ANNALS OF PSYCHOLOGY/ROCZNIKI PSYCHOLOGICZNE
2023, XXVI, 1, 67–81
DOI: https://doi.org/10.18290/rpsych2023.0004

PSYCHOSOCIAL DETERMINANTS OF THE NEED FOR COGNITION IN INDIVIDUALS WITH HIGH ACADEMIC ACHIEVEMENTS

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The aim of the research was to verify what factors determine the level of the need for cognition (NFC) in students and doctoral students with high academic achievements. The project involved 207 participants: 102 individuals with high achievements and 105 without great scientific successes. The following tools were used: the Need for Cognition Questionnaire (in Polish adaptation), the Formal Characteristics of Behavior – Temperament Questionnaire Revised Version, the Popular Emotional Intelligence Questionnaire and the Questionnaire of Retrospectively Perceived Parental Attitudes. Research results indicate that in people with high academic achievement, emotional intelligence, activity and perceived mother's inconsistency positively influence the need for cognition. In the comparison group, emotional intelligence is a positive predictor of NFC and the perceived attitude of father's inconsistency is a negative predictor of NFC.

Keywords: need for cognition; temperament; emotional intelligence; parental attitudes; academic achievements.

Need for cognition (NFC) as a motivational variable plays a highly significant role in an individual's intellectual effort. It is thanks to NFC that the individual experiences cognitive activity as pleasant, which motivates them to engage in it

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Handling editor: Marcin Zajenkowski, University of Warsaw. Received 29 Oct. 2022. Accepted 9 Jan. 2023. Published online 21 Feb. 2023.

(Cacioppo & Petty, 1982). Need for cognition is positively correlated with cognitive skills (Soubelet & Salthouse, 2011; von Stumm & Ackerman, 2013) and with soft skills, such as self-knowledge (Dickhäuser & Reinhard, 2010) or sense of efficacy (Chen et al., 2021), which are crucial elements of coping with difficulties and reaching goals. Thus, the need for cognition becomes a human characteristic that deserves attention.

Need for cognition is positively correlated with academic achievements (Colling et al., 2022; Grass et al., 2017; von Stumm & Ackerman, 2013) and supports development of skills (Sękowski & Dudek, 2016). Individuals with academic achievements display the tendency to engage in cognitive activities. Researchers consider high achievements to be a psychological and pedagogical criterion that determines gifted learners (Sękowski, 2006). Those individuals value and enjoy cognitive effort, which also characterizes those with a high need for cognition. It is especially important to establish what facilitates the development of the need for cognition in people with well-developed NFC.

Literature offers numerous publications on the subject, but there is a scarcity of studies aimed at explaining this variable, for example in the context of its determinants. It appears worthwhile to gain this knowledge to be able to positively influence the development of the need for cognition both in young students and adults. The conceptualization of the need for cognition assumes that NFC develops throughout an individual's lifetime (Cacioppo & Petty, 1982), and therefore, it is worthwhile to support it.

Need for Cognition

The creators of the concept of need for cognition, Cacioppo and Petty (1982), define it as "the tendency to engage in and enjoy cognitively demanding activities" (p. 116). NFC is developed both through enjoyment of intellectual effort and the experienced sense of competence. Both these elements act as a reward for the individual (Cacioppo et al., 1983).

Individuals with a strong need for cognition can faster retrieve information from memory and more effectively analyze intellectually demanding content (Fleischhauer et al., 2014). Studies conducted on Finnish primary school students at different ages revealed that the significance of the need for cognition increases with age (Luong et al., 2017).

Based on conducted studies (Cacioppo et al., 1996), several theses have been proposed by the authors of the concept of the need for cognition (Cacioppo & Petty, 1982). The process of shaping NFC is positively related to the experience of

one's own competence, as well as to the enjoyment felt during cognitive activities. An important role in the development of the need for cognition is played by the individual's own activity that enables them to explore reality.

