

The Need for Cognition and Emotional Intelligence in Individuals with High Academic Achievements

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ABSTRACT

Aim

The aim of this study was to verify the relationship between the need for cognition (NFC) and emotional intelligence (EI) in people with high academic achievement.

Method

This research involved 207 undergraduate and PhD students who were divided into two groups: (1) students who received scholarships from the Ministry of Science and Higher Education (currently the Ministry of Education and Science) in recognition of their scientific achievements, and (2) students who did not receive scholarships. The research tools were the Polish version of the Need for Cognition Scale (Cacciopo & Petty, 1982) developed by Matusz, Gašiorowska and Traczyk (2011) and the Popular Emotional Intelligence Questionnaire (Jaworowska & Matczak, 2005).

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Results

The need for cognition and emotional intelligence were positively correlated in both groups. Further analyses indicated that high academic achievement does not moderate the relationship between NFC and EI.

Conclusion

The study demonstrated that the need for cognition increases with a rise in the ability to manage, use and understand emotions.

Keywords: need for cognition, emotional intelligence, high academic achievements, self-regulation

INTRODUCTION

The relationship between the emotional and cognitive zone has been the subject of psychological studies since a relatively recent time. In the 1980s, Howard Gardner (2002) presented his concept of multiple intelligences, which he divided into, among others, intrapersonal and interpersonal intelligence, emphasizing the human capacity for performing cognitive operations on matters of social and emotional life. In the 1990s, first Salovey and Mayer (1990), followed by Goleman (1997) described a construct they named emotional intelligence. The close relationship between the emotional and cognitive sphere is more and more frequently emphasised in literature on the subject (e.g., Orzechowski & Śmieja, 2008; Sękowski, 2010).

Another interesting subject – significant for human intellectual development – is the concept of the need for cognition. It is a construct connected with the category of cognitive motivation; it refers to an individual's tendency to seek opportunities to experience cognitive effort, which they find satisfying (Cacioppo & Petty, 1982). There is no doubt that individuals with high academic achievements are among those who frequently engage in and enjoy cognitive activities. Their successes are the outcome of long-term activity in a scientific field. Research to date provides evidence for the existence of a positive relationship between academic achievements and the need for cognition (Cazan & Indreica, 2014; Grass, Strobel & Strobel, 2017), as well as emotional intelligence (Sánchez-Álvarez, Berrios Martos & Extremera, 2020). It is interesting to explore the connection between the emotional sphere and the tendency to undertake intellectual effort and shape cognitive motivation, in people with high educational achievements.

The need for cognition

Cacioppo and Petty's (1982) conceptualization of the need for cognition is based on differences in the tendency to engage in intellectual effort in individuals with similar cognitive abilities. The authors have concluded that cognitive misers are *reluctant* to engage in that type of effort, while *cognitively generous* individuals experience it as enjoyable. The need for cognition is defined in the context

of the following two factors: engagement in intellectually demanding tasks and enjoying and experiencing satisfaction during these activities (Cacioppo & Petty, 1982). Individuals with a high need for cognition exercise more effort in the process of information seeking, problem solving, and reasoning (Petty & Jarvis, 1996); they also process data more deeply (Jebb, Saef, Parrigon & Woo, 2016) in comparison with those with a low need for cognition.

Researchers (Cacioppo & Petty, 1982) emphasise that the need for cognition is a dimension of cognitive motivation that develops as a consequence of experiencing one's own competence during the performed cognitive activities. The development of the need for cognition is supported by the individual's activity, exploration of reality, effective coping with intellectual tasks, as well as experiencing changes in one's life (Mendecka, 2012). The need for cognition develops through stimulation in an environment that provides intellectual challenges (Soubelet & Salthouse, 2017).

