

STUDENTS' DESIRE TO ENGAGE IN COGNITIVE ACTIVITIES, FAMILY OF ORIGIN CHARACTERISTICS AND NEED FOR COGNITION SCORES

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Abstract

In this research 30 graduate students were asked to complete the Need for Cognition Scale. The individual scores were compared with: (1) school performance and the desire to engage in cognitive activities measured by: grade point average, the last three books read and interest in recent social events; (2) number of members in family of origin—especially the number of siblings—parental educational attainment, perceived cognitive abilities of siblings, rural-urban differences and parental encouragement of education; (3) gender, age and sibling position. A qualitative analysis of students' subjective perspectives on need for cognition scores was also included. The results of this research show that participants with a higher need for cognition were more likely to have a higher level of school performance and a greater desire to engage in effortful cognitive activities. Participants that had a higher sibling position, parents with a higher level of educational attainment and that came from an urban background scored higher on need for cognition scale. Participants with a lower need for cognition had a larger number of siblings and perceived the cognitive abilities of siblings as higher. Parental encouragement of education, gender and age of participants were unrelated to the need for cognition scores.

Key words: *cognitive activities, family of origin, need for cognition.*

Introduction

Need for cognition refers to the way individuals process information, more specifically to the “individual’s tendency to engage in and enjoy effortful cognitive endeavors” (Cacioppo, Petty & Kao, 1984: 306). Research shows that there are two models for the way information is processed: heuristic-systematic model (Chaiken, 1987) and elaboration-likelihood model (Petty & Cacioppo, 1986; Petty, Cacioppo & Schumann, 1983; Petty, Harkins & Williams, 1980; Petty, Harkins Williams & Latane, 1977; Petty & Wegener, 1999). These two models explain that humans do not always process information carefully, systematically and analytically, but often are influenced by cognitive heuristics, attribution biases and group processes (e.g. the reputation and charisma of the source, length of the message, familiarity of arguments and/or the majority’s support) (Priester & Petty, 1995; Ginner-Sorolla & Chaiken, 1997). On the one hand, individuals will evaluate information on a central or systematic route if the message is relevant to them (Haugtvedt & Petty, 1992; Petty & Cacioppo, 1981), if the content of the arguments is of interest (Petty & Cacioppo, 1986), if the arguments are deemed to be of a superior quality and if the message is significant for them (Greenwald 1968). On the other

hand, individuals will evaluate information on a peripheral route when influenced by heuristics or simple principles such as the characteristics of the source (Hovland & Weiss, 1951), the presentation order of the arguments (Miller & Chambell, 1959), appeals to fear (Witte, 1992) and appeals to positive emotions (Janis, 1965).

Apart from these factors (source and message), there are also individual characteristics that influence the way people process information. Need for cognition is one such personality variable that is relatively stable and represents an individual's tendency to choose the central or systematic route of persuasion. Those who are high in need for cognition report enjoyment in activities such as problem solving, looking for clues and analyzing deeply a broad range of situations (Cacioppo & Petty, 1982; Cohen, 1957). A high need for cognition correlates with grade point average (Gulgoz, 2001) and with a generally high life satisfaction rating in college students (Dwyer, 2008). Need for cognition reflects cognitive motivation rather than intellectual ability, suggesting only individual differences in intrinsic motivation in engaging in effortful cognitive activities (Dwyer, 2008: 12). Research initiated by Cacioppo et al. (1996) show that there are no gender differences in Need for Cognition Scale (NCS) scores, but a high need for cognition negatively correlates with: dogmatism, attention to social comparisons and the tendency to value factors such as physical attraction and popularity and positively correlates with: acquiring information, problem solving skills, formulation of complex attribution, making decisions based on rational grounds, interest in cognitive activities, verbal (but not abstract) intelligence and interest in recent social events. Individuals with a high NCS scores are intrinsically motivated to learn, achieve more academically, (Sadowski, & Gulgoz, 1996), have a higher self-efficacy rating (Gulgoz, 2001) and are more satisfied with the quality of their lives (Coutinho & Woolery, 2004). However, people with a high need for cognition have a lower score in skill-based learning when intermittently evaluated (Espejo et al., 2005).

Problem of Research

In this study the short 18-items version of NCS proposed by Cacioppo et al. (1984) was applied to a number of 30 students from a small, private and confessional university in Romania. Their individual scores were compared with: (1) school performance and desire to engage in cognitive activities (i.e. a natural tendency to seek, acquire, think about and reflect back on information to make sense of stimuli, relationships and events); (2) number of members in the family of origin, education attainment of parents, perceived cognitive abilities of siblings, urban or rural background and the perceived encouragement of education by parents; (3) gender, age and sibling position of respondents. Also, the subjective explanations and insights of respondents towards the NCS scores were described.