An analysis of the literature of the subject shows psychosocial variables that correspond with the described theses. They include temperament traits (connected both one's activity, how one approaches tasks, and how one experiences emotions), emotional intelligence (management of emotions, also during cognitive processes), and the perceived parental attitudes (and their impact on the development of attitudes, values, and motivations in the individual).

Temperament

Most theories define temperament as a collection of traits (e.g., Buss & Plomin, 1984; Strelau, 2002). Authors who study this subject consider temperament a foundation for human emotionality and activity (Buss & Plomin, 1984; Rothbart & Bates, 2006). An individual's temperament influences the frequency and intensity of their engagement in seeking specific tasks and social interactions. It determines both one's capacity for processing stimulation and their need for it (Pracka, 2021; Strelau, 2002). Individuals characterized by the need for a high level of stimulation seek numerous and varied activities, including cognitive ones. Human emotionality is also influenced by temperament: it affects the way emotions are created and experienced and determines factors important for the individual's cognitive control and their capacity for self-reflection. Among the temperament-related determinants of the need for cognition, it appears justified to discuss activity. Cacioppo and Petty (1982) assume in their conceptualization that NFC develops on the basis of the individual's own activity, thanks to which the person seeks tasks that engage their cognitive effort (Sękowski & Dudek, 2016).

Studies conducted on undergraduate students and doctoral candidates with high academic achievements (Żmuda & Sękowski, 2021a) have proven a positive correlation between the need for cognition and such temperament traits as activity ($r = .35$, $p < .001$) and resilience ($r = .21$, $p < .05$), and negative correlation with emotional reactivity ($r = –.25$, $p < .05$).

Emotional Intelligence

Literature offers various definitions of emotional intelligence (EI). Those interpreting it as a collection of traits (Bar-On, 1997; Goleman, 1997) are accompanied by the ability model (Mayer & Salovey, 1997/1999), according to which EI

is a combination of agency and a set of cognitive skills. Authors of the model (Mayer & Salovey, 1997/1999, p. 26) describe emotional intelligence as "an ability to perceive and access emotions, and activate them in a way that guides one's thinking; the ability to understand emotions and possess the emotional knowledge which allows one to regulate emotions and facilitate emotional and intellectual development". Thus, it is justified to call EI a category of intelligence.

Emotional intelligence allows one to accurately interpret one's emotions, which facilitates determining and satisfying one's needs. The individual's awareness of their own motivations in various activities is higher, which translates into the ability to more efficiently direct one's actions and build one's character (Siregar et al., 2018). Moreover, individuals with increased emotional skills are able to better cope with failure, which prevents premature discouragement (Mayer et al., 2016). As mentioned, realization of the need for cognition is connected with positive affect (Cacioppo & Petty, 1982). The enjoyment derived from cognitive activities and the satisfaction from the sense of competence are both of significance here. Thanks to the connection between the emotional and the cognitive sphere, it is possible for human beings to experience the sense of competence more intensely, and thus feel rewarded and motivated to pursue further cognitive activities.

Results of studies on individuals with high academic achievements (Żmuda et al., 2021) have highlighted the existence of interdependencies between the need for cognition and the level of emotional intelligence, both among individuals with high academic achievements and those who do not have such achievements. The strongest correlation occurs between NFC and the general EI level (in the group of individuals with achievements $r = .48$, $p < .001$, and in the group of individuals without achievements $r = .42$, $p < .001$). Positive interdependencies have also been observed between the need for cognition and acceptance of emotions, empathy, understanding emotions, and the ability to control emotions, in both described groups.

Perceived Parental Attitudes

Parental attitudes refer to the parents' response to the child, on the cognitive, emotional, and behavioral level (Plopa, 2011). It should be emphasized "that parental behavior influences the child to the extent to which the child perceives it" (Plopa, 2011, p. 293). Therefore, the perception of parental attitudes plays a significant role.