Emotional intelligence

The literature defines emotional intelligence in two ways. One group of researchers claim that the nature of emotional intelligence is connected with personality and describe it in terms of "mixed models" (Bar-On, 1997; Goleman, 1997). Another group of scholars interpret it as a category closer related to intelligence (Mayer & Salovey, 1999), and define it as an ability that allows to notice emotions and manage them in a manner that supports one's thinking, as well as an ability to understand and regulate emotions and use the emotional knowledge that one possesses (Mayer & Salovey, 1999; Salovey et al., 2004). Due to the subject of the present study, the latter approach has been adopted.

Researchers (Knopp, 2020; Śmieja, 2018) emphasise the positive role of emotions in encouraging thinking. The abilities that are components of emotional intelligence are significant both for the emotional and intellectual development of a child. Emotional intelligence is also positively connected with the individual's interpersonal relationships. According to Mayer and Salovey (1999), the discussed construct comprises 4 dimensions of skills, including the following: (1) perception, expressing and recognizing emotions; (2) assimilation of emotions and their impact on one's thinking process; (3) understanding emotions and the one's knowledge of them; (4) managing one's emotions and influencing the emotions of other people's. The order in which these skills are listed is of significance, as they form a hierarchy in the model. In this hierarchical system, each subsequent dimension is based on the previous. Emotional intelligence develops throughout an individual's lifetime (Mayer & Salovey, 1999; Szczygiel & Jasielska, 2008).

A comparison of academic and emotional intelligence should acknowledge that the difference between these two types of intelligence is connected, above all, with the nature of problems with which an individual copes (Matczak & Knopp, 2013). Traditionally understood, intelligence is a skill one uses to solve problems one encounters in life, connected with logical processing of information. Emotional intelligence, however, allows an individual to cope with problems that

directly concern them. In other words, the difference between the two types of intelligence lies in the material with which the individual works. A common trait of emotional and traditional intelligence is their adaptive function in various situations in a person's life.

The need for cognition and emotional intelligence

An important issue in the context of the relationship between the need for cognition and emotional intelligence is self-regulation, which refers to an individual's ability to effectively realise their goals. Researchers frequently associate it with conscious control of one's behaviour (e.g. Gollwitzer & Moskowitz, 1996) or shaping standards of the Self (Higgins, 1997). Emotional self-regulation is a particular type of self-regulation which is one of the skills that constitute emotional intelligence (Cazan & Indreicab, 2014; Mayer & Salovey, 1999). It represents an individual's capacity for seeking and engaging in those activities that they consider attractive from the perspective of their needs, and that are connected with experiencing positive emotions. It is, thus, related to the need for cognition, as they both motivate an individual to seek cognitive activities that they find enjoyable and satisfying.

The literature on the subject does not provide much data on the relationship between the need for cognition and emotional intelligence. One can, however, find a similar relationship in the mechanisms of the connection between the former and general intelligence. For instance, Fleischhauer et al. (2010) have proven the existence of a significant correlation between the need for cognition and fluid and crystallised intelligence. Similar results were obtained by other researchers (Hill et al., 2013; 2016; Luong et al., 2017). Hill et al. (2013) indicate that, due to engagement in various cognitive activities, individuals with a high need for cognition develop stronger intellectual skills. Since the need for cognition frequently involves deep processing of information, its high level in an individual acts as a stimulant for the person's intellectual development. As emphasised by the authors, high cognitive abilities may be the factor that encourages more frequent cognitive effort in an individual, which causes the individual to value that effort more.

It appears that the relationship between the need for cognition and emotional intelligence might be similar. Due to their tendency to engage in intellectual effort, persons with a high need for cognition are also likely to more frequently concentrate on emotional stimuli, analysing their experiences and collecting emotional knowledge, which may, in turn, support the development of emotional intelligence. Conversely, one's own emotional skills may be supportive to intellectual activity and building a sense of competence. It is for these reasons that emotional intelligence may encourage the development of the need for cognition. Acceptance of one's own emotions allows the individual to remain open to both positive and negative emotions. It supports experiencing satisfaction and shaping a sense of competence, as well as the ability to cope with negative experiences and failures (Matczak & Knopp, 2013). Thus, the need for cognition develops

through the experience of one's own efficiency in one's intellectual efforts and the satisfaction that they bring to the individual. The understanding and the ability to control emotions result in an individual's awareness of their own influence on their affective state and their actions. It is expressed, among others, in seeking situations in which the individual can experience emotions of positive valence (Doliński & Błaszczak, 2011). Moreover, research indicates that the capacity for abstract thinking is developed better in individuals with a high need for cognition (Cacioppo, Petty & Kao, 1984), which is likely to be significant for the ability to understand emotions.