The general objective of this study was to offer a better understanding of the way individual characteristics and family of origin characteristics may influence the need for cognition. The specific objectives of this study were (1) to compare the NCS score with (a) grade point average of last semester, (b) number of hours a week engaged in effortful cognitive activities and (c) the last three books read; (2) to compare the NCS score with the number of members in the family of origin; (3) to compare the NCS score with the gender, age and urban/rural background of respondents; (4) to compare the NCS score with parental academic attainment, perceived level of academic abilities of siblings and with the perceived parental encouragement of education and (5) to describe the subjective explanations and insights of respondents regarding the NCS scores.

To the authors' knowledge this is the first study that analyzed the complex processes between family context (number of children, sibling position, academic attainment of parents, academic performance of siblings, urban/rural background and parental encouragement of education) and the individual scores in NCS.

Research Methodology

General Background of Research

This study used a mixed methodology by including the NCS and semi-structured interviews. Data collection took place either in the students' dorms or in the classrooms. Student researchers asked permission from all participants and a consent script was read informing students of their right to refuse to participate in this research. After students were finished completing the NCS, they were thanked and during the next week they were contacted again for the semi-structured interviews. All students agreed to complete the NCS scale, but during the interviews one decided to withdraw from the study and was later replaced by another student. Each interview was audio taped and transcribed *ad verbum*. The interviews were coded by identifying the common categories and themes of the answers given. Discrepancies were resolved through discussion and collaboration.

Research Sample

The 30 participants in the study were students of a small, private confessional university from Romania and were selected through an opportunity sampling. Participants ranged in academic status from first year students to seniors, and all departments of the university were represented, with 8 participants from the Social Work Department, 7 of participants from the Literature Department, 3 participants from Music Department, 6 participants from School of Management and 5 participants from the Theology Department. Sixteen of the participants were female and 14 male, and they ranged in age from 19 to 25 years, with the average age being about 20 years. With respect to the sibling position of participants, 50% were first born, 20% second born, 10% third born, 4% were fourth born, 7% were fifth born, 3% were sixth born, 3% were seventh born, and 3% were ninth born. Three participants were an only child, 5 had one sibling, 8 had two siblings, 4 had three siblings, 2 had four siblings, and 8 had five or more siblings. A number of 10 participants came from a rural background and 20 from an urban background. Five participants had at least one parent that graduated a university, 12 participants had both parents that graduated high-school, 3 participants had at least one parent graduate a professional school, and the rest of the 10 participants had parents that only graduated 8-10 classes of school or went to some form of post high-school training. The use of human participants followed the guidelines of the Ethical Committee of Emanuel University of Oradea.

Because of the small number of participants, results can not be generalized and should be understood as representative only of those subjects. The sample studied is a sample of convenience, not a representative one, and thus the stated variables are not manipulated in order to explain the relationship between them, but only describe the relevant factors—derived from the family of origin—and their contribution to the need for cognition and implications on the academic performance and school adaptation of children.

Instruments and Procedures

This research used three instruments of data collection. Firstly, need for cognition was measured using the short 18-items NCS (Cacioppo et al., 1984). This scale measures participants' individual responses to various situations that require a cognitive effort such as: "I prefer complex to simple problems", "I like to have the responsibility of handling a situation that requires of lot of thinking", "Thinking is not my idea of fun", "I feel relief rather than satisfaction after completing a task that required a lot of mental effort" and "I usually end up deliberating about issues even when they do not affect me personally." Responses were given on

a five-point Likert scale from 1 (extremely uncharacteristic of me) to 5 (extremely characteristic of me). For the purposes of this study the NCS was translated and rendered in Romanian. The individual scores for the need of cognition were calculated by scoring each statement on a scale of 1 to 5. The score for each item depended on participant responses regarding the degree to which they believed the statement to be characteristic or uncharacteristic of them; it was then divided by the number of statements (i.e. 18) to calculate the mean score. Table 1 shows the scale that was used to rank the scores.

Table 1. Need for cognition scale.

