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PAST, PRESENT AND FUTURE PERSPECTIVES

HARRY BARNES
EDITOR

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This publication is designed to provide accurate and authoritative information with regard to the subject matter covered herein. It is sold with the clear understanding that the Publisher is not engaged in rendering legal or any other professional services. If legal or any other expert assistance is required, the services of a competent person should be sought. FROM A DECLARATION OF PARTICIPANTS JOINTLY ADOPTED BY A COMMITTEE OF THE AMERICAN BAR ASSOCIATION AND A COMMITTEE OF PUBLISHERS.

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This book provides new research on linguistics. Chapter One shows the shortcomings and drawbacks of classical single-factor or unilateral theories of word learning, lexical acquisition, and language development. Chapter Two reviews the Verbal Grammar Correlation Index (VGCI) as a tool of comparative linguistics. Chapter Three discusses academic literacy adaptation in the international graduate students’ use of lexical bundles through corpus research. Chapter Four investigates the role of the implementation of the multisemiotic theory through the analysis of the Orthodox Patriarchs’ photographs.

Chapter 1 - Language represents an intriguing and challenging topic, having fascinated mankind since its dawn. In the current study, the authors’ aim is to show the shortcomings of classical single-factor/unilateral theories of word learning, lexical acquisition, and language development, that generally tend to restrict these processes to single causes, constraints, factors or principles. Such theories imply a unilateral, linear growth pathway of language learning, acquisition, and development. Participants were 128 Moroccan children, 71 boys and 57 girls, aged between 4 and 12 years, all belonging to the social middle class. They lived in Taza city, capital of Taza province, a city in northern Morocco, 120 kilometers east of Fez, with a population of approximately 300,000 citizens, and surrounded by the Rif and Middle Atlas mountains. They were exposed to the two tasks, namely to the task of distinguishing between the appearance and the reality of a word and to the “False Belief Task on Word-Concept”. The authors borrowed both tasks from the theory of mind and tried to adapt them to the field of linguistics, aiming at discovering the child’s ability to distinguish between the signifier as an acoustic-linguistic reality, the signified as a mental entity and the reference as
a physical/material entity. Findings of the current study support the pluralistic mentalist word theory.

Chapter 2 - Method of comparative linguistics based on comparison of lexis allows making different conclusions about the genetic classification of the same language. When different conclusions are based on the same methodology it is the best evidence that such methodology (comparison of lexis) is irrelevant. Language isn’t a heap of lexemes, but is ordered pair \( \langle A; \Omega \rangle \) where \( A \) is set of grammatical meanings and \( \Omega \) is set of positional distributions defined upon \( A \). On the base of such understanding of language was elaborated Verbal Grammar Correlation Index (VGCI). The main idea of VGCI is simple: more closely related languages have more alike sets of grammatical meanings and their common meanings are distributed in more alike positions, so the index of correlation of more closely related languages is higher. VGCI is the direct comparison of languages which exist/existed in reality. VGCI works with pure structures (it doesn’t use any reconstructions or comparison of material exponents). Tests of VGCI on the material of firmly assembled stocks (Austronesian; Indo-European; Sino-Tibetan) showed the following: if value of VGCI is about 0.4 or higher it means that compared languages are related; if value of VGCI is about 0.3 or lower it means that compared languages aren’t related. With use of VGCI have been found relatives of Ainu language (Great Andamanese language and Sino-Tibetan stock) and has been proven relatedness of Austronesian and Austroasiatic stocks. VGCI can be extremely useful in the fields of genetic classifications of indigenous languages of the Americas, Papuan languages and Australian Aboriginal languages.

Chapter 3 - More and more international students come to the United States to study in higher education. Due to the increasing number of the population, international students are considered crucial for the economic and social impact on academia in the U.S. For instance, they have contributed more than 30.8 billion dollars to the economic vigor of the U.S. higher institutions and their communities. However, international students’ adaptation may not be successful due to several reasons. One of them would be their language proficiency—in particular, productive language skills: writing and speaking. In the academic setting, many international students struggle with their written assignments in English. Acknowledging the international students’ challenge of academic writing in English, this study investigated international graduate students’ academic literacy adaptation via corpus research. The use of lexical bundles was examined as one of the academic literacy adaptation indicators in this corpus-based study. The results revealed
that the students did not use stance lexical bundles, indicating that they may not express their own voices in critical reviews. Rather, they tend to write carefully to reflect the original articles. This study suggests that the authors should view international students’ academic literacy adaptation with larger corpus data. Further implications of the findings are discussed.

Chapter 4 - The paper investigates the role of the implementation of the multisemiotic theory through the analysis of the Orthodox Patriarchs’ photographs. The research is based on the multisemiotic theory by Kress and van Leeuwen and supports the view that semiotic codes are used in specific historical, cultural and institutional contexts. It is customary for people to communicate the meaning referring to various codes, depending on the contexts, as codes are not only planned, taught, justified, but also criticized. The authors of this paper make an attempt to prove the hypothesis that Russian and Indian respondents code similar photos differently due to their cultural/ideological backgrounds. According to Kress and van Leeuwen, pictures are images that convey an interactive meaning. Thus, the main focus of the research is on the image viewer interaction. The present study examines the data obtained from 526 official photographs of the Patriarchs and consists of several stages. At the first stage two groups of coders (Indian and Russian) were created. The selected groups were provided to code the collected corpus of photos (in total 526 photographs) autonomously. In case of discrepancies between the coding images, the agreement was terminated by two national coders collaboratively. At the second stage, the semi-structural interviews with the coders were conducted. The interviews allowed to identify and reveal similarities and differences in photo perception. The results of the study show, that the multisemiotic theory can be entirely employed and serve as an effective tool in image analysis within different cultures through identifying the interpersonal (interactive) metafunction. As the research demonstrates limitations like small amount of studied samples and a low number of Indian participants’ opinion provided in the Russian Federation, further research in India is recommended.
Chapter 1

CHILDREN AS LITTLE LINGUISTS

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ABSTRACT

Language represents an intriguing and challenging topic, having fascinated mankind since its dawn. In the current study, our aim is to show the shortcomings of classical single-factor/unilateral theories of word learning, lexical acquisition, and language development that, generally tend to restrict these processes to single causes, constraints, factors or principles. Such theories imply a unilateral, linear growth pathway of language learning, acquisition, and development. Participants

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were 128 Moroccan children, 71 boys and 57 girls, aged between 4 and 12 years, all belonging to the social middle class. They lived in Taza city, capital of Taza province, a city in northern Morocco, 120 kilometers east of Fez, with a population of approximately 300,000 citizens, and surrounded by the Rif and Middle Atlas mountains. They were exposed to the two tasks, namely to the task of distinguishing between the appearance and the reality of a word and to the “False Belief Task on Word-Concept”. We borrowed both tasks from the theory of mind and tried to adapt them to the field of linguistics, aiming at discovering the child’s ability to distinguish between the signifier as an acoustic-linguistic reality, the signified as a mental entity and the reference as a physical/material entity. Findings of the current study support the pluralistic mentalist word theory.

Keywords: language acquisition and development; mentalist word theory, meta-cognition, meta-language, meta-representation, meta-semantics, meta-theory of mind, pluralistic coalition model, theory of theories.

1. The Different Conceptual Frameworks Concerning Language/Meta-Language Acquisition and Development and the Main Goals of the Present Study

Language represents an intriguing and challenging topic, having fascinated mankind since its dawn. In order to dissect this mystery, the Egyptian pharaoh Psamtik I, the Holy Roman Emperor Frederick II and the King James IV of Scotland carried out a “forbidden experiment,” namely the so-called “language deprivation experiment”, in which they isolated a sample of children and raised them with no human interaction, in order to verify to which language the first words would belong.

In the current study, our aim is to show the shortcomings and drawbacks of classical single-factor or unilateral theories of word learning, lexical acquisition, and language development, that generally tend to restrict these processes to single causes, perceptual/cognitive constraints (namely, reference, mutual exclusivity, shape, “whole object assumption” and “taxonomic assumption”), social factors or principles (such as innate forces, parent-child interaction, cultural scaffolding, self-construction, relevance, salience or the “dumb attentional mechanism”, among others).
Such theories, like the cognitive heuristic, the social-pragmatic or the associationistic conceptual frameworks, imply a unilateral, linear growth pathway of word learning, lexical acquisition, and language development, which is the same for all children worldwide.

For example, according to associationism, as stated by Paul Bloom (2006), “if two thoughts occur at the same time, they become associated, and one gives rise to the other. Children learn the meaning of rabbit, then, because the word is used when they are observing or thinking about rabbits. As a result, the words and the thoughts become associated, and children could be said to have learned what the word means”. Ellen Markman, while working on 4-years-old children, showed that taxonomic constraint could be a major driver in language acquisition and development (Carey & Markman, 1999).

However, these theories fail to explain language acquisition and development in “real-world” contexts and situations.

In order to overcome these limitations, we have adopted a different approach, namely the pluralistic paradigm called the “emergentist coalition model” (ECM; Hollich, Hirsh-Pasek & Golinkoff, 2000; Hirsh-Pasek, Golinkoff, Hennon & Maguire, 2004). According to this theory, multiple, differentially weighted factors, interacting in complex, non-linear ways, may contribute to word learning, lexical acquisition, and language development, as well as to the formation of the mentalist word theory. In particular, this approach is characterized, both in its formation and its functioning, by various types of variability, observable at different levels (namely, inter-individual, intra-individual, inter-contextual and cross-cultural).

Hence, the mentalist word theory is not governed by a linear pathway and a straight trajectory, but is represented by a highly dynamic and complex process. Thanks to multiple, co-occurring cues, children would, first, acquire word learning principles, which are supposed to guide the following processes of lexical acquisition, vocabulary building and language development. These different steps also reflect specific developmental phases: for example, during infancy, attentional mechanisms could drive the process of mapping labels to “non-boring” objects, whilst, subsequently, in 10-month-old children the principle of “conceptual saliency” could prevail, and in 18-month-old children’s social cues, such as eye gaze and object handling, could guide the cognitive processes (Hollich, Hirsh-Pasek & Golinkoff, 2000; Hirsh-Pasek, Golinkoff, Hennon & Maguire, 2004).
In particular, our research questions were:

1) To which extent is the growth of the mentalist word theory in accordance with the principles of the pluralistic paradigm and, more specifically, in line with the multi-variability principle?

2) Which are the factors that may contribute to the acquisition, formation, development and refinement of the mentalist word theory?

2. What Is a Mentalist Word Theory

The concept of a mentalist word theory emerges from various modern psycho-cognitive approaches which underline that the young child, even before attending the school, is capable of building naïve (folk) theories about his/her own self and the world surrounding him/her. These theories enable him/her to understand and explain various phenomena, including complex ones. In other words, the child sometimes behaves like a novice scientist, reflecting upon himself/herself and the rest of the world.

He/she builds such theories on specific mental domains which deal with different phenomena occurring within his/her environment (Melot, 1997). Thus, he/she constructs naïve theories in physics (Spelke, Vishton & Hofsten, 1995), in biology (Gutheil, Vera & Keil, 1998) and also in psychology (Flavell, 2001).

Here in the current study, however, we will attempt to uncover another type of naïve theories: the child’s naïve linguistic theory. It is worth noting here that our understanding of the naïve linguistic theory has nothing to do with the Chomsky’s concept. Rather, it is based on various concepts within the theory of theories or the meta-theory or the theory of mind. Our definition of the above-mentioned concept is then dependent on the answer to this central question:

To what extent is the child at a certain age able to distance himself/herself in a conscious and neutral manner from language as a topic for reflection far away from day uses, or, in other words, to what extent is the child able to behave the way the linguistic researcher does?

Since language is a vast domain, we will limit ourselves to a relatively small component of it: namely, the word. We will attempt to investigate how the child formulates his/her mentalist word theory.

First point: what do we mean by a mentalist word theory?
We could explain this concept, starting from the definition of meta-semantics. When we talk about meta-semantic related activities, we refer to a person’s awareness and consciousness of the arbitrary relationship between a word and its reference. In other words, meta-semantics is the part of a meta-language that deals with semantics. Some scholars define meta-semantics as the philosophy or the metaphysics of semantics.

To be more specific, referring to the three definitions of meta-semantics given by the researchers Alexis Burgess and Brett Sherman (2014), for meta-semantics we do not mean the basic meta-semantics (which aims to describe the grounds or metaphysical bases of semantic facts) or the metaphysics of semantic values (which deals with issues such as how semantic values should be thought of), but rather the theory of meaning (which explains or tries to explain the nature or essence of the semantics). As such, meta-semantics, dealing with analyzing and relating different concepts, aims to build a conceptual space within which semantic theories can be thought, formulated and developed.

The mentalist word theory, as we mean it, is a concept larger than the mere meta-semantic related dimension/activity. Indeed, a person’s mental activity in forming and developing his/her mentalist word theory is not limited to self-representation and self-awareness of the kinds of the arbitrary relationship between a word and its reference, but includes also his/her ability to make representations of his/her own representations, comparing these representations with those expected to be formulated by other people. In other words, for mentalist word theory, we mean that ability to create meta-representations of one’s own representations, in order to check one’s own and others’ understanding of the arbitrary relationship between a word and its reference. In more precise words, the mentalist word theory includes the skill to check to what extent oneself is capable of judging his/her own and others’ beliefs about the word.

In order to discover the child’s mentalist word theory, we used these two tasks:

The first is the task of distinguishing between the appearance and the reality of a word, and the second is the task of evaluating the child’s capacity and ability to detect false beliefs about the word-concept.

We borrowed both tasks from the theory of mind and tried to adapt them to the field of linguistics, aiming at discovering the child’s ability to distinguish between the signifier as an acoustic-linguistic reality, the signified as a mental entity and the reference as a physical/material entity.
The first task, then, aimed at measuring the extent to which a child is capable of distinguishing the word as a linguistic reality from the non-word as a mere linguistic phenomenon which does not refer to any linguistic reality.

The second task aimed at looking closely at the child’s ability to understand others’ perception of the relationship between a word and its reference.

3. THEORETICAL REFERENCES AND METHODOLOGICAL COMPONENTS

3.1. Theoretical References

Viewing the mentalist word theory from a coalition-pluralistic angle/ECM perspective requires us to first introduce the main characteristics and principles of the pluralistic paradigm, and second to briefly review the extant literature related to the pluralistic-coalition approach advocated by the theory of theories in general and the mentalist word-theory in particular.

3.1.1. The Characteristics, Principles, and Stakes of the Pluralistic Paradigm

The main challenge for the pluralistic paradigm of the ECM is to overcome the shortcomings that plague and limit single-factor theories and unilateral models in explaining the growth and functioning of knowledge.

In the current study, when we speak of unilateral conceptual frameworks, we specifically refer to Jean Piaget’s developmental stage theory, as well as to the Neo-Pagetian theories further developed and refined by his disciples (namely, Juan Pascual-Leone, Robbie Case, Graeme S. Halford, Kurt W. Fischer and Michael Commons, among others). It is well known that these unilateral approaches have dealt with the self from an epistemological viewpoint. In their conceptual frameworks, this self is characterized by stereotypes both in its growth and functioning that take the form of general rules (whole structures, hierarchical integration, and growth subordination, among others), which evolve in a linear, steady and increasingly growing pathway pertaining all cognitive domains and for all children worldwide, with no subject- and culture-related differences and nuances.

On the contrary, proponents of the pluralistic paradigm have stressed that the self is a psychologically complex, multi-faceted and variable concept;
whose growth and development are characterized by various degrees and types of variability (as already mentioned, inter-individual, intra-individual, inter-contextual and cross-cultural variability) (Troade & Martinot, 2001).

The knowledge-building mechanisms of this self are also varied in that they are not limited to coordination or integration as Piaget believed, rather they extend to incorporate also impoverishing processes that continually disqualify a competence for a better one.

Hence, we can divide the knowledge-building mechanisms into two groups: the group of disqualification mechanisms and the group of enrichment mechanisms, as proposed by Mounoud (1990).

The set of impoverishing mechanisms deals with inhibiting one skill and keeping another active and well functioning (Houde, 1999; Houdé & Guichart, 2001). Other important differential mechanisms are given by the operations of interaction and of vicariance between processes; that is to say the skill of substituting and replacing one process with another fulfilling the same function, according to a given context or situation (Reuchlin, 1978; De Ribaupierre, 2005).

These principles stem from the more general principle of “cognitive redundancy”. We can, also, include in this category of processes the operation of modularization which enables to distinguish a cognitive structure from another by making it more refined and specialized (Karmiloff-Smith, 1998; Fisher & Yan, 2002).

Whereas the group of enrichment mechanisms includes: i) the operation of bridging between different cognition domains (Demetriou & Kazi, 2001), or between various skills (Granott, Fischer & Parziale, 2002), ii) the processes of coalition that seek to create a conceptual change by integrating two different cognitive domains until they take the form of a new domain (Carey, 1985), and iii) the processes of representational re-description (Karmiloff-Smith, 1992) which aim at optimising a communication between all cognitive domains, by transforming implicit knowledge of each domain into an explicitly coded, formal knowledge.

These mechanisms can guarantee some kind of synergy and interaction between the cognitive processes of our knowledge system (Lautrey, 2003). Moreover, in an advanced level of growth, this dynamic synergy between processes may contribute to the foundation of a conscious knowledge that can take the form of a meta-concept (Carey, 1991) or of a hyper-cognitive domain, together with self-awareness and self-regulation (Demetriou, 1998).

Since the pluralistic conception within the ECM stresses that the growth of cognitive mind is based on varied patterns of unevenness, varied
mechanisms of functioning and flexibility of its cognitive systems, it will not restrict itself to a linear, progressive and steady pathway only, but would rather be as varied as the variegation of cognitive domains and the diversification of forms of variability affecting the cognitive mind.

Hence, the growth of knowledge will oscillate between recession and regression in one area and progression and stability in another. Thus, the multiple pathways of growth are like a spider’s web or a network (Fischer, Yan & Stewart, 2002).

3.1.2. The pluralistic Approach of the Theory of Theories

Many modern researchers have tried to approach the theory of theories with a pluralistic view that is characterized by the principles that we have briefly explained in the previous paragraphs.

To be concise, these authors took a fairly critical stand towards a number of unilateral Piagetian concepts, such as the principles of whole structures and hierarchical growth (Fischer & Immordino-Yang, 2002). Moreover, they also refused to consider the small child, in the early years of his/her life, as an empty vessel or as a mere sensory-motor being, but rather they viewed him/her as a pluralistic subject capable of producing advanced, symbolic knowledge. They also abandoned the idea of dividing growth into stages of unilateral knowledge and, instead, asserted that this growth is characterized by different levels of varied domains of knowledge (Karmiloff-Smith, 1997; Mounoud, 2000).

They also challenged the Fodor’s principle of modularity of mind and modular system of knowledge since this conceptual framework claims that knowledge functions according to a hierarchical, inevitable and stereotypical way (bottom-up), and that its modules are self-contained, independent and non-interactive.

Instead, they proposed a conceptual framework relying on dynamic systems whose style of treating knowledge varies according to the factors affecting it. Furthermore, they stressed that mental domains are not separate from each other but rather participate all together in an interactive way according to coalition relationships that end up formulating new specific domains. This would enable the mind to attain high levels of cognitive flexibility that sometimes take the form of meta-cognition (Karmiloff-Smith 1997; Carey 1985; Spelke, 2003; Vosniadou, 2007).

Moreover, they called for reconciliation between the constructional, the innate, and the social theories by stressing that mental knowledge is not wholly innate but rather pseudo-innate, and, as such, while growing, it has to
Children as Little Linguists

maintain an interactive relationship with the dynamic system of knowledge, on one hand, and the environment, on the other hand, so that it will develop and grow into mature knowledge.

According to this view, mental domains should not be considered as specialized from the very beginning but rather pseudo-specialized (relevant domains). It is only thanks to the continuing operation of distinguishing and modularizing that i comes to draw and re-draw their epistemological frontiers. This would occur according to the nature of interactions between the dynamic system of knowledge, its innate constraints and the new inputs it gets from the surrounding environment (Karmiloff-Smith 1994; Carey & Spelke, 1994).

3.1.3. The Mentalist Word Theory and the Pluralistic Coalition Conception

We would like to notice that the nature of the theses that we discussed earlier are those in line with the main topic of this study. This is in the sense that they view the mentalist theory from two main perspectives:

The first perspective is pluralistic in the sense that the authors and researches that promote this conceptual framework admit that language, as the mentalist word theory or the acquisition of other processes, is subject to various kinds of variance such as: intra-individual variability (Bassono, 1998), inter-individual variability (Karmilof-Smith, 1997), inter-contextual variability (Karmiloff-Smith, Grant, Sims, Jones & Cuckle, 1996) and inter-linguistic/intercultural variability (Gopnik & Choi, 1995).

Furthermore, the development of the mentalist word theory is not restricted to progressive and accumulative pathways only but is rather subject also to unsteadiness, collapse and mutation (Bassono, 1999). It, therefore, takes the form of an unpredictable scallop-like trajectory.

The second perspective is coalitional in the sense that the scholars stress that multiple factors intervene in the formulation of the child’s mentalist word theory. One such factor is the innate factor in the form of specific principles that guide the child’s acquisition of the word-concept and his/her development of a theory hereupon (Hollich et al., 2000).

The socio-cognitive theory claims that language acquisition and development is driven by socio-cognitive factors, that can be demonstrated in the fruitful cooperation between the adult and the child learning a language (Carpenter, Nagell & Tomasello, 1998). Constructive factors include two distinct dynamics.

The first dynamics is characterized by complex, subtle modularising/specializing/discriminating processes and events whose role and activities
result into the transformation of the domain of language from a vague domain (relevant domain) into a domain with well-defined concepts and with distinct epistemological characteristics (Carey, 1991).

The second dynamics is cooperative, meaning that the domain of language is not isolated from other cognitive domains but is rather open, interacting and cooperating with them, and this occurs through importing many cognitive processes that are of considerable help in its construction (Spelke, 2003).

3.2. Methodological Components

3.2.1. Hypotheses
The main working hypotheses that we formulated were:

1) The development of the mentalist word theory is mainly governed by the multi-variability principle.
2) Various and different factors intervene in the acquisition and subsequent development of the mentalist word theory.

3.2.2. Participants
Participants were 128 Moroccan children, 71 boys and 57 girls, aged between 4 and 12 years, all belonging to the social middle class. They lived in Taza city (in Arabic language: تزات), capital of Taza province, a city in northern Morocco, 120 kilometers east of Fez, with a population of approximately 300,000 citizens, and surrounded by the Rif and Middle Atlas mountains.

We randomly chose the population from two schools (namely, the “Petit Prince” kindergarten and school, and the “Fatima Al Fehria” school for elementary education). We concentrated specifically on children whose ages were in line with the legal ages set forth for education levels. Hence, the variable of education and age were integrated in one single variable, that is to say the schooling/age variable. Thus, we used the same symbol to refer to both variables (Table 1).