Cognitive tasks are certainly attractive and important for individuals with a high need for cognition. Emotional intelligence may be helpful in shaping the motivation to engage in intellectual activities and support the sense of competence that accompanies them. Persons with high academic achievements unquestionably belong to the category of individuals with a heightened need for cognition. What is more, a highly developed need for cognition may assist in the development of the individual's emotional skills and expanding their emotional knowledge via intellectual effort exercised in the context of the individual's own experiences.

Problem and hypotheses

The goal of the present study was to determine the correlation between emotional intelligence and the need for cognition in the group of individuals with high academic achievements.

Emotional intelligence is understood, according to the definition formulated by Salovey and Mayer (1999, p. 26) as "the ability to monitor emotions, access them, and activate them in a way that guides one's thinking; the ability to understand emotions and the possession of the emotional knowledge that allow one to regulate one's emotions and support one's emotional and intellectual development". The need for cognition is defined as "the tendency to engage in and enjoy cognitively demanding activities" (Cacioppo & Petty, 1982, p. 116). The final variable is academic success, achieved through education, confirmed in accordance with specific criteria (Sękowski, 2010). In the present project, the criterion was the scholarship granted to an undergraduate or postgraduate student by the Minister of Science and Higher Education (MNiSW).

The first research question was: what is the relationship between the need for cognition and emotional intelligence in individuals with high academic achievements? Four hypotheses were formulated:

- H1. There is a positive correlation between the need for cognition and the overall level of emotional intelligence in individuals with high academic achievements.
- H2. There is a positive correlation between the need for cognition and the acceptance of emotions in individuals with high academic achievements.
- H3. There is a positive correlation between the need for cognition and the control of one's emotions in individuals with high academic achievements.

- H4. There is a positive correlation between the need for cognition and the ability to understand emotions in individuals with high academic achievements.

The second research question was: is the profile of the correlations between the need for cognition and emotional intelligence different in individuals with high academic achievements than in individuals who do not have such achievements? The question had exploratory nature, since the current knowledge of theory and research does not create a basis for formulation of hypotheses.

METHOD

Participants

The studied participants were undergraduate and postgraduate students of various faculties from 16 universities in Poland. Two groups of respondents were included in the study. The first group consisted of individuals who have obtained the Ministerial Scholarship for academic achievements (this type of scholarship was chosen due to the subject of the study, which is the relationship between the need for cognition and emotional intelligence), while the second group included individuals who have not obtained that scholarship (i.e., those who have not had high academic achievements). The latter constituted a comparison group. Studying both groups allowed researchers to compare the results obtained by individuals with educational achievements with the results from the comparison group and to verify whether the obtained correlations between emotional intelligence and the need for cognition are characteristic of one of the groups or universal.

207 respondents in total qualified to participate in the study: 102 individuals with high academic achievements (scholarship beneficiaries) and 105 individuals from the comparison group (who have not been granted the scholarship). A similar number of men and women was ensured in the process of selection of the participants for both samples. The group of scholarship beneficiaries consisted of 53 men and 49 women, while the comparison group contained 48 men and 57 women. The age range of the studied scholarship beneficiaries was between 21 to 31 years old ($M = 24.15$; $SD = 1.88$); the members of the comparison group were between 21 and 34 years old ($M = 24.38$; $SD = 2.71$).