Need for cognition score	Likelihood to engage in and enjoy effortful cognitive activities
1. 00 – 1. 24	Participant is not at all likely to engage in and enjoy effortful cognitive activities
1. 25 – 2. 49	Participant is not likely to engage in and enjoy effortful cognitive activities
2. 50 – 3. 49	Participant is somewhat likely to engage in and enjoy effortful cognitive activities
3. 50 – 4. 49	Participant is very likely to engage in and enjoy effortful cognitive activities
4. 50 – 5. 00	Participant is extremely likely to engage in and enjoy effortful cognitive activities

Secondly, participants were asked to give information about their age, gender, sibling position, number of family members, urban/rural background, academic attainment of parents, perceived academic abilities of siblings, perceived level of parental encouragement of education, academic achievement (measured by the students' self-reported grade point average, on a 10 point scale), number of hours per week spent learning for school, doing extra reading, accessing internet news sites or reading the press, and data regarding the last three books read (author, title, time frame in which the book was read and classifying the book—fiction, (auto)biography, study-guide/textbook, spirituality, self-help (poetry was not included as in this sample no participant choose this category)).

Thirdly, semi-structured interviews were taken that revealed information on (1) perceived causes for the NCS score; (2) ways in which parents encouraged participants' education and desire to engage in effortful cognitive activities; (3) subjective perspectives on the motivational factors involved in the desire to enjoy and engage in effortful cognitive activities and (4) participants' suggestions on how teachers can encourage students to engage in and enjoy effortful cognitive activities.

Data was analyzed using an empirical correlational design, and thus, the research results have not been obtained by a quantitative statistical procedure of information processing in order to grasp the relations between the variables studied, but focused specifically on a qualitative analysis of the results.

Results of Research

In this study, 7% of participants had a very high need for cognition (NCS=4.50-5.00), 47% had a high need for cognition (NCS=3.50-4.49), 43% had a somewhat high need for cognition (NCS=2.50-3.49), 3% had a low need for cognition (NCS=1.25-2.49). None of the participants in this study had a very low need for cognition (NCS=1.00-1.24).

Comparing the NCS Score with School Performance and the Desire to Engage in Effortful Cognitive Activities

School performance and the desire to engage in effortful cognitive activities was measured by: (a) self-reported grade point average (on a 10 point scale) from last semester, self-reported high-school graduation exam grade (the Romanian *Bacalaureat*—on a 10 point scale) and self-reported 12th grade point average (on a 10 point scale); (b) engagement in activities such learning for school and reading extra literature and (c) interest in current social events (see Table 2).

Table 2. Comparing the NCS score (n=30) with enjoyment of and engagement in effortful cognitive activities.

No. of participants	Mean NCS score	Grade point average of last semester	High-school graduation exam grade	Grade point average from 12 th grade	Interest in recent social events (times/week internet news sites are accessed or press read)	Engagement in effortful cognitive activities	
						h/week spent learning for school	h/week spent reading extra literature
n=2	4.60	9.10	9.39	9.36	3	10.5	12
n=14	4.10	9.18	9.02	9.40	6.92	19.78	8.07
n=13	2.92	8.46	8.64	8.75	2.07	10.38	4.1
n=1	2.22	8.86	8.80	8.50	4	15	4

This study shows that students with a higher need for cognition had higher grades last semester, at the high-school graduation exam and during 12th grade. Regarding the last three books read, the participants in this study mentioned a total of 88 books: 44% fiction, 35% spirituality, 8% self-help, 7% (auto) biographies, and 6% study-guides/textbooks. The time spent by participants reading a book differed from individual to individual and to a certain degree depended on the book read, ranging from a couple of hours (e.g. C.S. Lewis' *Screwtape Letters*) to three months (e.g. P.F. Drucker's *Managing a nonprofit organization*). Participants with a higher need for cognition were more inclined to read study-books/textbooks and less inclined to read self-help books. All participants in this study, probably as a result of being students in a confessional university, mentioned at least one spirituality or spirituality oriented fiction book as one of the last three books read.

Comparing the NCS Score with Number of Siblings, Urban/Rural Background, Academic Attainment of Parents, Perceived Academic Abilities of Siblings and Perceived Parental Encouragement of Education

This study shows that participants that came from larger families had a lower NCS score. For example, the participants with a very high need for cognition (NCS score=3.50-4.49) came from families with a mean of 3.85 children, while participants with a somewhat high need for cognition (NCS score=2.50-3.49) came from families with a mean of 4.6 children. The participant with a lower need for cognition (NCS score=2.22) came from a family of 6 children (see Table 3). More research is needed to test for a possible correlation between number of siblings and need for cognition score.

Also participants that came from an urban background had a higher need for cognition (mean NCS score=3.58) than participants that came from a rural background (mean NCS score=3.15). More research is needed to test for a possible correlation between urban/rural background and NCS score.

