Categorisation and Reading Comprehension in Social-Cognitive and Behavioural Sciences

Eva Stranovská[a], Dáša Munková[a], Silvia Hvozdíková[a]*

* Corresponding author: Silvia Hvozdíková, shvozdikova@ukf.sk

[a] *Constantine the Philosopher University in Nitra, Slovakia*

Abstract

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The focus of the study was to examine categorisation or cognitive structuration of foreign language information in the process of foreign language reading and its relation to comprehension of such information. The emphasis is laid on categorisation and the process of reading comprehension and its dependency to cognitive-social and behavioural scienses represented by the study programmes of the research participants and the combination of the study programmes. The research was carried out at the Constantine the Philospher University in Nitra at the individual faculties/schools: Faculty of Arts, Faculty of Education, Facutly of Natural Sciences and Faculty of Central European Studies. The selected students studied English language as an optional subject. The research methods used in the current research study were as follows: PNS Scale (Thomson et al., 2001), test of foreign language competence (based on ISED – the level of language proficiency B1/B2). Results of the research showed dependency of foreign language reading comprehension on desire for structure of the students of behavioural sciences compared to the students of other study programmes from the other examined faculties.

Keywords: Categorisation, reading comprehension, foreign language competence.

1.   **Introduction**

Process of categorisation and cognitive structuration together with closely related constructs are the cores of many social-cognitive and personality centred psychologists (Grežo, Sarmány-Schuller, 2015 Sarmány-Schuller, 2014, Prokopčáková, 2015, Sollár, Turzáková, 2014, Stangor, 2000, and others). They direct their research mainly in examining correlations and personal determinants, which effect preferable ways of categorisation, information processing, decision-making processes coping strategies, etc. Contemporary foreign language research in reading comprehension examines mainly

text comprehension through interactive and learner-centred models of learning (Schwarzová, 2009), then examining reading competence of lower secondary education learners (Straková, 2011) or reading comprehension activities design (Hockicková, 2010, etc.). Research in foreign language reading information comprehension and its categorisation has not been widely examined. Research of cognition and its interaction with specific processes influencing the extent of understanding or missunderstanding of information in foreign language comprehension stays behind. The aim of the current research study was to find a relation between foreign language reading comprehension and desire for structure: simple foreign language information organisation; as well as dependence to lack of structure: response to cognitive load or unpredictable situations; both in relation to the category of cognitive-social and behavioural sciences or faculties, specifically, Faculty of Arts, Faculty of Education, Faculty of Natural Sciences and their mutual combinations.

2. Categorisation and Reading Comprehension in Foreign Language

There are a great number of stimuli affecting human mental analysators that are not possible to be perceived at the same instant. Categorisation perception is one of the stimuli defined as a focus on essential elements, on invariants of perceived phenomenon: foreign language text or speech in the current study; for example, studying about phrases, learning the essentials of phrases, etc. Kelly (in Výrost, Ruisel, 2000) claims that humans create a number of personal constructs based on which they perceive the world: characteristics – dimensions used for categorisation of phenomena and individuals – based on which similarities and differences are determined. The constructs are used for anticipation, prediction of situations. Bar-Tal, Spitzer (1999) defines cognitive structuration or categorisation as an activity, process, which participates in achieving certainty by filtering inadequate information. Furthermore, he states that when information is processed gradually it assimilates in the structure and becomes utilized. Neuberg and Newsom (1993) define cognitive structuration as a means of understanding the relations in the world around. If the system of cognitive structuration is rigid and simple then the same constructs are used all over again and the same mistakes are done over again. Burger's studies (1993, in Ruisel, Výrost, 2000) indicated that individuals with higher level of cognitive structuration achieved better communicative competences and copes with cognitive loads and stressful situations better. Moreover, to create cognitive structures means to learn how to recognise relations between different cultures as defined previously. Cognitive structuration processes in foreign language speech are used in anticipation, prediction of situations, predictions of situational contexts in foreign language text.