3.2.3. Experiment
This experiment was made up of two tasks that were in their turns divided into several items.
3.2.3.1. The Task of Distinguishing the Linguistic Appearance from the Linguistic Reality of a Word

The aim of this task was to assess the subject’s ability to differentiate between the word as a linguistic reality (that in addition to its phonetic structure has a semantic meaning and a reference in reality) from the non-word (which has no sense and no reference because it is not a real word in any language).

Task, Items and Procedures

Before administering the different tasks, we explained the main objectives of our investigation to the recruited subjects. We specified that we wanted them to distinguish between the word as a linguistic reality because it has a meaning and refers to an object in reality, and the non-word which, even though for its linguistic structure, could appear to be a word, is not a real, existing word, because it has no meaning and does not refer to any subject in reality.

We, then, presented the subjects with two words (namely, “/madrasa/” or “school”, an existing word in Arabic language and “dattaà” as a non-word) as two examples of what we meant with the concept of existing word and the concept of non-word.

 Afterwards, we presented them with the following instructions: i) to say whether these utterances are words or just random clusters of sounds that appear to be like words but are not; and ii) to justify their given answer.
These instructions applied to the following four utterances:

First item: first utterance “/kalimal/” (meaning “word” in Arabic language)
Correct answer: 1. Incorrect answer: 0.

Second item: second utterance “/sabsabsabf/” (a non-word)
Correct answer: 1. Incorrect answer: 0.

Third item: third utterance “/rajolf/” (meaning “man” in Arabic language).
Correct answer: 1. Incorrect answers: 0.

Fourth item: fourth utterance “/bibibibiqf/” (a non-word).
Correct answer: 1. Incorrect answer: 0.


3.2.3.2. The False Belief Task on the Word-Concept

The aim of this test which is made up of five items was to measure the subjects’ ability to evaluate the beliefs of others regarding the concept of the word, in other words, this test aimed at verifying the child’s ability in hypothesizing the others’ ability to distinguish between the word as a mental linguistic reality and its reference as a material, physical reality.

The items of the task take the form of scenarios characterized by a narrative nature with characters such as the teacher, the mother, the father and peers, and Alice in Wonderland. The aim was to create natural, engaging and motivating contexts so that the subject would easily interact with the task on one hand, and positioning himself/herself in indirect situations so as to discover his/her opinion of the others’ belief regarding the word-concept.

In this regard, we agree with Karmillof-Smith et al. (1996) in stressing that indirect procedures which rely on games or narration are more effective than direct procedures such as explicitly asking “What does this word mean?” or giving instructions like “Divide this sentence into words”.

Task Items, Instructions and Procedures

Item (1): the subject was presented with the following scenario and was asked to evaluate it. “I asked Ali, a child with your age: “What is the biggest
word in this sentence: “/dahabi tu ma’a alasa di qe a aala matni al qitar/” (meaning “I went with friends by train”, in Arabic language)? Ali answered that the biggest word was “the train”. I asked him why and he said that the biggest word was the train “because the train is the longest means of transportation. I asked Lamia, a girl one year younger than you, the same question and she said that “the train” was not the biggest word in the sentence but the correct answer was rather “friends” “because it is made up of a larger number of words than the other words in the sentence [“words” instead of “letters”]. Who do you think is right? And why?”

Scoring: appropriate answer 2, incomplete answer 1, inappropriate answer 0.

Item (2): the subject was presented with the following scenario and was asked to evaluate it. “We asked your father this question: “What is the smallest word in this sentence: “/adoda qor ba zahra/” (meaning “The worm is near the rose”, in Arabic language)?” and he answered “the worm” “because it is a very small insect”. We also asked Mustafa, a student, the same question and he answered “/qor bal/” (meaning “near”, in Arabic language) “because it has the smallest number of letters than the rest of the words in the sentence”. Who do you think is right? And why?”

Scoring: the same as previous item 1, that is to say appropriate answer 2, incomplete answer 1, inappropriate answer 0.

Item (3): the subject was presented with this scenario and was asked to evaluate it. “I asked your teacher to draw the word “ghost” (“/chabah/”, in Arabic language) and she gave me this (I presented him/her with a ghost picture). Then I asked your mother to draw the word “ghost”, but she answered that it is not possible to draw the word “ghost” “because the word can be read, written and uttered, but we can only draw a picture of a ghost, not a picture of the word “ghost”. As such, the task is not feasible”. In your view, was the teacher right? Or was your mother right? Can we draw the word “ghost”? How? Why?”

Scoring: the same as previous item 1, that is to say appropriate answer 2, incomplete answer 1, inappropriate answer 0.

1 We use the symbols of the International Phonetic Association (IPA) in order to transcribe Arabic utterances.
Item (4): the subject was presented with the following scenario and was asked to evaluate it. “I asked your friend Osama to buy me a candy with the word “/dirham/” (which is a Moroccan currency, in Arabic language). He shouted at me and said that he could not buy a candy with the word “/dirham/” because it is just a word’. Therefore, he asked me to give him a real “/dirham/” to buy a candy. Now, can you buy a candy with the word “/dirham/”? How? Why?”

Table 2. Symbols of the mentalist word theory-based experimental items

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Items</th>
<th>Symbols</th>
</tr>
</thead>
<tbody>
<tr>
<td>The task of distinguishing between linguistic appearance and linguistic reality of a word</td>
<td>Item 1</td>
<td>Word</td>
</tr>
<tr>
<td></td>
<td>Item 2</td>
<td>Sabs</td>
</tr>
<tr>
<td></td>
<td>Item 3</td>
<td>Man</td>
</tr>
<tr>
<td></td>
<td>Item 4</td>
<td>Bibib</td>
</tr>
<tr>
<td></td>
<td>Overall scoring of items</td>
<td>OSI</td>
</tr>
<tr>
<td>False belief task on word concept</td>
<td>Item 1</td>
<td>Train</td>
</tr>
<tr>
<td></td>
<td>Item 2</td>
<td>Worm</td>
</tr>
<tr>
<td></td>
<td>Item 3</td>
<td>Ghost</td>
</tr>
<tr>
<td></td>
<td>Item 4</td>
<td>Dirham</td>
</tr>
<tr>
<td></td>
<td>Item 5</td>
<td>Alice</td>
</tr>
<tr>
<td></td>
<td>Overall scoring of items</td>
<td>OSI</td>
</tr>
</tbody>
</table>

Scoring: the same as previous item 1, that is to say appropriate answer 2, incomplete answer 1, inappropriate answer 0.

Item (5): the subject was presented with the following scenario and was asked to evaluate it. “Alice travelled to Wonderland, a strange place, completely different from other places in the world; there, she found Humpty Dumpty who changed the dog’s name and called it “cat” and so the dog began to cry like a cat. He also changed the cat’s name and called it “dog” so it began to bark like a dog. All this happened in Wonderland. Do you think that this would be possible in our real world? Can we change animals’ cries and characteristics by changing their names? How? Why?”

Scoring: the same as previous item 1.

Overall scoring (OSI): The sum of the expected ideal theoretical answers (2x5= 10).
4. ANALYSIS, EXPLANATION AND DISCUSSION OF RESULTS

4.1. Analysis of Results

4.1.1. The Task of Discriminating Linguistic Reality from Linguistic Appearance

4.1.1.1. Effect of the Age/Schooling Factor on the Subjects’ Answers in the Task of Discriminating Linguistic Reality from Linguistic Appearance

Table 3. Means and percentages of correct answers in the task of discriminating linguistic reality from linguistic appearance, according to age/schooling variable

<table>
<thead>
<tr>
<th>Schooling/age</th>
<th>Word</th>
<th>Sabs</th>
<th>Man</th>
<th>Bibib</th>
<th>OSI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>Mean</td>
<td>%</td>
<td>Mean</td>
<td>%</td>
</tr>
<tr>
<td>A</td>
<td>68</td>
<td>0.68</td>
<td>87</td>
<td>0.87</td>
<td>81</td>
</tr>
<tr>
<td>B</td>
<td>93</td>
<td>0.93</td>
<td>100</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>C</td>
<td>93</td>
<td>0.93</td>
<td>100</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>D</td>
<td>93</td>
<td>0.93</td>
<td>93</td>
<td>0.93</td>
<td>100</td>
</tr>
<tr>
<td>E</td>
<td>100</td>
<td>1</td>
<td>100</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>F</td>
<td>100</td>
<td>1</td>
<td>100</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>G</td>
<td>100</td>
<td>1</td>
<td>100</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>H</td>
<td>100</td>
<td>1</td>
<td>100</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>All</td>
<td>93</td>
<td>0.93</td>
<td>97</td>
<td>0.97</td>
<td>97</td>
</tr>
</tbody>
</table>

Analysis of variance (ANOVA) revealed that the means of OSI varied significantly with the age factor ($F_{(7,120)}=6.18$, $P<0.001$). Table 3, however, showed that the lowest value for correct answers recorded for the four-year-old subjects exceeded 70% with a mean of 3.18, while the eight-year-old group got the highest value of correct answers (100%) with a mean of 4. The five-year-old and the six-year-old groups got 98% with an mean of 3.93. This value decreased to 96% with a mean of 3.87 when considering the seven-year-old group.

This showed that there was no a clear pattern of sustained increase that started with a lower level and moved on to a higher one, as we found that about 79% of the lowest age group were capable of distinguishing between the
linguistic reality of a word and its linguistic appearance (resemblance). Further, since the age of six years, the subjects’ answers seemed to satisfy enough the required value of correct answers which was achieved at the age of eight years.

Although the subjects’ answers to the “word” item varied significantly according to the age factor (F(7,120)=3.42, P <0.01), we should notice that its lowest percentage exceeded the percentage of 60% for the youngest age group, while the five-, six- and seven-year-old groups scored 93%, with a mean of 0.93. These values were close to 100% (with a mean of 1), which was achieved by the groups of eight-year-old and older children (as can be seen in Table 3).

The mean values of correct answers to the items “man” and “bibib” varied significantly with age (“man” item: F(7,120)=3.46, P <0.01; “bibib” item: F(7,120)=3.46, P <0.01).

This variance, however, did not take the form of a sustained increase as six-year-old and older children reached the ideal percentage of 100% with a mean of 1. Subjects belonging to the four-year-old group approximated this value as they scored 81% with a mean of 0.4 in both items (as can be seen in Table 3).

Concerning the “bibib” item, we should notice that answers were not affected by the age factor (F(7,120)=1.54, not statistically significant), and this means that the mean values of correct answers for different age groups were quite close to each other with regards to this item.

4.1.1.2. The Effect of the Horizontal Comparison Factor on the Subjects’ Answers to the Task of Distinguishing between Linguistic Reality and Linguistic Resemblance

Performing our experiment, we were able to observe that the difference in all subjects’ answers to the items of the task of distinguishing between linguistic resemblance and linguistic reality of a word, was not statistically significant (F(3,360)=2.26, not statistically significant).

This proves that task items, regardless of their being varied, did not affect the performance of the subjects in a statistically significant way. In other words, the number of correct answers of all subjects to the different items was relatively the same, in that the lowest value scored for the “word” item 93% with a mean of 0.93, whereas other items scored the same value (that is to say, 97%) and the same mean value of 0.97 (as can be seen in Table 3 and in Figure 1).
Figure 1. Percentages of correct answers given by all population in replying to the items of task of distinguishing between linguistic appearance and linguistic reality.

4.1.1.3. The Level of Interaction between Age and Horizontal Comparison Factors in the Task of Distinguishing between Linguistic Appearance and Linguistic Reality of the Word

The interaction between the age factor and the horizontal comparison factor appeared to be not significant ($F_{(21,360)}=0.67$, not statistically significant). This in turn shows some relative similarities between the growth pathways of subjects’ answers to different task items (as can be seen in Figure 2).

Figure 2. The growth pathways of subjects’ answers to different items of distinguishing between linguistic appearance and linguistic reality.
4.1.2. False Belief Task on Word-Concept

4.1.2.1. Effect of the Age-Schooling Factor on the Subjects’ Answers to False Belief Task on Word-Concept

Table 4. Percentages of correct answers and insufficient answers to the false belief task on word-concept

<table>
<thead>
<tr>
<th>Items</th>
<th>Train</th>
<th>Worm</th>
<th>Ghost</th>
<th>Dirham</th>
<th>Alice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schooling/age groups</td>
<td>Correct answers</td>
<td>Insufficient answers</td>
<td>Correct answers</td>
<td>Insufficient answers</td>
<td>Correct answers</td>
</tr>
<tr>
<td>A</td>
<td>12</td>
<td>25</td>
<td>25</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>B</td>
<td>37</td>
<td>6</td>
<td>31</td>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td>C</td>
<td>81</td>
<td>0</td>
<td>75</td>
<td>0</td>
<td>45</td>
</tr>
<tr>
<td>D</td>
<td>94</td>
<td>0</td>
<td>94</td>
<td>6</td>
<td>81</td>
</tr>
<tr>
<td>E</td>
<td>100</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>69</td>
</tr>
<tr>
<td>F</td>
<td>94</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>69</td>
</tr>
<tr>
<td>G</td>
<td>94</td>
<td>0</td>
<td>94</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>H</td>
<td>100</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 5. Means of correct answers and insufficient answers to the false belief task on word-concept

<table>
<thead>
<tr>
<th>Items</th>
<th>Train</th>
<th>Worm</th>
<th>Ghost</th>
<th>Dirham</th>
<th>Alice</th>
<th>OSF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schooling/age groups</td>
<td>Mean</td>
<td>Mean</td>
<td>Mean</td>
<td>Mean</td>
<td>Mean</td>
<td>Mean</td>
</tr>
<tr>
<td>A</td>
<td>0.5</td>
<td>0.5</td>
<td>0.06</td>
<td>0.37</td>
<td>0.5</td>
<td>2</td>
</tr>
<tr>
<td>B</td>
<td>0.81</td>
<td>0.68</td>
<td>0.93</td>
<td>1.37</td>
<td>1.31</td>
<td>5.12</td>
</tr>
<tr>
<td>C</td>
<td>1.62</td>
<td>1.5</td>
<td>0.87</td>
<td>1.25</td>
<td>1.62</td>
<td>6.81</td>
</tr>
<tr>
<td>D</td>
<td>1.87</td>
<td>1.93</td>
<td>1.62</td>
<td>1.5</td>
<td>1.93</td>
<td>8.81</td>
</tr>
<tr>
<td>E</td>
<td>2</td>
<td>2</td>
<td>1.37</td>
<td>1.937</td>
<td>2</td>
<td>9.31</td>
</tr>
<tr>
<td>F</td>
<td>1.87</td>
<td>2</td>
<td>1.87</td>
<td>2</td>
<td>2</td>
<td>9.75</td>
</tr>
<tr>
<td>G</td>
<td>1.87</td>
<td>1.87</td>
<td>2</td>
<td>1.875</td>
<td>2</td>
<td>9.62</td>
</tr>
<tr>
<td>H</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>10</td>
</tr>
</tbody>
</table>
ANOVA unveiled that the mean values of OSF varied significantly through age evolution \((F_{7,120}=35.250, P <0.001)\). The extreme values related to four-year-old and eleven-year-old groups, respectively, which ranged between the mean of 2 and 10 (Table 5).

Insufficient answers to the “train” item were restricted to the four-year-old subjects with a percentage of 25% and to the five-year-old group with a percentage of 6%. Correct answers, however, covered different age groups, and they were situated between the percentage of 100%, obtained by the eight-year-old and the eleven-year-old groups, and the percentage of 12% observed in the five-year-old group.

Generally speaking, what is noticeable is that the means of the “train” item also changed with age evolution \((F_{7,120}=15.691, P <0.001)\), as it was subject to a gradual increase that reached the highest level with the eight-year-old group, while slightly decreasing with the nine- and ten-year-old groups and getting back with 11-year-old subjects to the same high level obtained by the 8-year-old group.

If insufficient answers to the “worm” item were given only by the 4-, 5- and 6-year-old groups with a marginal percentage of 6%, correct answers, however, covered all age groups, and ranged between 25%, observed for 4-year-old subjects, and 100% observed for the 8-, 9-, 11-year-old groups. Therefore, the means of the “worm” item increased significantly with age evolution \((F_{7,120}=17.651, P <0.001)\), in a linear trajectory, attaining the highest value with 8- and 9-year-old subjects, slightly declining with 10-year-old subjects and getting back with 11-year-old subjects to the same high value obtained by the 8- and 9-year-old groups.

Further, other points that should be noticed are the following ones:

- Insufficient answers to the “ghost” item were observed with four-year-old subjects with a percentage of 6% and with the five-year-old group with a percentage of 18%. Whereas, except for four-year-old subjects, all other age groups scored correct answers with a percentage between 18% obtained by the five-year-old group, and 100% for the ten- and eleven-year-old groups. What is noticeable is that the mean values of the “ghost” item increased with age growth \((F_{7,120}=15.673, P <0.001)\) as they were subject to some fluctuations with a light increase between the age of four and nine years, and reaching the highest value at age of ten and eleven years (as can be seen in Table 4).
• Unsatisfactory answers to the “dirham” item were restricted to eight-year-old groups only. Whereas, all other age groups scored correct answers with a percentage of 18%, recorded for the four-year-old subjects, and 100%, reached by both nine- and eleven-year-old groups (as can be seen in Table 4). We also noticed that the mean values of the “dirham” item increased with age ($F_{(7,120)}=10.753$, $P<0.001$) in an unsteady manner (effect shown in Figure 5).

• Unsatisfactory answers to the Alice item were given by five- and six-year-old subjects with a percentage of 6%; whereas correct answers were scored by different age groups, ranging between 25%, recorded for four-year-old subjects, and 100%, reached by 8-, 9-, 10- and 11-year-old and older children. Overall, the mean values for the Alice item gradually increased as children grew older ($F_{(7,120)}=15.229$, $P<0.001$); this increase reached its peak at the age of eight years.

4.1.2.2. Effect of the Horizontal-Comparison Factor on the Subjects’ Answers to False Belief Task on Word-Concept

Means of answers (considering the sum of both correct answers and unsatisfactory answers) of all subjects to the false belief task on word-concept varied from one item to the other ($F_{(4,480)}=6.125$, sign with $P<0.001$), ranging from a percentage of 21.7% for the Alice item, to a percentage of 20.4% for the “train” item, to a percentage of 20.3% for the “worm” item and to a percentage of 20% for the “dirham” item, whereas the “ghost” item scored the least percentage (17.5%) (Figure 3).

![Figure 3. Percentages of correct answers and insufficient answers given by all population in replying to the items of the false belief task on word-concept.](image-url)
4.1.2.3. The Level of Interaction between Age Factor and Horizontal Comparison Factor in the False Belief Task on Word-Concept

The interaction between horizontal comparison and age was statistically significant \( (F_{28,360}=1.836, P <0.001) \), which indicated that the growth pathways of the subject’s answers to the items of the test of wrong belief were not uniform. However, we observed in Figure 4 that they became uniform starting at the age of nine years, reaching a plateau.

![Figure 4](image.png)

Figure 4. The growth pathways of subjects’ answers to different items of false belief task on word-concept.

4.2. Explanation of Results

To explain the data in the experiment related to the mentalist word theory, we should answer the following questions:

- What is the nature of the growth pathways of the mentalist word theory?
- To what extent could these pathways be termed “plural” or “pluralistic”?
- To what extent is the principle of “multi-variability” or “poly-variability” present in the dynamics of the evolution of the mentalist word theory and its functioning?
- How multiple are the factors that contribute to the development of the mentalist word theory?
4.2.1. The Development of the Mentalist Word-Theory

4.2.1.1. The Development of the Competence of Distinguishing between Linguistic Appearance and Linguistic Reality of the Word

Data from the task of distinguishing between linguistic appearance and linguistic reality of a given word revealed that the percentage of successful subjects’ answers surpassed a percentage of 70% at the age of four years, and got closer to 100% at the age of five years. The percentage of 100% was reached since eight years of age.

Hence, there is not a linear and sustained growth pathway that starts with cognitive weakness and moves on to reach cognitive expertise, in that even very young children have a fair amount of such expertise.

The question is why and how are even four year old subjects able to distinguish between the linguistic reality of a word and its linguistic appearance? Is it because of schooling? Or are there other factors playing a major role?

It is evident that these children are newcomers to kindergarten and, as such, we believe that schooling is not a sufficient reason to explain their success in the task of distinguishing between linguistic reality of a word and its linguistic appearance. This, undoubtedly, means that the child comes to kindergarten with already-established beliefs and naïve hypotheses, and these enable him/her to pass the linguistic task so successfully.

Scholars like Hollich et al. (2000) and Carey and Markman (1999) have wondered how the child could acquire and develop language in such a short period of time; we, also, cannot avoid asking the same question in relation to the experiments we conducted.

More specifically, we wonder how the kindergarten pupils were so successful in the task of distinguishing between linguistic reality of a word and its linguistic appearance.

The reality is that the child may be pre-equipped with certain principles and constraints that guide him/her to understand the word-concept; we believe that these same principles and constraints are used by our subjects while dealing with the linguistic task, and these conceptual principles are as follows:

Reference principle: this appears at the pre-linguistic stage and it is manifested in the child’s tendency to look closely at the subjects/things we name (Hollich et al., 2000). It appears that, in our experiment, four-year-old subjects tended to exploit this principle when they refused to consider the items “sabsab” and “bibibiq” as words as they have no reference in the real world. We should notice that over-generalizing the use of this principle may
result in the fact that some subjects refused to consider the word “word” as a word as it has no real reference. They, indeed, explained that word is “not a word because we don’t understand it; because it is not a thing”.

**The Extendibility principle:** this principle means the child’s understanding since two years of age that the name is not an attribute of a specific subject/thing alone, but that it can refer to various subjects/things (Hollich et al., 2000). This reflects the fact the child has started to become aware of the nature of the arbitrary relationship between a word and its reference. Hence, we believe that the subjects of our experiment, especially the very young ones, that were successful in the “word” item task, relied on this principle: in that they believed that, as the word-concept refers to no specific material subject, it should be perceived and understood as extended, and that the names of all subjects are words. Thus, their justification was as follows: “the word is a word because we understand it; bread is a word, milk is a word, the table is a word, too”.

**Object scope or whole object assumption principle:** at an early age, the child formulates the belief that every name refers to the whole object and not just to some of its parts, components and attributes, and that it does not refer to events and actions (Hollich et al., 2000). We consider quite probable that the kindergarten pupil utilized this principle while dealing with the “man” item task as we got the following justifications: “man” is a word “because we name him man, because it is the name of a human being, because we use it to name the teacher and dad, for example”.

