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The Mediator Role of Rumination on the Link between Critical Thinking and Social Discomfort

Busuioc Andrada Cristiana

University of Bucharest

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University of Bucharest, Department of Psychology, 90 Panduri Av, Bucharest, RO.
Tel.: +40 (0) 31-425.34.45
E-mail address: andradabusuioc@yahoo.com

ABSTRACT

This study aims to investigate whether rumination could be a potential mediator of the relationship between critical thinking and social discomfort. Featuring new knowledge reported in the literature, a non-experimental, cross-sectional study based on a sample of 158 participants from different fields of activity was conducted. The results of the statistical analysis showed that critical thinking is a significant predictor of social discomfort. Furthermore, rumination partly mediated the relationship between the two studied constructs. These findings can be explained based on the literature on perseverative cognition, a characteristic that may explain the effect of rumination as an explanatory mechanism for the relationship between critical thinking and social discomfort. Theoretical and practical implications highlight the negative effects that critical thinking can have in a social context..

Keywords: *social anxiety, performance anxiety, autobiographical memory, negative emotionality*

1. INTRODUCTION

Numerous theoretical frameworks have highlighted the importance of critical thinking and its associated consequences, both in educational environments and from an organizational perspective (Facione, 1990; Halpern, 2007). Critical thinking is considered a significant predictor of academic success, academic performance (D'Alessio, Avolio & Charles, 2019; Fong et al., 2017), problem solving and decision making (Smith, 2003). However, critical thinking has not been studied in the social context or interpersonal relationships, the research has focused largely on learning and applying the principles underlying critical thinking in educational and organizational contexts.

Previous studies have not concisely described this association, thus there is also an ambiguity regarding the explanatory mechanisms of critical thinking in a social context. Moreover, a consensus claims that critical thinking

is a complex thinking process with the purpose of obtaining the desired result (Facioni, 1990). But so far, the negative effects of critical thinking have not been studied, neither in terms of its levels nor the individual differences that may explain the effect of critical thinking on possible outcomes.

Based on these observations, this thesis first examines critical thinking in a social context, specifically the relationship between critical thinking and social discomfort. In addition, the factors that explain the effect of critical thinking in relation to other concepts are not studied with priority in the literature. Thus, the second aim investigates the mediating role of rumination on the link between critical thinking and social discomfort.

Critical thinking – conceptualization

Being in continuous development, today's society, characterized as changing and challenging, stimulates the development of people's cognitive abilities. Thinking critically, expressing one's ideas in a coherent manner, making comparisons, or examining one's thoughts to make conscious choices are qualities of people in our society (Temel, 2014).

According to the literature, critical thinking is a cognitive skill associated with thinking in order to improve it. The critical thinking function involves the objective evaluation of one's own and others' ideas without preconceptions in order to make judgments about the inner and outer world (Jeevanantham, 2005).

In the current literature, there is a wide range of conceptualizations of critical thinking. Different researchers' perspectives on critical thinking illustrate its multifaceted nature (Li & Liu, 2021). In regard to defining critical thinking, some authors emphasize the reflexive nature and reasoning of critical thinking (Dantas-Whitney, 2002; Ennis, 1991). Other authors highlight the active process of analyzing what we receive from the external world and argue that it focuses on decision-making (Fisher, 2001; Nugent & Vitale; 2008). Simpson and Courtney (2002) argue that critical thinking requires logical reasoning, the ability to examine things before accepting them, and to ask questions all the time. According to the authors, all these skills constantly interact, and critical thinking is not innate, so it can be taught. It is a skill that can be enhanced through practice (Fahim & Pezeshki, 2012).

The best-known theoretical framework in the literature on critical thinking is "The Delphi Report", a consensus of researchers regarding its definition and components. Thus, they define critical thinking as an intentional and self-regulatory judgment that is based on hypothetical, conceptual, methodological, or contextual considerations and their explanations (Facione, 1990). According to this theoretical framework, critical thinking includes cognitive skills and affective dispositions. On the one hand, the cognitive dimension consists of interpretation, analysis, evaluation, inference, explanation, and self-regulation. Knowledge is also needed to strengthen and support the cognitive process of critical thinking.

