by Fornell and Larcker (1981) indicates that the items explain the common variance at a sufficient level. When these findings are evaluated together, it can be concluded that the Romantic Loneliness Scale exhibits high reliability and satisfactory convergent validity across all study groups comprising adult individuals.

3.2. Findings Related to Confirmatory Factor Analysis

Confirmatory factor analysis was applied to determine whether the items adequately represented the factors and which factor each item showed a stronger relationship with. The resulting path diagram is presented below.
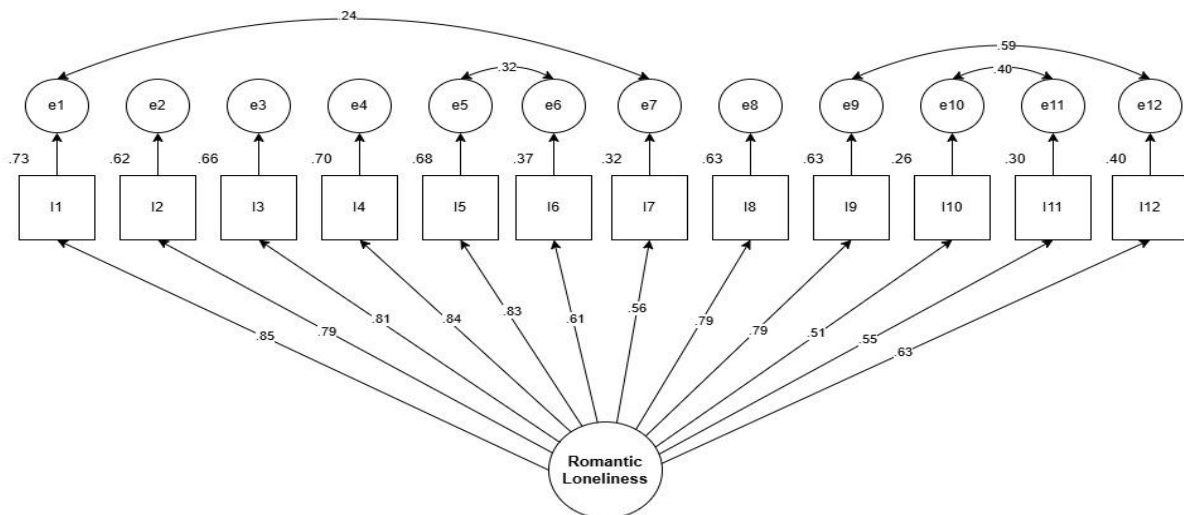

Figure 1. Confirmatory Factor Analysis Model Related to Romantic Loneliness

As a result of the confirmatory factor analysis performed, the chi-square value of the Romantic Loneliness Scale [χ^2/df = 2.977, p < .01] was found to be statistically significant. The ratio of the chi-square value to the degrees of freedom was calculated as 2.977, and this value being below 5 indicates that the model has an acceptable level of fit (Kline, 2011). To improve the model fit of the scale, a limited number of covariance definitions were established between item error terms, consistent with recommendations in the literature for theory-driven model refinement (Rubio et al., 2003; Brown, 2015). Specifically, four covariances were specified between item pairs that shared highly similar wording and content focus, particularly reflecting overlapping experiential aspects of perceived emotional deficiency and lack of meaning in romantic contexts. These covariances were introduced based on modification indices and theoretical interpretability rather than solely on statistical considerations, and no cross-loading or factor re-specification was applied. Although some guidelines suggest limiting the number of correlated errors, the present covariances were theoretically justified, parsimonious, and did not alter the underlying unidimensional factor structure. The fit indices obtained as a result of the analysis were CFI = 0.948, NFI = 0.925, GFI = 0.901, and SRMR = 0.051. These values are within the criteria specified in the relevant literature (Baumgartner & Homburg, 1996; Browne & Cudeck, 1993).

3.4. Findings on Gender-Related Measurement Invariance

Using data obtained from the working group, a multiple-group confirmatory factor analysis was applied to determine whether the measurement tool for adults demonstrated measurement equivalence across genders. For this purpose, data was collected from a new group. Table 5 presents the measurement invariance results related to this analysis.

Table 5.