**Conventionality principle:** This is the child's attempt of getting rid of words that he/she (or someone else) invented, while embracing words that the family and society have agreed upon (Hollich et al., 2000). Hence, the subjects relied on this principle when they refused to consider the words “sabsab” and “bibiq” as words because for them no social convention or norm exists for these words. Thus, they formulated the following justification: “bibiq” is not a word “because we don’t hear it so often, “bibiq” is not a word because we don’t understand it, it is just a nonsense.”

**The Novel name-nameless category:** this principle has been recently reformulated by Hollich et al. (2000). It is known also as principle of mutual exclusivity (Markman, & Wachtel, 1988). This refers to the young child’s tendency to attach every invented name to a new still-nameless subject/object. We think that the supremacy of this principle over the child’s mentalist word theory leads him/her to consider a number of non-words as real words that refer to specific references. This is what we were able to deduce from
justifications as these: “sabsabsab” is a word “because we name dogs “sabsabsab”. “Bibibiq” is a word because we hear “bibibiq” in the street”.

As such, it becomes clear that there are a number of specialized principles that guide the child in differentiating between linguistic appearance and linguistic reality of the word. For the recruited subjects, these principles may have helped to draw the frontiers of the domain of language and to lay the foundations of what we call the naïve linguistic theory.

Therefore, we conclude that even if the linguistic domain contains specific linguistic principles, it is not isolated from other cognitive domains, but is rather in interaction and in addition to the previous ideas.

For example, Melot (1999) stated that the child between the age of 4 years and of 5 years could be capable of discriminating the appearance of a thing from its reality. Still, what attracts much attention, according to our data, is the fact that the child is able of distinguishing between linguistic appearance of the word and its linguistic reality at such an early age.

Hence, we can ask the following question: why do these children succeed in the two tasks simultaneously?

We believe that the child at this age begins to understand that the mind can produce various and different representations about the same object (Melot, 2001). Subsequent to this is the emergence of the skill of distinguishing between mental entities (that is to say, beliefs, representations) and their corresponding material entities.

In our view, this is a general skill, belonging to the domain of the theory of mind, and it influences the child’s mentalist word theory, thus helping him/her to distinguish between the linguistic appearance of the word (non-word) and its reality (real word).

4.2.1.2. The Development of the Skill of Evaluating the False Belief Task on Word-Concept

Age evolution does certainly influence the advancement of the skill of differentiating between miss-representation of the word-concept and its appropriate representation. Whereas, the development of correct answers to the items of false belief task about word-concept is not always linear.

We observed, indeed, a wide diversity of development trajectories, which follow varied multi-step, progressive, regressive or stable pathways. For instance, we found that correct answers to the “ghost” item were stable for 8-9-year-old groups (69%). Nevertheless, 8-9-year-old subjects were less successful in correctly answering to the “ghost” item task than the 7-year-old group which attained a higher percentage (81%). Further, we can notice some
slight regress in the answers to the “train” item for 9-10-year-old subjects (94%) and the 8-year-old group (100%). Also, this could be noticed in analyzing and discussing the answers to the “worm” item for 10-year-old subjects (94%) as well as for the 8-9 year-old group (100%). Furthermore, we observed the same trend in the answers to the “dirham” item task for 6-year-old subjects (63%), as well as for the 8-9- and 5-year-old groups (69%).

Hence, the trajectory of the skill of evaluating the false belief task on word-concept oscillates between stability and regression in one area and progression in another one. This leads us to describe it as pluralistic pathway.

We would like to notice, however, that when we stress the diversity of the rhythm of growth pathways formation and development for the skill of evaluating false belief on word-concept, we do not mean to reject the hypothesis that the mentalist word theory may evolve through constructive dynamics.

While reviewing subjects’ answers, we noticed clear differences between justifications given by kindergarten children and advanced students, in that ambiguous justifications were restricted to kindergarten children with an average of 12.5% but were practically non-existent for other school levels; such justifications were fully irrelevant and contained no clear causal connectors.

For example, we considered an irrelevant justification to the “worm” item, a reply like “I choose the flower because we can give it to someone as a gift” or “The worm is the smallest word because it can fly”. We considered an irrelevant justification to the “ghost” item an answer like “We do not draw the word “ghost”, we write it because it can be written easily”, or “We don’t draw the word “ghost” because it cries”.

What is noticeable, however, is that the majority of justifications, though classified as incorrect answers, were based on clear causal explanations. For example, in the case of the “train” item task, “The word “friends” is longer than the word “train” because we have many friends”, “The word “train” is longer because the train is very long”, or in the case of the “worm” item task “The “worm” word is the smallest word in the sentence because the worm is so small that it can go inside peas”. In the case of replies to the “dirham” item task, “With the word “dirham”, we can buy cakes”, or in the case of the Alice in Wonderland task, “It is possible because it was a dog, but when we gave it milk and called it pussy-cat it began to mew, and if we called it dog, it would have started to bark”.

Such answers revealed the existence of a causal-explanatory linguistic theory that still lacks the dimension of the arbitrary relationship between the
word and its reference, as it considers the word a material attribute/ characteristic inherent to the subject/object it refers to. Thus, it can be termed as a naïve theory.

However, if we know that the child, in the early years of his/her schooling, is highly likely to encounter the arbitrary relationship between the word and objects and to familiarize with such concept, it becomes obligatory to wonder about which strategy he/she uses to deal with this idea. Does he/she give up once and forever to his/her naïve theory together with his/her deeply rooted naïve linguistic beliefs and replace them with a serious, scientific linguistic theory? Does he/she stick, instead, to his/her first naïve theory at the expense of a more scientific one?

We should notice that the justifications provided by pupils at higher kindergarten levels and at the first level of elementary education indicated that they very often tried to combine their naïve representations together with their school-learned scientific knowledge, and this lead them to formulate a mixed or rather synthetic theory.

This is, indeed, what can be inferred from the following justifications given to the “ghost” item: “We don’t draw the word “ghost”, we write it instead, because it’s very big and it’s difficult to draw; we don’t draw the word “ghost” because it would appear to us while drawing it”. To some extent, the child has begun to become aware of the stenographic and abstracting function of the word; as in the given explanation, transforming the ghost from a material object to an abstract entity so that it would not appear: “It is too big to be a word”.

The following example (the justification given to the “Dirham” item task) goes in the same direction: “We can buy nothing with the word “dirham”, because it’s just a word, and the word is just like a piece of paper; can we buy anything with a piece of paper? Can we buy something with nothing?”

Such a justification shows that the child has started to become aware of the fact that the word is an abstract entity but still is unable to declare it. This is so, because he/she is still not capable of getting rid of naïve beliefs altogether. Later on, and as a result of the influence of the schooling factor, on one hand, and the cognitive-maturity factors on the other hand, the child is convinced of the necessity of giving up to his/her complex, hybrid linguistic theory for embracing a scientific one.

This is, in fact, what the following justifications given to the “train” item task shows: “The word “/asadigaei” (meaning “friends” in Arabic language) is the longest word in the given sentence because it contains many letters”.
Also the explanation given to the “worm” item seem to suggest a similar process: “The word “/gorbal/” (meaning “near” in Arabic language) is the smallest word in the sentence because it contains just three letters”.

The same trend can be observed in the explanation given to the “Dirham” item (“No, because it’s just a word and not a real dirham), in the case of the reply to the “ghost” item task (“It is not possible, because drawing is not like writing”) or in the answer to the Alice in Wonderland task (“Because the dog’s barking does not change even if we would change its name, the name is just a name, it has no impact on animals”).

Hence, the schooling factor plays a fundamental role in the development of the child’s mentalist word theory (higher kindergarten level and first level at elementary school).

In addition, the following answers further reinforce this fact: in the case of the “train” item “The word “/asdiqael/” (meaning “friends” in Arabic language) is the longest word in the given sentence, because it contains many words [instead of letters]” or “The word “train” is very long to write”. These justifications/explanations will, at advanced levels, be replaced by the following ones: “The word “/asdiqael/” (meaning “friends” in Arabic language) is a long word because it contains six letters”. This means that it is schooling that enables the child to differentiate between the concept of the letter and the concept of the word.

Overall, it can be said that the development of the child’s mentalist word-theory, which is a co-product of the schooling factor and the dynamics of internal construction, is realized through a set of gradual conceptual changes that move from a naïve theory to a synthetic one and are finally crowned with the establishment and development of a serious, scientific theory (Vosniadou, Skopeliti, I. & Ikospentaki, 2004).

It should be noticed that this conceptual change of the child’s mentalist word theory is subject to variability from one item to another. For instance, even if more than 60% of five-year-old subjects are able to provide correct answers to the “Dirham” item and to the Alice in Wonderland task, we do not get such a satisfactory percentage for the item “/doda/” (meaning “worm” in Arabic language) and “/qitar/” (meaning “train” in Arabic language) in subjects with less than six years of age.

Concerning the replies to the item “/chabah/” (meaning “ghost” in Arabic language), the above-mentioned percentage is reached at eight years of age.

Hence, items’ development pathways are varied even if they have the same objective, which is to measure the subjects’ ability of evaluating a number of representations on the relationship between a word and its
reference. This ability varies depending on the level of difficulty and complexity of each item; some are highly complex such as the item “/ichabahl/” (meaning “ghost” in Arabic language); others are less complex, such as the word “/Dirham/” item and the Alice in Wonderland task.

As such, the development of the mentalist word theory is not context-independent but rather context-dependent. In simple and easy situations (distinguishing between linguistic appearance and linguistic reality of a word, the “/Dirham/” item and the Alice in Wonderland task), the child is able to express and convey very advanced, sophisticated representations on word-concept at an early age.

However, in tricky and challenging situations or ambiguous contexts, it is necessary for the subject to be older in order to express appropriate conception of the word, as was, for example, stated by researchers like Fischer & Yan (2002).

4.2.2. The Mentalist Word Theory and the Multi-Variability Principle

If the multi-variability or poly-variability principle constitutes the principle tenet of the pluralist paradigm, the question is to what extent does this principle affect the child’s construction of a mentalist word theory?

In the following paragraphs we will focus on the different kinds of variability in order to give a serious reply to this crucial question.

A. The Multi-Variability Principle and the Task of Distinguishing between Linguistic Reality and Linguistic Resemblance of a Word

A.1. Inter-Individual Variability

In our experiments, we found that inter-individual differences were almost non-existent in the task of distinguishing between linguistic appearance and the linguistic reality of the word, since the majority of subjects reached the required maximum in answering this task, with the exception of four-year-old subjects.

As such, overall, there was a marginal presence of this kind of variability: namely, for the “word” item 68% were successful versus 32% unsuccessful, for the “Sabs” item, 87% successful versus 13% unsuccessful, for the “man” item 81% successful versus 19% unsuccessful; for the OSI 79% successful versus 21% unsuccessful.
A.2. Inter-Contextual Variability

Since horizontal comparison was found to have no impact on the subject’s answers to the test of discriminating linguistic appearance from linguistic reality, this reveals outstanding similarities in their performances with regards to other task items. This leads to the eventual removal of inter-contextual variability.

A.3. Intra-Individual Variability

The reasoning formulated for the inter-contextual variability applies also the intra-individual variability.

A.4. Cross-Cultural Variability

We would first mention that it is really hard to draw any kind of cultural comparison between the present study and other Western studies since the nature of the items and the instructions used in our experiment have not been adopted in any of the previous researches. Therefore, this puts aside any kind of uniformity on the level of the experiment condition.

However, Baker’s (1984) experiments resulted in the same conclusion that children between the ages of five and seven years do distinguish the word from the non-word.

Flavell, Speer, Green, August, (1981) concluded that four- and five-year-old children express their non-understanding of rare words. Such findings do further reinforce our hypothesis that the competence of distinguishing between linguistic reality and linguistic appearance is indeed a pre-school activity. We recorded that about 79% of four-year-old subjects performed well in the task of discriminating linguistic reality from linguistic appearance.

However, a study carried out by Bowey, Tunmer and Pratt (1984) demonstrated that the child can only discriminate the word from the sound after six years of age.

In the same context, Downing, (1969, 1970, 1972) performed several experiments in which five-year-old groups were presented with a number of sounds (natural, sounds, noise, phonemes, words and sentences) and were asked to say “yes” when they recognized a word in this chain of sounds. The outcome was that none of the subjects was successful in the task.

We believe that the main reason behind such differences and discrepancies between these findings and our result, is not related to the cultural variable but is rather mainly because of the nature of the tasks: their difficulty level and their degree of appropriateness to the child’s mentality.
B. Multi-Variability Principle and the False Belief Task on Word-Concept

B.1. Inter-Individual Variability

Inter-individual differences in seven-year-old children and older groups remain marginal. Indeed, most subjects from the age of seven years on reach the maximum required value of correct answers in the task of the false belief on word-concept. There is, however, a significant inter-individual variability in all age groups younger than seven years.

B.2. Inter-Contextual Variability

The performance of the majority of subjects varies slightly from one item to another. For most items, correct answers fluctuate between 20% and 21%. We should notice, however, that the “ghost” item is a significant exception to this as subjects scored the lowest percentage (17%).

We believe this is so because the item is an inappropriate situation to the child and the reference is an abstract and imaginary entity (the ghost). Within the same context, De Villiers (1978) concluded that the child refuses to consider the “ghost” as a word because the ghost does not exist.

B.3. Intra-Individual Variability

More than 70% of the recruited subjects were successful in the task of discriminating linguistic appearance from linguistic reality since four years of age. However, we have to wait until six years of age to get acceptable percentages in the false belief task on word-concept. This means that most subjects were more successful in the first task than in the second task.

In other words, we can depict this kind of cognitive behavioural change for the same individuals from one situation to another as a sort of intra-individual variability.

B.4. Cross-Cultural Variability

Berthoud-Papandropoulou and Sinclair (1974)’s study is somewhat similar to our study especially concerning tasks and procedures. This study found out that the six-year-old child is incapable of comprehending the arbitrary relationship between a word and its reference, and only starts becoming aware of this relationship at the age of seven years. Before this age, when asked to give examples of long words he/she gives words that refer to long things (reference). He/she also considers the words “cigarette”, “box” and “worm” as short words because they refer to small subjects/objects. Although
the seven-year-old child starts becoming aware of the independence of the word from its concept, he/she continues to refusing to consider conjunctions, pronouns and adverbial particles as words, because for him/her they do not refer to real references (that is to say, real subjects or real things) (Berthoud-Papandropolou 1978, 1980).

Another study of Osherson and Markman (1975) concluded that five-year-old subjects refuse to substitute the word “sun” for the word “moon” because they believe the sky would not get any darker; these children also believe that changing the dog’s name and calling it “cat” makes it mew.

On the contrary, our study concludes that more than 70% of the six-year-old group were aware of the arbitrary relationship between the word and its reference; and more than 70% of these refused to consider the word “worm” as the smallest word in the sentence and tended to replace it with the word “near” (lqorbal² in Arabic language), because it contained the least number of letters, regardless of the difficulties that this word could pose in that it does not refer to a concrete subject or thing but is rather a spatial adverbial particle.

Also, our data reveals that approximately 80% of subjects at 6 years of age could recognize that the biggest word in the sentence was not the word “train” but the word “friends”. As such, we are in accord with Bialystok (1986)’s experience when the researcher asked children between 5 and 6 years of age to determine the smallest and biggest word in a given list of words (“hippopotamus”, “train”, ...). The outcome was 67% of correct answers at 6 years of age versus 28% of correct answers given at 5 years of age.

In addition to what already said and discussed, more than 60% of five-year-old subjects in our study accepted the possibility of substituting the cat’s name with dog with no impact whatsoever as to the animal’s physical characteristics.

We should notice that the discrepancy between our data and the previously cited data is not only due to cultural differences but can rather be explained by the nature of the procedures used and opted for optimal contexts.

As a matter of fact, the items of the false belief task on word-concept were made up of dialogs with different characters (namely, the father, the mother, the teacher, Alice in Wonderland, Humpty-Dumpty, and pupils) and these added a playful, engaging dimension, making it easier for the child to better-express his/her meta-semantic activities at an early age.

²When we consulted an Arabic grammar book (“jamia doros al arabiya”, in Arabic language) on this point we found the following: the word “near” (in Arabic language, “lqorbal”) is not considered as a spatial adverbial particle, meaning that in Arabic language it has no concrete representation that can be perceived.
However, the previously cited studies mostly used direct questions, like “What does this word mean to you?” and sometimes tricky, challenging or too sophisticated situations that exerted some sort of inhibition on the subject and did not allow him/her to express his/her mentalist word theory skills.

4.3. Discussion of Results

In discussing the results of this experiment, we will focus on the following points:

4.3.1. The Pluralistic Characteristic of the Mentalist Word Theory

According to Piaget (1926), the child becomes aware of the arbitrary relationship between the word and its reference through a linear, progressive and sustained growth pathway. Until six years of age the child considers the word as being an intrinsic attribute of the subjects/objects it refers to (the “sun” is called “sun” because we can see it or because it is hot); between seven and eight years of age the child believes that God or a God-like creature creates things with their names, at nine years of age he/she starts to consider the word as a result of social convention, and only deals with it as a symbol when he/she reaches ten years of age.

The growth of semantic awareness for Piaget depends on the general cognitive growth. Indeed, he claimed that the various cognitive domains (namely, serial arrangement, conservation, inclusion, and semantic awareness) are, on one hand, subject to the principle of whole structures that force it to follow the same growth-pathway; and, on the other hand, they are governed by a quite standardized operation of hierarchical integration. In that, each level of linguistic awareness has to incorporate the preceding level and extend further. This operation takes the form of hierarchical, substituting phases, and standard, invariable organization that governs the cognitive development of all children. In addition, it is guided by the principle of subordination, meaning that the development of semantic awareness is subordinated to operational structures.

It is worth mentioning that a number of psycholinguistic scholars adopted the Piagetian unilateral approach in dealing with semantic awareness. Such researchers were: Herriman (1986), who stressed that linguistic awareness is subject to operational structures; Smith (1979) who stated that the emergence of semantic awareness is dependent on the child’s ability to accessing the stage of formal operations. Similarly, many studies tried to prove the existence of
whole structures through revealing the significant correlation between child’s success in some Piagetian tasks (namely, inclusion, serial arrangement, and conservation, among others) and progress in semantic awareness (Hakes, 1980; Tunmer & Fletcher, 1981).

Flavell (1978) was also influenced by this Piagetian view and stressed that both operational thinking and linguistic awareness were expression of a general change undergone by the cognitive system, represented by the formation of the meta-cognitive domain.

Berthoud-Papandropolou (1980) challenged some Piagetian concepts in that this researcher claimed that the meta-linguistic growth is not part of the growth of logical structures, and cannot be included within whole structures, believing that there is some sort of parallelism between the meta-linguistic pathway and the logical-mathematical pathway. As such, the development of the child’s word-concept is likely to interact with the formation of such cognitive skills as numeration, conservation, serialization and inclusion, among others. Furthermore, the development of linguistic awareness is achieved through a linear progressive and sustained pathway that eventually enables the child to become an expert, and this through consecutive phases of evolution.

A number of facts in the experiments within the scope of the present study indicate that the unilateral approach failed to explain the mentalist word theory’s growth and function.

These facts are:

The development of the skill of distinguishing between linguistic appearance and linguistic reality is not achieved through a linear, progressive and sustained pathway. As a matter of fact, even young children have the same linguistic abilities as older ones, concerning some specific domains. This undermines the unilateral claim that the child’s linguistic awareness improves constantly through a progressive and sustained growth pathway that goes up from lack of meta-linguistic expertise to the attainment of such an expertise.

The growth pathway of evaluating false belief competence is not subject to a sustained increase rate solely but also to other rhythms or rates of growth (such as regressions or stagnations) and this observation makes our findings incompatible with the unilateral principle of the “hierarchical growth”.

The multi-variability principle, which is a fundamental principle of the mentalist word theory, differently from the essential unilateral paradigm of single-factor theories which imply the rule of “whole structures”, implies the existence of intra-individual variability (that is to say, the variation in
performance for the same subjects from the first task to the second task), of inter-individual variability (that is to say, in our case, the presence of inter-individual differences within all age groups younger than seven years in the task of the false belief on word-concept), and of cross-cultural variability (that is to say, the discrepancy between our results and those of a number of Western studies, especially the fact that we found that the child may become aware of the word-concept at an age much earlier than the one claimed by other studies).

Thus, we have to admit that the unilateral paradigm is limited in explaining “real-world” phenomena, and cannot adequately explain the formation of the mentalist word theory. As such, it should be replaced by another paradigm that is much more open and much more efficient. This is the pluralistic paradigm.

Indeed, many studies have approached the formation of the word-concept within the pluralistic paradigm that we advocate. Some studies have, in fact, concluded that this formation is subject to intra-individual variability and that it is not limited to a progressive and sustained pathway but is also subject to periods of recession (Bassono, Eme & Maillochon, 1999).

Other scholars have stressed the important role of inter-contextual variability in the development of the child’s word-concept awareness. Karmiloff-Smith et al. (1996) maintained the role of word-concept awareness of the child in particularly suspenseful situations (for example, while a story is being narrated, the narrator pauses and asks the subject to recall the last word he/she heard) and concluded that the child may become aware of the word-concept at the pre-school phase; in other words, at an age much earlier than what Berthoud-Papandropolou (1980) claimed.

We would like to notice here that one of the exciting conclusions of Karmiloff-Smith et al. (1996) is that four-year–old subjects with a percentage of 75% and five-year-old children with a percentage of 95% considered the open-class words (like adjectives, nouns, verbs) and the closed-class words (such as conjunctions, prepositions) as words.

In our study, we also recorded that the child demonstrates a number of meta-linguistic abilities before the age of eight years – earlier than the age claimed by Berthoud-Papandropolou (1980); such ability is demonstrated by the fact that he/she considers the adverbial particle “/gorbal” (meaning “near” in Arabic language) as a word. Another proof is his/her awareness at five years of age of the arbitrary relationship between names and their references (in the “Dirham” item or in the Alice in Wonderland task).
As is the case with Karmilloff-Smith (1980), the main reason for the emergence of such meta-linguistic competence within our data is the type and nature of our tasks, which take the form of game-like scenarios. This enables subjects to feel happy, relaxed and perfectly at their ease, especially with the Alice in Wonderland task. In this manner, we were able to discover the child’s meta-linguistic competence through an indirect path and, most importantly, at an earlier age than other researchers.

We decided not to adopt the Berthoud-Papandropolou’s task that takes the form of school-like and direct questions (such as “What does the word “word” mean to you?”) or explicit instructions (like “Give me an example of a long word”). Such questions ended up positioning the child in inappropriate context and this caused the researcher to discover the child’s linguistic awareness at a later age than we did. Thus, we believe that the child’s mentalist word theory varies according to the nature of the tasks used. Hence, the important role of inter-contextual variability.

In spite of the small margin of inter-individual variability recorded within the experiment of this study, a number of pluralistic researchers have, in fact, recorded the importance of this factor in the acquisition, formation and development of the child’s word-concept. These researchers include well-known scholars, such as Bassono (1999), Fenson (1994, cited by Karmilloff-Smith, 1997) and Keznick (1997, cited by Karmilloff-Smith, 1997a).

