

Development and Validation of the Responsibility for Negative Thoughts Questionnaire

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ABSTRACT

Objective: This study aimed to develop and psychometrically validate a questionnaire for assessing responsibility for negative thoughts.

Methods and Materials: This descriptive-correlational instrument-development study used a researcher-developed 35-item questionnaire. The initial items were evaluated by six psychology professors and two educational sciences professors to determine their content validity and conceptual relevance. Construct validity was examined using exploratory factor analysis based on principal component analysis with varimax rotation. First- and second-order confirmatory factor analyses were subsequently conducted to assess the relationships between the items and their corresponding factors and between the identified factors and the overarching construct. Convergent validity was evaluated by examining the correlations between the developed questionnaire and the Jerabek Social Anxiety Scale. Internal consistency reliability was assessed using Cronbach's alpha coefficients for the subscales and total questionnaire.

Findings: The content validity ratio of the questionnaire was 0.91. The Kaiser-Meyer-Olkin coefficient was 0.88, and Bartlett's test of sphericity was statistically significant, $\chi^2(596) = 7,786.54$, $p < .001$, confirming the suitability of the data for factor analysis. Exploratory factor analysis identified three factors with eigenvalues greater than 1.00, which collectively explained 70.18% of the total variance. First-order confirmatory factor analysis demonstrated an acceptable model fit, $\chi^2/df = 2.53$, GFI = 0.92, CFI = 0.94, IFI = 0.93, and RMSEA = 0.053. The second-order model also showed satisfactory fit, $\chi^2/df = 2.45$, GFI = 0.93, CFI = 0.94, IFI = 0.95, and RMSEA = 0.051. Thought control, magical thinking, compensatory behavior, and the total questionnaire score were significantly correlated with social anxiety, with coefficients ranging from 0.52 to 0.68 ($p < .01$). Cronbach's alpha coefficients ranged from 0.89 to 0.93 for the subscales and were 0.94 for the total scale.

Conclusion: The Responsibility for Negative Thoughts Questionnaire demonstrated a coherent three-factor structure, satisfactory convergent validity, appropriate model fit, and excellent internal consistency, supporting its use in psychological research and clinical assessment.

Keywords: responsibility, negative thoughts, rumination, factor analysis, validity and reliability

1. Introduction

Negative thoughts constitute a common component of human cognition and may arise in response to stressful events, interpersonal difficulties, perceived failures, uncertainty, or threats to personal well-being. In many situations, such thoughts are transient and may assist individuals in identifying risks, evaluating problems, and preparing appropriate responses. However, when negative thoughts become repetitive, intrusive, difficult to control, and associated with an exaggerated sense of personal responsibility, they may contribute to persistent psychological distress and maladaptive behavior. Repetitive negative thinking is generally characterized by recurrent attention to distressing experiences, anticipated threats, perceived mistakes, or undesirable consequences without arriving at constructive solutions. This form of cognition encompasses processes such as rumination, worry, negative automatic thoughts, and obsessional thinking, all of which may interfere with emotional regulation, concentration, decision-making, and everyday functioning. Recent evidence indicates that negative automatic thoughts are closely associated with psychological distress and that their effects may be strengthened when individuals rely on experiential avoidance or ineffective cognitive emotion-regulation strategies (Alipour et al., 2025). Accordingly, understanding how individuals interpret, control, and assume responsibility for negative thoughts is important for both psychological assessment and intervention.

Negative automatic thoughts are rapid, involuntary, and frequently distorted cognitive responses that emerge in reaction to internal or external events. These thoughts often contain themes of inadequacy, rejection, hopelessness, guilt, danger, and anticipated failure. Although individuals may recognize that such thoughts are exaggerated or irrational, they may nevertheless experience them as emotionally compelling and behaviorally influential. In adolescents, emotional self-regulation has been identified as an important predictor of negative automatic thoughts, particularly among those exposed to family disruption and emotionally demanding circumstances (Sohrabi et al., 2025). This association suggests that the ability to recognize, tolerate, and regulate emotional experiences may determine whether negative cognitions remain temporary or become persistent patterns of psychological vulnerability. Furthermore, negative automatic thoughts may not merely reflect emotional distress but may also mediate the effects of adverse experiences on neuropsychological functioning.

Research on adolescents has demonstrated that negative automatic thoughts can mediate the relationship between emotional abuse and alterations in functional brain connectivity, indicating that maladaptive cognition may constitute an important mechanism through which adverse experiences influence emotional and neurological development (Yeo et al., 2024).

The clinical significance of negative thinking is evident across diverse psychological and medical contexts. Patients confronting serious health conditions may experience elevated anxiety accompanied by recurring negative predictions concerning treatment outcomes, physical disability, pain, or mortality. For example, individuals awaiting corneal transplantation have been found to experience preoperative anxiety together with negative automatic thoughts, demonstrating that distressing cognitions may intensify emotional responses to medical uncertainty (Tanrıverdi et al., 2024). Similarly, automatic negative thoughts have been associated with psychological distress among individuals with a history of suicide attempts, with cognitive emotion regulation functioning as an important mediating mechanism (Alipour et al., 2025). These findings indicate that negative thoughts are not isolated mental events; rather, they interact with emotional regulation, avoidance, perceived threat, and behavioral responses. Consequently, assessment instruments should address not only the frequency of negative thoughts but also the meanings individuals attribute to them and the strategies they employ in response.

One of the most important cognitive interpretations of unwanted thoughts concerns responsibility. Responsibility, in a psychological sense, refers to the belief that one has the power or obligation to prevent, control, or neutralize harmful outcomes. A moderate sense of responsibility may promote ethical conduct, careful decision-making, and adaptive self-regulation. Nevertheless, inflated responsibility may lead individuals to assume excessive personal accountability for events that are uncertain, uncontrollable, or only remotely connected to their actions. The broader concept of responsibility has been examined in relation to moral agency, accountability, harm, and the attribution of blame (Harris, 2020). From a clinical perspective, excessive responsibility may become problematic when individuals believe that merely having a negative thought increases the probability of a harmful event or makes them morally accountable for preventing it. Such beliefs can transform ordinary intrusive thoughts into sources of guilt, anxiety, and compulsive action.

The association between responsibility beliefs and obsessive-compulsive processes is especially important. Individuals with elevated responsibility beliefs may interpret unwanted thoughts as evidence of danger, moral failure, or personal negligence. They may believe that failing to suppress or neutralize a thought is equivalent to allowing a harmful event to occur. This interpretation can increase vigilance toward internal experiences and create repeated attempts to monitor, suppress, or replace distressing thoughts. Research has shown that obsessive beliefs involving responsibility, perfectionism, and the perceived importance of thoughts are related to impaired sleep quality (Dalir, 2020). Such findings suggest that responsibility-related cognitions may have consequences that extend beyond obsessive symptoms and affect broader aspects of psychological and physiological functioning. Persistent monitoring of thoughts may maintain arousal, increase cognitive load, and prevent emotional disengagement, thereby disrupting rest and recovery.