The current study emphasises personal need for structure constructs. Personal need for structure is defined as representation of simplified pieces of information, generalisation of previous experience, organisation of information in less complex categories that are used in new ambigous situations in order to sustain certainty (Neuberg & Newsom, 1993). High level of personal need for structure is characterised by high level of instant and simple straightforward answers in order to digress from ambiguous uncertain information. Neuberg & Newsom (1993) identified two conceptually diferentiated factors of personal need for structure: 1) desire for structure, represented by F1: to have

structured environment, and 2) response to lack of structure, represented by F2: response to lack of structure in a given situation. In his study Steinmetz et al. (2011) presented stronger relation between rigidity scale and the factor desire for structure than between the factor response to lack of structure. Possibly the first element is focussed more on the need: personal need for structured, known environment, and the second, more on response, response to uncertain, unstructured environment. Steinmetz et al. (2011) found out correlation between the factor response to lack of structure and adaptability. Response is more related to thinking and coping with uncertain situations. Higher extent of personal need for structure is possibly related to lower adaptability and flexibility.

The current research in the field of foreign language reading comprehension is influenced by the model of Goodman and Smith who state: reading in mother tongue and reading in foreign language are identical processes. Further research was later initiated by the above mentioned model compassing the following hypotheses: 1. Interdependency Hypothesis: reading comprehension in foreign language depends on cognitive skill of reading in mother tongue, which individuals acquire in natural development of mother tongue reading comprehension competence, and 2. Linguistic Threshold Hypothesis: the skill reading comprehension in foreign language depends on language competence in the examined foreign language. As Clarke (1980) states readers with both, lower or higher achievements use the same graphical, syntactical, and semantic indicators in foreign language texts. In the research of Czika (1978) the author indicates that only advanced foreign language or mother tongue readers are able to identify semantic or pragmatic indicators in texts. Thus, the hypothesis of dependency between the level of reading comprehension skills and the level of general language skills was supported. Beginning foreign language readers concentrate their attention to graphical element of texts, more advanced readers, however, use strategies of mother tongue and paralinguistic elements. Allen, Bernhardt, Berr, Demel (1988) claim that understanding of texts increased when dependency on graphical and syntactical elements lowered.

In his research studies Ehler (1998) claimed that foreign language knowledge was insufficient for foreign language reading comprehension. Foreign language readers need to have relevant general knowledge for foreign language text comprehension. The essential for foreign language readers are both processes activation of received knowledge, and its utilisation by connecting it with acquired knowledge. It is a combination of academic, scientific, and social competences. Foreign language use is determined by studying specifically aimed themes and topics written foreign language defined by scientific nature of study programmes. University students learn to apply results of research studies by studying specific academic texts through the means of reading and writing – developing academic competence. The extent of understanding of foreign language texts depends on the reader's disposability of the text scheme and his ability to activate the scheme.

3. Methods

3.1 Research Sample

The current research was carried out at Constantine the Philosopher University in Nitra (CPU in Nitra) during the academic years of 2012/2013, 2013/2014, and 2014/2015. It was attended by 296 students of various study programmes of three faculties of the same university: The Faculty of Arts,

The Faculty of Natural Sciences, and The Faculty of Education. They enrolled for English as an optional class, titled as English for Specific Academic Purposes. They were full-time second year university students attempting for bachelor's degree. The average age of the students was 20.5 years. They had been studying English for nine years in average.

3.2 Hypotheses

The following hypotheses were examined by the correlation analysis and the multivariate analysis stating the following assumptions:

HO1: There is a negative relation between reading comprehension in English and German languages for Specific Academic Purposes and need for structure.

Multivariate analysis of variance (MANOVA) was used for testing global null hypotheses.