We think it would be inappropriate to use the data in this study to build up cross-cultural or inter-lingual comparisons as there is the absence of the homology in experimental conditions between our present study and other studies. However, this does not mean that we do not recognize the important role of cross-cultural and inter-lingual variabilities in the formation and refinement of the child’s word-concept.

As such, we agree with many studies like the investigation performed by Gopnik and Choi (1995) or by Bassano (1999) when it is stated that the cross-cultural and inter-lingual variabilities play a major role in the evolution of the child’s mentalist word theory.

To conclude, on the basis of our experimental data and given the extant scholarly literature, the mentalist word theory appears to be a complex, variable phenomenon. Indeed, the data emerged from our experiments are of invaluable significance with regards to intra-individual and inter-contextual variabilities. Such types of variability are more than sufficient to deny the universality claim and rather reinforce the value of pluralistic theories and models. However, in spite of the fact that the mentalist word theory is variable
and relative, it still is possible to draw local pathways of its evolution based on our current data.

4.3.2. The Coalition Aspect in the Formation of the Mentalist Word Theory

Our data seem to strongly indicate that the development of the mentalist word theory is achieved through a course of conceptual changes that enables the child to eventually transform naïve knowledge into scientific knowledge.

We would like to stress that this is not realized all at once, but rather via a lengthy process that goes through an intermediate phase where the child tries to combine together his/her naïve beliefs and the scientific knowledge, which he/she most often learns at school, in order to build up some sort of a synthetic theory, thus giving rise to an original syncretism.

Hence, the course of conceptual changes in language is rather similar to conceptual changes occurring in the domains of Physics and Astronomy (Ioannides, & Vasniadou, 2002). In other words, the child does not abolish his/her primitive linguistic knowledge all at once but rather combines it with the new inputs to formulate some sort of new, hybrid theories (Carey & Johnson, 2000).

In addition to the coalition mechanism used by the child during the course of conceptual changes, he/she also uses and exploits the differentiation mechanism. The use of the latter mechanism is not restricted to the formation of concepts in Mathematics and Physics as indicated by some researchers (discriminating the hot from the warm, force from energy) (Carey 1991, Ioannides, & Vasniadou, 2002) but is also of significant relevance to the formation of the word-concept.

This is clearly demonstrated by the fact that low-level pupils in the experiments carried out in our study consistently confused words, letters and spelling (writing). For example, in the replies to the “train” item task, we received replies like “I have chosen the word “/asdiqae/” (meaning “friends” in Arabic language) because it is longer to write, … because it contains a lot of words [instead of letters]”. At a more advanced level, we got justifications as “The word “/asdiqae/” (meaning “friends” in Arabic language) represents the longest word in the given sentence, because it contains a larger number of letters”.

Schooling has a very influential role convincing the child to give up to his/her naïve and even to his/her complex theories for embracing scientific knowledge. The important role of the schooling factor is clearly demonstrated
by the outstanding variability between the answers given by kindergarten pupils and those by pupils at more advanced levels.

Thus, we emphasize that without schooling there may be no real progression of conceptual changes and the subject would undoubtedly limit himself/herself to his/her naïve word theory.

In this respect, Kolinsky, Carey & Morais (1987) concluded that illiterate adults tend to have the same level of semantic awareness of primary school pupils. We would like to add that this conclusion is not specific to the mentalist word theory but is also pertinent (for example) to the formation of the naïve astronomical theory. As a matter of fact, the representations of illiterate adults about the earth’s roundness (sphericity) and other astronomy-related concepts are rather similar to those of a young pupil (Vosniadou, 2007).

The reality is that kindergarten pupils do have a naïve word theory that enabled them to deal with the task of distinguishing linguistic appearance versus linguistic reality. This pre-built knowledge is gradually developed, built, refined, expanded and guided by pseudo-innate and specialized principles (Karmiloff-Smith, 1992).

On the whole, various factors contribute to the formation of the mentalist word theory:

- Innate/pseudo-innate knowledge.
- Acquired knowledge (learned either at school or out-of-school).
- The dynamics of the internal cognitive system.

Hence, as Hollich et al. (2000) argued in their coalition model, the child may use multiple cues in his/her endeavor to acquire, develop and refine the word-concept.

**CONCLUSION: VALIDITY AND LIMITATION OF THE HYPOTHESES**

We conclude that the mentalist word theory with a unilateral approach (Herriman, 1981; Smith, 1979; Berthoud-Papandropolou, 1980) fails to explain “real-world” phenomena.
1) On the contrary, the variability of the mentalist word theory is demonstrated by:

- The growth pathways not subject to linear, progressive and sustained growth rates but (also) subject to periods of stability, regression and recessions.
- Intra-individual variability as demonstrated by the performance of examinees that varies with the task of false belief about word-concept on one hand and the task of distinguishing between linguistic appearance versus linguistic reality on the other hand.
- Inter-contextual variability as demonstrated by the fact that a slight modification of the task enables us to get results that are different from those of other studies. Indeed, facilitating the task and making it more appropriate enables us to discover the child’s meta-linguistic activity at an age much earlier than what Berthoud-Papandropolou (1980) specified.
- Cross-cultural and inter-lingual variability: for the sake of scientific validity we would specify that our data are insufficient to measure the extent of these two types of variability. As such, further research is warranted.

2) The coalition dimension in the evolution of the mentalist word theory.

To summarize, we can say that the mentalist word theory is built through a course of conceptual changes. This progression is a coalition activity that involves a number of different factors: namely, innate/pseudo-innate knowledge, knowledge learnt and acquired both at school and out-of-school, and the complex dynamics of the cognitive system.

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Chapter 2

VERBAL GRAMMAR CORRELATION INDEX (VGCI) AS A TOOL OF COMPARATIVE LINGUISTICS

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ABSTRACT

Method of comparative linguistics based on comparison of lexis allows making different conclusions about the genetic classification of the same language. When different conclusions are based on the same methodology it is the best evidence that such methodology (comparison of lexis) is irrelevant. Language isn’t a heap of lexemes, but is ordered pair \(<A; \Omega>\) where \(A\) is set of grammatical meanings and \(\Omega\) is set of positional distributions defined upon \(A\). On the base of such understanding of language was elaborated Verbal Grammar Correlation Index (VGCI). The main idea of VGCI is simple: more closely related languages have more alike sets of grammatical meanings and their common meanings are distributed in more alike positions, so the index of correlation of more closely related languages is higher. VGCI is the direct comparison of languages which exist/existed in reality. VGCI works with pure structures (it doesn’t use any reconstructions or comparison of material exponents). Tests of VGCI on the material of firmly assembled

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stocks (Austronesian; Indo-European; Sino-Tibetan) showed the following: if value of VGCI is about 0.4 or higher it means that compared languages are related; if value of VGCI is about 0.3 or lower it means that compared languages aren’t related. With use of VGCI have been found relatives of Ainu language (Great Andamanese language and Sino-Tibetan stock) and has been proven relatedness of Austronesian and Austroasiatic stocks. VGCI can be extremely useful in the fields of genetic classifications of indigenous languages of the Americas, Papuan languages and Australian Aboriginal languages.

**Keywords:** comparative linguistics, Verbal Grammar Correlation Index, typological methods in comparative linguistics, Ainu, Andamanese, Austronesian, Austroasiatic, Sino-Tibetan

### 1. INTRODUCTION TO THE PROBLEM

In contemporary linguistics can be seen an obsession of discovering the relationship of certain languages by comparison of lexis and an obsession to separate analysis of structures from historical linguistics. The main problem of all hypotheses of so called distant relationship is that it is not based on any firmly testable method, but just on certain particular views and on “artist sees so” principle. Tendency to think that typology should be separated from historical linguistics was inspired by Joseph Greenberg in West and Segrei Starostin and Nostratic tradition in USSR/Russia. Despite followers of Nostractics insist that their methods differ from those of Greenberg, but actually their methods are almost the same: they take word lists, find some look-alike lexemes\(^1\) and on the base of these facts conclude about genetic relationships of certain languages. Followers of Greenberg and Starostin consider typological studies as rather useless glass bead game. Typological items are never considered as a system by adepts of megalocomparison\(^2\); usually some randomly selected items are taken outside of their appropriate contexts. For instance, active or ergative typology, or the fact of so called isolating or polysintetic typology (i.e., items that are unusual in the native

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\(^1\) Nobody actually cares that sometimes certain lexemes can look alike just by coincidence: the shorter certain lexeme is, the higher is the probability that there can be randomly alike lexemes with close meanings in some other languages.

\(^2\) Megalocomparison is a term invented by James Matisoff (Matisoff 1990); the term is used to denote attempts to discover the relationship of certain languages by so called “mass comparison” of lexis.
languages of researchers and that shock researchers’ minds) are considered as interesting exotic items, while no attention is paid to holistic and systematic analysis of language structures. Such approach makes typology be a curiosity store, but not a tool of comparative linguistics. However, according to founding-fathers of linguistics, typology should be the main tool of historical linguistics. According to the mythology created by adepts of megalocomparative linguistics has actually little connection with typology and makes its statements by the use of a lexicostatistical hoodoo. Often megalocomparativists object on such critics saying that they also pay attention to structural issues and also compare morphemes. Actually the megalocomparative comparison of morphemes is analysis in a lexical way, i.e., only material implementations of morphemes are compared, so there is no difference between such comparison and comparison of lexemes. The fact that any morpheme consists of three components (meaning, position and material implementation) is ignored; and morphemes are actually reduced to their material components. Almost no attention is paid to the fact that grammar is first of all positional distribution of certain meanings. There is a presupposition that genetic relationship of two languages can be proved by discovering of look-alike lexemes of so called basic vocabulary and by finding out certain regular phonetic correspondences.

So called “basic vocabulary” is actually a badly defined issue; there are no clear criteria which could determine: what lexis belongs to so called “basic lexicon” and what doesn’t. So called “basic lexicon” is actually culturally determined (Hoijer 1956) and borrowings can be inside it. Any scholar who uses the methodology of lexicostatistics actually can determine basic vocabulary according to certain particular wishes arbitrarily widening or narrowing it: if there is a need to show relatedness “basic vocabulary” can be narrowed, if there is a need to show that compared languages aren’t related “basic vocabulary” can be widened, and particular conclusions seriously depend on the preferences of particular scholar. When I say that “artist sees so” principle is the base of lexicostatistics it isn’t a figure of speech it’s nothing else, but just ascertaining of a fact.

However, yet Atoine Meillet pointed at the fact that regular phonetic correspondence can appear due to borrowings and can’t be proofs of relationship:

Grammatical correspondences provide proof, and they alone prove rigorously, but only if one makes use of the details of the forms and if one establishes that certain particular grammatical forms used in the
languages considered go back to a common origin. Correspondences in vocabulary never provide absolute proof, because one can never be sure that they are not due to loans (Meillet 1954: 27).

Regular phonetic correspondence can be between words of any randomly selected languages. For instance, it is possible to find some regular correspondence between Japanese and Cantonese and even “prove” their relationship: *boku* Japanese personal pronoun “I” used by males – Cantonese *buk* “servant”, “I”; Japanese *bō* “stick” – Cantonese *baang* “stick”; Japanese *o-taku* “your family”, “your house” or “your husband” – Cantonese *zaak* “house”; Japanese *taku* “swamp” in compounds – Cantonese *zaak* “swamp”; Japanese *san* “three” – Cantonese *sam*; Japanese *shin* “forest” used in compounds – Cantonese *sam* “forest”; Japanese *rok* “six” – Cantonese *lük*; Japanese *ran* “orchid” – Cantonese *laan* “orchid”. If there would be no other languages of the so called Buyeo3 group and no languages of Chinese stock we would have no ability to single those words as items borrowed from Southern Chinese dialects since they have same regular and wide use as words of Japanese origin. In the case of Japanese and Cantonese we know history of their stocks rather well and have many firm evidences that Japanese isn’t a relative of Chinese stock.

If someone thinks that this example about Japanese and Cantonese is just an odd joke, then everyone can take a look at the procedure that was used by Greenberg in order to prove that Waikuri language belonged to Hokan family4: the conclusion that Waikuri belonged to Hokan stock was based on comparison of FOUR (!) words only (Poser, Campbell 1992: 217 – 218). Also, we should keep in mind that Greenberg actually didn’t care much about precise phonetic correspondences and superficial likeness was rather sufficient for him.

Phonetic correspondences can be even between unrelated languages and so a stock can’t be proved by regular correspondences, but regular correspondences should be proved by the existence of a stock since truly regular phonetic correspondences exist only inside stocks.

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3 Buyeo stock is conventional name of a group that includes Japanese, Korean and Ryukyuan languages. Close relatedness of Japanese and Korean has been proven in Akulov 2016.

4 Waikuri is an extinct language that existed in Southern part of Baja California (pic 1). Hokan stock is a hypothetical stock of a dozen small language families that were spoken mainly in California, Arizona and Baja California (pic 1).
A methodology that ignores structural/grammatical issues allows different scholars to make completely different conclusions about the same language, for instance: Sumerian is thought to be a relative of Uralic stock (Parpola 2007), or Sino-Tibetan (Braun 2001, 2004), or Austroasiatic (Diakonoff 1997). Another notable example is Ainu that is attributed to Altaic (James Patrie 1982), to Austronesian (Murayama Shichirō 1993), to Mon-Khmer (Vovin 1993). The most notable fact is that all such attempts coexist and all are considered by public as rather reliable in the same time. It looks much alike a plot for a vaudeville sketch rather than a serious matter of a science. Different methods can lead to different conclusions, but if people use same methodology they supposedly are expected to make same conclusions about the same material, however, we don’t see it; it means only that methodology based on comparison of lexis is a completely irrelevant method for historical linguistics.

The main function of any language is to be an instrument of communication, but in order to be able to communicate first of all we have to set a system of rubrics/labels/markers, that’s why the main function of any language is to rubricate/to structurize reality. Structural level/grammar is the

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5 Ainu is especially attractive material for perfunctory and naïve hypotheses.
mean that rubricates reality and so it is much more important than lexicon. I suppose we can even say that structure appeared before languages of modern type, i.e., when the ancestors of Homo sapiens developed possibility of free combination of two signals inside one “utterance” it had already been primitive form of modern language. Structure is something alike bottle while lexicon is liquid which is inside the bottle; in a bottle can be put wine, water, gasoline or even sand but bottle always remains the same.

To those who think that structure is not important I can give the following example: *Gakusei ha essei wo gutueto purinto shita.* “Having googled an essay student printed [it]”. What makes this phrase be a Japanese phrase? Words *gakusei “student”* (a word of Chinese origin), *essei “essay”* (a word of English origin), *purinto “print”* or, may be, “Japanese” verb *guguru “to google”*?

All the above considered facts mean that comparison of lexis should not be base of genetic classification of languages and any researches about genetic affiliation should be based on comparative analysis of grammar, i.e., comparison of grammatical systems is completely obligatory procedure to prove/test some hypothesis of genetic affiliation of a language.

### 2. A Description of the Method

#### 2.1. General Theoretical Background of the Method

Language is first of all grammar. Grammar is ordered pair of the following view: \(<A; \Omega>\) where A is set of grammatical meanings and \(\Omega\) is set of positional distributions defined upon A.

It is possible to estimate the degree of proximity of grammars by estimation degrees of proximities of sets of grammatical meanings and sets of positional distributions and then take superposition of both indexes.

It is rather obvious that the more closely related are certain languages the higher value of the correlation index they demonstrate: languages which are closer relatives have more common grammatical meanings and these common meanings have more alike positional implementations; languages which are more distant relatives have less common grammatical meanings and these common meanings demonstrate less alike positional implementations.
2.2. The Main Idea of the Method and Its Value for Comparative Linguistics

It was supposed that there was certain threshold value of the correlation index that determined the borders of stocks, i.e., if certain particular value of the correlation index is higher than the threshold, then compared languages are relatives, if certain particular value is lower than threshold value then compared languages are not related.

It was supposed that having compared distant relatives of firmly assembled stocks it could be possible to detect the threshold value of the correlation index (i.e., value of the correlation index that demonstrated distant relatives) and then this threshold could be applied to languages with unsettled genetic affiliation in order to see whether they were related to certain other languages.

And threshold value has been detected after comparison of distant relatives belonging to such firmly assembled stocks as: Austronesian, Austroasiatic, Indo-European and Sino-Tibetan (see 2.6).

Should be specially noted that the method is intended to make a direct comparison of languages that exist/existed in reality, i.e., it doesn’t suppose any use of reconstructions which often are much alike constructed languages since they in many cases are determined by particular preferences of authors and can’t be verified anyhow.

Also should be noted that the method doesn’t pay any attention to material implementations at all, i.e., the method supposes comparison of meanings and their positional distributions only. It isn’t a response to radical adepts of lexicostatistics who harshly ignore issues of grammar, but it just a practical matter of reality since material correlation (regular phonetic correspondences) between languages which are distant relatives can be a very complicated matter, so the method is intended to prove genetic relationship/unrelatedness only by the comparison of sets of meanings and by comparison of their positional distributions.

The last point is especially important in the case of comparison of Sumerian with certain other languages. Sumerian phonology is not even a reconstruction, but is just a very approximate rough imagination based on Sumerian-Akkadian dictionaries. The case of Sumerian is this very issue where any comparison of material implementations should be completely eliminated and where any conclusions about possible relationship should be made on the analysis of pure structures only.
2.3. Why the Method Is Based on Comparison of Verbal Grammar?

Why it is supposed that it is possible to conclude about the relatedness of certain languages considering only verbal grammar? It is possible because verbal grammar is much more universal than the grammar of noun. There are many languages which have almost no grammar of noun while there is no language without verbal grammar, i.e., there are languages which have no cases and genders, but there are no languages without modalities, moods, tenses and aspects (even language that are very close relatives can differ seriously in that case, for instance: English and German or Russian and Bulgarian). That’s why the verb is considered as the backbone of any grammar and backbone of the comparative method.

2.4. Whether Is It Possible to Prove Genetic Unrelatedness of Certain Languages?

An important point of current consideration is the possibility to prove unrelatedness of certain languages.

The possibility to prove unrelatedness is a necessary tool of any classification as well as possibility of proving of relatedness. If there would be no possibility to prove unrelatedness then even a single stock hardly could be assembled since it would not be possible to detect certain languages which don’t belong to this stock.

Possibility of proving of unrelatedness is discussed and proved in the following papers: Akulov 2015b; Brown 2015.

Relatedness/unrelatedness is an equivalence relation since it meets necessary and sufficient requirements for a binary relation to be considered as equivalence relation:

Reflexivity: \( a \sim a \): \( a \) is related with \( a \);
Symmetry: if \( a \sim b \) then \( b \sim a \): if \( a \) is related with \( b \) then \( b \) is related with \( a \);
Transitivity: if \( a \sim b \) and \( b \sim c \) then \( a \sim c \): if \( a \) is related with \( b \) and \( b \) is related with \( c \) then \( a \) is related with \( c \).

If it has been proved that an \( x \) language belonging to \( X \) stock is related/unrelated to \( y \) language belonging to \( Y \) stock then it means that \( x \) is
related/unrelated to the whole Y stock and that whole stocks X and Y are correspondingly related/unrelated.

Thus, can be resumed the following:

a) Relatedness means “language belongs to a stock”; unrelatedness means “language doesn’t belong to a stock”.

b) If set of 234 classes/stocks has been set up, then it obviously supposes that there should be a possibility of classification, i.e., we can say whether a language belongs to a stock; moreover, we always can show some languages which don’t belong to certain stock. If possibility to prove unrelatedness is denied then we actually can’t establish scopes of stocks and can’t distinguish one stock from another; then even a single stock hardly could have been assembled.

Any two randomly selected languages can be related or not related, i.e., there can be no ‘third variant’ since relatedness/unrelatedness supposes the existence of classes which don’t interject. If a language of X stock is related to a language of Y stock it means that these stocks are related.

2.5. The Algorithm of Calculation of Verbal Grammar Correlation Index (VGCI)

2.5.1. An Abstract Scheme of VGCI Calculation

Let’s imagine two abstract model languages: X and Y.

X is described by the following sets:

\( A_X \) (set of grammatical meanings of X) is the following: \( \{x_1, x_2, x_3, x_4, x_5, x_6\} \);

\( \Omega_X \) (set of positional distributions of grammatical meanings of X) is the following:

\( \{x_1 \rightarrow p_1; x_2 \rightarrow p_1p_2; x_3 \rightarrow p_2; x_4 \rightarrow p_2p_3; x_5 \rightarrow p_4, x_6 \rightarrow p_5\} \)

Y is described by the following sets:

\( A_Y \) (set of grammatical meanings of Y) is the following: \( \{y_1, y_2, y_3, y_4, y_5\} \)

\(^6\) According to Ethnologue nowadays there are 234 language stocks/families (Ethnologue 2016).
Ω\text{Y} \text{ is the set of positional distributions of grammatical meanings of Y) is the following:} \{y_1 \rightarrow p_1; y_2 \rightarrow p_1, p_2; y_3 \rightarrow p_2, y_4 \rightarrow p_5, p_3; y_5 \rightarrow p_4\}

It is possible to estimate degree of correlation between X and Y by the following way:

1) estimate degree of correlation between \text{A}_X and \text{A}_Y \text{ (to do it we have to find intersection of \text{A}_X and \text{A}_Y and then take intersection ratio to the number of elements of each set and then take arithmetical mean of both ratios);}
2) estimate degree of correlation of positional distributions of common grammatical meanings \text{ (i.e., meanings belonging to intersection of \text{A}_X and \text{A}_Y);}
3) take superposition of two indexes since lists of grammatical meanings and lists of positional distributions should be correlated in the same time.

The degree of correlation \text{A}_X and \text{A}_Y \text{ is the following: intersection of \text{A}_X and \text{A}_Y \text{ is } \{y_1, y_2, y_3, y_4, y_5\}, let’s suppose that all elements of \text{A}_Y \text{ are correlated by one-to-one correspondence with first five elements of \text{A}_X, so intersection consists of 5 elements and thus the ratios of elements belonging to the intersection to the numbers of elements of \text{A}_X and \text{A}_Y \text{ are the following: } 5/6 \text{ and } 5/5, and then the arithmetical mean of both ratios is the following: } (5/6 + 5/5)/2 \approx 0.9.