Thought control represents a central dimension of responsibility for negative thoughts. Individuals who believe that they must exercise complete control over their mental activity may regard the occurrence of an unwanted thought as evidence of weakness, danger, or irresponsibility. They may engage in thought suppression, distraction, reassurance seeking, avoidance, or excessive self-monitoring in an effort to eliminate the thought. Paradoxically, deliberate attempts to suppress unwanted thoughts may increase their salience and recurrence. The individual may then interpret the persistence of the thought as proof that greater control is necessary, thereby reinforcing a self-perpetuating cycle. In this cycle, the thought becomes more distressing not necessarily because of its original content but because of the perceived obligation to control it. The inability to achieve complete control may subsequently generate guilt, self-criticism, and anxiety.

Repetitive attempts to control cognition may also impair working memory and executive functioning. Rumination consumes attentional resources and restricts the cognitive capacity available for problem solving, flexible thinking, and goal-directed behavior. Evidence indicates that the manner in which individuals process distressing experiences can influence working memory performance among those with severe rumination. In particular, abstract processing, which emphasizes generalized causes and implications, may maintain repetitive thinking more strongly than concrete processing focused on specific situational details and actionable responses (Soheili et al., 2021). This distinction

is relevant to responsibility for negative thoughts because individuals who repeatedly ask why a thought occurred or what it says about their character may become trapped in abstract, evaluative processing. By contrast, concrete processing may facilitate contextualization and reduce the tendency to interpret thoughts as indicators of personal danger or moral responsibility.

Rumination is another important component of maladaptive cognitive functioning. It involves repetitive and relatively passive attention to distress, its possible causes, and its anticipated consequences. Although individuals may engage in rumination with the intention of understanding or resolving a problem, the process often intensifies negative affect and reduces effective action. Rumination has also been linked to obsessive-compulsive symptoms, particularly when combined with limited distress tolerance. During the COVID-19 pandemic, rumination and distress tolerance were found to predict obsessive-compulsive disorder symptoms, illustrating how repetitive cognition and difficulty tolerating emotional discomfort may contribute to compulsive patterns during periods of heightened uncertainty (Mousavi & Seyed, 2023). Responsibility for negative thoughts may intensify this relationship because individuals who feel accountable for preventing harmful outcomes may repeatedly analyze their thoughts and seek certainty that no danger will occur.

Co-rumination, which refers to the repeated and extensive discussion of problems within interpersonal relationships, further demonstrates that repetitive negative thinking can occur both internally and socially. Although discussing difficulties with others may provide support, excessive focus on problems, negative emotions, and speculative consequences can strengthen distress and maintain maladaptive cognitive patterns. The development and validation of culturally appropriate instruments are therefore essential for accurately measuring such constructs. The Persian version of the Co-Rumination Questionnaire has undergone validation and reliability assessment, underscoring the importance of adapting psychological measures to the linguistic and cultural characteristics of Iranian respondents (Tanhaei Rashvanloo et al., 2021). Nevertheless, co-rumination measures do not directly assess whether individuals feel responsible for controlling, preventing, or compensating for their negative thoughts. This distinction highlights the need for an instrument specifically designed to measure responsibility-related responses to negative cognition.

Magical thinking constitutes another potentially important dimension of responsibility for negative thoughts. Magical thinking involves the belief that thoughts, words, wishes, or symbolic actions can directly influence external events despite the absence of a plausible causal mechanism. In the context of unwanted thoughts, individuals may believe that imagining a harmful event increases its likelihood or that failing to perform a specific mental or behavioral act may permit the event to occur. Such beliefs overlap with thought-action fusion, in which thinking about an action is interpreted as morally equivalent to performing it or as increasing the probability that it will happen. Magical thinking may therefore amplify the perceived significance of intrusive thoughts and lead individuals to experience guilt or fear merely because a particular idea entered their minds.

The implications of exaggerated responsibility are also visible in morally distressing experiences. Moral injury refers to psychological, emotional, social, and spiritual suffering that may arise after individuals perpetrate, fail to prevent, witness, or learn about actions that violate deeply held moral beliefs (Koenig & Al Zaben, 2021). Although moral injury is distinct from responsibility for negative thoughts, both constructs involve appraisals of accountability, guilt, and perceived failure to prevent harm. Individuals who overestimate their responsibility may experience moral distress even when they had little realistic control over an outcome. This observation reinforces the need to distinguish adaptive moral responsibility from maladaptive cognitive responsibility, in which individuals attribute excessive causal or ethical significance to thoughts and imagined possibilities.

Compensatory behavior represents a further dimension through which responsibility for negative thoughts may be expressed. When individuals believe that a thought is dangerous or morally significant, they may engage in behaviors intended to cancel, prevent, neutralize, or repair its perceived consequences. These responses may include checking, reassurance seeking, avoidance, ritualized behavior, confession, repeated apology, mental review, or attempts to replace a negative thought with a positive one. Although compensatory behaviors may temporarily reduce anxiety, they can prevent corrective learning and reinforce the belief that the original thought posed a genuine threat. Over time, the individual may become increasingly dependent on these behaviors and less able to tolerate uncertainty or intrusive cognition.

Responsibility-related fears are not confined to traditional clinical settings. Large-scale social threats can also produce

anxiety, guilt, and perceived responsibility. Climate anxiety among children and young people, for instance, has been associated with concerns about governmental responses and feelings that responsible institutions have failed to act adequately (Hickman et al., 2021). Although this form of responsibility concerns collective and institutional action, it demonstrates how perceived failures of responsibility can shape emotional distress. Individuals may also internalize responsibility for broad threats that exceed their personal control, thereby intensifying helplessness, guilt, or compulsive efforts to compensate. These patterns suggest that responsibility should be understood as a multidimensional construct influenced by personal beliefs, social expectations, moral standards, and perceptions of control.

Organizational and occupational research similarly demonstrates that responsibility can influence emotional responses to threat. Socially responsible human resource management has been shown to affect employees' fears regarding the threats posed by COVID-19, indicating that responsible organizational practices may reduce uncertainty and enhance perceptions of safety (He et al., 2021). This evidence highlights an important distinction between responsibility that is appropriately assumed by institutions and responsibility that is excessively internalized by individuals. When organizations communicate transparently and act responsibly, employees may experience less need to monitor threats personally. Conversely, unclear responsibility structures may contribute to insecurity, self-blame, and heightened vigilance. Thus, responsibility operates not only as an individual cognitive belief but also as a socially and organizationally constructed expectation.

Contemporary technological developments have further expanded discussions of responsibility. Responsible artificial intelligence requires attention to ethical design, accountability, transparency, unintended harm, and the potential "dark side" of technological systems (Mikalef et al., 2022). Likewise, the application of large language models in behavioral healthcare has generated calls for responsible development, validation, privacy protection, bias assessment, and ongoing evaluation before such systems are integrated into clinical decision-making (Stade et al., 2024). These debates are not direct investigations of negative thoughts, yet they illustrate the increasing theoretical importance of responsibility across disciplines. They also emphasize that responsibility must be operationally defined and measured rather than treated as a vague moral principle. In psychological assessment, a

similarly precise approach is required to determine how individuals experience responsibility for their own cognitive events.