Measurement invariance and fit values of the romantic loneliness scale

Model Tests	Model Fit Criteria				Model Difference Statistics		
	χ^2	Sd	RMSEA	CFI	$\Delta\chi^2$	Δsd^b	ΔCFI
Individual groups							
Females	359.569	108	,155	.935			
Males	207.872	108	.136	.903			
Configural İnvariance	285.770	54	.161	.880			
Metric equivalence	370.602	119	.143	.835	84.832	65	.045
Scalar equivalence	383.063	119	.146	.840	12.461	0	.005

As shown in Table 5, the Romantic Loneliness Scale exhibited a significant structure by gender. First, the acceptable fit values of the configural model (χ^2 = 285.770, df = 54, RMSEA = .161, CFI = .880) indicate that the scale has a similar factor structure in both female and male groups. Although a significant decrease in fit is observed in the metric model compared to the configural model ($\Delta\chi^2$ = 84.832, Δsd = 65, ΔCFI = .045), the literature emphasizes that metric invariance is often not achieved in the social sciences, but that higher-order models may still be evaluated (Byrne, 2012; Vandenberg & Lance, 2000). Indeed, in the scalar model where the coefficients were fixed, the fit values were only minimally impaired (χ^2 = 383.063, sd = 119, RMSEA = .146, CFI = .840) and ΔCFI remained below. 01 (ΔCFI = .005) indicates that scalar invariance was achieved. These findings reveal that the scale's item cut-off points are equivalent across gender groups. Therefore, comparisons between women and men based on latent means can be made validly and reliably.

4. Discussion and Conclusion

In this study, which aimed to develop a romantic loneliness scale for adults, analyses were conducted using data collected from three different groups. Therefore, considering this gap in the relevant literature, researchers decided to develop a measurement tool to assess adults' levels of Romantic Loneliness. In this study, the psychometric properties of the Romantic Loneliness Scale, developed to measure adults' levels of romantic loneliness, were comprehensively examined. The results indicate that the scale is a robust measurement tool in terms of construct validity and reliability indicators. Beyond demonstrating statistical adequacy, these findings are significant because they provide empirical support for conceptualizing romantic loneliness as a distinct experiential phenomenon rather than a secondary aspect of general loneliness. The findings suggest that the Romantic Loneliness Scale offers a novel and valid contribution to measurement tools, aligning with Weiss's (1973) conceptualization of emotional loneliness and DiTommaso and Spinner's (1993, 1997) distinction between romantic and emotional loneliness. In this sense, the present scale contributes to the literature by operationalizing romantic loneliness as a measurable construct that captures unmet emotional and attachment-related needs within romantic contexts.

The study demonstrates that the single-factor structure of the Romantic Loneliness Scale is statistically robust. Although romantic loneliness is theoretically conceptualized as a multidimensional construct shaped by developmental, emotional, and relational processes, its measurement in the present study was operationalized as a unidimensional latent structure. This approach reflects the phenomenological convergence of these interrelated processes into a coherent subjective experience of perceived emotional disconnection and unmet attachment needs within romantic contexts. This finding advances the measurement of romantic loneliness by showing that complex relational experiences can be meaningfully represented through parsimonious latent structures when they reflect a shared experiential core (Weiss, 1973). Thus, the single-factor structure does not contradict the multidimensional theoretical foundations of romantic loneliness; rather, it represents a parsimonious psychometric representation of a unified experiential construct. Both the high factor loadings and item-total correlations suggest that the items consistently reflect the construct they aim to measure and adequately represent the dimension of romantic loneliness. In particular, the calculation of the eigenvalue as 7.056 and the explanation of 59% of the total variance by a single factor support the scale's ability to encompass the concept of romantic loneliness under a comprehensive structure. Indicators related to the preconditions of the analysis also strengthen the robustness of the model. The KMO value of .926 indicates that the sample is suitable for factor analysis. At the same time, the Bartlett's test, being significant, suggests that there is a correlation structure suitable for factorization among the variables. Taken together, these results suggest that romantic loneliness constitutes a psychologically coherent experience that can be reliably distinguished from broader forms of social or emotional loneliness. When all these findings are evaluated together, it can be said that the scale successfully reflects the theoretically predicted structure and that its construct validity is strongly supported. When examining the item discrimination values for the single-factor, 12-item scale, it is observed that the relationships between the items and the total score are meaningful and at the expected levels. This indicates that the scale items are consistently linked to the structure of romantic loneliness and that each item adequately reflects the characteristic being measured. Furthermore, the fact that the unidimensional structure forms a consistent whole within itself

supports that the internal structure of the scale is consistent with theoretical expectations. This internal coherence is significant for applied research and clinical contexts, where concise and interpretable measurement tools are needed to assess relational vulnerability in adulthood. When all these findings are evaluated together, the scale has strong and reliable psychometric properties in terms of construct validity. The Romantic Loneliness Scale's high level of internal reliability across all study groups demonstrates that the instrument's measurement consistency is quite strong. The fact that Cronbach's alpha, McDonald's omega, and Guttman's lambda coefficients are within acceptable limits supports the scale's internally stable structure (McDonald, 1999; Nunnally & Bernstein, 1994). Additionally, the CR, a composite reliability indicator, and the AVE values related to convergent validity were found to be within acceptable ranges (Fornell & Larcker, 1981). These findings indicate that the scale not only performs well statistically but also provides a stable and replicable framework for assessing romantic loneliness across independent samples. When these results are evaluated holistically, it can be stated that the Romantic Loneliness Scale offers high reliability in adult samples and possesses satisfactory psychometric properties in terms of convergent validity.