Procedure and materials

Selecting participants for the two studied groups and collecting the data

The Polish Ministry of Science and Higher Education annually publishes a list of beneficiaries of the scholarship. As the list contains names of the students, as well as information about their faculty and the university at which they study, the researchers were able to find and contact the students via the social media service Facebook. The scholarship beneficiaries who agreed to participate in the

study obtained, via mail, a set of questionnaires. The comparison group was selected mainly through the scholarship beneficiaries who shared the researchers' contact data with the students from their universities who did not receive the scholarship. The researchers' personal network of contacts was another resource which helped select participants, who were put in the comparison group. The majority of participants from this group received the research tools via traditional mail. The remaining participants received the questionnaires directly from the researchers. All participants participated in the study voluntarily; the questionnaires were completed in the absence of the researchers, and returned via mail or submitted directly by the respondents to the researchers.

Tools used in the study

The research methods applied to measure the variables studied in the present project included the following: The Questionnaire of the Need for Cognition (Matusz, Traczyk & Gašiorowska, 2011) and The Popular Questionnaire of Emotional Intelligence PKIE (Jaworowska & Matczak, 2005).

The Questionnaire of the Need for Cognition is a Polish adaptation of the tool created by Cacioppo and Petty in 1982. The need for cognition was defined by the authors of the tool as the tendency to engage in intellectually demanding effort and experiencing it as both enjoyable and satisfying. The method contains 36 items. The participants respond to the provided statements on a five-item scale. The tool allows researchers to obtain a general result, that is, a ratio of the level of the need for cognition. The authors of the Polish adaptation (Matusz et al., 2011) verified the reliability of the Questionnaire, with Cronbach's $\alpha = .91$. In order to test the construct validity of the tool, a comparison was made between the results obtained by students and those obtained by researchers. Consistently with the predictions, the latter group obtained higher results for the need for cognition. The authors of the Polish version of the scale tested also the questionnaire's convergent validity and discriminant validity, by correlating it with The Scale of the Need for Cognitive Closure PDP (Kossowska, 2003). The analyses did not indicate significant correlations between the need for cognition and the need for cognitive closure. This suggests a different specificity of both variables.

The Popular Questionnaire of Emotional Intelligence (PKIE) is based on the definition of emotional intelligence as a skill (Salovey & Mayer, 1990). Similarly to the aforementioned concept, PKIE distinguishes four factors of emotional intelligence. The tool obtains 5 results in total: overall level of emotional intelligence, and 4 results on the following scales: *acceptance of emotions*, *empathy*, *emotional control* and *understanding emotions*. The described method contains 94 statements to which participants responded on a five-item scale. The theoretical validity of the method was tested by correlating the results obtained from PKIE with the results from The Questionnaire of Emotional Intelligence INTE (Jaworowska & Matczak, 2008). The obtained results show a very high correlation between the results obtained with each method (Jaworowska & Matczak, 2005). The highest reliability was obtained for the general result of EI ($\alpha = .90$). The reliability of the other scales was slightly lower ($.70 < \alpha < .80$).

RESULTS

In order to test the research hypotheses proposed in the present project, the following statistical analyses were performed: Pearson r correlation analysis (to verify the correlation between the variables) and the Fisher z -transformation (as a test, in both studied groups). Additionally, the t -test was conducted for the independent sample (in order to verify if there are any differences between the groups in the need for cognition and emotional intelligence).

Table 1

Pearson r correlation between the need for cognition and emotional intelligence in individuals with high academic achievements and individuals from the comparison group

Emotional intelligence	Need for cognition		z
	Individuals with high academic achievements	Comparison group	
Acceptance of emotions	.27*	.34**	-.49
Empathy	.33**	.28*	.44
Emotional control	.31*	.35**	-.31
Understanding emotions	.33**	.39**	-.54
Overall result EI	.48**	.42**	.54

Note. Fisher z -transformation indicating the significance of differences between correlations (all with insignificant); * $p < .05$; ** $p < .001$

Table 1 presents the correlations between the studied variables in both groups of participants. The obtained results provide evidence of a connection between the need for cognition with emotional intelligence in both studied groups. Positive correlations have been observed between the need for cognition and the general level of emotional intelligence, as well as its various dimensions. The obtained results indicate that the higher the emotional intelligence (and its dimensions) is in an individual, the higher their need for cognition becomes. The strongest correlation was observed between the need for cognition and the general level of emotional intelligence. That correlation was registered both in the group of participants with high academic achievements and in the group of participants without those achievements. An additional test was conducted to determine significant differences between the correlations (Fisher z -transformation) in both groups. Table 1 presents the results of this analysis, which indicate lack of differences in connections between the need for cognition and emotional

intelligence, in both groups. This means that there is no basis for the claim that the relationship between those two variables is shaped differently among the beneficiaries of the scholarship than in the comparison group.