On the other hand, affective dispositions are divided into general and specific approaches. General approaches include curiosity about a wide range of issues, concern to become and remain generally well-informed, vigilance to opportunities to use critical thinking, confidence in one's ability to reason, openness, responsiveness to different worldviews, understanding and flexibility in reflecting other views, fairness in appreciating reasoning, honesty in dealing with one's own prejudices or stereotypes. The specific approach aims at clarity in the expression of questions, good functioning regarding complex situations, diligence in searching for relevant information, concentration on the concern in question, but also perseverance (Facione, 1999).

Researchers agree on the list of affective dispositions that characterize critical thinkers. However, authors have different perspectives on the conceptualization of critical thinking and whether these affective dispositions are as much involved in the critical thinking process as cognitive skills (Facione, 1990). There is agreement on the relationship between the two components of critical thinking, namely that the disposition towards critical thinking is a necessary precondition for the proper functioning of cognitive abilities and is an integral part of critical thinking ability (Zoller, et al., 2000) . It is critical to cultivate these dispositions in order to ensure the use of cognitive skills. Thus, people who have developed dispositions are much more likely to use their cognitive skills adequately in solving problems or making decisions (Temel, 2014).

Regarding the antecedents of critical thinking, they are represented by learning experiences and individual differences, but also by the fundamental knowledge possessed (Macpherson & Stanovich, 2007). The literature supports the idea that critical thinking is acquired through learning experiences. It can be learned, taught, and improved with appropriate instruction (Halpern, 2007). Conceptualized in an ideal way, the critical thinker is characterized as curious, well-informed, confident in reason, receptive, flexible, unprejudiced, fair in evaluation, cautious in formulating judgments, willing to reconsider, clear on issues, orderly in complex issues, and persistently seeking results that are as precise as the subject matter and circumstances of the problem allow (Facione, 1990). Educating the person to develop critical thinking means tending towards this proposed ideal. Thus, this involves combining the development of critical thinking skills with the improvement of dispositions that consistently provide useful insights that underlie this thinking (Duchscher, 1999).

Individual differences also contribute to the process and level of critical thinking. For example, the antecedents of a student's critical thinking may be autonomy and openness to experience. As a result of this openness to experience, the

student may consider new ideas or alternative solutions that may later become integral parts of the critical thinking process. In this sense, the personality trait becomes an antecedent of the critical thinking process (Tajvidi, Ghiyasvandian, & Salsali, 2014). Furthermore, autonomy can foster the development of an independent critical thinker who internalizes and accepts responsibility for the critical thinking process, thereby becoming independent of the critical thinking process's outcomes (Yildirim, zkaharam, & Karabudak, 2011).

Critical thinking can predict a number of variables involved in the educational and organizational processes. Critical thinking ability is a significant predictor of problem solving (Tong, 2019) and decision making (Butler, Pentoney, & Bong, 2017). The results of a meta-analysis demonstrated a moderate correlation between critical thinking and students' academic success (Fong, Kim, Davis, Hoang, & Kim, 2017). Critical thinking is labeled in the literature as higher-order thinking along with problem solving, decision making, and creative thinking (Facione, 1990).

Critical thinking s positively related to employee creativity at work (Jiang & Yang, 2015). Employees need not only divergent thinking to generate ideas and solutions, but also critical thinking to judge these ideas and assess the practicality and feasibility of solutions. That is, employees must be trained to engage in critical thinking, thinking that enables them to decide what to believe or do (Jiang & Yang, 2015). In addition to these positive consequences in the educational and organizational process, the novelty of the current research refers to the establishment of relationships or less favorable effects of critical thinking in a social context.

Critical thinking and social discomfort

Critical thinking is a complex process by which current knowledge is overcome and improved to achieve a new result (Dewey, 1933). People engaged in the process of critical thinking try to understand the cause of each situation, criticize the information they have, question basic truths, and make efforts to generate solutions to solve the problems they encounter (Temel, 2014). Additionally, an important part of the process is exploring ideas about the existing knowledge for problems that are not clearly defined and require clear answers (Mulnix, 2012).