The development of valid measures is particularly important because responsibility for negative thoughts may influence treatment response. Psychological interventions that reduce cognitive fusion, experiential avoidance, and rigid control strategies may help individuals relate to negative thoughts more flexibly. A recent meta-analysis found that acceptance and commitment therapy can reduce negative emotions and automatic thoughts while improving psychological flexibility among individuals with depression (Zou et al., 2025). From the perspective of responsibility for negative thoughts, such interventions may be effective because they challenge the assumption that distressing thoughts must be suppressed, neutralized, or obeyed. Acceptance-based approaches encourage individuals to observe thoughts as transient mental events rather than as commands, predictions, or indicators of moral character.

Despite growing research on negative automatic thoughts, rumination, obsessive beliefs, experiential avoidance, and emotion regulation, there remains a need for an integrated instrument that directly assesses responsibility for negative thoughts. Existing measures often focus on the frequency or content of negative thoughts, general rumination, anxiety, obsessive-compulsive symptoms, or specific responsibility beliefs. These instruments may not fully capture the interconnected processes through which individuals attempt to control their thoughts, attribute magical or causal power to them, and perform compensatory behaviors to prevent imagined consequences. A multidimensional scale encompassing thought control, magical thinking, and compensatory behavior could therefore provide a more comprehensive assessment of the construct.

Cultural context is also critical in the development of such an instrument. Beliefs concerning responsibility, morality, fate, thought control, interpersonal obligation, and compensatory action may vary across societies. An instrument developed in one cultural setting may not adequately reflect the linguistic expressions, social expectations, and belief systems of another population. Consequently, direct translation of an existing measure may be insufficient when the intended construct has not been clearly operationalized in the target culture. Developing and validating a questionnaire specifically for the Iranian population can improve conceptual relevance, item comprehensibility, and measurement precision. It can also

support research examining the role of responsibility-related cognition in anxiety, depression, obsessive-compulsive symptoms, rumination, and other forms of psychological distress.

A psychometrically robust questionnaire should demonstrate adequate content validity, a theoretically coherent factor structure, convergent validity, and internal consistency. Content validation ensures that the items adequately represent the conceptual domain. Exploratory factor analysis identifies the latent dimensions underlying responses, while confirmatory factor analysis tests whether the proposed measurement model fits the observed data. Convergent validity establishes that the scale is meaningfully related to theoretically associated constructs, and reliability analysis determines whether the items consistently measure the intended dimensions. Through these procedures, a new questionnaire can provide both a theoretically grounded and empirically supported framework for assessing responsibility for negative thoughts.

Accordingly, the aim of the present study was to develop and psychometrically validate the Responsibility for Negative Thoughts Questionnaire and to examine its three proposed dimensions of thought control, magical thinking, and compensatory behavior among the Iranian population.

2. Methods and Materials

The present study employed a descriptive-correlational instrument-development design and aimed to develop and psychometrically evaluate a questionnaire for assessing responsibility for negative thoughts among the Iranian population. For this purpose, a researcher-developed scale consisting of 35 items was initially constructed. The dimensions of the scale included thought control, magical thinking, and compensatory behavior. The content validity and conceptual appropriateness of each item were evaluated through the expert opinions of eight faculty members in psychology and educational sciences. Relevant content validity indices were calculated to ensure that the items were consistent with the research objectives and adequately represented the theoretical content of the construct.

Following confirmation of content validity, the factorial structure of the scale was examined using exploratory factor analysis. Principal component analysis with varimax rotation was employed to identify the principal dimensions of the scale and assign each item to the most appropriate factor. The assumptions underlying factor analysis,

including sampling adequacy and correlations among the items, were also evaluated to ensure that the data were suitable for factor analysis.

To assess convergent validity, the scores obtained from the researcher-developed questionnaire were compared with scores on the Jerabek Social Anxiety Scale (Jerabek, 1997). This analysis was conducted to determine whether the developed questionnaire was consistent with a relevant and established external measure and could appropriately assess the intended construct.

In the subsequent stage, first- and second-order confirmatory factor analyses were conducted to evaluate the fit of the proposed factorial structure. First-order confirmatory factor analysis was used to examine the relationships between the items and their respective factors, whereas second-order confirmatory factor analysis was used to investigate the relationships between the factors and the overarching construct. These analyses confirmed the three principal dimensions of the questionnaire—thought control, magical thinking, and compensatory behavior—and demonstrated that the factorial structure of the scale was consistent with the collected data.

The reliability of the instrument was evaluated by calculating Cronbach's alpha coefficients for each factor and the total scale. This analysis was performed to assess the internal consistency of the items and the stability of the questionnaire for use in comparable samples.

The study sample consisted of individuals selected from the population under investigation. Data were collected using the researcher-developed Responsibility for Negative

Thoughts Questionnaire and the Jerabek Social Anxiety Scale. The sampling procedure was designed to provide sufficient diversity for conducting the statistical analyses and generalizing the findings to the target population.

Overall, the research methodology included the development and content validation of the researcher-developed questionnaire, examination of its convergent validity using the Social Anxiety Scale, exploratory factor analysis, confirmatory factor analysis, and reliability assessment. Together, these procedures provided an integrated evaluation of the factorial structure and applicability of the questionnaire for assessing responsibility for negative thoughts.

3. Findings and Results

Initially, the content validity of the 35-item researcher-developed scale was evaluated based on the opinions of specialists, including six faculty members in psychology and two faculty members in educational sciences. The Content Validity Ratio (CVR) was calculated, and the level of expert agreement regarding the items was found to be 0.91.

Exploratory factor analysis was conducted to determine the number of factors underlying the Responsibility for Negative Thoughts Questionnaire. The Kaiser–Meyer–Olkin (KMO) test was used to evaluate sampling adequacy, while Bartlett's test of sphericity and its statistical significance were used to determine whether the population correlation matrix differed significantly from an identity matrix. The results are presented in Table 1.

Table 1

Results of the Kaiser–Meyer–Olkin Test and Bartlett's Test of Sphericity

Test or index	Value
Kaiser–Meyer–Olkin measure	0.88
Bartlett's test of sphericity, χ^2	7,786.54
Degrees of freedom	596
Significance level	0.0001

Given that the KMO value exceeded the minimum acceptable criterion of 0.70, sampling adequacy and compliance with the assumptions required for factor analysis were confirmed. In the present study, the KMO value was 0.88, and Bartlett's test of sphericity yielded a value of 7,786.54, which was statistically significant ($p < .001$). These findings demonstrated that the correlation matrix was suitable for factor analysis. Accordingly, the factorial

structure of the questionnaire was examined using exploratory factor analysis based on principal component analysis with varimax rotation. Factors were extracted according to the proportion of variance explained, in descending order of importance. The statistical indices obtained from the exploratory factor analysis indicated that three factors had eigenvalues greater than 1.00; therefore,

these three factors were retained for the researcher-developed scale.