The level of the need for cognition and emotional intelligence was also compared in the studied groups (cf. Table 2). The conducted analyses showed significant differences in the need for cognition in the studied groups. The beneficiaries of the scholarship are characterized by a significantly higher level of that variable in comparison with the comparison group. No differences were observed for emotional intelligence between the studied groups.

Table 2

The differences between the mean results (the need for cognition and emotional intelligence) obtained by individuals with high academic achievements and participants from the comparison group

Variable	<i>M (SD)</i>		<i>t</i> (205)	<i>p</i>
	Individuals with high academic achievements	Comparison group		
Need for cognition	144.48 (13.90)	135.61 (17.21)	4.07	< .001
Acceptance of emotions	52.15 (10.56)	53.53 (9.35)	-1.00	.318
Empathy	69.55 (9.90)	71.70 (7.16)	-1.79	.075
Emotional control	33.45 (7.10)	33.82 (6.52)	-.39	.698
Understanding emotions	32.96 (7.79)	33.43 (6.35)	-.49	.628
Overall result EI	334.06 (41.60)	344.45 (38.72)	-1.86	.065

Note. *t* – test of equality of means for independent samples.

DISCUSSION

The goal of the present study was to answer two research questions: (1) what is the relationship between the need for cognition and emotional intelligence in individuals with high academic achievements, and (2) is the profile of the correlations between the need for cognition and emotional intelligence different in persons with high academic achievements than in those who do not have such achievements?

In order to answer the first question, authors of the study formulated four hypotheses which have been confirmed by the obtained results. Positive correlations were observed between the need for cognition and the general level of emotional intelligence and its dimensions (*acceptance of emotions, control over one's*

emotions, and *understanding emotions*) in the group of participants with high academic achievements. The obtained results also indicate that the same correlations occur in the comparison group. Emotional intelligence supports openness to the experienced emotions, both of positive and negative valence, and encourages using one's affect in a way that enhances the effectiveness of one's thinking and activities. It appears that emotional self-regulation (one of the skills that constitute emotional intelligence) has particular significance in this context. Self-regulation allows an individual to engage in activities during which they experience positive affect, which acts as positive reinforcement for those activities and is likely to increase effectiveness of the individual's actions (Stańczak, 2009). Previously conducted research presents evidence for a positive relationship between the need for cognition and self-regulation (Cazan & Indreicab, 2014) and emotional adaptation (Bertrams & Dickhäuser, 2012). A person with a high need for cognition, possessing self-regulation skills, actively seeks intellectual exercises which act as a source of positive emotions (Petty et al. 2009). The foundation of self-regulation is the individual's self-motivation (Stańczak, 2009). Individuals with a high need for cognition possess self-motivation that allows them to undertake intellectual activity and that has a positive impact on their effectiveness in performing those activities (Taracha, 2010). Moreover, the awareness of one's own emotions and their acceptance facilitate satisfaction from one's performance and enhance a sense of efficiency (Mataczak, 2004). It is consistent with the results of the present study, conducted on a sample of undergraduate and postgraduate students, which provide evidence of the existence of the following regularity: the higher one's emotional intelligence, the higher their need for cognition and the more frequent is their engagement in intellectual activities.