The whole process of critical thinking becomes demanding, both in terms of the cognitive resources and the affective dispositions that are involved. The lack of clarity in the content of tasks, the effort put into solving or innovating tasks, and the persistence in overcoming obstacles that may arise can lead to psychological discomfort, both socially and individually. This largely depends on the relevant content of thoughts that can be internally and externally contested (Goetzel, Hawkins, Ozminkowski, & Wang, 2003).

Psychological discomfort is defined in terms of unpleasant emotions felt by a person in a hostile situation, both interpersonally and intrapersonally. Psychological distress can cause negative feelings and outcomes such as depression, anxiety, isolation, fear, and vulnerability (Bell, Tsang, Greig, & Bryson, 2009; Davis, Stoner, Norris, George, & Masters, 2009). Social discomfort is a source of psychological discomfort. Social discomfort can have certain negative individual and organizational consequences. Studies have reported negative correlations between high levels of social discomfort and low levels of workplace productivity (Goetzel, Hawkins, Ozminkowski, & Wang, 2003) and low levels of life satisfaction (Murphy, Duxbury, & Higgins, 2006).

Analyzing the current literature, Ashkenazy and DeKeyser Ganz (2019) centralize dimensions within which social discomfort develops. Thus, the literature shows that people feel social discomfort following threatening events. In the first phase, they detect environmental cues associated with risk or perceived stress. It then evaluates these cues as a threat to itself. In this way, the feeling of physical or psychological threat from a hostile environment can lead to feelings of discomfort (Davis, Stoner, Norris, George, & Masters, 2009).

Antecedents of psychological discomfort include sexual assault, a lack of communication, a lack of respect for privacy or personal space, a lack of information, and hostile situations or moods (Ashkenazy & DeKeyser Ganz, 2019). Hostile situations refer both to physical events and to a person's affective dispositions in performing tasks, caused by a lack of clarity, overexertion, or emotional exhaustion (Montero-Marín et al., 2013). When a person is engaged in the process of critical thinking, he often feels uncomfortable because critical thinking requires him to reflect on the new situation, exert effort, and remove potential obstacles (for example, distinguishing between false and true information in a specific context). Thus, the person in question leaves aside established assumptions, which they are familiar and comfortable and is forced to consider or create other perspectives, sometimes contrary to their initial thoughts and ideas (Halx & Reybold, 2005).

These circumstances change the way people react to the environment or even cause changes at the individual level. Thus, they may become more reserved about new social interactions, avoid difficult situations, and feel uncomfortable in new situations (Ashkenazy & DeKeyser Ganz, 2019).

We can assume that critical thinking is associated with social discomfort because the process of critical thinking is demanding, which may result in an unfavorable situation for the people involved, and because it is interdependent with the content of social thoughts. Consequently, based on the arguments in the literature, the current study proposes the following hypothesis:

H1: *Critical thinking is positively associated to social discomfort*.

The mediator role of rumination on the link between critical thinking and social discomfort

Rumination is a cognitive-emotional regulator. The authors define rumination as the experience of having repetitive, intrusive cognitions with negative affective content (Brosschot, Gerin, & Thayer, 2006). This is made up of conscious thoughts. The process of rumination does not result in active and effective problem solving, nor does it change the circumstances in which the problem was created (Martin & Tesser, 1996).

Meta-analytic research has looked at differences between adaptive and maladaptive forms of rumination (Mor & Winquist, 2002; Watkins, 2008). Watkins and Teasdale (2001) distinguished between two types of rumination: brooding and reflective pondering. Brooding is defined as anxious thinking, a maladaptive process that is associated with an unattainable standard (Trapnell & Campbell, 1999; Treynor, Gonzalez, & Nolen-Hoeksema, 2003). Reflective pondering is defined as engaging in cognitive problem-solving that helps alleviate an individual's negative moods. These components correlated significantly with each other, suggesting that they share a common variance (Teasdale & Green, 2004).

The results of studies support the notion that brooding is associated with neuroticism, explaining thought patterns with negative affect and anxiety. Then, pondering is associated with openness to experience, motivating the desire to engage in the resolution of emotional conflicts (Teasdale & Green, 2004; Trapnell & Campbell, 1999).