The assumption was as follows:

HO: The values of variables in vector of variables (reading comprehension, F1, F2 and PNS) do not depend on study programmes (on the school students attend; faculties (pf- Faculty of Education, ff- Faculty of Arts, fpv- Faculty of Natural Sciences and their combinations- combi)

3.3 Methods

PNS Scale personal need for structure assumes that the ability to reduce uncertainty of situations, cognitive load or ability to organize simplified pieces of information is connected to the ability to manage unpredictable situations. The PNS Scale was invented by Thomson, Naccarato, Parker (2001) and it consisted of 12 items. The PNS construct is based on two-factorial concept of personal need for structure: 1) desire for structure (sub-factor F1), and 2) response to lack of structure (sub-factor F2).

Test of foreign language proficiency (testo) diagnosed foreign language proficiency, specifically, the skill of reading comprehension in English and German languages. The test consisted of 74 items and diagnosed individual language skills in English and German morphology, syntax, lexicology, cultural studies, and reading comprehension. The test was designed according to ISED 3 the level of proficiency B1/B2 by English and German language experts from The Constantine the Philosopher University in Nitra.

4. Results

Table 1 displays statistically significant correlations among examined variables – F1, F2, PNS, reading comprehension test score, in categories identified by the study programmes as behavioural sciences, cognitive-social sciences, natural sciences and pedagogical sciences. The sciences are represented by the individual faculties – Table 1.

Table 1. Correlation matric of examined variables – Combination

Combination of Sciences	Reading comprehension	F1	F2	PNS
Reading comprehension	1.000	-0.097	-0.066	-0.093
F1	-0.097	1.000	0.381	0.741
F2	-0.066	0.381	1.000	0.903
PNS	-0.093	0.741	0.903	1.000
Behavioural Sciences				
Reading_comprehension_test_score	1.000	-0.455	-0.055	-0.244
F1	-0.455	1.000	0.579	0.841
F2	-0.055	0.579	1.000	0.928
PNS	-0.244	0.841	0.928	1.000

Positive relation was found between the factors need for structure and need for categorisation in the category combi – combination of sciences (Table 1). Relation to personal characteristic variable need for structure was not statistically significant. Statistical significance was proved in case of behavioural sciences: Faculty of Arts. The following table displays correlation between behavioural sciences and combination of sciences (Table 1).

Table 2. Multivariate analysis of variance (MANOVA)

	Test	Value	F	Effect df	Error df	p
Intercept	Roy's	24.316	1734.590	3	214.0000	0.000
Faculty	Roy's	0.037	2.670	3	216.0000	0.048

Based on the analysis results the nule hypothesis was refused in case of the faculty with 95 % reliability, statistically significant difference at least in one variable (Table 2).

After refusing of global hypothesis the examination of relations among the factors statistically significant differences in individual variables scores were followed (reading comprehension, F1, F2, PNS).

Table 3. Multiple comparisons displayed – faculties (reading comprehension –RC- F1. F2. PNS)

Faculty	RC	1	2	F1	1	F2	1	2	PNS	1	2
Pf	2.435	****		16.546	****	26.944	****		43.490	****	
Fpv	2.562	****	****	16.000	****	26.281	****	****	42.281	****	****
Ff	2.826	****	****	17.608	****	27.130	****	****	46.739	****	****
combi	3.327		****	17.103	****	29.017		****	44.120		****

Table 3 displays multiple comparisons of identified homogenous groups. The results showed the differences in relations scores in the category faculty and the following individual variables: need for structure, desire for structure, response to lack of structure. The significance was identified. Statistical significance of difference was identified in the variable foreign language reading comprehension between Faculty of Education (*pf*) and the combinations (*combi*) of behavioural, social-cognitive, natural sciences. Moreover, there was statistical significance indicated in differences between factors

natural sciences and behavioural sciences in the variable need for structure. Statistical significance was also proved in the sub-factor response to lack of structure in the following factors: natural sciences, and behavioural sciences. The results proved no statistically significant difference in the factor faculties in case of the sub-factor desire for structure.