Table 2

Eigenvalues of the Extracted Factors of the Researcher-Developed Responsibility for Negative Thoughts Questionnaire

Factor	Initial eigenvalue	Initial variance explained (%)	Initial cumulative variance (%)	Rotated eigenvalue	Rotated variance explained (%)	Rotated cumulative variance (%)
1	12.34	35.27	35.27	9.88	28.23	28.23
2	9.20	26.29	61.56	9.15	26.15	54.39
3	3.02	8.62	70.18	5.52	15.79	70.18

As shown in Table 2, the first factor, with an eigenvalue of 12.34, explained 35.27% of the total variance. The second factor, with an eigenvalue of 9.20, explained 26.29% of the total variance, while the third factor, with an eigenvalue of 3.02, explained 8.62% of the total variance. Collectively, the three factors explained 70.18% of the common variance. No items were removed from the scale at this stage. An examination of the correspondence between the items and the theoretically proposed dimensions of the researcher-developed Responsibility for Negative Thoughts

Questionnaire indicated that the first factor, identified as thought control, comprised 11 items; the second factor, identified as magical thinking, comprised 14 items; and the third factor, identified as compensatory behavior, comprised 10 items. The scree plot and the data related to the explained variance and eigenvalues were subsequently examined.

To evaluate convergent validity, the relationships between the scores of the developed scale and scores on the Jerabek Social Anxiety Scale (1997) were examined. The results are presented in Table 3.

Table 3

Correlations Between the Developed Responsibility for Negative Thoughts Scale and Social Anxiety

Variable	Jerabek Social Anxiety Scale
Thought control	.61**
Magical thinking	.52**
Compensatory behavior	.68**
Total responsibility for negative thoughts score	.64**

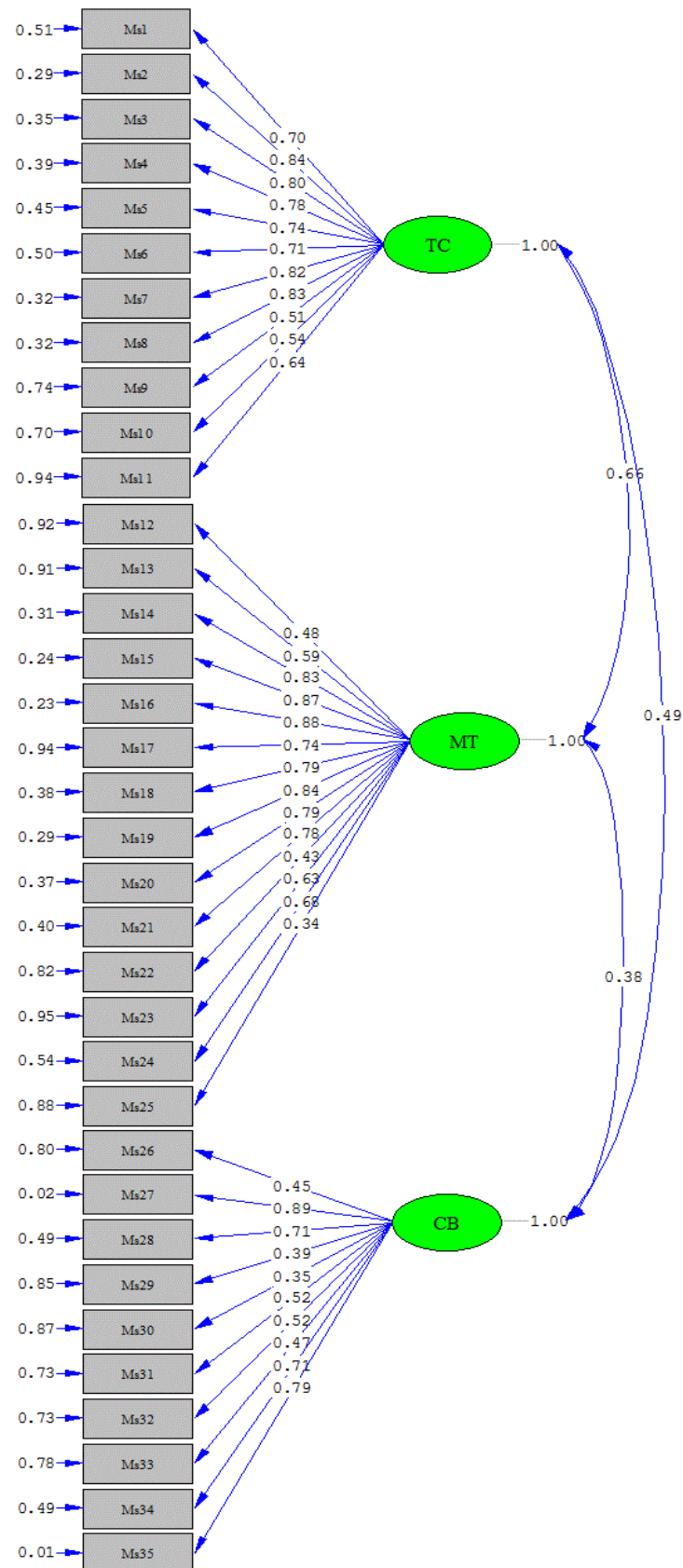
The results presented in Table 3 indicate that thought control, magical thinking, compensatory behavior, and the total responsibility for negative thoughts score were positively and significantly correlated with scores on the Jerabek Social Anxiety Scale ($p < .01$). These findings

demonstrate that the developed scale has satisfactory convergent validity.

First-order confirmatory factor analysis was subsequently conducted to examine the relationships between the items and their corresponding factors. The results are presented in Figures 1 and 2.