Table 3. Comparing the NCS score (n=30) with family of origin characteristics.

No. of participants	Mean NCS scores	Grade point average last semester	Mean no. of children	Urban background	Perceived parental encouragement of education (10 point scale)	Education attainment		
						Father	Mother	Perceived siblings' cognitive abilities (10 point scale)
n=2	4.60	9.1	3	100%	7.5	50% higher education 50% high-school	50% higher education 50% high-school	8
n=14	4.10	9.18		71%	9.64	57% high-school 29% post high-school classes 7% professional school 7% not mentioned	79% high-school 14% post high-school classes 7% not mentioned	8.57
n=13	2.92	8.46	4.6	62%	8.60	69% high-school 15% post high-school classes 8% professional school 8% not mentioned	80% high-school 8% general school 8% post high-school classes 8% professional school	9.38
n=1	2.22	8.86	6	0%	10	100% professional school	100% professional school	10

This study shows that a higher academic attainment of parents may lead to a higher need for cognition in their children (at least for those included in this study). Also, the participants in this research were asked to rate the academic abilities of their siblings. The results show that the higher the individual need for cognition is the lower the perceived academic abilities of siblings are. The perceived parental encouragement of education does not seem to make a difference on the need for cognition for the subjects included in this research.

Comparing the NCS Score with Gender, Age and Birth Order

In this study the female participants had a slightly higher (although not significant) need for cognition (mean SNC score=3.51) than male participants (mean SNC score=3.35). The age of participants was uniform and therefore no conclusions could be reached as to age-difference influence on need for cognition (see Table 4).

Table 4. Comparing the NCS score with individual characteristics.

No. of Participants	Mean NCS score	Gender	Mean age	Mean sibling position
N=2	4.60	100% female	20	2
N=14	4.10	43% male 57% female	20.5	1.9
N=13	2.92	62% male 38% female	20.2	2.7
N=1	2.22	100% female	20	5

Regarding sibling position, this study shows that higher birth order participants had higher need for cognition scores. However, participants that were a first born or an only child did not necessarily have a higher need for cognition. For example, from the total number of participants with a NCS score of 2.50-3.49 (n=13), five were first born (two of which were an only child), three were second born, and one was either third, fourth, fifth or seventh born. Also, from the total number of participants with a NCS score of 3.50-4.49 (n=14), nine were first born (one of which was an only child), three were second born, and one was either third or ninth born.

The Subjective Explanations Regarding the Need for Cognition

The subjects in this research also participated in semi-structured interviews that revealed information on: (1) the perceived causes for the NCS scores; (2) ways in which parents encouraged education and engagement in effortful cognitive activities; (3) subjective perspectives on what motivates one to enjoy and engage in effortful cognitive activities; and (4) desired ways in which teachers can encourage students to engage in effortful cognitive activities.

All participants interviewed reported that they believe that the NCS score is representative to how they feel and to what they believe about themselves. Participants with a higher need for cognition reported that their score was caused or influenced by their “desire to learn and gather new information.” Participants with a lower need for cognition declared that they preferred to “experience life” rather than “learn or over-analyze things.” For example, P.30 (NCS score=2.22) notes: “When we talk about knowledge, I personally prefer to learn through experience and through living my life rather than through thinking about stuff.”

The participants also described how their parents encouraged them to engage in cognitive activities by mentioning approaches such as: financial rewards or gifts, supporting creativity, exposing them to literature from an early age, pushing them to find new solutions to problems, and promoting critical thinking. Most participants believed that verbal encouragement has an important role in building the self-efficacy needed in engaging and persevering in effortful cognitive activities. For example, P. 2 (NCS=4.50) explains:

They never discouraged me...They always supported me and took interest in what interested me. I used to talk to my mom about things I learned in school and we discussed them, exchanged opinions, contradicted each other frequently and this helped me a lot when things got tough.

Students were asked to mention what they believed motivated them to engage in effortful cognitive activities. They mentioned: the desire to understand every day life, the desire to feel able to participate in their community, the knowledge that Romanian society needs able people from all walks of life, the desire to become an academic, the position and value obtained by knowledgeable people:

I realize that today, if I may say so, everyone is looking for knowledgeable people, not just regular folk, but individuals that know about things and are well trained...there is a competition in this sense and I know that if I engage in cognitive activities, my chances of succeeding and being preferred are higher. (P.28, NCS score=2.55)

The suggestions participants believed would help teachers in encouraging students to engage in effortful cognitive activities are: “to give high grades” in order to improve students self-efficacy ratings, to have interactive classes, to grade the students on how much they

improved and not only on how much they know. Also, P.5 (NCS score=4.30) notes: "most importantly, teachers need to try and become friends and earn the trust of students, and after that things will only move forward; there will be no problems at exams or anything like that."

