

## MOTIVES AND STRATEGIES OF LEARNING IN STUDENTS WITH DIFFERENT LEVEL OF NEED FOR COGNITION

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### ABSTRACT

*The study was aimed at probing into the motives and strategies of learning in the students varying in the degree of need for cognition. One hundred and fifty six students from the Physical Education Faculty (II semester) at Physical Education Academy in Gdańsk participated in this study. Age of 69 female and 87 male students participating in the study ranged from 19 to 25 years. There were. Subjects were examined with the use of two questionnaires: Cacioppo and Petty Need for Cognition Scale (NCS) in Polish modification by Matusz et al. (2011) and dichotomous version of the Learning Process Questionnaire (R-LPO) by Kember et al., (2004), adapted by Szejnberg (2008). The results the study showed that the degree of need for cognition in the individuals highly in need for it, determined their motivation and strategies used for learning. Need for Cognition Scale proved to be an effective tool for assessing individual differences in epistemic motivation.*

Key Words: *Motives, Strategies, Students and Learning.*

### INTRODUCTION:

In the literature, there are several concepts and studies on the need for cognition and cognitive motives (Sędek, 1995; Paris and Ayers, 1997; Brophy, 2002; Niemierko, 2002; Keller, 2010; Żylińska, 2013; Szejnberg and Jasński, 2015).

In psychology, it is assumed that the need means state of lack in the body something indispensable for life, i.e. lack of the defined value, decreasing life quality level and possibility the performance". The most justified classification is a division of needs into biological and social (Sawczuk, 1989, pp. 204 - 205). Needs are related also to the motives, i.e. directed tendencies to achieve the desired goal. According to Niemierko (2002, p. 11) term "motivation" relates to the "motives activity, i.e. tension setting both direction and size of the body activity".

In view of this study subject, two other terms require explanation, i.e. "learning" and "motivation for learning". Learning (in psychology) is relatively widely defined as a process "based on the experience, leading to the constant behavioral or cognitive changes" (Zimbardo

Johnson and McCann, 2011, p. 116). Such a type of learning "gives us advantage over the bodies more depending on the Nature and instincts. Some forms of learning, such as: habituation, are quite simply, whereas other forms, e.g. classical conditioning, operant conditioning, and cognitive learning, are more complex" (Zimbardo, Johnson and McCann 2011, pp. 114-186). Whereas motivation to learn is understood as "a degree of engagement and effort of the student devoted to learning during classes or care and time devoted to the various home tasks" (Sędek, 1995, p. 77).

Cacioppo and Petty (1982, p. 116), authors of the Need for Cognition Scale (NCS), referred this need to: tendency to engage in and enjoy thinking, while other authors referred it to: tendency to engage in and enjoy effortful cognitive endeavors, which have to serve to cope with life difficulties (Patty and Jarvis, 1996, p. 199, cit. from Matusz et al., 2011, p. 117).

Matusz, Traczyk and Gasiorowska (2011) surveying the results of longitudinal verification studies using the original American version of NCS, have shown that there are several easily identified differences important for everyday functioning related to the way of thinking and behavior resulting from the different epistemic motivation levels (Need for Cognition – NC). Cacioppo, Petty, Feinstein and Jarvis (1996) assumed that the individuals high in need for cognition (HNC) demonstrate different preferences concerning information processing, i.e. search for information, deep analysis, evaluation, and synthesis are quite natural for them, if compared with those low in NC (LNC). This results in the behavioral consequences such as involuntary memorizing the larger number of messages, reaction to the presented announcement with higher numbers of ideas both issue-relevant and issue-irrelevant (Cacioppo, Petty and Morris, 1983) or feeling more satisfaction (or lower tension) during problem solving. Moreover, it was shown several times that the individuals high in NC tend to process the message in "central route" (Petty, Cacioppo and Goldman, 1981), i.e. in depth, resulting from their sensitivity to the quality of arguments and insensitivity to the peripheral information during processing of the persuasive message (Cacioppo et al., 1983), and also higher coherence between their attitudes and behaviors (Cacioppo, Petty, Kao and Rodriguez, 1986). According to Matusz (2011), several situational factors may be distinguished which differentiate quantity of effort in

analyzing information coming from an environment (e.g. personal engagement; Petty, Cacioppo, Goldman, 1981). Therefore, NC in their opinion is dispositional equivalent, which is an important source of changeable behavior. In other words, there are people, who even in the most demanding tasks don't exercise profound effort of thinking, and there are others, who analyze information in depth. More importantly, such differences are consistent in time and in various situations, being situational behavioral tendencies situations (Matusz et al., 2011, p. 114).

NC is understood as an intrinsic epistemic motivation in the Maslow needs hierarchy, and represents its highest level – need of self-actualization (possessing goals, fulfilling own potentials, esthetic and cognitive needs). These needs come down to both using all talents and demonstrating initiative and real creativity to the personality development in the intellectual, professional, esthetic aspects etc. Maslow assumes that the need for cognition and understanding makes an individual in such need to pay attention to self-actualization and is more inquisitive in of his work is more inquisitive (Maslow, 1990, pp. 72-92). Probably NC fulfillment is done in different ways in the different individuals due to its intensity and various methods and strategies used for learning.