Figure 1

First-order confirmatory factor analysis: Standardized solution



Chi-Square=1412.32, df=557, P-value=0.00000, RMSEA=0.053

Figure 2

First-order confirmatory factor analysis: Significance coefficients

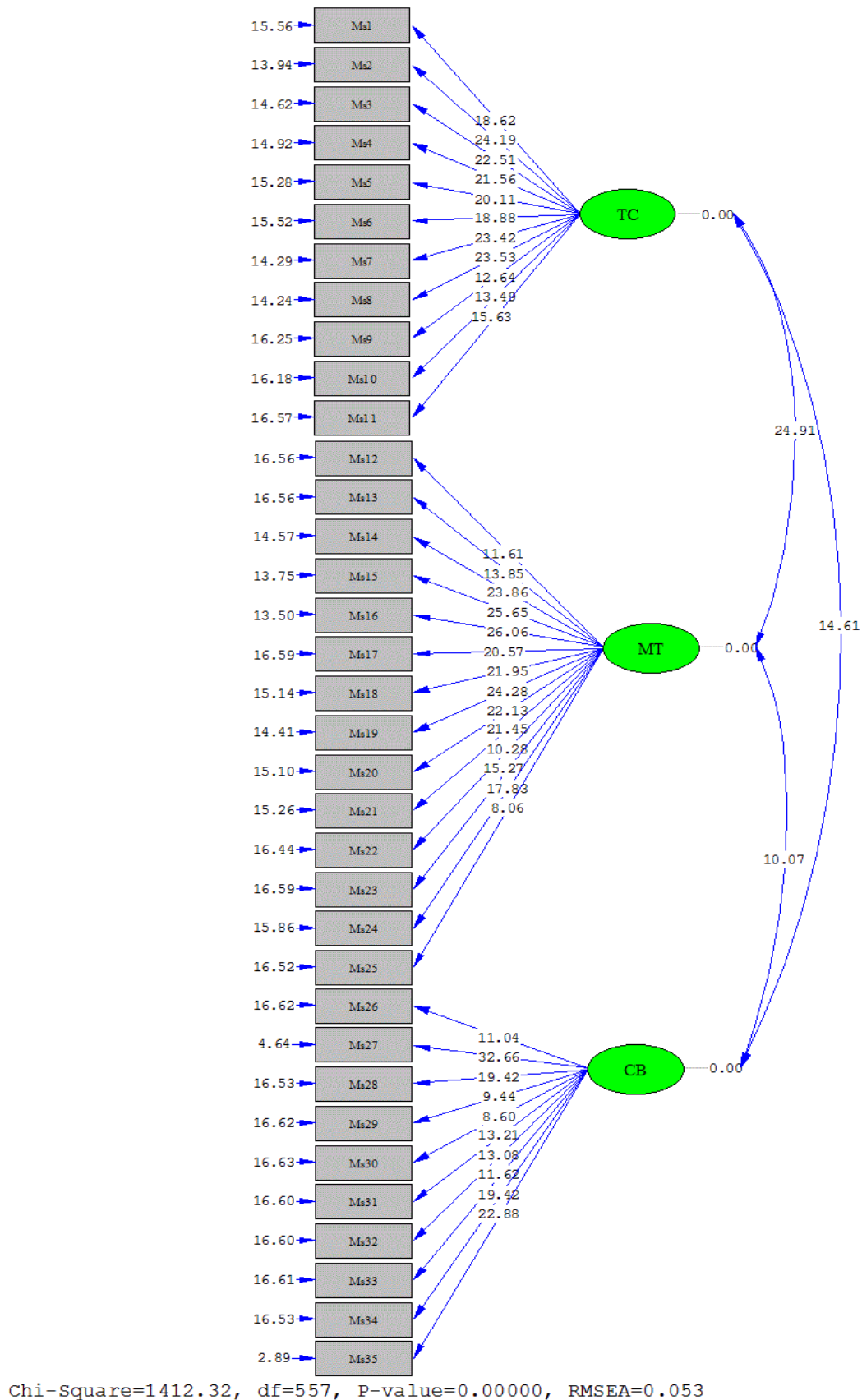
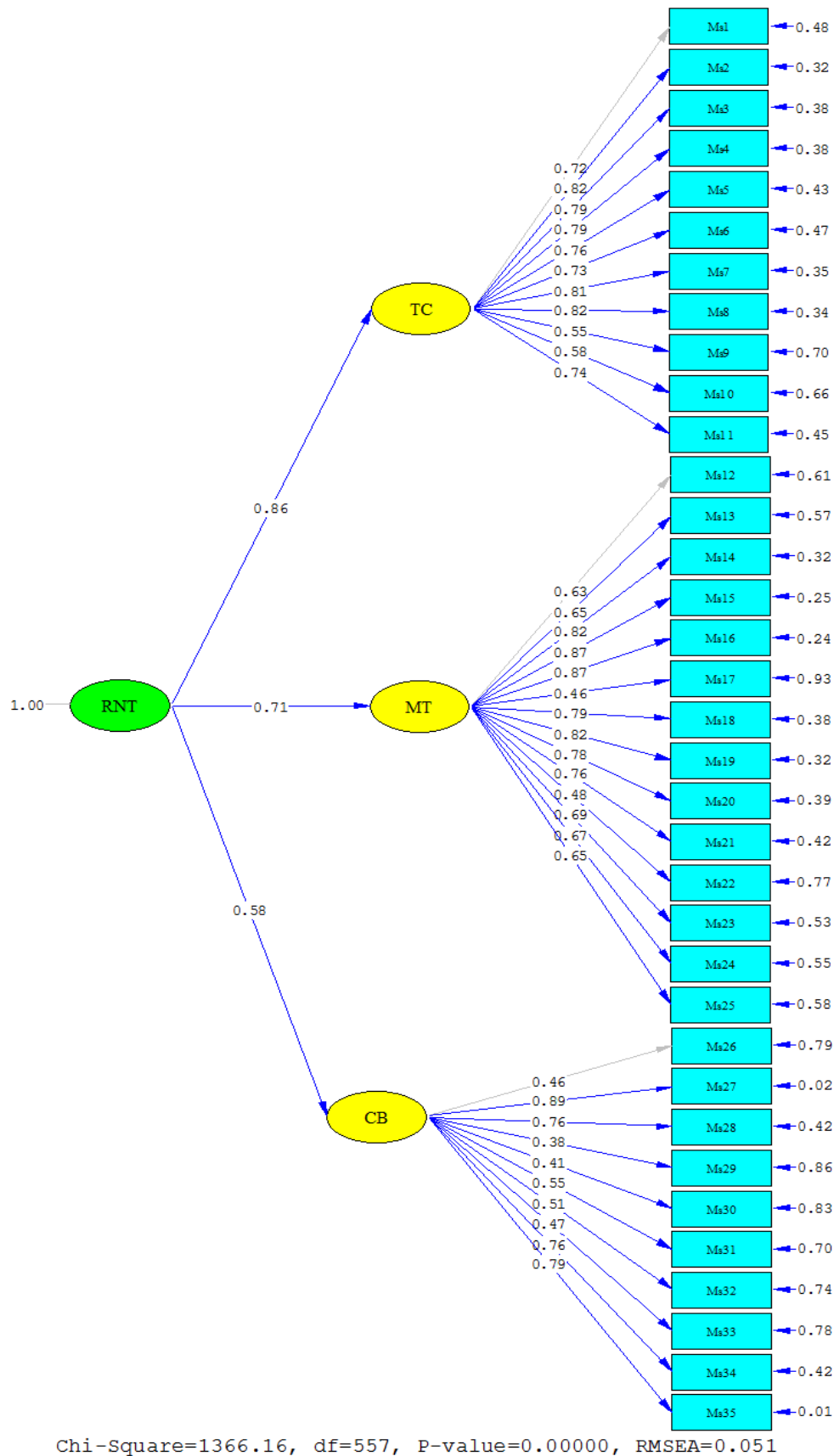