5. Conclusion and Discussion

Process of foreign language text information categorisation in relation of reading comprehension in behavioural, social-cognitive, natural and pedagogical sciences was the focus of the attention in the current study. Process of categorisation was determined by the variable personal need for structure PNS and the sub-factors desire for structure F1 (desire to categorise of simple and known information) and response to lack of structure F2 (emotional refusal of categorisation in case of ambiguous information resulting in frustration, intolerance to unknown in the case of the study, foreign language information from a read text). Foreign language reading test score was also one of the variables.

The assumption of negative relationship between need for structure and reading comprehension in English and German languages was confirmed regarding the sub-factor F1 desire for structure in behavioural sciences, specifically, students of the Faculty of Arts. The results showed negative correlation between reading comprehension in English and German languages and desire for structure of faculty of arts' students: the lower desire for structure, the higher achievements in reading comprehension competence and vice versa. Presumably, desire for structure is a predictor for English and German language reading comprehension by the students studying at The Faculty of Arts. The less they simplified texts and experienced cognitive load when categorising information from texts, the more they were aware of semantic, pragmatic, and paralinguistic means, for instance, cultural peculiarities or connotations. They paid less attention to grammar rules, grammar structures, sentence structures or denotations. Significantly, desire for structure was related to foreign language reading comprehension skill, response to lack of structure, however, was not related to foreign language reading comprehension skill in the research study.

The results of the current study supported the claims by Steinmetza (2011) about desire for structure, which directs attention more often to the need for the structured or the familiar when compared to response to lack of structure. The results of the current study indicated reference of the variable *desire for structure* to the need for the structured and organised pieces of information from text, simplification or non-simplification of text in the process of its comprehension. Noticeably, the results indicated statistically significant above mentioned negative correlation only by the students of behavioural sciences, compared to the students of other sciences and their combinations. . Most probably, the students of behavioural sciences were knowledgeable in a wide variety of social sciences including philosophy, history etc. The current study shares the same findings as Carrell, 1983, Steffensen, 1986 assuming any foreign language reader to poses relevant information and knowledge, which are activated and utilised when necessary. Readers are effective readers because when they know how to utilise relevant general knowledge when reading a foreign language text.

The assumption of the hypothesis of the variables reading comprehension RC, F1, F2 and PNS do not depend on the study programmes, or faculties pf, ff, fpv, combi, was confirmed regarding the following variables: RC, F2, PNS. Score of variable RC depended on the study programmes – pedagogical sciences, social-cognitive sciences or combination of more sciences – combi – the results are displayed in the Table 3. The results in reading comprehension of the students of pedagogical sciences showed lower score in comparison to the students studying two programmes. Based on the results, the reference to the level of foreign language competence was speculated. In the previous research studies (Stranovská et al. 2014) the sample students from The Faculty of Education showed low foreign language proficiency and low reading comprehension competences, which corresponded with The Linguistic Threshold Hypothesis (Clarke, 1980, Cziko, 1978, Devine, 1987, and others).

The results of the analyses of the two following factors response to lack of structure F2 need for structure PNS showed differences between the two following variables ff behavioural sciences and fpv natural sciences in the process of reading comprehension (Table 3). The selected students of natural sciences behavioural sciences differed in language processing: organising individual pieces of information in foreign language texts texts, in thinking patterns, and in uncertain situation coping. Behavioural sciences processed information depending on their general knowledge, compared to the selected students of natural sciences who preferred to rely on numbers, biological principles (theory of humans), physics, and math theories more often. Need for structure of the selected behavioural sciences students was higher than the need for structure of the selected students of natural sciences (table 3). Presumably, the selected students of behavioural sciences need higher extent of structure because they need to rely on gained facts and pieces of knowledge in process of categorisation of new pieces of information; they need more routine in information processing. The question is if research among students studying the foreign languages as major programmes, would show comparable results as the results in the current study. It is the matter of further research in the field.

Acknowledgements

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