Discussion

The results of this study need to be interpreted through its limitations such as the small nonrepresentative sample and the specific problems of any study that uses the self-report ratings of its subjects. This research aimed to offer a better understanding on the complex processes between need for cognition and family of origin characteristics. Firstly, the results show that participants with a higher NCS score had a higher level of school performance (measured in this study by grade point average). It is important to note that need for cognition does not refer to an individual's intellectual abilities but to a cognitive, intrinsic motivation to engage in effortful cognitive activities. That is, even individuals that have a high need for cognition, that are intrinsically motivated and that are more likely to obtain higher academic grades may occasionally experience academic failure. For example in this study the participants with the highest need for cognition (P1 and P2) both mentioned failing one exam last semester. A high need for cognition does not refer to the desire to learn equally well in all school subjects. It is possible for students with a high need for cognition to have various interests regarding the information presented during different school classes, and therefore they may engage at different levels in the activities of those classes. Secondly, students that came from larger families had a lower need for cognition and as pointed out by other research had lower school grades (Åslund & Grönqvist, 2010; Greenberg, 1989). Thirdly, NCS score is higher in those participants that had a higher birth order (but not necessarily the first-born or the only-child), than in those participants that had a lower birth order (Silles, 2010; Zajonc & Markus, 1975). However, this result needs to be carefully interpreted; research show that the causal relation between school grades and birth order is age-dependent—sometimes older siblings have better school results, and other times the younger ones outperform their older brothers (Zajonc, Markus & Markus, 1979). Fourthly, as highlighted by the Zajonc and Markus's research (1975), there is a relation between the academic attainment of parents and children's desire to engage in effortful cognitive activities. Also, parental encouragement of education and engagement in effortful cognitive activities are considered important and valuable by the participants included in this study even if this study did not show a relation between parental encouragement of education and need for cognition score. Fifthly, an urban background may lead to a higher need for cognition. This may be explained by the different life experiences and different aspirations of parents and students (pupils) that come from rural comparing to urban background (Moore, Baum, & Glasgow, 1984; Cosby & Picou, 1973; Yang, 1981).

Lastly, this study looked at the subjective perspectives of participants regarding their individual need for cognition scores. Those that had a higher need for cognition score explained that they enjoy acquiring new information, debating, critically engaging in knowledge and finding new and innovative solutions to problems. Individuals with a high need for cognition reported feeling intrinsically motivated to engage in effortful cognitive activities and explained that they learned to appreciate the value of knowledge. Individuals with a lower need for cognition pointed out that they preferred to experience life in a practical way and stated that they felt extrinsically motivated to engage in effortful cognitive activities through incentives such as: gifts, good grades and the social value put on competitive individuals. All respondents appreciated the encouragement received from their parents and believed that teachers can better motivate students to engage in effortful cognitive activities through: interactive lessons, sustaining the emotionally well being of students, earning the student's trust and appreciating the improved not only the achievers.

Conclusion

This research compared the individuals NCS scores of 30 students with: school performance and the desire to engage in effortful cognitive activities; number of members in the family of origin, the educational attainment of parents, and the perceived cognitive abilities of siblings; urban/rural background and perceived parental encouragement of education; and gender, age and birth order of respondents. School performance was measured by the grade point average of: (a) last semester, (b) the Romanian high-school graduation exam (*Bacalaureat*) and (c) 12th grade. Interest in effortful cognitive activities was measured by interest in recent social events and last three books read (fiction, (auto) biography, study-guides/textbooks, spirituality and self-help). The results of this study show that participants with a higher NCS score also had a better school performance and the likelihood of reading study-guides or textbooks. However, the majority of subjects included in this research, possibly as a result of being in a confessional university, indicated reading more spirituality oriented books. Also, the results of this study show that birth order or participants, academic attainment of parents, urban background may lead to a higher need for cognition. Participants with a lower need for cognition came from larger families and perceived the cognitive abilities of siblings as higher. In this study, gender and age of respondents (age was uniformly represented in this study) were not related to the need for cognition score.

This research does not offer a final and decisive answer to the complex interaction between need for cognition, school performance, intellectual abilities and family of origin characteristics. However, the results described in this paper add to the body of knowledge on the need for cognition by bringing into the discussion the influence of family of origin. Also, this study encourages the development of new research on this topic of high interest for students, parents, teachers, tutors, psychologists and social workers.

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