Degree of correlation of positional distributions of grammatical meanings belonging to intersection of \text{A}_X and \text{A}_Y is estimated by the following way:

\begin{align*}
\text{x}_1: & \text{ p}_1 \leftrightarrow y_1: p_1 \text{ positional distributions are identical so index of correlation is 1} \\
\text{x}_2: & \text{ p}_1, p_2 \leftrightarrow y_2: p_1, p_2 \text{ positional distributions are identical so index of correlation is 1} \\
\text{x}_3: & \text{ p}_2, \leftrightarrow y_3: p_2 \text{ positional distributions are identical so index of correlation is 1} \\
\text{x}_4: & \text{ p}_2 \neq y_4: p_5 \text{ positional distributions are dissimilar so index of correlation is 0} \\
\text{x}_5: & \text{ p}_4 \leftrightarrow y_5: p_4 \text{ positional distributions are identical so index of correlation is 1}
\end{align*}
And then to estimate degree of positional correlation we should take sum of all particular indexes of positional correlation and take their arithmetical mean: \( (1 + 1 + 0 + 1)/5 = 0.8 \).

Then in order to get the final index of correlation of \( X \) and \( Y \) we have to take superposition of two indexes since lists of grammatical meanings and positional distributions both should be correlated simultaneously, i.e., we have to multiply two indexes, in current case it gives the following value: \( 0.9 \times 0.8 = 0.72 \).

Thus resuming the above said it is possible to represent scheme of calculation of index of correlation by the following formula:

\[
\left( \frac{N_{e(A \cap B)}}{N_{e(A)}} + \frac{N_{e(A \cap B)}}{N_{e(B)}} \right) \frac{1}{2} \times \left( \frac{i_1 + i_2 + \ldots + i_n}{N_{e(A \cap B)}} \right)
\]

A is set of grammatical meanings of one language;
B is set of grammatical meanings of another language;
\( N_e \) means amount of elements;
i means index of positional correlation of certain common meaning.

### 2.5.2. An Example of VGCI Calculation: Comparison of English and Russian

First of all we need to take the list of grammar meanings of both compared languages (in current case of English and Russian).

I am to note that in current text I pay attention mostly to so called contensive grammatical meanings. i.e., not to, for instance, markers of transitivity, but to such items as: markers of tenses, aspects, modalities and so on, i.e., to those grammatical categories which have certain content that can be expressed by lexical means.

As far as it can be a rather complicated task to distinguish obligatory features of certain verb from facultative so first of all attention should be paid to the following categories:

a) tenses and aspects;
b) mood and modalities;
c) voices;
d) agent, patient, object, subject.
Also, there can be certain specific categories like, for instance: markers of
evidentiality (a kind of modality), or spatial orientation/versions (can be
considered as a development of triggers system), that’s why good descriptions
are matters of high importance (however, often same items can be described
by different terms).

In every language usually there are about 20 – 40 grammatical meanings
expressed in the verb, so actually the list of possible meanings is rather
compact and all meanings can be surveyed rather easily. This is one of
important and substantial differences of this methodology from methodology
based on comparison of lexis since in the case of lexis it’s almost impossible
to determine border of so called basic lexicon and much depends on particular
preferences of certain authors.

2.5.2.1. The List of Russian Grammatical Meanings Expressed in the
Verb with Their Positional Implementations

The list of Russian grammatical meanings expressed in verb and their
positional implementations has been compiled after Wade 2011.

1. Active voice: zero marker
2. Agent: [prp] * 6 -sfx
3. Attemptive aspect/mood: prfx-
4. Causative: prp-
5. Deontic modality: prp-1/prp-2/prp-3
7. Feminine gender: -sfx
   -sfx/prfx-5 * 6 -sfx/prfx-6 *6 -sfx/prfx-7 *6 -sfx/prfx-8 *6 -sfx
10. Indicative: zero marker
11. Imperative1: -sfx1/-sfx2/-sfx3/inner fusion + -sfx1
12. Imperative2: -sfx1 + -sfx/-sfx2 + -sfx/inner fusion + sfx1 + -sfx
13. Impossibility1 prp-
14. Impossibility2 prp-
15. Indicative mood: zero marker
16. Interrogative: prp-
17. Masculine gender: -sfx (zero suffix)
18. Negation: prp-
19. Neutral gender: -sfx
20. Passive voice: prp- + -sfx
21. Past simple: -sfx/suppletion + -sfx
23. Patient: -pp
24. Plural number: [prp-] * 3 -sfx
25. Potential modality: prp-
27. Present simple: 6 -sfx / inner fusion * 6 -sfx
29. Reciprocity: -sfx
30. Reflexivity: -sfx
31. Singular number: [prp-] * 3 -sfx
32. Subject [prp-] * 6 -sfx
33. Subjunctive mood: prp-

Each grammatical meaning is followed by certain schemes of letters and signs. These are notations representing general schemes of positional implementation of certain grammatical meaning.

Notations of positional implementations are the following: prp- – preposition; prfx- – prefix; -infx – infix; crfx---crfx – circumfix; crp---crp – circumposition; -RR- – reduplication; inner fusion – any irregular changes inside the root; suppletivism; R – root; -sfx – suffix; -pp – post position.

If there are some different forms of same positional implementations (i.e., forms used in different contexts) they are numbered the following way: prp1/-/prp2/-/prp3- and distinguished by slash, however, they also can be marked by the following way, for example: 6 -sfx that means six different suffixes; positional elements that are components of the same implementation are expressed in the following way: prp- + -sfx.

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7 Reduplication is interpreted as reiteration of root.
If a certain positional element can optionally be omitted, then it is written in square brackets for instance: [prp-].

Notation of the following view: [prp-] * 6 -sfx means that there are 6 different suffixes expressing certain grammatical meaning and each of them can optionally be accompanied by a preposition.

This way of notation shows not absolute positions of grammatical meanings in a linear model of word form/linear model of phrase*, but their positions in relation to nuclear position, i.e., it doesn’t matter what prefix is placed closer to the nuclear position and what is placed in a more distant position since for current tasks is necessary and sufficient information that certain meanings are expressed by positions placed to the left of the nuclear position.

Also should be specially noted that this way of notation just shows places and technical means of expressions of grammatical meanings, i.e., I don’t care about ‘school grammar’, for instance, I am not interested in how many verbal stems there are in a certain language. I consider language as something alike dark box with many holes, and implementation of certain grammatical meaning is light appearing in some holes and my task is to record in what holes light appears and then compare recording of different boxes (i.e., different languages).

2.5.2.2. Estimation of Correlation of Grammatical Meanings Sets of English and Russian

1. Active voice
2. Agent
3. Causative
4. Deontic
5. Desiderative
6. Future perfect
7. Future simple
8. Imperative
9. Impossibility

---

8 Can be spoken out the following objection: certain languages have no linear models of word forms as far as they have no morphology; however, I am to note that even with increasing the degree of analytism (i.e., when a language syntaxizes and grammatical meanings begin to be expressed by the means of syntax) the positional distributions of grammatical meanings in relation to the nuclear position remain the same in general, and thus it is possible to say that there is no much difference between morphology and syntax and it is possible to speak about linear model of word form/linear model of phrase.
10. Indicative
11. Interrogative
12. Negation
13. Passive voice
14. Past simple
15. Past perfect
16. Patient
17. Plural number
18. Potential modality
19. Present perfect
20. Present simple
21. Prohibitive
22. Singular number
23. Subject
24. Subjunctive mood

In the case of English and Russian we haven’t met any serious problems with correlation of grammar meanings since both languages actually have rather alike grammatical systems, however, sometimes it can be rather complicated.

We have 24 common meanings (or relatively common, anyway we have to suppose some drift and backlash of meanings) so index of correlation of sets of grammatical meanings is the following:

\[
\frac{24/33 + 24/33}{2} \approx \frac{0.73 + 0.73}{2} = 0.73.
\]

2.5.2.3. Estimation of Positional Correlation of Grammatical Meanings

Intersection of English and Russian

Now should be estimated degree of correlation of positional implementations of common grammatical meanings singled out in 2.5.2.2.

Schemes of positional implementation will help us to do it: we take the schemes that have been drawn above and completely formally compare the set of positional schemes of each meanings; if there is no difference (positional schemes are the same or very close, for instance: prp- and prfx- is the same full correlation as prp- and prp-) then this point is counted as 1; if there is completely no correlation (for instance prp- and -pp) then we count it as 0, in other cases we estimate the degree of correlation.

System of recording is the following: first is name of a grammatical meaning that is common for both of compared languages (or meanings that are
correlated), then is abbreviation of name of the first of compared languages (En for English and Rus for Russian, then first language schemes of expressions of this grammatical meaning, then sign of correlation “~” or anti-correlation “≠”, then abbreviation of the name of second language, then second language ways of expressions of the grammatical meaning and then number that expresses degree of correlation. If certain meaning can be expressed by some ways in such case schemes representing these ways are separated by slashes; if there are some similar items expressing the same meaning, for instance, some prepositions, then they are marked by lower index numbers.

1. Active voice: En: zero marker ~ Rus: zero marker 1
2. Agent: En: prp- [prp-] * 6 -sfx ~ Rus: [prp-] * 6 -sfx 0.75
3. Causative: En prp- ~ Rus: prp- 1
4. Deontic modality: En prp- ~ Rus: prp- 1
7. Future simple: En: prp- ≠ Rus: prp- + -sfx/prfx- * 6 -sfx 0
8. Imperative: En: R ≠ Rus: -sfx1/sfx2/sfx3/inner fusion + -sfx1/sfx1 + -sfx/sfx2 + -sfx/inner fusion + -sfx1 + -sfx 0
9. Impossibility: En: prp- ~ Rus: prp-1/prp2- 0.75
10. Indicative: En: zero marker ~ Rus: zero marker 1
11. Interrogative: En: prp- ~ Rus: prp- 1
12. Negation: En: prp- ~ Rs: prp- 1
13. Passive voice: En: prp- + -sfx/prp- + inner fusion ~ Rus: prp- + -sfx 0.75
14. Past simple: En: inner fusion/suppletion/-sfx ~ Rus: -sfx/suppletion + -sfx (1/3 + 1/2)/2 ≈ 0.41
15. Past perfect: En: prp + -sfx/prp + inner fusion ~ Rus: prfx-1 + -sfx/prfx-2 + -sfx/prfx-3 + -sfx/prfx-4 + -sfx/prfx-5 + -sfx/prfx-6 + -sfx/prfx-7 + -sfx/prfx-8 * 6 -sfx prfx-1 + suppletion + -sfx/prfx-2 + suppletion + -sfx/prfx-3 + suppletion + -sfx/prfx-4 + suppletion + -sfx/prfx-5 + suppletion + -sfx/prfx-6 + suppletion + -sfx/prfx-7 + suppletion + -sfx/prfx-8 + suppletion * 6 -sfx (1/2 + 1/16) ≈ 0.28
17. Plural number: En: prp-[prp-] * 3 -sfx ~ Rus: [prp-] * 3 -sfx 0.75
18. Potential modality: En: prp- ~ Rus: prp- 1
19. Present perfect: E: prp + -sfx/prp + inner fusion ~ Rus:
   prfx-1 + -sfx/prfx-2 + -sfx/prfx-3 + -sfx/prfx-4 + -sfx/
   prfx-5 + -sfx/prfx-6 + -sfx/prfx-7 + -sfx/prfx-8 * 6 -sfx
   prfx-1 + suppletion + -sfx/prfx-2 + suppletion + -sfx/prfx-3 +
     suppletion + -sfx/
   prfx-4 + suppletion + -sfx/prfx-5 + suppletion + -sfx/prfx-6 +
     suppletion + -sfx/
   prfx-7 + suppletion + -sfx/prfx-8 + suppletion * 6 -sfx (1/2 +16) ≈ 0.28
20. Present simple: in En: 6 -sfx ~ Rus 6 -sfx/inner fusion * 6 -sfx 0.75
21. Prohibitive: En: prp-[/prp-2 ~ Rus: prp-[/prp-2 1
22. Singular number: En: prp-[/prp-] * 3 -sfx ~ Rus: [prp-] * 3 -sfx 0.75
23. Subject: En: prp-[/prp-] * 6 -sfx ~ Rus: it is expressed as: [prp-] * 6 -sfx 0.75.

Thus we have got the following indexes of positional correlation for each meaning of intersection:

1. Active voice: 1
2. Agent: 0.75
3. Causative: 1
4. Deontic: 0.87
5. Desiderative: 1
6. Future perfect: 0
7. Future simple: 0
8. Imperative: 0
9. Impossibility: 0.75
10. Indicative: 1
11. Interrogative 1
12. Negation: 1
13. Passive voice: 0.75
14. Past simple: 0.41
15. Past perfect: 0.28
16. Patient: 1
17. Plural number: 0.75
18. Potential modality: 1
19. Present perfect: 0.28
20. Present simple: 0.75
21. Prohibitive: 1
22. Singular number: 0.75
23. Subject: in 0.75
24. Subjunctive mood: 1

In order to calculate the index of positional correlation we have to take the sum of all these indexes and then take their arithmetic mean:

\[
\frac{(10 + 0.87 + 7*0.75 + 0.41 + 2*0.28)}{24} \approx 0.71.
\]

### 2.5.2.4. VGCI of English and Russian

And finally we should multiply index of positional correlation of common meanings by the index of meanings correlations since we want to know in what degree sets of meanings are correlated and in what degree intersection of sets of meaning is positionally correlated, i.e., we need both indexes to do intersection or conjunction, so we do the following: 0.71*0.73 ≈ 0.52.

### 2.6. Threshold Values of VGCI

Tests of VGCI on the material of firmly assembled stocks have given us the following threshold values:

- VGCI of English and Russian ≈ 0.52;
- VGCI of English and Lithuanian ≈ 0.43;
- VGCI of English and Latin ≈ 0.41;
- VGCI English and Persian ≈ 0.38;
- VGCI of Hawaiian and Lha’alua ≈ 0.39;
- VGCI of Chinese and Tibetan ≈ 0.39.

From other hand tests of VGCI on the material of unrelated languages have shown us the following:

- VGCI (Chinese and English) ≈ 0.32;
- VGCI (Chinese and Latin) ≈ 0.3;
- VGCI (English and Tibetan) ≈ 0.13.
If value of VGCI is about 0.4 or more than 0.4 then languages are related (i.e., belong to the same stock), if value of VGCI is about 0.3 or less than 0.3 then languages are not related. Such values as 0.39 and 0.38 also are variants of 0.4; while 0.31 or 0.32 are variants of 0.3. The more closely are related certain languages, the higher is value of corresponding VGCI.

2.7. Measurement Error

Test of measurement error shows that it is about 2% (Akulov 2015a: 37).

2.8. Estimation the Probability of Coincidence

One can probably say that occasionally any two randomly selected languages can seem to be relatives. Let’s think whether it is possible. Let’s estimate the probability of such event. We have seen that intersections of sets of meanings are shaped by 15 – 24 elements. Let’s suppose that each meaning is expressed by only one positional implementation that which can be chosen from following list of possible positional implementations:

1. prp-
2. prfx-
3. crp---crp
4. crfx---crfx
5. -infx-
6. -RR-
7. inner fusion
8. suppletion
9. R
10. -sfx
11. -pp
12. tr-sf-x

It is possible to say that prp- and prfx- and so on are actually very close and can modify this list:

1. prp- ~ prfx-
2. crp---crp ~ crfx---crfx
3. -infx-
4. -RR-
5. inner fusion
6. suppletion
7. R
8. -sfx - pp
9. tr-sf-x

We have got 9 positions, but actually it would be more convenient to deal with a list of 10 positions so let’s round the value we got and let’s suppose there are 10 positions.

According to our above proposition we supposed that one meaning can be expressed only in one position. What is probability to choose coincidentally the same position as has been chosen by the same grammatical issue in another language? Imagine that you toss up a decahedron. What is probability that once certain face will appear? The probability is one tenth and it is same for any other faces. However, we have to get about 19 average positions simultaneously, so we have to multiply 0.1 by 0.1 nineteen times. The probability is $10^{-19}$. Actually the real probability is much less than $10^{-19}$ since in current estimation has been counted only probability of positional correlation and has not been estimated and counted the probability of choice of similar sets of grammatical meanings. Anyway, this probability is very little, it is much less than, for instance, probability of meeting Earth with a truly dangerous asteroid that is about $2.5 \times 10^{-4}$ (the Earth exists about 4 milliard years and serious asteroids visit it about once per million years).

A more detailed description of VGCI method can be seen in Akulov 2015a.

3. VGCI PROVES THAT AINU ISN’T RELATED TO AUSTRONESIAN AND MON-KHMER STOCKS

3.1. VGCI Proves that Ainu and Austronesian Stock Are Unrelated

Basing on comparison of some randomly chosen lexemes Murayama Shichirō wrote that Ainu is a relative of Austronesian stock (Murayama 1993). Let’s check whether it is so by use of VGCI.
3.1.1. Ainu and Lha’alua

3.1.1.1. The list of Ainu Grammatical Meanings Expressed in the Verb with Their Positional Implementations

The list of Ainu grammatical meanings and their positional distributions has been compiled after Tamura 2000.

1. Agent: [prp-] * 7 prfx-
2. Causative -sfx
3. Deontic modality: -pp
4. Desiderative mood: -pp
5. Dubitative mood ~ evidentiality “may be”: -pp
6. Evidentiality “people say”: -pp
7. Evidentiality “speaker has seen it” -pp
8. Evidentiality “something can be heard/smelt” -pp
9. Evidentiality “something can be seen” -pp
10. Exclusive prfx-/prfx-/ sfx
11. Future conditional: -pp/-pp
12. Future simple: -pp + -pp
13. Hortative: -pp
15. Imperative (polite): -pp
16. Impossibility: -pp
17. Inclusive: prfx-/prfx-/sfx
18. Indicative mood: zero marker
19. Intensiveness: -RR-/sfx/-sfx/suppletion
20. Interrogative: -pp/-pp
21. Iterative: -RR/-suppletion/-sfx/-sfx
22. Negation: prp-
23. Patient: [prp-] * 7 prfx-
24. Past simple: -pp
25. Past perfect: -pp
27. Possibility: -pp
29. Present-future (general tense) zero marker
30. Present perfect: -pp
31. Prohibitive mood: prp-
32. Reason/intention: -pp
33. Reciprocity: prfx-
34. Reflexivity: prfx-
35. Singular number: [prp-] * 9 prfx- / [prp-] * 9 prfx- * suppletion
36. Subject: [prp-] * 5 prfx / 2 -sfx
37. Subjunctive mood “if” - pp
38. Transitivator: prfx-
40. Undefined causative -sfx

3.1.1.2. The List of Lha’alua Grammatical Meanings Expressed in the Verb with Their Positional Implementations

Lha’alua (or Saaroa) is one of Formosan languages; it belongs to Tsouic languages (see Figure 2). The list of Lha’alua grammatical meanings and their positional implementations has been compiled after Pan 2012.

1. Actor voice: prfx-/infx-/zero marker
2. Agent prfx-6 -sfx
3. Attenuative/diminutive aspect aspect: -RR-
4. Causative: prfx-
5. Change of state aspect: -sfx
6. Durative aspect: -RRR/-RR-
7. Evidentiality (reported evidentiality): -sfx
8. Exclusive: -sfx
9. Existential negation: prp-
10. Experiential aspect: prfx-
11. Habitual aspect: -RR-
12. Hortative: -sfx
13. Imperative 1: polite request -sfx
14. Imperative 2: strong request: prp-/sfx
15. Imperfective aspect -sfx
16. Inchoative: prfx-
17. Inclusive: -sfx
18. Indicative: zero marker
19. Interrogative: -sfx
20. Irrealis: prfx-/infx-/RR-

-RRR- is the sign of triplication.
21. Iterative aspect: -RR/- -RRR-
22. Locative trigger (locative voice) -sfx/-sfx2/-sfx3
23. Negation: prp-
24. Patient trigger (voice): -sfx
25. Perfective aspect: prfx-
26. Plural number: prfx-/4 suffixes
27. Potential modality: -sfx
28. Prohibitive: prp-
29. Realis: zero marker
30. Singular number: prfx-/sfx1/-sfx2/sfx3
31. Uncertain modality: -sfx1/-sfx2/-sfx3

Figure 2. Location of Lha’ala’u and Tsou languages upon the island of Taiwan

3.1.1.3. VGCI of Ainu and Lha’ala’u

1. Agent: A.: [prp-] * 7 prfx- ~ Lh.: prfx-/6 -sfx (1/7+1/7)/2 ≈ 0.14
2. Causative: A.: -sfx ≠ Lh.: prp- 0
3. Dubitative mood ~ Uncertain modality: A.: -pp ~ Lh.: -sfx1/-sfx2/-sfx3 0.66
4. Present continuous ~ durative: A.: -pp + -pp\textsubscript{1} / -pp + -pp\textsubscript{2} \neq \text{Lh.: -RR-/}-RRR- 0
5. Evidentiality “people say” ~ reported evidentiality: A.: -pp ~ \text{Lh.: -sfx 1}
6. Exclusive: A.: prfx\textsubscript{-}/prfx\textsubscript{-}/-sfx ~ \text{Lh.: -sfx 0.66}
7. Future simple ~ irrealis: A.: -pp + -pp \neq \text{prfx-/infx-/}-RR- 0
8. Hortative: A.: -pp ~ \text{Lh.: -sfx 1}
9. Imperative (plain) ~ strong request: A.: R \neq \text{Lh.: prp-/}-sfx 0
10. Imperative (polite) ~ polite request: A.: pp ~ \text{Lh. -sfx 1}
11. Inclusive: A.: prfx\textsubscript{-}/prfx\textsubscript{-}/-sfx ~ \text{Lh.: -sfx 0.66}
12. Indicative: A.: zero marker ~ \text{Lh.: zero marker 1}
13. Interrogative: A.: -pp\textsubscript{-}/-pp\textsubscript{2} ~ \text{Lh.: -sfx 1}
14. Iterative: A.: -RR/-suppletion/-sfx\textsubscript{1}/-sfx\textsubscript{2} ~ \text{Lh.: -RR/-RRR- (½ + ¼)/2 \approx 0.37}
15. Negation: A.: prp- ~ \text{Lh.: prp- 1}
17. Present-future tense ~ Irrealis: A: zero marker \neq \text{Lh: prfx-/infx-/}-RR- 0
18. Present perfect: A.: -pp \neq \text{Lh.: prfx.: 0}
19. Possibility: A.: -pp ~ \text{Lh.: -sfx 1}
20. Prohibitive: A.: prp- ~ \text{Lh.: prp- 1}
21. Singular number: A: [prp-] * 9 prfx-/[prp-] * 9prfx- * suppletion ~ \text{Lh.: prfx-/sfx\textsubscript{1}/-sfx\textsubscript{2}/sfx\textsubscript{3} (1/18 +1/4)/2 \approx 0.15}

Conspectus system of recording is the following: first is name of a grammatical meaning that is common for both of compared languages (or meanings that are correlated), then is abbreviation of name of the first of compared languages, then first language schemes of expressions of this grammatical meaning, then sign of correlation “~” or anti-correlation “\neq”, then abbreviation of the name of second language, then second language ways of expressions of the grammatical meaning and then number that expresses degree of correlation. If certain meaning can be expressed by some ways in such case schemes representing these ways are separated by slashes; if there are some similar items expressing the same meaning, for instance, some prepositions, then they are marked by lower index numbers.