Positive attitudes in the parents, such as expressed acceptance and respecting the child's autonomy support the development of self-regulatory mechanisms in the child (Kadzikowska-Wrzosek, 2011). According to the theory of self-determination (Ryan & Deci, 2000), the individual whose need for autonomy, relationship, or

sense of competence is satisfied does not need external gratification to be able to become engaged in a particular activity; the autonomous motivation for learning is also developed (Engin, 2020). Studies conducted on individuals with high academic achievements (Żmuda & Sękowski, 2021b) have indicated that the need for cognition is not connected with retrospectively perceived attitudes in their mothers and fathers. In the group of individuals without achievements, a lower level of inconsistency in the father was observed co-occurring with a higher need for cognition. Considering, however, that the perceived parental influence is connected with emotional intelligence (which is in an interdependent relationship with need for cognition), it seems justified to seek the significance of the mother's and father's attitudes for the evolution of the need for cognition through their interaction with EI. In literature, the relationship between the parental attitudes and the EI level is well theoretically grounded; authors refer to the concept of parental attitudes (e.g., Plopa, 2011) and emotional intelligence (Mayer & Salovey, 1997/1999) and indicate that the parent who expresses acceptance of their child strengthens their openness to experiences and thus, encourages them to feel and share their emotions, including unpleasant ones. The mother's or the father's reactions to the child's behavior and their emotional expression bears significance for the development of the child's emotional intelligence (Jaworowska & Matczak, 2008; Łodygowska & Chęć, 2020). It is confirmed by research that indicates that a relationship exists between EI and the perceived attitudes in mothers and fathers (Al-Elaimat et al., 2018; Cameron et al., 2020; Łodygowska & Chęć, 2020; Nguyen et al., 2020).

Purpose

The goal of the article is to establish which predictors determine the development of the need for cognition in individuals with high academic achievements. The following research problem was formulated:

How do temperament, emotional intelligence and perceived parental attitudes predict need for cognition in the group of people with high academic achievements?

Following an analysis of literature, the hypothesis was formulated:

Hypothesis 1. Activity is a positive predictor of need for cognition in the group of people with high academic achievements.

Hypothesis 2. Emotional intelligence is a positive predictor of need for cognition in the group of people with high academic achievements.

Hypothesis 3. Perceived parental acceptance is a positive predictor of need for cognition in the group of people with high academic achievements.

METHOD

Participants

The sample consisted of 207 undergraduate students and doctoral candidates from 16 Polish universities. The participants were divided into 2 groups. The first group included individuals with high academic achievements, that is, the recipients of the scholarship granted by the Minister of Science and Higher Education (currently: Minister of Education and Science). The second group consisted of undergraduate students and doctoral candidates who did not receive this scholarship. Including the control group was necessary in order to compare the results obtained from the recipients of the scholarship with those obtained by the individuals without similar achievements.

Participants of the study were students of various faculties, including social sciences, humanities, and arts, as well as medical, technical specialties, science and natural sciences. Both groups consisted of a similar number of respondents from different faculties. Ratio of male to female students was also similar.

The participants were young adults. The age range in the group of the scholarship recipients was between 21 and 31 years ($M = 24.15$, $SD = 1.88$), and between 21 and 34 years in the control group ($M = 24.38$, $SD = 2.71$).

Procedure

Contacting the persons who obtained the ministerial scholarship was possible thanks to the lists of beneficiaries of the rewarded undergraduate students and doctoral candidates, published on the website of the Polish Ministry of Education and Science. The participants were contacted via social media. Individuals who agreed to participate in the study obtained, via traditional mail, research tools in the form of questionnaires. The control group was selected mainly thanks to the courtesy of the recipients of the scholarship, who presented the offer to participate in the study to other students from their universities; this additionally helped to select, for the control group, respondents from the same faculties as those from the first group.

Respondents were informed that participation in the study was voluntary and anonymous. All participants gave informed consent to participate in the study. Initially, participants were asked to complete a short survey in which they provided information on their gender, age, place of residence, details regarding their academic achievements, and if both of their parents participated in their upbringing.