The confirmatory factor analysis findings indicate that the single-factor structure of the Romantic Loneliness Scale is a good fit at an acceptable level. The chi-square/df value falls within the recommended threshold (≤ 5), indicating that the model fit is adequate (Kline, 2011). To improve model fit, as suggested in the literature, covariances were defined between some items (Rubio et al., 2003), and the fit indices obtained after these adjustments approached the target ranges. The CFI, NFI, GFI, and SRMR values obtained as a result of the analysis are consistent with the acceptable limits specified in the relevant sources (Baumgartner & Homburg, 1996; Browne & Cudeck, 1993). This level of model fit supports the structural validity of the scale and confirms that the latent construct of romantic loneliness is empirically distinguishable within adult samples. These results demonstrate that the confirmatory factor structure of the scale has been validated to a satisfactory level in the adult sample. When examining the measurement equivalence of the Romantic Loneliness Scale across genders, it was found that the scale has a similar factor structure in both female and male groups. Configural model findings indicate that the basic structure remains unchanged. In contrast, the limited decrease in fit in the metric model is considered a common occurrence in the social sciences and does not prevent higher-level analyses from being performed (Byrne, 2012; Vandenberg & Lance, 2000). In the scalar model, the ΔCFI value falling below the desired values indicates that the item cut-off points functioned equivalently across gender groups. This finding distinguishes the present scale from many existing loneliness measures by demonstrating that romantic loneliness can be meaningfully compared across genders without measurement bias. These results indicate that the Romantic Loneliness Scale measures the same structure in both female and male participants, and that comparisons based on latent means are valid and reliable. Therefore, the scale is suitable for safely assessing gender differences.

The Romantic Loneliness Scale, developed within the scope of this study, initially consisted of 24 items; however, factor analyses resulted in a single-factor structure comprising 12 items. The lowest possible score on this scale is 12, and the highest possible score is 84. A high score on this measurement tool is interpreted as indicating a high level of Romantic Loneliness. The exploratory and confirmatory factor analyses obtained show that the Romantic Loneliness Scale is a reliable measurement tool in terms of construct validity and internal consistency. Unlike broader loneliness instruments, the present scale focuses specifically on the subjective experience of romantic disconnection, thereby offering greater conceptual precision for research on adult romantic relationships. The fact that the correlations between the scale items and the total score are meaningful and high indicates that the items establish consistent relationships with the romantic loneliness construct to be measured. Internal reliability analyses (Cronbach's alpha, McDonald's omega, and Guttman's Lambda) support the scale's consistent and stable structure. AVE values related to convergent validity also reveal that the common variance of the items is at a sufficient level.

5. Recommendations

The strong psychometric properties demonstrated by the Romantic Loneliness Scale developed in this study indicate that the scale can be used reliably in both theoretical and applied research in future studies. Researchers are encouraged to retest the scale in different age groups, cultural contexts, and clinical or at-risk samples to diversify the validity and reliability evidence of the measurement tool; they are also encouraged to examine the change in romantic loneliness over time and its psychosocial determinants through longitudinal studies. The scale's single-factor and short structure allows for rapid screening of romantic loneliness levels in large samples and can be used by practitioners as an assessment tool in individual psychological counseling, couple and family counseling, or psychoeducational programs. In this regard, it is recommended that field practitioners use the scale as a screening tool to identify difficulties in emotional attachment in romantic relationships, loneliness-based cognitive-emotional patterns, and areas of risk that may affect relationship satisfaction. Furthermore, the scale's measurement equivalence across genders enables practitioners to compare female and male individuals confidently. Future studies examining the relationships between romantic loneliness and variables such as depression, hopelessness, subjective well-being, attachment styles, and social support will both enrich theoretical knowledge and contribute to the development of intervention programs aimed at reducing romantic loneliness.

6. Declarations

All articles must be submitted with a "Declaration" section that includes the following headings. Under this heading, the points that authors should pay attention to are stated.

Ethics Approval and Consent to Participation. This study was reviewed and approved by the İstanbul Sabahattin Zaim University Ethics Committee (Date: 30.10.2025; Approval No: 2025/10). All procedures were conducted in accordance with institutional ethical standards and the principles of the Declaration of Helsinki. Informed consent was obtained from all participants before data collection, and participation in the research was entirely voluntary.

Approval for Publication. Not Applicable.

Availability of Data and Materials. The datasets generated during this study are available from the corresponding author upon reasonable request.

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Authors' Contributions. First Author conceptualized the study, developed the measurement tool, collected the data, performed the analyses, and wrote the manuscript. The Second Author supervised the study, provided methodological and theoretical guidance, contributed to the interpretation of the findings, and critically revised the manuscript.

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