VGCI of Ainu and Lha’alua is the following:
Verbal Grammar Correlation Index (VGCI) …

\[
(21/40 + 21/31)/2^* (7 + 0.75 + 3*0.66 + 0.37 + 0.14 + 0.33 + 0.15)/21 \approx 0.3.
\]

Such value of VGCI is the same as that of unrelated languages (2.6).
Due to transitivity of unrelatedness (2.4) even comparison of Ainu with one Austronesian language is sufficient for proving unrelatedness, but for the sake of much visibility Ainu is also compared with Cham and Hawaiian.

3.1.2. Ainu and Cham
The list of Ainu grammatical meanings can be seen in 3.1.1.1.

3.1.2.1. The List of Cham Grammatical Meanings Expressed in the Verb and Their Positional Implementations
The list of Cham\(^{10}\) grammatical meanings and their positional distributions has been compiled after Alieva, Bui 1999 and Aymontie 1889.

1. Active: prp-
2. Agent: prp-
3. Causative: prfx\(_1\)/prfx\(_2\)-
4. Centrifugal orientation: -pp
5. Centripetal orientation: -pp
6. Desiderative: prp-
7. Durative aspect\(_1\): prp-
8. Durative aspect\(_2\): prp-
9. Future: prp-
10. General tense ~ general aspect: zero marker
11. Imperative: -pp
12. Interrogative: -pp
13. Indicative: zero marker
14. Iterative \(_1\): -pp
15. Iterative \(_2\): prfx-
16. Negation: prp\(_1\)/prp\(_2\)/crp---crp
17. Passive: prp\(_1\)/prp\(_2\)-
18. Past simple: prp\(_1\)/prp\(_2\)/-pp
19. Patient: -pp
20. Perfect aspect \(_1\): -pp
21. Perfect aspect \(_2\): -pp

\(^{10}\)Cham is an Austronesian language spoken in Southern Vietnam (pic 3, pic 4).
22. Perfect aspect 3: -pp
23. Plural number: prp-
24. Potential modality: -pp
25. Prohibitive: prp-
26. Reciprocity: prfx-/pp
27. Singular number: prp-
28. Subject of intr: prp-

3.1.2.2. VGCI of Ainu and Cham

1. Agent: A.: [prp-] * 7 prfx- ~ Ch.: prp- (1/7 +1)/2 ≈ 0.57
2. Causative: A.: -sfx ≠ Ch: prp1/-prp2- 0
3. Desiderative: A.: -pp ≠ Ch: prp- 0
5. Imperative: A.: R/-pp ≠ Ch: -pp 0.75
6. Indiactive: A: zero marker ~ Ch: zero marker 1
7. Iterative: A.: -RR-/sfx1/-sfx2/ suppletivism ~ Ch: prfx-/pp: (1/2 + 1/4)/2 ≈ 0.37
8. Interrogative: A.: -pp/-pp2 ~ Ch.: -pp 0.75
9. Negation: A.: prp- ~ Ch.: prp1/-prp2/-crp---crp 0.66
10. Past simple: A.: -pp ~ Ch: prp1/-prp2/-pp 0.66
11. Patient: A.: [prp-] * 7 prfx- ≠ Ch: -pp 0
15. Present-future ~ general tense: zero marker ~ Ch: zero marker 1
16. Present perfect: A.: -pp ~ Ch: -pp1/-pp2/-pp3 0.66
17. Prohibitive: A.: prp- ~ Ch: prp- 1
18. Reciprocity: A.: prfx- ~ Ch.: prfx-/pp 0.75
19. Singular number: A.: [prp-] * 9 prfx-/ [prp-] 9 prfx- * suppletion ~ Ch: prp- (1/18 +1)/2 ≈ 0.53
20. Subject: A.: [prp-] * 5 prfx-/sfx1/-sfx2 ~ Ch.: prp- (1/7+1)/2 ≈ 0.57
VGCI (Ainu and Cham) is the following:

\[
\frac{20/40 + 20/28}{2} \times (4 + 2 \times 0.75 + 3 \times 0.66 + 2 \times 0.57 + 0.53 + 0.51 + 0.37)/20 \\
\approx 0.32.
\]

Such value of VGCI means that languages are unrelated.

Figure 3. The region where Cham language is located.

Figure 4. The map showing location of Cham speaking communities in Southern Vietnam.
3.1.3. Ainu and Hawaiian

The list of Ainu grammatical meanings can be seen in 3.1.1.1.

3.1.3.1. The List of Hawaiian Grammatical Meanings Expressed in the Verb and Their Positional Implementations

The list of Hawaiian grammatical meanings has been compiled after Krupa 1979.

1. Active voice: zero marker
2. Agent: -pp
3. Attemptive mood: prp-
4. Causative: prp-
5. Consequence: -pp
6. Deontic modality: prp-
7. Desiderative mood: prp-
8. Durative aspect: crp-\-crp1/crp---crp2
9. Frequency: -RR-
10. “If” mood: prp-
11. Imperative: prp-
12. Indicative mood: zero marker
13. Intensiveness: -RR-
14. Interrogative: -pp
15. Negation: prp-
16. Non-past tense ~ general tense: prp-
17. Passive voice: -pp
18. Past simple: prp-
19. Patient: -pp
20. Perfective aspect: prp-
21. Plural number: -RR- + -pp/prfx- + pp/-pp
22. Possibility: prp-
23. Prohibitive mood: prp-
24. Reason ~ in order to: prp-
25. Singular number: -pp
26. Subject: -pp

3.1.3.2. VGCI of Ainu and Hawaiian

5. Imperative: A.: R-/pp ≠ H.: prp- 0
7. Intensiveness: A.: -RR/-sfx1/-sfx2/suppletion ~ H.: -RR- 0.62
8. Iterative ~ Frequency: A.: -RR/-sfx1/-sfx2/suppletion ~ H.: -RR- 0.62
13. Plural number: A.: [prp-] * 10 prfx-/[prp-] * 2 -sfx/[prp-] * 10 prfx- *
   crp2 0
   prp- 0
17. Present perfect ~ perfective aspect: A.: -pp ≠ H.: prp- 0
   -pp 0
21. Subject: A: [prp-] * 5 prfx-/ 2 -sfx ~ H: -pp (1/7 +1)/2 = 0.57

VGCI (Ainu; Hawaiian) is the following:

\[(21/26 +21/40)/2* (3+2*0.62 + 0.75 + 0.57 + 0.53)/21 = 0.19\]

Such value of VGCI means that compared languages are unrelated.

### 3.2. VGCI Proves that Ainu and Mon-Khmer Are Unrelated

There is also a hypothesis that Ainu is a distant relative of Mon-Khmer (see, for instance: Vovin 1993). In order to see whether Ainu is a relative of Mon-Khmer VGCI is applied to Ainu and languages of Mon-Khmer stock.

#### 3.2.1. Ainu and Khmer

The list of Ainu meanings can be seen in 3.1.1.1.
3.2.1.1. The List of Khmer Grammatical Meanings Expressed in the Verb and Their Positional Implementations

The list of Khmer grammatical meanings has been compiled after Gorgoniev 1961; Haiman 2011.

1. Active: zero marker
2. Agent: prp-
3. Causative1: prfx-/infx-
4. Causative2: prp-
5. Centrifugal version 1: -pp
6. Centrifugal version 2 “to go out” – pp
7. Centripetal version – pp
8. Deontic modality1: prp-
9. Deontic modality 2: prp-
10. Durative aspect: prp-
11. Future simple: prp-
12. General aspect: zero marker
13. “If” mood: prp-
14. Impossibility: -pp
15. Imperative: R
16. Indicative: zero marker
17. Interrogative: -pp
18. Negation: prp-/crfx-crfx
19. Passive: prp-
20. Patient: - pp
21. Perfect aspect: prp-
22. Possibility: prp-/ - pp
23. Prohibitive: prp-
24. Subject: prp-
25. Version “to move down” – pp
26. Version “to move inside” – pp
27. Version “to rise up” – pp
28. Volition: prp-

3.2.1.2. VGCI of Ainu and Khmer

1. Agent: A: [prp-] * 7 prfx- ~ Kh: prp- (1/7 +1)/2 ≈ 0.57
2. Causative: A: -sfx ≠ Kh: prp-/prfx-/infx- 0
6. “If” mood: A: -pp ≠ Kh: prp 0
7. Imperative: A: R/-pp ~ Kh: R 0.75
8. Impossibility: A: -pp ~ Kh: -pp 1
9. Indicative: A: zero marker ~ Kh: zero marker: 1
10. Interrogative: A: -pp/-pp ~ Kh -pp 0.75
11. Negation: A: prp ~ Kh: prp/-crfx---crfx 0.75
12. Patient: A: [prp-] * 7 prfx- ≠ Kh: -pp 0
13. Possibility: A: -pp ~ Kh: prp/-pp 0.75
15. Present-future ~ General aspect: zero marker ~ Kh: zero marker 1
17. Prohibitive: A: prp- ~ Kh: prp-
18. Subject: A: [prp-] +5 prfx-/sfx1/sfx2 ~ Kh: prp (1/7 +1)/2 ≈ 0.57

VGCI of Ainu and Khmer is the following:
(18/40 +18/28)/2* (3 +4*0.75 +2*0.57)/18 ≈ 0.21.

Such value of VGCI means that compared languages aren’t related.

3.2.2. Ainu and Vietnamese

The list of Ainu grammatical meanings can be seen in 3.1.1.1.

3.2.2.1. The List of Vietnamese Grammatical Meanings Expressed in the Verb and Their Positional Implementations

The list of Vietnamese grammatical meanings compiled after Panfilov 1993.

1. Active voice: zero marker
2. Agent: prp-
3. Benefactive voice (positive meaning): prp-
4. Causative: prp-
5. Deontic modality: prp1/prp2-
6. Desiderative: prp-
7. Durative aspect: prp-
8. Experiential aspect: prp-
9. Future simple: prp-
10. General tense ~ aspect: zero marker
11. Immediate future: prp-
12. Imperative: R/-pp/crp-crp/-crp-crp/-prp1/-prp2-
13. Indicative mood: zero marker
14. Negation: prp-
15. Passive voice (negative meaning): prp1-/prp2-
16. Past tense: prp1-/prp2-
17. Patient: -pp
18. Possibility: prp-/pp
19. Prohibitive: prp1-/prp2-/prp3-
20. Perfect aspect: prp-/pp
21. Recent past: prp-
22. Subject of intransitive: prp-
23. Version 1 “to go” -pp
24. Version 2 “to come” -pp
25. Version 3 “to go up” -pp
26. Version 4 “to go out” -pp

3.2.2.2. VGCI of Ainu and Vietnamese

1. Agent: A: [prp-] * 7 prfx- ~ V: prp- (1/7 +1)/2 ≈ 0.57
2. Causative: A: -sfx ≠ V: prp 0
3. Deontic: A: -pp ≠ V: prp1-/prp2- 0
4. Desiderative: A: -pp ≠ V: prp- 0
5. Future simple: A: -pp + -pp ≠ V: prp- 0
6. Imperative: A: R/-pp ~ V: R/-pp/crp---crp/-crp---crp/prr1-/prr2- (1 +2/6)/2 ≈ 0.66
7. Indicative mood: zero marker ~ V: zero marker 1
9. Past simple: A: -pp ≠ V: prp1-/prp2- 0
10. Patient: A: [prp-] +7 prfx- ≠ V: -pp 0
11. Possibility: A: -pp ~ V: prp-/pp 0.75
12. Prohibitive: A: prp- ~ V: prp1-/prp2-/prp3 0.66
15. Present perfect: A: -pp ~ V: prp-/pp 0.75
16. Subject: A: [prp-] * 5 prfx-/2 -sfx ~ V: prp-(1/7+1)/2 ≈ 0.57
VGCI of Ainu and Vietnamese is the following:

\[(16/26 + 16/40)/2* (3 + 2*0.75 + 2*0.66 + 2*0.57)/16 \approx 0.22.\]

Such value of VGCI means that compared languages aren’t related.

**4. VGCI Proves That Austronesian and Mon-Khmer Stocks Are Related**

During searches for Ainu language relatives has been discovered that Austronesian and Mon-Khmer stocks are relatives.

The idea that Austronesian languages are distant relatives of Mon-Khmer stock was first spoken out by Wilhelm Schmidt (Schmidt 1906); later ideas of Schmidt were developed by Paul K. Benedict (Benedict 1976); Benedict also included Tai-Kadai and Hmong-Mien languages in this hypothetical Austric stock. This hypothesis like any other hypotheses of distant relationship had no firm proves until now, it was based mostly on comparison of randomly chosen lexemes. That’s why now VGCI method is applied to it.

**4.1. Austronesian and Khmer**

**4.1.1. Cham and Khmer**

The list of Cham grammatical meanings can be seen in 3.1.2.1; that of Khmer can be seen in 3.2.1.1.

1. Active voice: Ch: zero marker ~ Kh: zero marker
2. Agent: Ch: prp- ~ Kh: prp
3. Centrifugal orientation/version: Ch: -pp ~ Kh: -pp
5. Causative: Ch: prp1/- /prp2- ~ Kh: prfx/- /prp2- /infx- (1+2/3)/2 \approx 0.83
7. Durative aspect: Ch: prp1/- /prp2- ~ prp- ~ Kh: prp- .75
9. General tense ~ General aspect: Ch: zero marker ~ Kh: zero marker
10. Imperative: Ch: -pp ≠ Kh: R 0
11. Indicative: Ch: zero marker ~ Kh: zero marker
12. Interrogative: Ch: -pp ~ Kh: -pp 1
13. Negation: Ch: prp₁/-prp₂/-crp ~ Kh: prp-/crfx-crfx (1+2/3)/2 ≈ 0.83
14. Passive: Ch: prp₁/-prp₂~ Kh: prp- 0.75
15. Patient: Ch: -pp ~ Kh: -pp 1
16. Perfect aspect: Ch: prp₁/prp₂/prp₃ ~ Kh: prp- 0.66
17. Potential modality ~ Possibility: Ch: -pp ~ Kh: prp-/prp 0.75
18. Subject: Ch: prp~ Kh: prp- 1

VGCI of Cham and Khmer is the following:

\[
(18/28 +18/28)/2 * 15.57/18 ≈ 0.55.
\]

Such value of VGCI (see 2.6), means that Cham and Khmer are rather close relatives.

Cham and Khmer have been usually supposed to be members of the same sprachbund, i.e., scholars thought Cham can look alike Khmer and alike other languages of the region due to local contact influence. Of course, contacts can influence, for instance, on degree of analytism/synthetism, but I seriously doubt that contacts can influence on fundamental levels of grammar, i.e., on positional distributions. However, let’s test more.

### 4.1.2. Hawaiian and Khmer

The list of Hawaiian grammatical meanings can be seen in 3.1.3.1; that of Khmer can be seen in 3.2.1.1.

1. Active: H: zero marker ~ Kh: zero marker 1
2. Agent: H: -pp ≠ Kh: prp- 0
3. Causative: H: prfx- ~ Kh: prfx-/infx-/prp- 0.66
4. Deontic modality: H: prp~ Kh: prp₁/-prp₂~ 0.75
5. Desiderative mood ~ Volition: H: prp- Kh: ~ prp 1
6. Continuous ~ Durative: H: crp---/crp---/crp₂ ≠ Kh: prp- 0
7. Non-past tense/aspect ~ General aspect: H: prp~ Kh: zero marker 0
8. Imperative: H: prp- ≠ Kh: R 0
9. Indicative: H: zero marker ~ Kh: zero marker 1
12. Negation: H: prp~ Kh: prp-/crfx---/crfx 0.75
15. Perfective aspect: H: prp~ Kh: prp-1
16. Possibility: H: prp~ Kh: prp/~pp 0.75
17. Prohibitive: H: prp~ Kh: prp 1
18. Subject: H: -pp ≠ Kh: prp- 0

VGCI of Hawaiian and Khmer is the following:

$$\frac{18/26 + 18/28}{2} \ast \frac{8 + 2 \times 0.75 + 3 \times 0.66 + 0.58}{16} \approx 0.39$$

Such value of VGCI means that languages are distant relatives.

4.1.3. Lha’alua and Khmer

The list of Lha’alua grammatical meanings can be seen in 3.1.1.2; that of Khmer can be seen in 3.2.1.1.

1. Actor voice ~ Active voice: K: zero marker ~ Lh: pf/~infx/~zero marker 0.66
2. Agent: K: prp ≠ -Lh: sfx 0
3. Causative: K: prp/~prfx/~infx- ~ Lh: prp-0.66
4. Durative aspect: K: prp- ~ Lh: -RR-1
5. Realis ~ General aspect: K: zero marker ~ Lh: zero marker 1
7. Imperative: K: R ≠ Lh: -sfx 0
8. Indicative: K: zero marker ~ Lh: zero marker 1
9. Interrogative: K: ~pp ~ Lh: -sfx 1
10. Locative voice ~ one of versions K: -pp/-pp/-pp/-pp/~pp/-pp6 ~ Lh:-pp (1 +1/6)/2 = 0.58
11. Negation: Kh: prp/~crfx---crfx ~ Lh: prp-0.75
12. Passive voice ~ Patient voice: K: prp ≠ Lh: -sfx 0
13. Perfective aspect: K: prp ~ Lh: prfx-1
14. Possible modality: Kh: prp/~pp ~ Lh: -sfx 0.75
15. Progressive aspect: K: prp- ~ Lh: -RR-1

VGCI of La’alua and Khmer is the following:

$$\frac{16/28 + 16/31}{2} \ast (7 + 2 \times 0.75 + 3 \times 0.66 + 0.58)/16 \approx 0.38$$

Such value of VGCI means that languages are distant relatives.
4.2. Austronesian and Vietnamese

4.2.1. Vietnamese and Cham

The list of Vietnamese meanings can be seen in 3.2.2.1; that of Cham can be seen in 3.1.2.1.

1. Active voice: V: zero marker ~ Ch: zero marker 1
2. Agent: V: prp- ~ Ch: prp- 1
3. Causative: V: prp- ~ Ch: prp1/-/prp2- 0.75
4. Centrifugal orientation ~ Version 4 “to go out”: V: -pp ~ Ch: -pp 1
5. Centripetal orientation ~ to come: V: -pp ~ Ch: -pp 1
6. Desiderative mood: V: prp- ~ Ch: prp- 1
7. Durative aspect: V: prp- ~ Ch: prp1/-/prp2- 0.75
8. Future: V: prp- ~ Ch: prp- 1
9. General tense: V: zero marker ~ V: zero marker 1
10. Imperative: V: R/-/pp/prp-crp1/crp-crp2/prp1/-/prp2- ~ Chm: -pp 0.58
11. Indicative: V: zero marker ~ Ch: zero marker 1
12. Negation: V: prp- ~ Ch: prp1/-/prp2/-/crp-crp 0.66
13. Passive voice: V: prp1/-/prp2- ~ Ch: prp1/-/prp2- 1
14. Past tense: V: prp1/-/prp2- ~ Ch: prp1/-/prp2/-/ -pp 0.83
15. Patient: V: -pp ~ Chm: -pp1
16. Perfect: V: prp/-/pp ~ Ch: prp1/-/prp2/-/ -pp 0.41
17. Possibility: V: prp/-/pp ~ Ch: -pp 0.75
18. Prohibitive: V: prp1/-/prp2/-/prp3 ~ Ch: prp- 0.66
19. Subject: V: prp- ~ Ch: prp- 1

VGCI of Vietnamese and Cham is the following:

\[(19/26 +19/28)/2* (11 + 0.83 + 3* 0.75 + 2*0.66 +0.58 + 0.41)/19 \approx 0.6.\]

Such value of VGCI means that compared languages belong to the same stock.

4.2.2. Vietnamese and Hawaiian

The list of Vietnamese meanings can be seen in 3.2.2.1; that of Hawaiian can be seen in 3.1.3.1.

1. Active voice: V: zero marker- ~ H: zero marker 1
2. Agent: V: prp- ~ H: -pp 0
4. Deontic modality: V: prp-1/prp-2 ~ H: prp 0.75
5. Desiderative mood: V: prp- ~ H: prp- 1
7. Imperative: V: R/-pp/crp-1/crp-2/prp-1/-prp-2 ~ H: prp- 0.58
8. Indicative: V: zero marker ~ H: zero marker 1
10. Non-past tense: V: zero marker ≠ H: prp- 0
12. Past tense: V: prp-1/-prp-2 ~ H: prp- 0.75
14. Perfect aspect: V: prp-/-pp ~ H: prp- 0.75
15. Possibility: V: prp-/-pp ~ H: prp- 0.75
16. Prohibitive: V: prp-1/-prp-2/prp-3 ~ H: prp- 0.66
17. Subject: V: prp- ≠ H: -pp 0

VGCI of Vietnamese and Hawaiian is the following:
(17/26 +17/26)/2* (6 + 4*0.75 + 0.66 + 0.58)/17 ≈ 0.39.
Such value of VGCI means that compared languages are distant relatives.

4.2.3. Vietnamese and Lha’alua

The list of Vietnamese meanings can be seen in 3.2.2.1; that of Lha’alua can be seen in 3.1.1.2

1. Active voice ~ Actor voice: V: zero marker ~ Lh: pf-/infx-/zero marker + R 0.66
2. Agent: V: prp- ≠ V:-sfx 0
3. Causative: V: prp- ∼ Lh prp- 1
4. Durative aspect: V: prp- ∼ Lh: -RR- 1
5. Experience ~ Experiential: V: prp- ~ Lh: prp- 1
6. General tense ~ realis: V: zero marker ~ Lh: zero marker 1
7. Future ~ irrealis: V: prp- ~ Lh: prfx-/-infx-/-RR- 0.66
8. Imperative: V: R/-pp/crp-1/crp-2/prp-1/-prp-2 ∼ Lh: sfx (1 +1/6)/2 = 0.58
9. Indicative: V: zero marker ∼ Lh: zero marker 1
10. Irrealis ~ future: V: prp- ∼ Lh: prfx-/infx-/RR- 0.66
11. Locative voice ~ any version: V: -pp/-pp3/-pp4 ∼ Lh: -sfx1/-sfx3/-sfx3 0.87
13. Passive voice ~ patient voice: V: prp₁/prp₂ ≠ Lh: -sfx 0
14. Perfect aspect: V: prp/-pp ~ Lh: prfx- 0.75
15. Possibility: V: prp/-pp ~ Lh: sfx 0.75
16. Prohibitive: V: prp₁/prp₂/prp₃ ~ Lh: prp- 0.66

VGCI of Vietnamese and Lha’alua is the following:
\[(16/26 + 16/31)/2 \times (6.87 + 2.64 + 1.5 + 0.58)/16 \approx 0.4\]
Such value of VGCI means that languages belong to the same stock.