People who ruminate remain anchored in the original problem and their feelings about it without taking steps to resolve the consequences or even the factors that caused the rumination process (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). According to the literature, rumination has a negative impact on cognitive flexibility and problem solving and is associated with numerous maladaptive cognitive styles, such as attentional biases (Monteiro, Sherbino, Sibbald, & Norman, 2019; Beblo, Sinnamon, Baune, 2011). Rumination is also associated with dysfunctional attitudes, such as self-criticism or pessimism (Lyubomirsky, Tucker, Caldwell, & Berg, 1999; Robinson & Alloy, 2003). People who ruminate also have a dependent interpersonal style (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). This can hinder the development of autonomy, previously presented as an antecedent of critical thinking. Consequently, in the absence of autonomy, critical thinking is less likely to develop, both as a cognitive skill and as a disposition to think critically. Thus, we can assume that the levels of critical thinking and its dispositions influence the occurrence of rumination.

Rumination is defined as a process of perseverative cognition. This process is based on thoughts about feelings and problems rather than their specific content. Perseverative cognition is the basic characteristic in the process of rumination and is defined as the repeated or chronic activation of the cognitive representation of one or more psychological factors (Brosschot, Gerin, & Thayer, 2006), which also falls within the definition of critical thinking dispositions. In other words, it is based on the attitude of a person to maintain his disposition in analyzing and examining information, referring to the attitude of being persistent towards a given situation. Therefore, we can assume that rumination can explain some of the variance in the effect of critical thinking in relation to other variables.

People who ruminate for an extended period of time lose social support (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). People with a high level of rumination (or chronic rumination) are perceived in a less favorable manner by those around them because they exhibit counterproductive or undesirable behaviors in their relationships with family, friends, and even strangers (Nolen-Hoeksema & Davis , 1999).

In this manner, rumination is associated with several undesirable personality characteristics, which include aggressive tendencies following a challenge (Collins & Bell, 1997), the desire for revenge after an interpersonal conflict (McCullough & et al., 1998), but also social anxiety, the consequences of which can lead to loss of social support and social discomfort in relationships with others. Perry, Rubinsten, Peled, and Shamay-Tsoory (2013) argue that individuals with social anxiety experience social discomfort earlier than others, distance themselves from other people, and communicate less.

In a social experiment, participants in the experimental group, who were induced to ruminate, highlighted, and talked more often about problems, family conflicts, and social discomfort in relationships with others. In the second group, the participants were induced to relax as a distraction from negative thoughts. They focused on more joyful life situations than the former (Lyubomirsky et al., 1999).

People engage in the ruminative process for conscious as well as unconscious reasons. The conscious reasons refer to the understanding of events that are meaningful to the person. The unconscious motive is represented by the avoidance of hostile situations (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). People who ruminate avoid these aversive circumstances through two specific mechanisms, namely inactivity and social withdrawal. These reactions aim to conserve resources and retain control in uncertain situations (Nesse, 2000; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Inactivity and social withdrawal, framed as defensive mechanisms but also integral parts of the rumination process, can lead to social discomfort in relationships with others. In this regard, people who use

these withdrawal mechanisms are characterized by minimal social interaction, even refusing to interact with other people other than friends and family (Wong, 2012).

According to the previous arguments, we can hypothesize that rumination may act as a mediator of the relationship between critical thinking and social discomfort. Thus, the current study frames rumination as a mechanism for explaining the possible effects of critical thinking and its dispositions on social relationships. When rumination occurs, critical thinking can cause unfavorable reactions or situations for the individual that lead to psychological discomfort in relationships with others. Thus, research suggests that rumination may be a mechanism through which critical thinking may influence social discomfort. Consequently, based on the arguments in the literature, the current study proposes the following hypothesis:

H2: *Rumination will mediate the relationship between critical thinking and social discomfort*.

2. METHODOLOGY

Participants and procedure

Participant data was collected between March and April 2022, through a Google form, addressed through an online link, only to people who gave their consent for data processing for research purposes. At the beginning of the questionnaire, participants were given explicit instructions to go through each set of questions, a brief description of the study, and assurances of the confidentiality of the data they provided. In the first part of the form, participants provided the requested demographic data, such as age, gender, most recent education, length of employment, and field of activity. The second part of the form required the provision of information corresponding to the analyzed concepts, a total of 43 items with a duration of approximately 10 minutes. No participant expressed a desire to withdraw from the research. All respondents were volunteers and received no incentives. In case there were any concerns or they wanted to withdraw from the study without any risk, an email address was provided. The data provided by the participants was subsequently entered into a database and statistically processed.