Figure 3

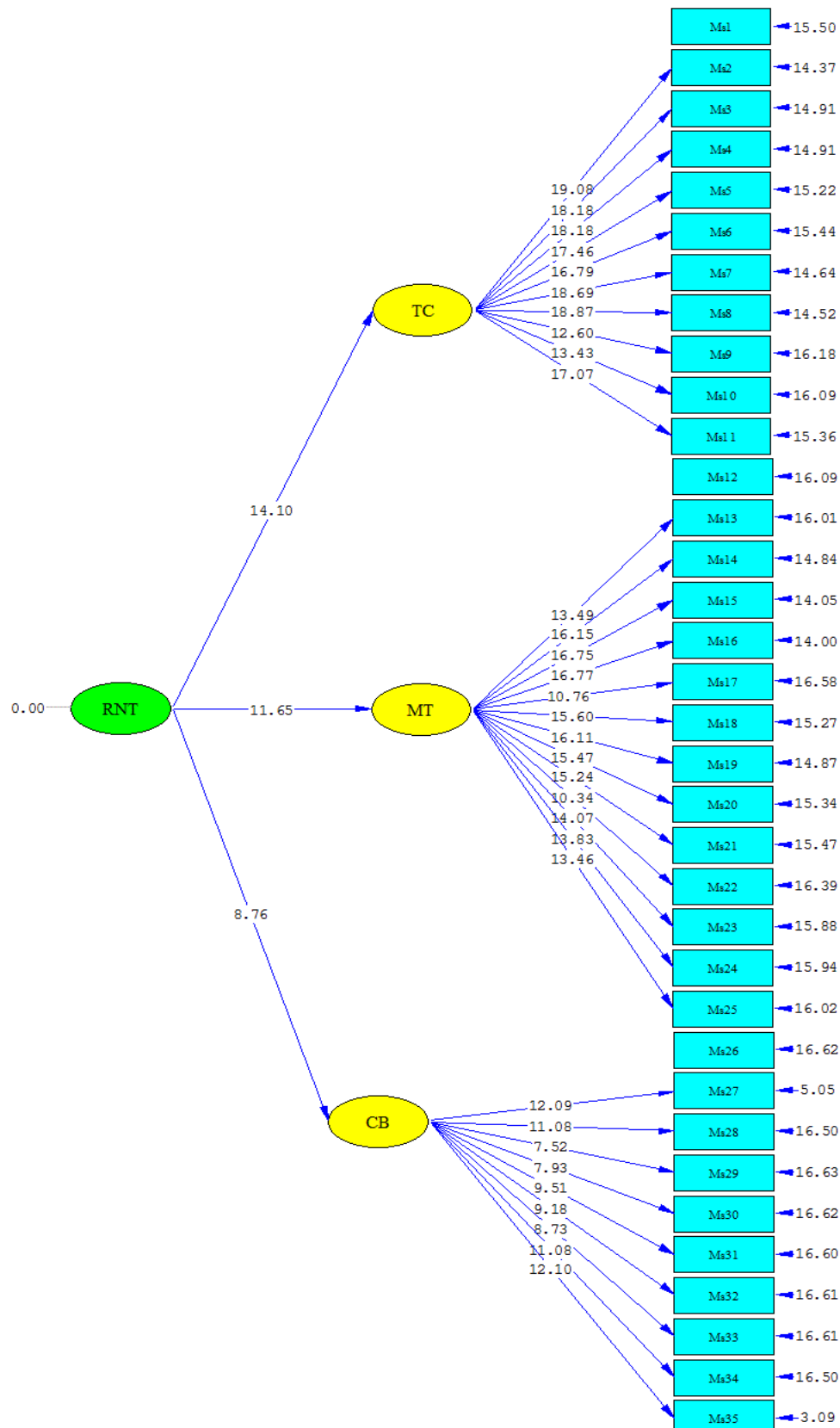
Second-order confirmatory factor analysis: Standardized solution



Chi-Square=1366.16, df=557, P-value=0.00000, RMSEA=0.051

Figure 4

Second-order confirmatory factor analysis: Significance coefficients



Chi-Square=1366.16, df=557, P-value=0.00000, RMSEA=0.051

The findings of the first-order confirmatory factor analysis indicated that the proposed model adequately fitted the research data. As demonstrated by the results, all items had satisfactory factor loadings on their corresponding factors. Furthermore, the obtained root mean square error of

approximation (RMSEA) value indicated an acceptable model fit. An RMSEA value below 0.08 is generally considered indicative of an acceptable model fit. The remaining model-fit indices were also calculated and are presented in Table 4.

Table 4

Goodness-of-Fit Indices for the First-Order Confirmatory Factor Analysis Model

χ^2/df	GFI	CFI	IFI	RMSEA
2.53	0.92	0.94	0.93	0.053

Although no single definitive criterion has been established for determining an acceptable chi-square-to-degrees-of-freedom ratio, values of the goodness-of-fit index, comparative fit index, and incremental fit index equal to or greater than 0.90 generally indicate a well-fitting model. Furthermore, RMSEA values equal to or below 0.05 indicate a close model fit, while values greater than 0.05 and up to 0.08 indicate a reasonable approximation error in the population. Based on the goodness-of-fit indices reported in Table 4, the model demonstrated a satisfactory fit, thereby confirming the results of the first-order confirmatory factor analysis and supporting the proposed measurement model.

After establishing the relationships between the factors and their respective items through first-order confirmatory

factor analysis, the relationships between the factors and the overarching construct were examined using second-order confirmatory factor analysis. The results are presented in Figures 3 and 4.

The findings of the second-order confirmatory factor analysis supported the three-factor structure identified through the first-order confirmatory factor analysis and indicated that the proposed model adequately fitted the research data. As demonstrated by the results, all three factors had satisfactory factor loadings on the overarching construct. In addition, the obtained RMSEA value indicated an acceptable model fit because it was below 0.08. The remaining model-fit indices were also calculated and are presented in Table 5.

Table 5

Goodness-of-Fit Indices for the Second-Order Confirmatory Factor Analysis Model

χ^2/df	GFI	CFI	IFI	RMSEA
2.45	0.93	0.94	0.95	0.051

Although no single definitive criterion has been established for an acceptable chi-square-to-degrees-of-freedom ratio, values of the goodness-of-fit index, comparative fit index, and incremental fit index equal to or greater than 0.90 are generally indicative of a well-fitting model. In addition, RMSEA values equal to or below 0.05 indicate a close fit, whereas values greater than 0.05 and up to 0.08 indicate a reasonable approximation error in the population. Based on the goodness-of-fit indices reported in Table 5, the values of the model-fit indices supported the adequacy of the proposed model. The results indicated that the three factors—thought control (TC; Items 1–11), magical

thinking (MT; Items 12–25), and compensatory behavior (CB; Items 26–35)—were appropriately associated with the overarching construct of responsibility for negative thoughts.

Following factor analysis and confirmation of the three-factor structure of the developed scale, Cronbach's alpha coefficients were calculated according to the components extracted through factor analysis. The mean, standard deviation, and Cronbach's alpha coefficient were calculated separately for each factor and for the total scale. The results are presented in Table 6.

Table 6

Means, Standard Deviations, and Internal Consistency Reliability of the Dimensions and Total Responsibility for Negative Thoughts Questionnaire

Dimension	Number of items	Mean	Standard deviation	Cronbach's alpha
Thought control	11	20.46	7.45	0.90
Magical thinking	14	30.66	12.23	0.93
Compensatory behavior	10	18.63	6.54	0.89
Total responsibility for negative thoughts score	35	69.77	22.17	0.94

The results indicated that the Cronbach's alpha reliability coefficients for the thought control, magical thinking, and compensatory behavior components ranged from 0.89 to 0.93. The Cronbach's alpha coefficient for the total Responsibility for Negative Thoughts Questionnaire was 0.94.