4.3. Conclusion about Austronesian and Mon-Khmer Stocks Relatedness

4.3.1. General Notes on Proximity of Grammatical Meanings Distributions
Values of VGCI received above evidently show relatedness of Austronesian and Mon-Khmer (Austroasiatic)\(^{11}\) stocks:

VGCI of Khmer and Cham is 0.55;  
VGCI of Khmer and Hawaiian is 0.39;  
VGCI of Khmer and Lha’alua is 0.38;  
VGCI of Vietnamese and Cham is 0.6;  
VGCI of Vietnamese and Hawaiian is 0.39;  
VGCI of Vietnamese and Lha’alua is 0.4

These data should be interpreted in the context of VGCI values of languages of firmly assembled stocks:

VGCI of English and Russian is 0.52;  
VGCI of English and Lithuanian is 0.43;  
VGCI of English and Latin is 0.41;  
VGCI English and Persian is 0.38;  
VGCI of Hawaiian and Lha’alua is 0.39;  
VGCI of Chinese and Tibetan is 0.39.

\(^{11}\) As far as Mon-Khmer is just a part of Austroasiatic stock, so due to transitivity of relatedness it’s possible to state relatedness of whole Austronesian to whole Austroasiatic. And thus it is possible to name this Austronesian-Mon-Khmer stock Austric stock.
Probably in the case of Cham and Khmer and in the case of Cham and Vietnamese it is possible to speak about certain contact influence. In the case of Cham and Vietnamese value of VGCI actually shows that they belong not even to the same stock, but to the same group (VGCI value of a group should be higher than 0.56, for more details see Akulov 2016). I don’t think that contact influence can seriously change deep levels of grammar, i.e., basic positional distributions of grammatical meanings; contacts usually influence on superficial items of languages, for instance: language can become less or more analytical, can appear certain new affixes, but no contacts can influence can’t fundamental level of grammar. And I want to ask those who are obsessed by the mythology of “languages in contacts’: what “contact influence” was in the case of Khmer and Hawaiian or in the case of Hawaiian and Vietnamese?

4.3.2. Some Characteristic Features of So Called Austric Stock

4.3.2.1. Markers of Causative

Beside above shown general proximity/similarity of positional distributions of common grammar meanings there are certain noteworthy grammatical similarities.

One of such similarities is the way of expression of causative mood/causative voice in Austronesian and Mon-Khmer: in both stocks causative is expressed by prepositions/prefixes; in Austronesian languages can be seen even an amazing material resemblance of causative markers: Cham: pa-; Hawaiian: ho’o-‘ho”-‘ho”-‘ha’a-‘ho”-‘ha”-‘la’a-‘alua: poa-. In Khmer can be seen almost the same prefix: p- (taking into consideration the fact that degree of consonantism of Khmer seems to be higher than that of Cham, so it’s rather possible to suppose drift from pa- in Cham to p- in Khmer). In Vietnamese we don’t see such form (probably if we pay attention to certain dialects we can see something alike) and causative is expressed by a newly made form, but anyway this newly made form is prefixed/preposed.

4.3.2.2. The System of Focus/Triggers/Orientations

Another amazing structural similarity is so called focuses/triggers system, i.e., system of several voices; each voice accents on certain particular issue of action/process: on agent, on instruments, on location, on patient et c. Due to this fact such system of voices is called the system of focuses.

Austronesian languages (especially Austronesian languages of Taiwan) are well known for their systems of focuses; while in Mon-Khmer languages systems of focuses are almost unknown. However, in Vietnamese we actually
can see focuses system: it is possible to say that in Vietnamese there are focuses: actor focus, benefactive focus and patient focus; this system correlates well with Austronesian system that is well represented in Lha’alua.

I hardly can imagine that system of focuses is a new item appeared in Vietnamese due to contacts with languages of Austronesian. I would rather suppose gradual decay of system of focuses in Vietnamese under the influence of contacts and appearing a Chinese alike system of two voices; however, as I mentioned above I think that contacts influence actually is too much overrated.

The only possible conclusion is that such system of focuses in Vietnamese obviously is a relic of a well elaborated focuses system of Formosan/Philippine type.

In Cham and in Khmer, however, we don’t see focuses, but in Cham and in Khmer we can see orientations.

Orientation (or spatial orientation) is a special grammatical category that is used when speaker/subject attitude toward an action/process is expressed by, for instance, verbs of movement.

Orientations can be seen in different languages, for instance: in Ket there are spatial orientation markers (Werner 1997: 183); in Japanese there are directionally tinted aspectual markers (Lavrent’yev 2002: 127 – 133) and markers of whether an action/process is focused on subject or patient – these last are actually connected with Japanese system of formalized politeness (Ibid: 174 – 181).

Whether the system of orientations in Ket or in Japanese was somehow connected with any system of focuses is theme for special research; however, I do suppose that in the case of Austronesian and Mon-Khmer it is possible to speak about transformation of focuses system into the system of orientations/versions.

In Vietnamese there are three triggers and four orientations: ra “to go out”, lên “to ascend”, lại “to come”, đi “to go” (Panfilov 1993: 182 – 183).

In Khmer we don’t see triggers, but we can see just a system of orientations: cen “to go out”, mōk – centripetal, coh – “to move down”, cân “to enter”/“to move inside” inside”, la Còn “to ascend” (Gorgoniev 1961: 94 – 95).

In Cham we can see only two markers or orientation: nqwx “to go” – centrifugal orientation and maj “to come” – centripetal orientation (Alieva, Bũi 1999: 73).

Thus, as I suppose, it is possible to conclude the following:
Austronesian has triggers system, in Vietnamese we can see relics of triggers and well elaborated system of orientations; in Khmer and Cham we don’t see triggers but see systems of orientations, so I came to the conclusion that in the case of Austric languages triggers system could transform into the system of orientations (spatial orientations are especially well correlated with locative triggers). Anyway this is theme for further research.

4.3.2.3. Further Perspectives of Austric Stock
After Austronesian and Mon-Khmer relationship has been firmly proved then, first of all, should be solved the following questions: whether Tai-Kadai and Hmong-Mien stocks are relatives of Austric stock.

Also I am specially to note that typological proves don’t deny discovering of cognates, though many megalocomparativists probably think it does.
Or course, typology is the base, but since typological relatedness has been firmly proven there is no obstacles for discovering cognates that obviously exist, but cognates should be true cognates.

5. VGCI Proves that Ainu Is Relative of Great Andamanese and Sino-Tibetan Stocks

5.1. VGCI Proves that Ainu is a Relative of Great Andamanese

5.1.1. General Notes on Great Andamanese and Other Languages of Andaman Islands
The Great Andamanese languages are an extinct stock\(^\text{12}\) spoken by the Great Andamanese peoples of the Andaman Islands\(^\text{13}\), in the Indian Ocean.

Great Andamanese stock is supposed to be unrelated to other languages spoken upon the island of Andaman: such as Ongan (Jangil, Jarawa and Onge) and to Sentinelese\(^\text{14}\) (Abbi 2009). However, I suppose that actually Great Andamanese and Ongan stocks probably can be distant relatives.

\(^12\) Despite Great Andamanese is actually a stock, but in current text they are considered as a single language.

\(^13\) Figure 5.

\(^14\) Sentinelese language hasn’t been described anyhow yet since Sentinelese people intentionally escape any contacts with anthropologists/linguistics (Lakina 2016).
5.1.2. The List of Great Andamanese Grammatical Meanings Expressed in the Verb and Their Positional Implementations

The list of Great Andamanese meanings has been compiled after Choudary 2006.

1. Agent: [prp-] * 8 prfx-
2. Causative: prfx-
3. Conditional: -sfx
4. Durative: -sfx
5. *Evidentiality¹ 1 “hearsay”
6. *Evidentiality 2 “it can be seen”
8. Habitual: -sfx
9. Imperative: -sfx
10. Inclusive: prfx-1/prx-2
11. Indicative: -sfx
12. Interrogative: prp-
13. Negation prfx/-sfx
14. Non-past: -sfx
15. Past simple: -sfx
17. Plural number: [prp-] + prfx-
18. Prohibitive: -sfx
19. Reason: -pp
20. Reflexivity: prfx-
21. Singular number: [prp-] * 4 prfx-
22. Subject: [prp-] * 8 prfx-
23. Transitivator: prfx-

5.1.3. VGCI of Ainu and Great Andamanese

The list of Ainu grammatical meanings with their positional distributions can be seen in 3.1.1.1.

1. Agent: A: [prp-] * 7 prfx- ~ An.: [prp-] * 8 prfx- (1 + 7/8)/2 ≈ 0.94
2. Causative: A: -sfx ≠ An: prfx- 0

¹³ The description of Great Andamanese that I used is actually rather meager, it seems that some features of verb aren’t mentioned, that’s why I suppose it’s possible to reconstruct some features, i.e.: it’s possible to reconstruct such features as markers of evidentiality since they obviously should be represented in this language.
3. Conditional ~ Future conditional: A: -pp₁/ -pp₂ ~ An: -pp 0.75
5. Evidentiality “hearsay”: A: -pp ~ An: -pp 1
6. Evidentiality “it can be seen”: A: -pp ~ An: -pp 1
7. Exclusive: A: prfx₁/ prfx₂ - sfx ~ An: prfx₁/prfx₂/prx₂ 0.66
9. Inclusive: A: prfx₁/ prfx₂ - sfx ~ An: prfx₁/prfx₂ (1 + 2/3)/2 = 0.83
10. Imperative: A: R/ -pp ≠ An: -sfx 0.75
11. Indicative: A: zero marker ~ An: -sfx 0
13. Negation: A: prp ~ An: prfx/- -sfx 0.75
15. Past simple: A: -pp ~ An: -sfx 1
16. Patient: A: 7 prfx- ~ 5 prfx- (1 + 5/7)/2 ≈ 0.86
17. Prohibitive: Ai: prp- ≠ An: -sfx 0
20. Singular number: Ai: [prp-] * 9 prfx-/[prp-] * 9prfx- * suppletion ~ An.: 4 prfx- (1 + 4/18)/2 ≈ 0.61
21. Subject: A: [prp-] * 5 prfx-/[prp-] * 2 -sfx ~ 8 prfx- (5/7 + 5/8)/2 ≈ 0.66

VGCI Ainu and Great Andamanese is the following:

\[
\frac{22/24 + 22/40}{2}(5 + 0.94 + 3*0.75 + 2*0.66 + 0.83 + 0.86 + 0.56 + 0.61)22 \approx 0.4
\]

Such value of VGCI is the same as value of VGCI of English and Persian (see 2.6).
Figure 5. Spread of Great Andamanese and other languages of the Andaman islands in the beginning of 19th century (Source: Abbi, A. The Unique Structure…).
5.2. VGCI Proves that Ainu and Sino-Tibetan Stock Are Relatives

5.2.1. The List of Qiang Grammatical Meanings Expressed in the Verb and Their Positional Implementations

The list of Qiang meanings has been compiled after LaPolla, Huang 1996. Geographic location of Qiang language can be seen in pic 6.

1. Actor: 6 -sfx
2. Ability 1 learned: -sfx
3. Ability 2 natural: -sfx1/-sfx2
4. Ability 3: -sfx
5. Causative: -sfx
6. Centrifugal version: -pp
7. Centripetal version: -pp
8. Change of state aspect: -sfx
9. Continuative aspect ~ Progressive: prfx/-sfx
10. Declarative: -pp
11. Deontic modality: -sfx + -pp
12. Desiderative: -sfx
13. Directional: 8 prfx-
14. “To dare” to do: -sfx
15. Evidentiality 1 “hearsay”: -sfx
16. Evidentiality 2 mirative: -sfx
17. Evidentiality 3 “see”: -sfx
18. Experiential aspect: -sfx
19. Habitual aspect: -sfx1/-sfx2
20. Hortative: -pp1/-pp2/-pp3/-pp4
21. Imperative: zero marker
22. Imperfective aspect: zero marker
23. Indicative: zero marker
24. Intentional: -sfx + -pp
25. Interrogative: -pp1/-pp2/-pp3/-pp4/-pp5
26. Negation: prfx-
27. Optative: -pp1/-pp2/-pp3
28. Patient/non-actor/benefactive: 6 -sfx
29. Perfective aspect – resultative: 8 prfx/-prfx- + -pp
30. Permissive: -sfx
31. Plural: 9 -sfx
32. Prohibitive: prfx-/pp1/-pp2
33. Reciprocity: -RR-
34. Repetition: -sfx
35. Resultative: prfx- + -pp
36. Simultaneity: -pp
37. Singular: 9 -sfx
38. Subject: 6 -sfx

2.

5.2.2. VGCI of Ainu and Qiang

The list of Ainu meanings can be seen in 3.1.1.1.

1. Actor: A: [prp-] * 7 prfx- ≠ Q: 6 -sfx 0
2. Causative: A: -sfx ~ Q: -sfx 1
3. Deontic: A: -pp ~ Q: -sfx + -pp 1
4. Desiderative: A: -pp ~ Q -sfx 1
6. Evidentiality “people say” ~ hearsay: A: -pp ~ Q -sfx 1
7. Evidentiality: “speaker has seen it” ~ see: A: -pp ~ Q: -sfx 1
8. Experiential aspect ~ Past simple: A: -pp ~ Q -sfx 1
9. Hortative: A: -pp1/-pp2/-pp3/-pp4 (1 + ½)/2 = 0.625
10. Imperative: A: zero marker/-pp ~ Q: zero marker 1
11. Imperfective ~ General tense: A: zero marker ~ Q zero marker 1
12. Indicative: A: zero marker ~ Q: zero marker 1
13. Intention: A: -pp ~ Q -sfx + pp 1
14. Interrogative: A: -pp1/-pp2 ~ Q: -pp1/-pp2/-pp3/-pp4/-pp5 (1 + 2/5)/2 = 0.7
16. Patient: A: [prp-] * 7 prefixes ≠ Q: 6 -sfx 0
17. Perfective aspect: A: -pp ≠ Q: 8 prfx/-prfx- + -pp 0
19. Potential: A: -pp ~ Q: -pp1/-pp2/-pp3/-pp4 (1 + ¼)/2 = 0.625
20. Prohibitive: A: prp- ~ Q: prfx/-pp/-pp2 (1+1/3)/2 = 0.66
21. Reciprocity: A: prfx- ≠ Q: -RR16- 1

16 It is possible to say that reduplication can be interpreted as prefixation.
22. Repetition: A: -RR/-suppletion/-sfx3/-sfx2 ~ Q: -sfx (1 + ¼)/2 = 0.625  
23. Singular: [prp-] * 9 prfx-/[prp-] * 9prfx- * suppletion ≠ Q: 9 -sfx 0  
24. Subject: A: [prp- ]+ 5 prfx- / 2-sfx ~ Q: 9 -sfx (2/7+2/9)/2 = 0.25  

VGCI of Ainu and Qiang is the following:  

\[
(24/38 + 24/40)/2*(11 + 0.5 + 0.75 + 0.7 + 3*0.625 + 0.39 + 0.66 + 0.25)/24 \approx 0.4; 
\]

It means that Ainu and Qiang are relatives.  
Thus, due to transitivity of relatedness, it is possible to state that Ainu is a relative of whole Sino-Tibetan stock.

### 5.3. Particular Conclusion about Ainu-Andamanese-Sino-Tibetan Stock

#### 5.3.1. Ainu-Andamanese-Sino-Tibetan Stock

Now it is possible to speak about Ainu-Andamanese-Sino-Tibetan stock.  
Main structural features of the stock are the following: voices are badly elaborated; often can be seen personal markers; also category of evidence is elaborated rather well.  
Qiang is closer to Ainu than to Mandarin.  
Mandarin language is a marginal idiom inside the stock since it has well elaborated category of voice and has no category of evidence.  
It seems that Mandarin underwent certain influence of Austric languages since Austric languages have a well elaborated category of voice (system of trigger/focuses, see 4.3.2.2).

#### 5.3.2. Evidences of Genetics

Cultures and languages are usually considered separately from the data of genetics, and often can be seen the opinion that cultural anthropology should not use data of genetics. However, I have to note that since languages and cultures are spread not by themselves, but by people so influence of certain culture has to correlate with corresponding genetic traces (Nonno 2016a: 46).  
Different subclades of Y haplogroup D-M174 are rather widely spread among people of Southwest China (Xue et al. 2006). The same Y haplogroup can be seen among Ainu people (Tajima et al. 2004) and among Andamanese (Chandrasekar et al. 2007).
It’s notable fact that nowadays geographic spreading of languages preserving old features of Ainu-Andamanese-Sino-Tibetan stock correlates with that of Y haplogroup D (Figure 6).

Figure 6. Geographic spread of Ainu-Andamanese-Sino-Tibetan stock; genetic evidences and perspective territories for looking for other relatives of the stock.
It seems that initially large spaces of Southern and East Asia were occupied by people with Y haplogroup D and they were the first speaker of the idiom that was proto-language of Ainu-Andamanese-Sino-Tibetan stock.

As it has been noted in 5.3.1 it seems that initially Mandarin also was a language with a set of typical features of the stock, but had been undergone serious influence of certain Austic languages; and this hypothesis also correlate well with data of genetics, since there is almost no Y haplogroup D in the plains of China. It seems that people of Y haplogroup D mixed with newcomers who spoke Austic languages and bore Y haplogroup O upon the plains, or were ousted to the mountain where they could save their languages.

5.3.3. Evidences of Culture

Ornaments of Ainu textile and those of Shang bronzes demonstrate noteworthy resemblance. Basic element of both ornamental traditions is so called rectangular volute (Nonno 2016b: 54).

5.3.4. Location of Proto-Language of Ainu-Andamanese-Sino-Tibetan Stock

Proto-language of Ainu-Andamanese-Sino-Tibetan stock probably located somewhere in South Asia.

5.3.5. Other Potential Relatives

Potential relatives can probably be found among West Papuan and Halmahera languages (Figure 5).

Another potential relative is Ongan family. Despite Ongan languages are usually considered as unrelated to Great Andamanese (Abbi 2009), but it seems rather possible that they can be distant relatives.

Also, certain lexical relics can probably be found in languages of so called Orang Asli and Aeta. Despite now they are Austronesian speaking ethnic groups, in their languages there are some words of non-Austronesian origin (Reid 1994).

5.3.6. On the Origin of Ainu

Above described facts are firm evidences of southern origin of Ainu. Ainu people seem to be relic of a very large population that was spread throughout South and Southeast Asia in a very distant past.
CONCLUSION ABOUT VGCI METHOD

The basic idea of VGCI method is very simple:

Grammar is first of all positional distributions of grammatical means, i.e., ordered pair of the following view: \(<A; \Omega>\) where \(A\) is set of grammatical meanings and \(\Omega\) is set of operations (positional distributions) defined on \(A\).

In order to understand whether two languages are genetically related we should analyze the degree of correlation of grammatical meanings sets and to estimate the proximity of positional distributions of common grammatical meanings.

If value of VGCI is about 0.4 or more than 0.4 then languages are related (i.e., belong to the same stock), if value of VGCI is about 0.3 or less than 0.3 then languages are not related. Such values as 0.39 and 0.38 also are variants of 0.4; while 0.31 or 0.32 are variants of 0.3. The more closely are certain languages related, the higher is value of corresponding VGCI.

The more precise is notation the more precise will be conclusions. Current way of notation allows seeing whether languages are related, but obviously it can become more precise.

Good grammars and correct notation are matters of utmost importance in VGCI method. It’s better not to estimate VGCI at all rather than estimate it inaccurately. I mean the following: if someone receives VGCI value, for instance: 0.35, it means that there are some serious mistakes in notation or it simply means that grammar simply doesn’t describe a language in a sufficient way.

There can be no languages demonstrating such odd values as 0.35; VGCI of any pair of languages is somewhere outside of this “corridor of death” between 0.3 and 0.4.

Actually VGCI allows some backlash, since, as it has been shown, very different descriptions give almost the same values, but VGCI obviously doesn’t allow omission of the milestones of grammars.

Set of contensive grammatical meanings of any language is actually rather small: it hardly can count more than 50 elements and hardly can count less than 20. If certain list of grammatical meanings consists of less than 20 elements, then it should cause doubts about the correctness of a particular notation.
Differentiation between syntax and morphology has no real base: it can be especially clearly seen on the material of Austronesian stock: among Austronesian languages there are languages that “look alike” Vietnamese and Khmer (for instance Cham), i.e., from “traditional” point of view have no morphology; there are languages that “look alike” Ainu (for instance Lha’alua), i.e., have well elaborated morphology; and there languages that probably from that “traditional point of view” look alike “Austronesian itself” (for instance Hawaiian); and all these languages that are “so much different typologically” show rather similar positional distributions of grammatical categories. It also means that typology should be not collecting of curiosities, but should be study of positional distributions of all grammatical categories of verb represented in a certain language.

An important consequence from the previous point is the principle that can be conventionally named principle of grammar distribution stability, i.e., degree of synthetism/analytism can changes, morphology can convert itself into syntax or vice versa, but positional distributions of most important grammatical categories remain the same.

Unrelatedness of languages can be proved; anyone who states that it's impossible just steps outside of basic logic and outside of science.

VGCI can be extremely perspective in Americas, New-Guinea and Australia, i.e., in those areas where exist many languages which genetic affiliation is doubtful or simply unknown.

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Field work among Ainu in the island of Hokkaido in 2006 in order to estimate real number of Ainu language speakers (with financial support of Japan Foundation); report about this work: Akulov, A. (2015). Contemporary condition and perspectives of Ainu language. *Cultural Anthropology and Ethnosemiotics*, Vol. 1, N 1, 3-23

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Chapter 3

ACADEMIC LITERACY ADAPTATION IN THE INTERNATIONAL GRADUATE STUDENTS’ USE OF LEXICAL BUNDLES THROUGH CORPUS RESEARCH

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ABSTRACT

More and more international students come to the United States to study in higher education. Due to the increasing number of the population, international students are considered crucial for the economic and social impact on academia in the U.S. For instance, they have contributed more than 30.8 billion dollars to the economic vigor of the U.S. higher institutions and their communities. However, international students’ adaptation may not be successful due to several reasons. One of them would be their language proficiency—in particular, productive language skills: writing and speaking. In the academic setting, many international students struggle with their written assignments in English. Acknowledging the international students’ challenge of academic writing in English, this study investigated international graduate students’ academic literacy adaptation via corpus research. The use of lexical bundles was examined as one of the academic literacy adaptation...
indicators in this corpus-based study. The results revealed that the students did not use stance lexical bundles, indicating that they may not express their own voices in critical reviews. Rather, they tend to write carefully to reflect the original articles. This study suggests that we should view international students’ academic literacy adaptation with larger corpus data. Further implications of the findings are discussed.