The target population of this study included the 158 employees from various sectors of activity (education, medicine, engineering, marketing, etc.). Of the total questionnaires, 77 (48.8%) were completed by men and 81 (51.2%) by women, aged between 18 and 45 years (M = 31.47; SD = 6.94). Among them, 34 (21.5%) have post-graduate studies, 67 (42.4%) have university studies, and 57 (36.1%) have secondary education. From the point of view of experience in their field of activity, 68 (43.3%) of the respondents have experience between 1–5 years or less, 78 (49.2%) between 5–10 years, and 12 (7.5%) have experience of 10 years or more. A priori power analysis suggested a sample of 158 participants.

Instruments

Critical thinking dispositions. The Critical Thinking Disposition Scale (CTDS) instrument (Sosu, 2013) contains 11 items ("I use more than one source to learn information."; "I often think about my actions to see if I can improve them."; "I am often looking for new ideas."), measured on a five-point Likert scale from "Strongly Disagree" (1) to "Strongly Agree" (5). The Cronbach Alpha value is .91.

Rumination. The Ruminative Responses Scale instrument (Treynor, Richard Gonzalez, & Nolen-Hoeksema, 2003) contains 22 items ("I think about how hard it is to concentrate."; "I have analyzed recent events to try to understand why I am depressed."; "I think about why I always react that way."), measured on a four-point Likert scale from "Almost Never" (1) to "Almost Always" (4). The Cronbach Alpha coefficient is .80.

Social discomfort. The instrument HA3: Social Discomfort (Goldberg et al., 2006) contains 10 items ("I find it difficult to approach others."; "I am quiet around strangers."; "I feel comfortable only with friends."), measured on a five-point Likert scale from "Strongly Disagree" (1) to "Strongly Agree" (5). The Cronbach Alpha coefficient is .89.

Design

This research is based on a mediation model between critical thinking, rumination, and social discomfort. The analyzed variables are critical thinking as an independent variable, social discomfort as a dependent variable, and rumination as a mediating variable. With the cross-sectional design, variables are investigated at a single point in time without controlling or manipulating the variables in the study.

3. RESULTS

Descriptive statistics

Data were analyzed using the SPSS program. In the first step, descriptive statistics were obtained for all variables included in the study. Before testing the hypotheses, the variables were subjected to a preliminary analysis. The data was complete, with no missing values discovered. Table 1 presents demographic information about the sample.

Table 1. *Descriptive statistics for demographic variables*

Variables	*N*	Percent (%)
Age	*M* = 31.47	*SD* = 6.94
Gender		
Female	81	51.2%
Male	77	48.8%
Education		
Highschool	57	36.1%
Univeristy studies	67	42.2%
Post-univeristy studies	34	21.5%
Job tenure	*M* = 4.27	*SD* = 2.63

Note: M = Mean, SD = Standard Deviation, N = 158.

Multicollinearity between variables was low (Tolerance = 1.00; VIF = 1.00). Durbin-Watson tests for autocorrelation of residuals were also used. The value obtained was 2, indicating no autocorrelation. It also respected the assumption of non-zero variance.

Table 2. *Descriptive statistics and inter-scale correlations*

	M	SD	1	2
1 Critical thinking	3.76	.53		
2 Rumination	5.46	.75	.36**	
3 Social Discomfort	4.78	.89	.41**	.59**

Note: M = Mean; SD = Standard Deviation; N = 158. * p < .05, ** p < .001.

The correlations between variables have average values, all of which are statistically significant. Critical thinking and social discomfort have a positive, statistically significant correlation (r =.41, p < .001), implying that an increase in critical thinking is associated with an increase in social discomfort. A positive correlation was also identified between critical thinking and rumination (r = .36, p < .001). People with a high level of critical thinking are more likely to ruminate. The strongest correlation was discovered between level of rumination and social discomfort (r = .59, p < .001). Thus, individuals exhibiting high levels of rumination may experience higher social discomfort in relation to others.