The second stage was completing a set of questionnaires. After completing these forms, the participants returned them via traditional mail.

Measures

The following research tools were used in the study:

The Questionnaire of the Need for Cognition is the Polish version of the method Need for Cognition Scale designed by Cacioppo and Petty (1982). The Polish adaptation of the questionnaire was designed by Matusz et al. (2011). The method consists of 36 statements to which the participants respond on a five-item scale. The result of the survey is a general level of the need for cognition. The reliability of the tool is high, with Cronbach's alpha = .91.

The Questionnaire of the Formal Characterization of Behaviour FCZ-KT(R), designed by Cyniak-Cieciura et al. (2016), analyzes 7 temperament traits according to the Regulatory Theory of Temperament which outlines the formal characterization of behavior (Strelau, 2002). These traits include the following: briskness, perseverance, sensory sensitivity, rhythmicity, endurance, emotional reactivity, and activity. The questionnaire contains 100 statements to which the participants respond on a four-item scale and obtain 7 results (referring to each of the studied traits). The reliability of the tool has been verified. Cronbach's alphas obtained for each of the scales are between .73 and .88.

The Popular Emotional Intelligence Questionnaire is a Polish tool developed by Jaworowska and Matczak (2005). The questionnaire determines the general level of emotional intelligence and data from the following four scales: acceptance of emotions, empathy, control of emotions, and understanding emotions. The tool contains 94 statements. Participants respond to them on a five-item scale. The reliability of the method was verified and a high alpha was obtained (.80) (Jaworowska & Matczak, 2005).

The Questionnaire of Retrospectively Perceived Parental Attitudes, developed by Plopa (2008), consists of 5 scales reflecting the parental attitudes in the mother and the father towards the child. The questionnaire is intended for adults who perform a retrospective assessment of their parents' attitudes. The tool consists of two separate parts, one for the mother and one for the father. Each of these parts contains 50 statements that describe parental behaviors. The attitudes included in the questionnaire are acceptance, autonomy, inconsistency, excessive protection, and excessive demands. The participants respond to particular statements by choosing one answer on a five-item scale. The method is characterized by high reliability.

Cronbach's alpha for the questionnaire My Father is between .84 and .90. Cronbach's alpha for My Mother is between .86 and .93.

RESULTS

In order to determine which variables impact the level of the need for cognition in both studied groups, the stepwise regression method was applied. The results presented below provide information also on the degree to which the studied factors explain the need for cognition. Table 1 presents stepwise regression results for individuals with academic achievements. Table 2 presents results obtained in the control group.

Table 1

Regression Coefficients and Explained Variability for the Need for Cognition in Group of People With High Academic Achievements

	Model	*B*	*SE*	β	*t*	*R*	ΔR^2	*F*-change
1	(Constant)	92.08	9.91		9.29***	.48	.22	28.52**
	Emotional Intelligence	.16	.03	.48	5.34***			
2	(Constant)	78.84	11		7.17***	.52	.26	18.19**
	Emotional Intelligence	.18	.03	.56	6.02***			
	Mother's inconsistency	.35	0.14	.23	2.51*			
3	(Constant)	74.37	11.02	–	6.75***	.55	.28	14.04**
	Emotional Intelligence	.16	.03	.47	4.77***			
	Mother's inconsistency	.36	.14	.24	2.61*			
	Activity	.36	.17	.20	2.11*			

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Verification of the model of stepwise regression for individuals with academic achievements has shown that the level of the need for cognition is influenced by the following: general level of emotional intelligence, perceived inconsistent attitude in the mother, and the individual's activity. The model is well adjusted to the data, $F(3, 96) = 14.04$, $p < .001$. Emotional intelligence was the strongest predictor

(β = .47, $p < .001$). This suggests that its participation in the explanation of the level of NFC is the biggest (among the studied factors). Coefficient of multiple determination R^2 was .28, which indicates that the listed variables and their interactions explain, in total, 28% of the results for the level of the need for cognition. β had positive values for all three predictors, which suggests that all predictors positively influence the development of the need for cognition.