#### OBJECTIVES OF THE STUDY:

Aim of the present study was to obtain information about motives and strategies used by students for learning. Learning process has been of interest in higher education for years. Therefore, it is important to understand how need of cognition level effects the motive and chosen strategy for learning. Moreover, the present study is aimed at checking whether the two used questionnaires could be a valid tool to achieve the projected goal.

#### MATERIALS AND METHODS:

##### Participants:

One hundred and fifty six II semester Physical Education Faculty students (69 females and 87 males) in at the Academy of Physical Education in Gdańsk were recruited for the study. Their age ranged from 19 to 25 years (mean: 20.35 years; SD=1.03).

### Study Design:

The study was carried out in 7 academic groups (each about 20 students as fixed by the academic office) within classes of general psychology in October 2015.

### Materials and Analyzes:

Method used in this study was diagnostic poll with the use of two questionnaires. One was Cacioppo & Petty Need for Cognition Scale in Polish adaptation by Matusz et al., named Questionnaire of Need for Cognition (QNC). The second was Revised Learning Process Questionnaire (R-LPQ) developed by Kember et al., and adapted by Szejnberg.

Questionnaire of Need for Cognition (QNC) was developed as an experimental tool designed for the effective control of NC level in the population high in it, e.g. students.

Participating students were requested to fill up the questionnaire, marking the degree of their agreement with each of 36 items in a 5-score scale (1 – definitely disagree; 5 – definitely agree). According to Matusz (first author of the Polish QNC adaptation) suggestions, one should pay special attention to guarantee equal standards of the study to all respondents, such as:

- 1) Guarantee the complete anonymity during the whole time of collecting information as the nature of the construct is visible in the content of the test items and a possibility of the possible effect of chosen answers on later respondents' grade may significantly distort the results. However, respondents were asked to mark intuitional answers;
- 2) All instructions important for obtaining objective information were given in the text at the top of questionnaire sheet. To avoid any misunderstanding, which could affect the results, the instructions were also read out to the respondents before the start of the filling up questionnaire session.

According to Cacioppo and Petty (1982), individuals low in NC will tend to avoid intellectual effort despite the fact that they will be able to do it, much similarly to the individuals high in NC will.

The second questionnaire used in this study related to the process of learning (R-LPQ) and contained two approaches: deep and surface, concerning both motive and strategy. Deep motives – Interest in learning (3 statements), Commitment to work (4). Deep strategies – Relating ideas (2) and Understanding (2). Surface motives – Fear of failure (2) and Aim for qualification (2). Surface strategies – Minimizing scope of study (4) and Memorization (3 statements) for details see Table 3. Respondents were asked to assess, which of all 22 statements contained in the questionnaire were true for their process of learning. They could mark one of two answers: YES, when they always or nearly always presented the said performance or NO if they never or rarely behaved that way.

Obtained results were analyzed with basic statistical techniques, showing the rate (%), arithmetic mean (AM), standard deviations (SD), and difference significance as well as statistic values of the used Mann-Whitney U test (U, Z).

## RESULTS:

Degree of NC in the examined students (sum of QNC scores) was calculated at the beginning. Then, median (M=124), arithmetic mean (AM=123.22), and statistic range (R=71 – 163) for the data were calculated. Median value served to differentiate respondents high and low in NC. It was found that there 83 students were high in NC whereas 73 – low in NC. Notably, in the female of students group 56.52% expressed high need for cognition and 43.48% low need for cognition. Similar differences have been seen in the group of male students where 50.57% declared high need for cognition and 49.43% - low need for cognition.

Further analyses relate to the rate of motives and strategies used by the students for learning (R-LPQ) depending on the need for cognition. The obtained results, differentiated in dependence on high or low NC, are presented in Table 1.

Table 1. Rate of the motive and strategy of learning preferred by the students

Generalized motives and strategies of learning	HNC (%)	LNC (%)
Deep motive	52.05	30.13
Deep strategy	87.64	67.80
Surface motive	63.23	63.69
Surface strategy	48.44	66.08

Analysis of data shown in Table 1 revealed (as anticipated) that the students high in their need for cognition (HNC) more frequently used deep motive and strategy for learning than those low in need for cognition (LNC).

Individuals high in NC less frequently used surface strategy in comparison with low in need for cognition individuals. Out of study groups, respondents relatively often followed supervision motive for learning, percentage of students in both groups was similar.

An analysis of approach to learning, depending on the high and low need for cognition, enabled to know their preferences. Table 2 presents the data on frequency of the motive and strategy preferred by the student for learning.