Hypotheses testing

We performed a simple mediation model using the PROCESS macro in SPSS (Hayes, 2012). The proposed model examined the effect of critical thinking on social discomfort through rumination. Age, gender, level of education, and length of employment were entered as control variables. This program performs multiple regression analysis, reporting total, direct, and indirect effects. The indirect effect is significant when zero is not in the confidence interval.

Our first hypothesis concerns the total effect. The regression analysis results show that critical thinking is a significant predictor of social discomfort (β = .44, p < .001). When demographic variables were controlled for, critical thinking accounted for 11% of the variance in social discomfort (R2 =.11, p < .001). Demographic variables: gender (β = .10, p > .05), age (β = .09, p > .05), level of education (β = .11, p > .05) and job tenure (β = .07, p > .05) were not significant predictors.

Critical thinking was a significant predictor of rumination (β = .41, p < .001). Controlling for demographic variables, critical thinking explained approximately 13% of the variance in rumination (R2 = .13, p < .001). Demographic variables had a non-significant contribution in predicting rumination: gender (β = .06, p > .05), education (β = .07, p > .05), age (β = .05, p > .05), job tenure (β = .12, p > .05).

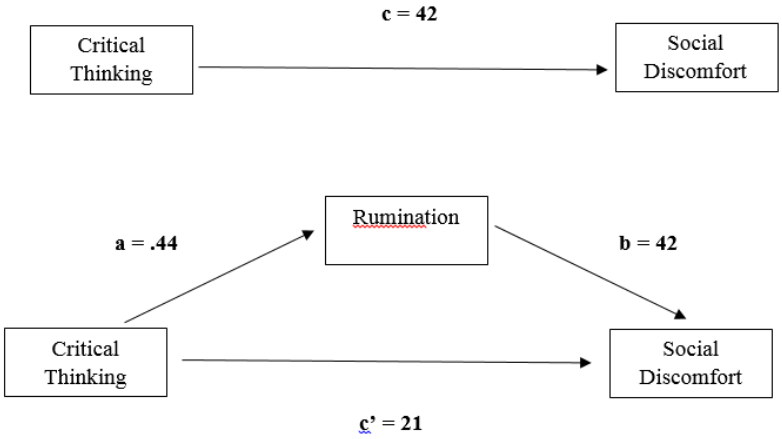
A final regression analysis presents both the relationship between rumination and social discomfort and the direct effect of the mediating relationship. Rumination was found to be a significant predictor of social discomfort (β = .42, p < .001). Along with demographic variables, critical thinking and rumination accounted for 21% of the variance in social discomfort (R2 = .21, p < .001). The only significant control variable was age (β = .19, p < .01).

The results and coefficients for these variables, as well as the results of the mediation analysis, are shown in Table 3. When controlling for the mediating variable, rumination, the results for the direct effect show that the relationship between critical thinking and social discomfort remained statistically significant (β =.21, p < .01). Thus, the mediation is partial. The results showed that zero was not within the confidence interval, suggesting a statistically significant effect..

Table 3. *The total, direct, and indirect effect of critical thinking on social discomfort*

	Coefficient *β*	Se	R^2	CI95%
Total effect	.42***	.10	.11***	
Covariables				
Gender	.10	.12		
Age	.09	.01		
Education	.11	.05		
Job tenure	.07	.03		
Direct effect	.21**	.10		
Indirect effect	.23	.05		[0.18, 0.37]

Note: Report values correspond to standardized coefficients (β)



Note:a – effect of critical thinking on rumination; b – effect of rumination on social discomfort; c – total effect; c' – direct effect.

Figure 1. *Final Research Model*

4. DISCUSSION

The current study aimed to investigate whether and to what extent critical thinking is associated with psychological discomfort in social relationships and to test whether rumination mediates this relationship. The results support the first research hypothesis. They showed that critical thinking is a significant predictor of social discomfort.

The relationship between the two mentioned variables has not been documented empirically with priority, but the literature supports the results of the current study. Research refers to the entire process of critical thinking becoming demanding, both in terms of the cognitive resources and affective dispositions involved (Goetzel, Hawkins, Ozminkowski, & Wang, 2003). Thus, the vagueness of the tasks, the effort put in, and the perseverance in overcoming the obstacles that may arise can lead to psychological discomfort, both in the relationships with those around and on a personal level. This largely depends on the relevant content of thoughts that can affect the individual on a personal as well as social level (Goetzel, Hawkins, Ozminkowski, & Wang, 2003).