Table 2

Regression Coefficients and Explained Variability for the Need for Cognition in Group of People Without High Academic Achievements

	Model	*B*	*SE*	β	*T*	*R*	ΔR^2	*F*-change
1	(Constant)	72.42	13.86	–	5.22***	.41	.16	20.95**
	Emotional Intelligence	.18	.04	.41	4.58***			
2	(Constant)	79.12	13.92	–	5.68***	.46	.19	13.42**
	Emotional Intelligence	.18	.04	.41	4.59***			
	Father's inconsistency	– .34	.15	–.20	– 2.25*			

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

The results of the regression analysis in the group of individuals without high academic achievements prove that the development of the need for cognition is influenced by general emotional intelligence as well as retrospectively perceived inconsistent attitude in the father. Similarly to the results obtained from the recipients of the scholarship, the general level of emotional intelligence was the strongest predictor (β = .41, $p < .001$) also in the control group. The results indicate that a higher level of EI co-occurs with a higher level of NFC. The perceived inconsistent attitude in the father, however, has a negative impact on the level of the need for cognition (β = –.20, $p = .027$); that is, the higher inconsistency in the father, the lower the level of NFC. The enumerated factors and the interactions between them explain 19% of the result for the need for cognition ($R^2 = .19$). The model of regression is well adjusted to the data, $F(2, 101) = 13.42$, $p < .001$.

DISCUSSION

The goal of the presented research was to answer the question which psychosocial variables influence the development of the need for cognition in individuals with high academic achievements.

The conceptualization of the need for cognition (Cacioppo & Petty, 1982) assumes that it is possible to shape it through experiencing one's own competence and enjoyment from intellectual effort. The variables studied in the present project are connected with people's emotional functioning, shaping their internal motivation, as well as seeking various types of tasks, including those of cognitive nature.

Three research hypotheses were formulated. The hypothesis referring to the influence of temperamental activity on the evolution of the need for cognition in the group with high academic achievements was verified positively. Human activity involves doing various tasks and participating in social situations. It is motivated by the need to seek stimulation (Strelau, 2002). Becoming engaged in new situations of varied complexity enables the individual to face challenges, experience successes and failures, and feel different emotions. Involvement in new activities allows one to train various skills, build the sense of competence, and, equally importantly, develops self-regulation strategies (Pekrun, 2006).

Research shows (Łubianka & Sękowski, 2016) that students with achievements prefer cognitive values. They display a natural appreciation of intellectual effort, which is a consequence of the possessed skills (von Stumm & Ackerman, 2013). Values are significant in the context of the choices one makes, goals one sets, and the development of competence and both academic and professional career (Łubianka & Sękowski, 2016). Gifted individuals with high academic achievements value cognitive effort and give it a relatively significant amount of their attention (Sękowski & Dudek, 2016).

Studies presented in the present article did not indicate the influence of activity on the need for cognition in individuals without high academic achievements. Temperamental activity in this group is most likely not focused on seeking cognitive effort to the extent as in the group of individuals with high academic achievements. The latter engage in numerous activities of intellectual nature, which they value and enjoy, which has an impact on the development of their NFC. Students with no high achievements most likely divide their activities into more varied tasks, without concentrating to such a high degree on situations that require cognitive effort.

Studies have confirmed the hypothesis on the influence of emotional intelligence on the need for cognition. The general level of EI was the best predictor (among

those included in the project) of the need for cognition both among the recipients of the scholarship and the students without academic achievements.