Table 2. Deep and surface approach to learning

Deep and surface approach to learning	HNC (%)	LNC (%)
Deep motive		
Interest in learning	59.83	36.98
Commitments to work	44.27	23.80
Deep strategy		
Related ideas	90.96	69.86
Understanding	84.33	65.75
Surface motive		



Fear of failure	60.84	74.65
Aim for qualification	65.66	52.73
Surface strategy		
Minimizing scope of study	40.66	60.95
Memorization	56.22	71.23

An analysis of the obtained data concerning deep approach to learning, in the examined students, revealed that high in NC students valued 'related ideas' significantly higher than the low NC students (HNC – 90.96%; LNC – 52.73%), and 'understanding' (HNC – 84.33%, LNC – 65.75%). Students high in NC more frequently than their male and female counterparts with low in NC picked 'interest in learning' (HNC – 59.83%, LNC – 36.98%). Moreover, the students high in need for cognition more often selected 'aim for qualification' than those low in need for cognition (HNC – 65.66%, LNC – 52.73%). In the group of LNC students 'fear of failure' happened to be dominant (LNC – 74.65%, HNC – 60.84%), whereas 'commitments to work' was relatively rarely (LNC – 23.28%, HNC – 44.27%) seen.

Statistical analysis of the data revealed significant differences in the approach to 4 deep motives and 3 deep strategies used for learning. Deep motive and strategy were characteristic for the students high in need for cognition. These deep motives included 'interest in learning' and 'commitment to work', while deep strategy included 'related ideas', 'understanding', and 'aim for qualification'. In the group of students low in NC, surface strategy dominated, e.g. 'minimizing scope of study' and 'memorization'. These differences proved to be statistically significant at  $p < 0.05$  (Table 3).

Table 3. Level of difference in the motives of strategies used for learning in respondents  
differing in need for cognition

Motive and strategy used for learning	$\Sigma$ rang - G1	$\Sigma$ rang - G 2	U	Z	p
Deep motive					
Interest in learning I feel that nearly any topic can be highly interesting once I get into it	7133.5	5112.5	2411.5	2.193	0.028
Interest in learning I work hard at my studies because I find the material interesting	7447.5	4798.5	2097.5	3.308	0.001
Commitment to work I come to most classes with questions in mind that I want answered	7165.5	5080.5	2379.5	2.307	0.021
Commitment to work I like to do enough work on topic so that I can form my own conclusions	7426.0	4820.0	2119.0	3.232	0.001
Deep strategy					
<b>Relating ideas</b> I try to relate what I have learned in one subject to what I learn in other subjects	7339.0	4907.0	2206.0	2.923	0.003
Understanding I try to relate new material, as I am reading it, to what I already know on that topic	7344.0	4902.0	2201.0	2.941	0.003
Surface motive					
Aim for qualification I'm going to achieve high results in learning,	7178.5	5067.5	2366.5	2.353	0.019



because I feel that this will help to get a better job in the future					
Surface strategy					
Minimizing scope of study I generally restrict my study to what is specifically set as I think it is unnecessary to do anything extra	5680.0	6566.0	2194.0	-2.966	0.003
Minimizing scope of study I find it is not helpful to study topic in depth. You don't really need to know much in order to get by in most topics	5773.0	6473.0	2287.0	-2.635	0.008
Memorization I find I can get by in most assessments by memorizing key sections rather than trying to understand them	5764.5	6481.5	2278.5	-2.666	0.008

Test U Mann-Whitney vs. NC variable. Difference is significant at p.05. G1: n=83; G2: n=73.

## DISCUSSION:

Analyses revealed that both motive and strategy used by the students for learning are determined by their need for cognition (NC) level. Differentiation of the examined students for high and low in NC (epistemic motivation) revealed different approaches to learning. According to the Kember, Biggs J. and Leung (2004) concept, approaches distinguished in this study are described by the defined motive and strategy of learning. It was found that NC level significantly differentiate students' approach. Those high in NC preferred deep approach, while the students low in NC – rather superficial strategy. Such results are not surprising as they confirm earlier empiric findings on behavioral changes and ways of thinking being different in the individuals of various NC levels, and more importantly: “enables to predict how so different individuals will behave during solving cognitive tasks” (Matusz, et al., 2011 p. 114).

An analysis of both methods and strategies used by the students for learning showed that every second respondent was high in NC. Percentage of such students was slightly higher in the female group of students. It is worth emphasizing that the students classified as high in NC in this study exhibited the approach and deep strategies for learning such as: 'Interest in learning' and 'Commitment to work' and 'Relating ideas', 'Understanding', and 'Aim for qualification', whereas the ones low in NC used mainly superficial strategies: 'Minimizing scope of study' and 'Memorization'. Observed differences proved to be statistically significant at  $p < 0.05$ .

Present study showed that the level of need for cognition (epistemic motivation) measured with NCS significantly differentiated methods and strategies (distinguished by Kember et al., 2004) used by students for learning. Therefore, techniques used in the present study should be taken into consideration not only by the students but also their teachers. It seems that an improvement of education effectiveness requires earlier recognition of both epistemic motivations and both motives and strategies used by the students for learning and later for designing adequate pedagogic actions and creation of the didactic situations optimal for the majority of students in a particular group (Szejnberg and Jasiński, 2015).

## CONCLUSIONS:

Analysis of the obtained results enabled to conclude as follows:

- (1) Need of Cognition level in the individuals in high level of NC determines their motives and strategies used for learning.
- (2) Need for Cognition Scale proved to be an effective tool for diagnosing individual differences in the epistemic motivation.

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