By discovering a partial mediation relationship between critical thinking, rumination, and social discomfort, the second hypothesis of the study was supported. According to the results, rumination shows a variation in the effect of

critical thinking on social discomfort. In other words, rumination may be a mechanism by which critical thinking may have effects on social discomfort. Rumination is defined in the literature as a person's disposition in analyzing, examining, and criticizing information, referring to the attitude of being persistent in a given situation (Fahim & Pezeshki, 2012). In this regard, research supports the results of the current study through the common reference between critical thinking dispositions and rumination (Brosschot, Gerin, & Thayer, 2006; Fahim & Pezeshki, 2012).

According to Response Styles Theory (Nolen-Hoeksema & Davis, 1999), rumination can be a mechanism between critical thinking and social discomfort. Rumination maintains and intensifies poor social relationships, negative thinking, and depressive symptoms, affecting problem solving in context. In this manner, if there are negative effects that critical thinking can have on social relationships, rumination can be considered a factor that explains them.

According to the literature, persistent thoughts that arise during rumination affect a person's availability and desire to integrate socially, actively maintain communication, and create social connections, making it difficult to interact with friends or family members (Schwartz & Koenig, 1996).

Theoretical and practical implications

Several theoretical and practical implications arise from the study. Regarding the theoretical perspective, firstly, critical thinking has not been primarily studied in the social context, and the present findings add to the academic literature. Thus, the current study can contribute to the critical thinking literature by also integrating the negative consequences of the concept. Secondly, from a theoretical point of view, it is not enough to establish the existence of a relationship between two variables; it is also necessary to determine the explanatory mechanisms associated with this relationship. Therefore, the next theoretical implication is to provide a mechanism that can explain the relationship between critical thinking and social discomfort and related effects.

In terms of practical implications, critical thinking has applications in all areas of life and learning. As with reading and writing, the teaching of critical thinking can occur in areas rich in subject-specific content or in areas that are based on everyday life events. Although, these skills can be identified, analyzed, and trained, their application in different contexts also requires knowledge of information specific to the respective fields (Facione 1990). On the other hand, this study highlights the negative effects that critical thinking can have in different contexts, in addition to the importance and positive consequences already established in the specialized literature (Tong, 2019; Butler, Pentoney, & Bong, 2017). It is important to note that there are different effects that one factor can have on another variable, regardless of their valence, whether positive or negative. Thus, by understanding them, the principles underlying the critical thinking process can be integrated and applied more easily and accurately.

Limitations and future directions

The current research has a number of limitations that will be outlined below. A first limitation is the cross-sectional design of the study. A longitudinal design may be more useful for accurately tracking the evolution of these variables, as well as comparing contrasting groups based on the analyzed characteristics.

Second, the research was designed based on a convenience sample. Thus, the results can be generalized to the reference population only under certain conditions. The sample consists mainly of students with an average level of education who belong to a narrow geographical area, which limits the representativeness of the reference population. In addition, the questionnaires were administered online, which leads to a lack of control over confounding variables such as the state of the respondent at the time of completing the questionnaire (lack of attention, fatigue, noise, etc.). At the same time, the respondents could have answered the questionnaire questions in a way contrary to their beliefs or thoughts out of a desire to create a good impression and comply with the standards imposed by society.

This study identified that rumination partially mediates the relationship between critical thinking and social discomfort, suggesting that numerous other explanatory mechanisms may exist. Future research should investigate other potential mediators and consider how multiple similar variables might be associated, providing a more comprehensive explanation of the effects of critical thinking on social discomfort.

Given the limitations presented, future directions can be considered. All the analyzed variables can be more deeply explored at the level of the subscales of the instruments to produce a more detailed and complete interpretation of the phenomena, which may have other theoretical and practical implications. For example, the distinction between brooding and pondering should be analyzed to provide a clearer perspective of the concept of rumination on the criteria being studied. Also, critical thinking should be measured across its two components, affective dispositions and cognitive abilities, and differentiate how rumination mediates the relationship between each critical thinking component and social discomfort..

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