To expand the theoretical context for the obtained results, Pekrun's (2006) social-cognitive model of emotions is also worth mentioning. According to the model, emotions that accompany one's own achievements (called for simplifications *achievement emotions*) encourage engagement in intellectual activities, using one's own cognitive resources, and even the effectiveness of learning strategies (Pekrun, 2006). The appearance of achievement emotions depends on the cognitive assessment performed by an individual in a specific situation. The first type of cognitive assessment is connected with the individual's belief that they control their process of learning and the results they obtain. The second type of cognitive assessment is assigning value to the process of learning and its effects (Grzegorzewska, 2012). An internal assessment of learning occurs when an individual engages in a cognitive activity for its own sake (rather than because of the result they anticipate), while placing more value on the outcome of the activity indicates an external assessment. Cacioppo and Petty (1982) define the need for cognition as a variable facilitating conducting intellectual tasks, motivated by enjoyment obtained from these activities. Thus, as proposed by Pekrun's (2006) concept, a high need for cognition is connected with assignment of positive value to learning, which facilitates experiencing achievement emotions. Individuals with a high need for cognition perceive as attractive not only intellectual tasks, but also those connected with intrapersonal or interpersonal experiences; this is due to the complexity of these experiences and the necessity to analyse

one's and others' behaviour and emotions (Petty, Jarvis & 1996). Thus, it can be suspected that individuals with a high need for cognition are eager to expand their self-awareness and engage in introspection and self-reflection. Indeed, the self-awareness skills are positively connected with the need for cognition (Dickhäuser & Reinhard, 2010).

In addition to the conclusions proposed in the hypotheses, the obtained results indicate a positive correlation of the need for cognition with empathy, in both groups. It is evident that a higher level of empathy is in an individual, the higher need for cognition they display. In order to better understand this result, one should note that empathy is not only the ability to share the feelings of another, but also to acknowledge different perspectives in one's perception of oneself and other people in the cognitive and emotional context (Decety, 2011). Empathy facilitates effective communication, exchange of experiences, development of one's self-image, and moral reasoning (Bonino, 1993, as cited in: Kliś, 2012; Modzelewski, 2017). It is a variable that applies both to one's perception of other people and one's relationships with them, and to one's cognitive resources of perception, reasoning, and analysing the processes connected with the Self. From a theoretical point of view, individuals with a high need for cognition are more willing to change their perspective on problems or even adopt another person's perspective, than those who display a low level of this variable.

In both studied groups, that is, both in individuals with high academic achievements and in the comparison groups, very similar connections were observed between the need for cognition and the dimensions of emotional intelligence and its general level. This indicates that there is no basis for the claim that high academic achievements are significant only for shaping the correlations between those variables. The results suggest also that both in undergraduate and postgraduate students with high academic achievements and in the comparison group, emotions have the same relationship with the level of the need for cognition. It is consistent with the thesis proposed by the authors (Cacioppo & Petty, 1982) on the significance of enjoyment and satisfaction from cognition itself, regardless of its outcome.

To summarize, the results of the present study indicate the existence of a relationship between emotions experienced by an individual and the cognitive activities in which they engage. The applied correlative paradigm does not, however, allow for cause/effect conclusions, which is the main limitation of the study presented in this article. It appears that the connection between the need for cognition and emotional intelligence is two-way: the ability to manage one's own emotions – a key skill for motivation – is significant for one's willingness to engage in intellectual tasks and for the quality of one's performance of those task; simultaneously, the need for cognition supports the development of emotional skills. Individuals with a tendency to engage in intellectual effort and explore various topics may also be more inclined to reflect on their own emotions and engage in introspection.

The literature contains results of studies which indicate that both the need for cognition and emotional intelligence are significant for educational achievements. It has been proven that both variables are predictors of educational

achievements (MacCann et al., 2019; Strobel et al., 2019). It is an important argument encouraging further research on the development of emotional skills and the need for cognition, particularly in children and adolescents. Interesting results could also be obtained from a study whose aim would be to determine if differences exist in the emotions (positive and negative) experienced during intellectual effort in individuals with a high and low need for cognition. There is no doubt that experimental studies should be conducted on the impact of emotional intelligence (and its specific dimensions) on the need for cognition, which, from a methodological perspective, would be a highly demanding task.

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