4. Discussion

The present study aimed to develop and psychometrically validate the Responsibility for Negative Thoughts Questionnaire among an Iranian population. The findings provided substantial evidence supporting the content validity, construct validity, convergent validity, factorial structure, and internal consistency of the instrument. Expert evaluation of the initial 35-item questionnaire yielded a content validity ratio of 0.91, indicating a high level of agreement regarding the relevance and representativeness of the items. Exploratory factor analysis identified three interpretable factors—thought control, magical thinking, and compensatory behavior—which jointly explained 70.18% of the total variance. The Kaiser–Meyer–Olkin value of 0.88 and the statistically significant Bartlett's test of sphericity demonstrated that the correlation matrix was suitable for factor analysis. Moreover, first- and second-order confirmatory factor analyses supported the proposed measurement structure. The fit indices for both models were within acceptable ranges, with χ^2/df ratios of 2.53 and 2.45 and RMSEA values of 0.053 and 0.051, respectively. The three dimensions and the total questionnaire score were also positively and significantly associated with social anxiety, supporting convergent validity. Finally, Cronbach's alpha coefficients ranged from 0.89 to 0.93 for the dimensions and reached 0.94 for the total scale, indicating excellent internal consistency.

The high content validity coefficient suggests that the items developed for the questionnaire adequately represented the conceptual domain of responsibility for

negative thoughts. This finding is important because the construct does not merely refer to the presence of negative cognition; rather, it concerns how individuals interpret such thoughts, how strongly they believe that they must control them, and whether they feel compelled to neutralize or compensate for their perceived consequences. Previous research has shown that negative automatic thoughts are associated with experiential avoidance, cognitive emotion-regulation difficulties, and psychological distress (Alipour et al., 2025). Therefore, an instrument designed to assess responsibility for negative thoughts must encompass cognitive, emotional, and behavioral responses rather than focusing only on thought frequency or content. The strong agreement among experts indicates that the developed items were conceptually aligned with these multidimensional processes.

The extraction of three factors provides empirical support for the theoretical assumption that responsibility for negative thoughts is a multidimensional construct. The first factor, thought control, reflects the belief that individuals should be able to regulate, suppress, or eliminate unwanted thoughts. This dimension is theoretically consistent with evidence indicating that difficulties in emotional self-regulation are associated with greater levels of negative automatic thoughts. Among adolescents from divorced families, emotional self-regulation was found to predict negative automatic thinking, suggesting that limited regulatory capacity may increase susceptibility to persistent negative cognition (Sohrabi et al., 2025). Individuals who experience difficulty regulating their emotional and cognitive responses may consequently develop stronger beliefs that distressing thoughts must be actively controlled. However, the repeated effort to achieve complete mental control may intensify monitoring of internal experiences and make unwanted thoughts more cognitively accessible.

The thought-control dimension may also be explained through the relationship between repetitive cognition and limited working-memory resources. Severe rumination can

occupy attentional capacity and reduce the ability to process information flexibly. Research comparing concrete and abstract processing styles has demonstrated that the form of cognitive processing influences working-memory capacity in individuals experiencing severe rumination (Soheili et al., 2021). Abstract processing is often characterized by generalized evaluation, causal questioning, and self-focused interpretation, whereas concrete processing directs attention toward specific situational details. Individuals with strong responsibility beliefs may engage in abstract questions such as why a negative thought occurred, what it signifies about their character, and whether it could cause harm. This type of processing may strengthen perceived responsibility and make disengagement from negative cognition more difficult.

The second factor, magical thinking, represents the belief that thoughts may directly influence external events or that thinking about an undesirable outcome may increase its likelihood. This factor is particularly relevant to obsessive beliefs concerning the importance and power of thoughts. Previous findings have demonstrated that obsessive beliefs involving responsibility, perfectionism, and the importance of thoughts are associated with impaired sleep quality (Dalir, 2020). Individuals who attribute excessive significance to thoughts may remain mentally alert to possible danger and engage in continuous monitoring to prevent unwanted consequences. Such hypervigilance can increase psychological arousal and interfere with rest, concentration, and emotional recovery. Therefore, the emergence of magical thinking as an independent factor indicates that responsibility for negative thoughts includes not only perceived control but also beliefs concerning the causal and moral power of cognition.

The magical-thinking factor may further reflect a tendency to confuse mental events with external reality. When individuals believe that merely imagining harm increases its probability, they may experience guilt and fear even though no harmful action has occurred. The broader philosophical literature on responsibility distinguishes between actual agency, causal contribution, and moral accountability (Harris, 2020). From this perspective, attributing responsibility to oneself solely because of an unwanted thought represents an expansion of responsibility beyond realistic causal boundaries. The identified factor therefore captures a clinically important distortion in which the occurrence of a thought is treated as equivalent to intention, action, or causation.

The third factor, compensatory behavior, concerns behavioral or mental responses intended to prevent,

neutralize, or repair the imagined consequences of negative thoughts. This factor explained a substantial proportion of variance and demonstrated the strongest correlation with social anxiety. Compensatory responses may include reassurance seeking, checking, avoidance, repeated apology, mental neutralization, ritualized action, or efforts to replace a negative thought with a positive one. Although these behaviors may temporarily reduce anxiety, they can reinforce the assumption that the thought was dangerous and that compensation was necessary. The relationship between rumination, limited distress tolerance, and obsessive-compulsive symptoms supports this interpretation. Rumination and distress tolerance were found to predict obsessive-compulsive symptoms during the COVID-19 pandemic, indicating that repetitive negative thinking combined with difficulty tolerating discomfort may contribute to repetitive neutralizing behavior (Mousavi & Seyed, 2023).

Compensatory behavior can also be understood as an avoidance-based strategy. Individuals may perform corrective or neutralizing actions to escape guilt, uncertainty, fear, or perceived moral threat. Evidence indicates that experiential avoidance is associated with automatic negative thoughts and psychological distress, while cognitive emotion regulation can mediate these relationships (Alipour et al., 2025). Therefore, compensatory behavior may serve as a behavioral expression of experiential avoidance. Rather than accepting the presence of an unwanted thought, the individual attempts to remove its emotional impact through action. This strategy may provide immediate relief but prevent the development of tolerance for uncertainty and reduce opportunities to learn that thoughts do not necessarily produce external consequences.

The three-factor structure is also consistent with the broader literature on rumination and co-rumination. The validation of the Persian version of the Co-Rumination Questionnaire has demonstrated the relevance of culturally appropriate measurement of repetitive negative thinking in Iranian samples (Tanhaei Rashvanloo et al., 2021). Nevertheless, co-rumination primarily assesses repetitive interpersonal discussion of problems, whereas the present instrument evaluates the sense of responsibility attached to negative thoughts. The current questionnaire therefore extends existing assessment approaches by measuring the perceived obligation to control cognition, the attribution of causal power to thoughts, and compensatory responses intended to neutralize perceived harm.

The significant positive correlations between all dimensions of the questionnaire and social anxiety provided evidence of convergent validity. Thought control correlated with social anxiety at 0.61, magical thinking at 0.52, compensatory behavior at 0.68, and the total questionnaire score at 0.64. The relatively strong association between compensatory behavior and social anxiety may indicate that socially anxious individuals frequently engage in post-event review, reassurance seeking, impression management, avoidance, or attempts to correct perceived interpersonal mistakes. Negative automatic thoughts are commonly observed in anxiety-provoking medical and social contexts. For instance, preoperative anxiety has been associated with negative automatic thoughts among patients awaiting corneal transplantation (Tanriverdi et al., 2024). These findings support the proposition that distress increases when individuals interpret negative thoughts as significant signals requiring immediate cognitive or behavioral responses.