Estrada et al. (2021) have proven that a connection exists between EI and involvement in education and that it has a beneficial influence on the students' academic success. Studies conducted on primary school students also showed a positive relationship between emotional intelligence and cognitive motivation (Arias et al., 2022). Authors have proven positive influence of emotions on cognitive processes, which is significant for the ability to solve tasks and facilitates the process of building a sense of competence. It is of great importance in the development of NFC. Emotional intelligence is, moreover, positively connected with temperamental activity and mediates the relationship between the latter and the need for cognition (Żmuda & Sękowski, 2021a). The more activities an individual engages in, the richer the repertoire of their emotional experiences and the more opportunities to train coping skills they have. It is confirmed by research whose results indicate that EI increases with age, due to the increase in the number of experiences the individual collects (Matczak & Piekarska, 2011).

The results of the present study did not confirm the hypothesis about the influence of parental acceptance on the development of the need for cognition. An overview of literature reveals that interdependencies between familial influences and the child's development are ambiguous (Collins et al., 2000, in Pufal-Struzik, 2013). Various studies indicate that parental acceptance facilitates academic achievements (Gwiazdowska-Stańczak et al., 2021; Sękowski & Gwiazdowska-Stańczak, 2017); others, however (Lee et al., 2012), maintain that acceptance is only indirectly connected with the students' results, and self-regulation is more significant than parental influence. A relationship between the need for cognition and perceived acceptance in the mother and father has also not been proven (Żmuda & Sękowski, 2021b).

The study shows that an increase in the level of the need for cognition in recipients of the scholarship is facilitated by perceived inconsistency in the mother's behavior which depends mainly on her mood at a given moment. It creates a sense of insecurity (or even chaos) in the child, and generates negative emotions (Plopa, 2008). In order to explain the obtained results, it is worth—again—analyzing the affective aspect of the development of the need for cognition. The perceived inconsistency in the mother that evokes confusion and a sense of instability in the child may be a factor that motivates them to seek activities in which they can feel (due to the results they achieve) confident and competent. What is more, gifted individuals with achievements experience cognitive effort as enjoyable and satisfying, which might, to an extent, compensate for the negative experiences connected with the perceived inconsistency in the mother. Research to date (Plopa, 2011) has shown that the bond between the mother and the child is closer than that between the child

and the father. The perceived inconsistency in the mother, rather than the father, has more impact on the emotional experiences of the child. It is for this reason that the child seeks ways to compensate for it. This might explain why the perceived inconsistency in the mother facilitates the development of the need for cognition in individuals with high academic achievements.

In the group of individuals without academic achievements the results showed that the level of the need for cognition is negatively affected by the perceived inconsistency in the father. The more inconsistency is perceived by an individual in the father's behavior, the more disadvantageous it is for the level of their need for cognition. This finding is confirmed also by other studies (Sękowski & Gwiazdowska-Stańczak, 2017), which prove that the perceived inconsistency in the father has a negative impact on the child's school performance. Research shows that the father provides a sense of security in the child more than the mother (Pufal-Struzik, 2013). The predictability of the father's behaviour is, therefore, significant for the individual's sense of stability, which, in consequence, creates the individual's ability and willingness to realize their interests (in the present context those connected with cognitive activities). It has more significance for the individuals without high academic achievements than for the recipients of the scholarship, for whom intellectual engagement is a natural consequence of the skills they possess (von Stumm & Ackerman, 2013).

Practical Implications

As proven by the presented research, emotional intelligence is the best predictor of the need for cognition. Since the EI resources facilitate the individual's cognition, and positive emotions that accompany their cognitive activities reinforce the need for cognition, particular attention should be paid to which didactic methods are applied in work with students of all levels of education or participants of various types of training courses. This would benefit both the sharing of knowledge in an engaging way and encouraging the need for cognition. Personal experiences of the students as well as the opportunity to experience positive affect in the process of cognition play important roles. Considering that the need for cognition develops on the basis of a sense of competence, selecting tasks on an appropriate level of difficulty for students is of particular importance, as it allows them to see the effectiveness of their own work and enjoy the effort they invest in it. Thus, encouraging and motivating people to engage in their own activity is of considerable importance for the development of the need for cognition.

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