The association with social anxiety may also be explained by the developmental and neuropsychological consequences of adverse emotional experiences. Negative automatic thoughts have been shown to mediate the relationship between emotional abuse and alterations in functional brain connectivity during adolescence (Yeo et al., 2024). This evidence suggests that repeated negative cognition may become embedded in broader systems of emotional and cognitive functioning. Individuals exposed to emotionally threatening environments may develop heightened monitoring of their internal states, stronger expectations of negative outcomes, and an excessive sense of responsibility for preventing rejection or conflict. The present scale may therefore capture cognitive patterns that extend across anxiety, trauma-related experiences, and interpersonal vulnerability.

The first-order confirmatory factor analysis demonstrated that the 35 items had satisfactory loadings on their respective dimensions. The fit indices, including a GFI of 0.92, CFI of 0.94, IFI of 0.93, and RMSEA of 0.053, supported the adequacy of the three-factor measurement model. These findings indicate that thought control, magical thinking, and compensatory behavior are empirically distinguishable but related dimensions. The second-order confirmatory factor analysis further demonstrated that these three factors loaded appropriately on the overarching construct of responsibility for negative thoughts. The second-order model also showed satisfactory fit, with GFI, CFI, and IFI values ranging from 0.93 to 0.95 and an RMSEA of 0.051. This finding supports

the use of both dimension-specific scores and a total questionnaire score.

The second-order structure is theoretically meaningful because responsibility can operate at different levels. At the general level, individuals may hold an overarching belief that they are accountable for controlling their mental experiences and preventing undesirable consequences. At the specific level, this general responsibility belief may be expressed through attempts to control thoughts, magical interpretations of cognition, and compensatory actions. Related research on moral injury has demonstrated that perceived responsibility, guilt, and failure to prevent harm can produce substantial psychological distress (Koenig & Al Zaben, 2021). Although moral injury and responsibility for negative thoughts are distinct constructs, both involve the attribution of personal accountability and the emotional consequences of perceived failure. The present findings suggest that excessive responsibility may similarly organize multiple cognitive and behavioral reactions to unwanted mental content.

Responsibility is also influenced by wider social and institutional contexts. Research on climate anxiety has shown that children and young people experience distress in relation to perceived governmental failure and inadequate responses to environmental threats (Hickman et al., 2021). In such situations, individuals may internalize responsibility for large-scale problems that exceed their personal capacity to control. Similarly, socially responsible human resource management has been found to affect employees' fears during the COVID-19 pandemic, indicating that responsible institutional practices can shape individual perceptions of threat and safety (He et al., 2021). These studies support the broader proposition that responsibility beliefs are formed through interactions between personal cognition, social expectations, and perceived institutional accountability.

Contemporary discussions of responsible technology further illustrate the importance of clearly defining responsibility and distinguishing realistic accountability from diffuse or exaggerated responsibility. Responsible artificial intelligence requires explicit attention to ethical oversight, transparency, unintended harm, and accountability for technological outcomes (Mikalef et al., 2022). Similarly, the use of large language models in behavioral healthcare requires responsible development, validation, privacy protection, and evaluation before clinical implementation (Stade et al., 2024). Although these studies address technological systems rather than individual cognition, they demonstrate that responsibility becomes

psychologically and ethically problematic when causal roles and accountability are unclear. The present questionnaire applies this principle at the individual level by identifying when people assign excessive responsibility to their own thoughts.

The high internal consistency coefficients provide further support for the psychometric quality of the instrument. Cronbach's alpha coefficients were 0.90 for thought control, 0.93 for magical thinking, 0.89 for compensatory behavior, and 0.94 for the total scale. These coefficients indicate that the items within each factor measure coherent aspects of the same underlying dimension. The particularly high reliability of the total scale is also compatible with the second-order factor model, which demonstrated that the three dimensions are organized under a common construct. At the same time, the distinct reliability coefficients support separate interpretation of the subscale scores when more detailed clinical or research assessment is required.

The findings also have implications for psychological intervention. Acceptance and commitment therapy has been shown to reduce negative emotions and automatic thoughts and to increase psychological flexibility among individuals with depression (Zou et al., 2025). Such findings suggest that maladaptive responsibility for negative thoughts may be reduced by helping individuals observe thoughts without attempting to suppress, neutralize, or treat them as literal predictors of reality. Greater psychological flexibility may weaken the perceived need for total thought control, reduce magical interpretations, and decrease compensatory behavior. The developed questionnaire may consequently be useful for evaluating cognitive changes during acceptance-based, metacognitive, or cognitive-behavioral interventions.

5. Conclusion

Overall, the findings indicate that the Responsibility for Negative Thoughts Questionnaire has a coherent three-factor structure, acceptable convergent validity, satisfactory model fit, and excellent internal consistency. The instrument adds to the literature by operationalizing responsibility for negative thoughts as a higher-order construct expressed through thought control, magical thinking, and compensatory behavior. It may therefore provide a useful framework for studying how negative thoughts become psychologically distressing when individuals attribute excessive significance, causal power, or moral responsibility to them.

6. Limitations & Suggestions

The present study had several limitations that should be considered when interpreting the findings. First, the use of a cross-sectional, self-report design may have increased the possibility of response biases, including social desirability, inaccurate recall, and subjective interpretation of questionnaire items. Second, although the sample was selected to provide sufficient variability for factor analysis, the extent to which it represented different age groups, educational levels, socioeconomic conditions, and clinical populations was not fully established. Third, convergent validity was examined using a measure of social anxiety, but discriminant validity and relationships with other theoretically relevant constructs were not investigated. Fourth, temporal stability was not assessed through test-retest reliability. Finally, because the study was conducted within an Iranian cultural context, the factorial structure and item meanings may not be directly generalizable to other linguistic and cultural populations.

Future studies should evaluate the questionnaire in larger and more diverse samples, including adolescents, university students, employees, clinical patients, and older adults. The factorial structure should be cross-validated using independent samples, and measurement invariance should be examined across gender, age, educational level, and clinical status. Researchers should assess test-retest reliability, discriminant validity, criterion validity, and predictive validity using measures of rumination, obsessive beliefs, anxiety, depression, experiential avoidance, psychological flexibility, and compulsive behavior. Longitudinal studies are also needed to determine whether responsibility for negative thoughts predicts the development or persistence of psychological symptoms over time. Cross-cultural adaptation and validation would clarify whether the three-factor structure is stable across different societies and languages.

Mental health professionals may use the questionnaire as a screening and assessment instrument to identify individuals who experience an excessive need to control their thoughts, attribute unrealistic power to negative cognition, or engage in compensatory behavior. Separate subscale scores may assist clinicians in developing individualized case formulations and selecting appropriate therapeutic targets. The instrument may also be administered before and after psychological interventions to evaluate changes in responsibility-related beliefs and behaviors. In educational, counseling, organizational, and healthcare

settings, the questionnaire can help identify maladaptive cognitive patterns before they develop into more severe anxiety, rumination, or compulsive symptoms. Its use should nevertheless be accompanied by clinical interviews and additional validated measures rather than being treated as an independent diagnostic instrument.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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All authors equally contributed in this article.

Declaration

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

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