1. Introduction

Prior research (e.g., Cheng & Fox, 2008; Spack, 1997) shows that a lot of international students face challenges in their adaptation process while studying in a foreign country. More and more international students come to the United States to study in higher education. According to Open Doors 2016, the number of international students studying in the United States grew by 7.1% over the prior year in 2015-2016 and was at a record high; international students constituted approximately 5.2% enrolled in the total U.S. higher education student population in the year 2015-2016 (“Institute of International Education,” 2016). The increasing population of international students has brought social and economic influence on higher education in the U.S. Their contribution to the U.S. higher education also includes providing a wide range of viewpoints in the U.S. classrooms.

In spite of the benefits that international students bring to higher educational contexts, the academic adaptation may not be reached to their expectation. For example, Park’s (2016) study showed that the participating international graduate students perceived that their sociocultural adaptation was agreeable with 93 percent of positive responses. The international graduate students seemed socially and culturally adjusted well to the target culture and society. However, the dimensions of academic adaptation and academic literacy adaptation yielded lower percentages (77.88% & 68.17% respectively). This indicates that international students have difficulty in academic adaptation and especially the adaptation of second language writing.

Realizing international students’ challenge of academic writing in English, this study investigated international graduate students’ academic literacy adaptation via corpus research. In particular, this study focused on the international students’ lexical bundle use. To better understand the nature of their language use and assist them to improve their English language skills, it is necessary to examine how international students receive the input and yield the output via second language writing. In this sense, lexical bundles can
manifest the extent of academic literacy adaptation. Thus, this study poses the following research questions:

1. What structural characteristic of lexical bundles are included in the participants’ second language writing?
2. What functional characteristics of lexical bundles are included in the participants’ second language writing?
3. Which features of lexical bundles used by the participants show academic literacy adaptation in second language writing?

2. LITERATURE REVIEW

2.1. Academic Adaptation through Second Language (L2) Writing

A growing body of literature of academic adaptation of international students, whose first language is not English, in higher education has focused on second language learners’ processes of engagement in the university settings (e.g., Cheng & Fox, 2008; Ivanić, 2006; Leki, 1995, 2007; Morita, 2000; Spack, 1997). Spack’s (1997) longitudinal case study explored one international undergraduate student’s reading and writing strategies in the U.S. academic context. The study analyzed multiple data sources, including interviews, observations, and texts from the participant’s courses, and examined the linguistic, cultural, and educational factors of the participant’s learning in a second language. The results revealed an inseparability of reading and writing processes and the participant’s strategy of applying previous literacy skills to new course materials. Spack’s (1997) study also implied that the educational background is closely related to academic discourse practices and rhetoric. Leki’s (2007) study is another exemplary research on language and literacy learning experiences of immigrant and international students throughout their entire undergraduate careers. In the multiple case studies, Leki (2007) argued that ESL composition courses may not be related to students’ experiences of academic language and literacy in the U.S. academic setting and that L2 writing classes should provide international students with an opportunity to develop literacy skills and to learn academic strategies to overcome challenges of international students in academic adaptation. Cheng and Fox’s (2008) study explored how international students were successfully engaged in the academic setting and developed more strategic learning and
social skills as part of their adaptation process. The study examined factors of the participants’ academic adaptation and a role of English for academic purposes (EAP) instruction as a mediator of academic adaptation processes. A grounded theory approach was employed in analyzing the responses elicited by semi-structured interviews with L2 students studying in three Canadian universities. The findings revealed that L2 students felt burdened in the new academic and cultural communities. A major issue was a mismatched agenda. Students’ expectations and needs do not often meet the ones within their universities. For this reason, successful academic adaptation may not take place with language or disciplinary learning alone. Academic adaptation is such a complex process in international students’ personal, social, intellectual, and cultural lives and cannot be a one-way communication from specialists in a target community to novice learners. As Cheng and Fox (2008) indicated, an adaptation process is so complicated and vibrant that second language researchers should investigate international students’ academic adaptation processes with different perspectives.

2.2. Lexical Bundles as a Part of Academic Literacy Adaptation

Language is considered as formulaic in nature (Ellis, Simpson-Vlach, & Maynard, 2008; Sinclair, 1991). Formulaic language is significant in academic writing (Biber, Johansson, Leech, Conrad, & Finegan, 1999). Lexical bundles are the most frequent sequences of words in a language (Biber, et al., 1999), considered as a subcategory of formulaic language. Qin (2014) asserted that the appropriate usage of formulaic language leads second language learners to keep their identity in a disciplinary community. Many corpus researchers (e.g., Biber, et al., 1999; Cortes, 2004; Sinclair, 1991; Stubbs & Barth, 2003) have examined lexical chunks in texts and indicated that there are patterns of the lexical bundle use across different registers—academic prose, fiction, and conversation (Biber et al., 1999; Stubbs & Barth, 2003). Ellis, Simpson-Vlach, and Maynard (2008) also claimed that formulaic language provides meaningful implications: (1) a high utility of formulaic expressions, (2) the integration of formulaic language into the learning curriculum, (3) the determination of learnability and processing fluency, and (4) needs-based developmental instruction of formulaic language. Second language researchers (e.g., Carroll, 2002; Harris, 1989; Hyland, 2009; Leki, 2007) maintained that adapting to the rhetorical styles and writing expectations of different disciplines is crucial in learning to gain membership in academia. Hyland
(2008a) believes that second language learners become familiar with lexical bundles by participating regularly in the target community. They will be able to ultimately obtain a natural language use and reach a qualified language use.

Despite a useful indication of academic adaptation, lexical bundles have been disregarded due to the nature of incompleteness (Conrad & Biber, 2004). However, Hyland (2008b) maintained that lexical bundles are a key way of “helping to shape text meanings and contributing to our sense of distinctiveness in a register” (p. 5). Qin (2014) also affirmed that explicit instruction is necessary for the attainment of the lexical bundle use. Future research on lexical bundles is critical in diverse registers so that the research can be applied to second language writing pedagogy.

3. METHODS

3.1. Research Design

This study is based on corpus-based research. The research site was the English as a Second Language (ESL) Programs at a Mid-western university in the U.S. A textual analysis was employed for identifying the participants’ writing patterns in a learner corpus with regard to lexical bundles in corpus research.

3.2. Sample

This study used convenience and purposive sampling. With the approval of the ESL Program Office, two graduate composition classes were assigned and selected according to the researcher’s criteria (i.e., international graduate students) as purposive sampling. During the observation period for the research, three participants were selected for this study. Their participation was voluntary. The participants’ demographic information is provided in Table 1.

<table>
<thead>
<tr>
<th>Participant*</th>
<th>Gender</th>
<th>Nationality</th>
<th>Age Band</th>
<th>Pursuing Degree</th>
<th>Field of Study</th>
<th>Years in the U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hoon</td>
<td>Male</td>
<td>Korean</td>
<td>30-32</td>
<td>PhD</td>
<td>Architecture</td>
<td>10 months</td>
</tr>
<tr>
<td>Jisoo</td>
<td>Female</td>
<td>Korean</td>
<td>27-29</td>
<td>PhD</td>
<td>Nursing</td>
<td>10 months</td>
</tr>
<tr>
<td>Liwon</td>
<td>Female</td>
<td>Korean</td>
<td>33-35</td>
<td>MA</td>
<td>Education</td>
<td>10 months</td>
</tr>
</tbody>
</table>

* All the participants’ names are pseudonyms.
3.3. Instrumentation

The three participants’ final written products were collected and used for this study. The students’ final product was a critical review on a topic of their own choices from the individual field of study. The length of the final product varied, but the students in the composition classes had to write at least 4,000 words with an appropriate format of critical literature reviews. The learner corpus data of the three participants included 12,941 words.

3.4. Data Analysis

Corpus researchers (e.g., Granger, Kraif, Ponton, Antoniadis, & Zampa, 2007; Nesselhauf, 2004) claimed that native corpora may not uncover learners’ difficulty in second language writing. Learner corpora, however, can reveal specific challenges and difficulty in speaking or writing. Grander et al.’s (2007) study showed that learner corpora enable researchers to identify characteristics of a learner language by separating it from the target language. Hence, it is applicable to use a learner corpus for investigating international students’ academic adaptation through second language writing. The data analysis began with clearing the corpus text without any non-text components (e.g., graphics, formulas, page numbers, references, tables, and figures) aligned with the requirement of AntConc software (Version 3.4.4) (Anthony, 2015). To analyze structural and functional characteristics of lexical bundles, the function of clusters/N-Grams was utilized in identifying four-word lexical bundles and clarifying whether they did not overlap in the AntConc software program.

Bal (2010) considers AntConc as a resourceful analysis tool for both quantitative and qualitative data in research. In the AntConc software, the N-Grams function enables the researcher to identify the count of “n” from the uploaded corpus. After a list of four-word bundles was extracted, I manually checked each lexical bundle whether it overlaps with other lexical bundles. Lastly, retrieved four-word lexical bundles were categorized into similar grammatical structures and functions based on their use and meanings in context by comparing the structural and functional taxonomies (Biber et al., 1999). Bal (2010) suggested that a second rater may assist the identification and classification of the lexical bundles for reliability of the data analysis.
4. FINDINGS

This section includes structural and functional characteristics of lexical bundles from the participants’ corpus data.

4.1. Structural Characteristics of Lexical Bundles

To identify academic literacy adaptation from students’ writing, structural features of lexical bundles were analyzed. The proportions of structural patterns in graduate international students’ writing were compared to the ones in academic prose in Biber et al.’s (1999) lexical bundle project. Biber et al.’s (1999) project revealed that proportions of structural patterns in the academic prose include noun phrases (32%) and preposition with noun phrase fragments (33%). The present study uncovered a somewhat different trend from Biber et al.’s (1999) work. It showed 67 percent of noun phrases, taking up two-thirds of the entire bundles; 17 percent of preposition with noun phrase fragments. Another major structural pattern involved content-focused compound noun phrases, containing two or more words to make a single noun (23%) in international students’ writing. Furthermore, specific disciplines of study, such as nursing and architecture, use technical terms (e.g., the cell cycle regulation) very frequently, with frequency counts of 15. Other structural patterns, such as anticipatory it + VP/-adjective phrase (+ complement clause) and passive verb
+ prepositional phrase fragment, have a similar trend to Biber et al.’s (1999) patterns. The rest of the three structural patterns, such as pronoun/NP (+ auxiliary) + copular be (+), (verb +) that-clause fragment, and (verb/adjective+) to-clause fragment, are not found in this study. This limited information would be because critical reviews were the only input of the written register, and the sample size is very small—three critical review papers with 12,941 word tokens.

4.2. Functional Characteristics of Lexical Bundles

This study yielded 39.82 percent of the functional use in the students’ written register as the preliminary findings. Biber et al. (1999) highlighted three primary functions of lexical bundles in the registers: 1) stance bundles, 2) discourse organizers, and 3) referential bundles. Stance bundles refer to attitudes or assessments of certainty representing other propositions (e.g., *I do not know, I do not think*). Discourse organizers are relationships between preceding and forthcoming discourse (e.g., *what do you think, you know I mean*). Referential bundles indicate direct references to the textual context to identify a particular attribute of the entity (e.g., *one of the things, in terms of the*).

Two types of functions (i.e., stance and referential bundles) are found in the study. The proportion of attitude/modality stance, specifically with an obligatory function, comprises 6.48 percent with seven frequency counts (e.g., *it is necessary to*). The proportion of referential bundles with the function of place takes up 12.04 percent with 13 frequency counts (e.g., *in the cell cycle*). The proportion of referential bundles with tangible framing attributes takes up 21.30 percent with 23 frequency counts (e.g., *the impact of urban form, the development of PTSD, phenomenon of post ICU-PTSD*). 60.18 percent of the rest of lexical bundles are all content-oriented combinations. For example, the most frequent bundle is ‘the cell cycle regulation’ with 15 frequency counts (13.89%).

4.3. Academic Literacy Adaptation through the Participants’ Use of Lexical Bundles

Academic literacy adaptation was examined with structural and functional characteristics of lexical bundles in the participant’s academic writing. First,
the analysis of structural features showed that nouns are the most frequently used part of speech patterns, reflecting that the written registers pursue the primary informative purpose of writing; that is, critical reviews. Compared to the academic prose in Biber et al. (1999), nouns are much more common than other parts of speech (i.e., adjectives and verbs) in the students’ writing samples.

For the functional characteristics, the analysis revealed that international graduate students tend to use a lot of technical terms from the previous literature focusing on unique disciplines when they write critical reviews. Nine out of 14 types of lexical bundles were topic-specific bundles. For example, cell cycle regulation and in the cell cycle are technical terms in the discipline of nursing, regardless of any lexical functions.

### Table 2. The summary table of lexical bundles in the corpus of the final critical review papers

<table>
<thead>
<tr>
<th>Lexical bundles</th>
<th>Structure</th>
<th>Function</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>the cell cycle regulation</td>
<td>NP</td>
<td>Topic-specific</td>
<td>15</td>
<td>13.88</td>
</tr>
<tr>
<td>in the cell cycle</td>
<td>PP</td>
<td>Referential-place</td>
<td>13</td>
<td>12.04</td>
</tr>
<tr>
<td>impact(s) on travel behavior</td>
<td>NP</td>
<td>Topic-specific</td>
<td>11</td>
<td>10.18</td>
</tr>
<tr>
<td>impact of urban form</td>
<td>NP</td>
<td>Referential-framing attributes</td>
<td>9</td>
<td>8.33</td>
</tr>
<tr>
<td>the development of PTSD</td>
<td>NP</td>
<td>Referential-framing attributes</td>
<td>8</td>
<td>7.41</td>
</tr>
<tr>
<td>form on travel behavior</td>
<td>NP</td>
<td>Topic-specific</td>
<td>7</td>
<td>6.48</td>
</tr>
<tr>
<td>it is necessary to involved in the cell</td>
<td>VP</td>
<td>Stance- obligation</td>
<td>7</td>
<td>6.48</td>
</tr>
<tr>
<td>of the cell cycle</td>
<td>VP</td>
<td>Topic-specific</td>
<td>6</td>
<td>5.56</td>
</tr>
<tr>
<td>phenomenon of post ICU-PTSD</td>
<td>PP</td>
<td>Topic-specific</td>
<td>6</td>
<td>5.56</td>
</tr>
<tr>
<td>RB/E2F pathway and dream complex</td>
<td>NP</td>
<td>Topic-specific</td>
<td>5</td>
<td>4.63</td>
</tr>
<tr>
<td>of the development of solve the problem of three argumentative organizational plans</td>
<td>PP</td>
<td>Topic-specific</td>
<td>5</td>
<td>4.63</td>
</tr>
<tr>
<td></td>
<td>VP</td>
<td>Topic-specific</td>
<td>5</td>
<td>4.63</td>
</tr>
<tr>
<td></td>
<td>NP</td>
<td>Topic-specific</td>
<td>5</td>
<td>4.63</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td></td>
<td>108</td>
<td>100</td>
</tr>
</tbody>
</table>

Total word tokens: 12,941
5. DISCUSSION

5.1. Lexical Bundles as an Indicator of Academic Literacy Adaptation

Lexical bundles were investigated through corpus research to find out whether lexical bundles indicate academic literacy adaptation. In other words, the use of lexical bundles may be a potential indicator of international students’ academic literacy adaptation. Lexical bundles include two characteristics: structural and functional (Biber et al., 1999). In terms of structural features, the participants’ lexical bundles were found to follow the trend of the most frequent used noun phrase fragments from Biber et al.’s (1999) work. In particular, topic-specific compound noun phrases were most frequently used due to a certain written register; that is, critical reviews. Thus, the writing samples tend to exhibit the information about the specific expertise from previous literature.

As for the functional use of lexical bundles, two types of functions (i.e., stance and referential bundles) were found with 43 frequency counts (40%) among the 108 lexical bundles. Discourse organizing bundles were not found, but this may be attributed to the small sample size. In Biber’s (2006) study, the proportion of discourse organizing bundles in the registers of textbooks and academic prose is far less than conversation and classroom teaching. Hence, it may be natural that no discourse organizing bundles existed in such a small corpus with 12,941 word tokens. The functional use of lexical bundles was not represented as meaningful in the findings due to the small sample size. However, it may be true that the students may not express their own voices in critical reviews due to no use of discourse organizing bundles. Rather, they are likely to write carefully to involve the original articles with sincere understandings. This also shows their academic adaptation regarding the rhetoric: international students’ tendency to veil their stance or arguments in critical reviews. To make this study meaningful, it is needed to accumulate more writing samples to represent international students’ academic literacy adaptation.

6. LIMITATION

Several limitations need to be addressed for enhancing future research. First, this study examined academic literacy adaptation with the small size of
the learner corpus. Since the sample size is relatively small, the results cannot be generalizable. With the small sample size, the corpus data were also too small to be analyzed or interpreted for the legitimate proposition. Second, the duration of the research was short in collecting the students’ written product and observing their writing patterns. If the corpus data were accumulated in a longer period of time, it would be possible to retrieve more representative findings. Finally, pre- and post-observations of lexical bundles could have revealed a more logical connection between academic literacy adaptation and the use of lexical bundles. For example, it would have been optimal to compare their initial writing products at the beginning to the final writing products at the end of the research.

**Conclusion**

The significance of the research is to understand the international graduate students’ academic literacy adaptation through corpus research. This study provides potentials for researchers to implement corpus research to explore academic literacy adaptation by examining lexical bundles, a linguistic component in a language. Despite the small sample size, the study yielded structural (67% of noun phrases) and functional (39.82% of stance and referential) features, and this uncovered some trend of international graduate students’ academic literacy adaptation.

Future research needs more improvement. First, more samples are necessary in developing valid and reliable corpus research so that the results can be representative and generalizable. Second language writing samples should be accumulated for significant contributions to the corpus research. Furthermore, examining different genres of writing and registers (i.e., spoken and written) would provide a lot clearer essence of lexical bundles in second language writing. The future research should also connect the information and knowledge of lexical bundles to second language learning instruction and pedagogy. Qualitative research may help uncover in-depth understandings of international students’ academic adaptation with qualitative-oriented research techniques, such as observations, field notes, interviews, and verbal protocols, which should be practically employed for yielding valuable research findings.
REFERENCES


Chapter 4

MULTISEMIOTIC ANALYSIS OF ORTHODOX PATRIARCHS’ PHOTOGRAPHS:
CROSS-CULTURAL (INDIAN AND RUSSIAN)
DIFFERENCES IN INTERPRETATION OF INTERACTIVE MEANINGS

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ABSTRACT

The paper investigates the role of the implementation of the multisemiotic theory through the analysis of the Orthodox Patriarchs’ photographs. The research is based on the multisemiotic theory by Kress and van Leeuwen and supports the view that semiotic codes are used in specific historical, cultural and institutional contexts. It is customary for

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people to communicate the meaning referring to various codes, depending on the contexts, as codes are not only planned, taught, justified, but also criticized. The authors of this paper make an attempt to prove the hypothesis that Russian and Indian respondents code similar photos differently due to their cultural/ideological backgrounds. According to Kress and van Leeuwen, pictures are images that convey an interactive meaning. Thus, the main focus of the research is on the image viewer interaction. The present study examines the data obtained from 526 official photographs of the Patriarchs and consists of several stages. At the first stage two groups of coders (Indian and Russian) were created. The selected groups were provided to code the collected corpus of photos (in total 526 photographs) autonomously. In case of discrepancies between the coding images, the agreement was terminated by two national coders collaboratively. At the second stage, the semi-structural interviews with the coders were conducted. The interviews allowed to identify and reveal similarities and differences in photo perception. The results of the study show, that the multisemiotic theory can be entirely employed and serve as an effective tool in image analysis within different cultures through identifying the interpersonal (interactive) metafunction.

As the research demonstrates limitations like small amount of studied samples and a low number of Indian participants’ opinion provided in the Russian Federation, further research in India is recommended.

**Keywords:** multisemiotic theory, interpersonal (interactive) metafunction, cross-cultural differences, Orthodox Patriarchs’ photographs

# 1. INTRODUCTION

The current paper explores the characteristic features of the interactive meanings of the Orthodox Patriarchs’ photographs. In this respect Kress and van Leeuwen state that “The interactive meanings are visually encoded in the ways that rest on competencies shared by producers and viewers” (Kress & van Leeuwen, 2006: 115). The photographs’ interactive meanings may partially change not only the viewers opinion in image perception, but also, to some extent, social representation of the church ideology. In order to apprehend why some photographs are more amiable than the others, producers and viewers’ intentions and interpretations have to be identified and considered compulsively.

Although the interactive meaning is a common concept of interaction with many social science, for example, sociology or systemic functional linguistics (SFL), it has often been distinguished as being related to the interpersonal
Metafunction (see Halliday & Matthiessen, 2014: 30). The SFL approach shares the overriding assumption that “We use language to make sense of our experience, and to carry out our interactions with other people. This means that grammar has to interface with what goes on outside language: with the happenings and conditions of the world, and with the social processes we engage in. But at the same time it has to organize the construal of experience, and the enactment of social processes, so that they can be transformed into wording” (Halliday & Matthiessen, 2014: 25).

It is claimed that modern pragmatics is not limited by reflecting society and language in contrast with events and social processes. However, the new perspective called “embodiment” and the role of the human body are being disadvantaged (see Lakoff & Johnson, 1980). The embodiment approach confirms that a human body is mostly accepted identically throughout the world. This fact predetermines a lot of questions and creates a new scope for the cross-cultural research. Recent developments have shown an increased interest in the embodiment of photographs and have highlighted it as one of the primary objectives for further investigation. So, the current study shares the view that the cross-cultural differences in identifying the interactive meanings can be fully explained in terms of the SFL-based multisemiotic theory, similar to Kress and van Leeuwen theory. The controversy about embodiment is connected with the process of distinguishing a human body as cultural and social product, because society and social institutes dictate the patterns of behaviour and draw boundaries for body perceptions.

Thus, this paper claims to apply and illustrate Kress and van Leeuwen multisemiotic theory’s analysis of the Orthodox Patriarchs’ photographs within the context of Indian and Russian cross-cultural study. The topicality of the research concerns the theoretical application and the data set. Theoretical significance is revealed in the attempts to apply western - origin multisemiotic theory to two selected types of non-western perceptions of the Orthodox Patriarchs’ photographs, using a model for the analysis of interpersonal metafunction of images. The concern expressed by Kress and van Leeuwen is related to the relevance of application of the multisemiotic theory in non-western environment (Kress & van Leeuwen, 2006:3). It can be argued that a similar approach to sociological content analysis assumes that standardization of procedures and control of inter-rater reliability can give information about differences and similarities in cross-cultural perception (see e.g., Yadov, 2007). The corpus data of this paper comprises 526 photographs dealing with the specialized topic called Orthodox Church Patriarchs’ activity. The
significance of statistical information is proved by the expanded corpus sample.

The selection of Patriarchs’ photos as a material for the research can be explained by the similarity in the tendencies to expand both on the part of Christian and Orthodox Churches (see e.g., Foundations of Social Concept of the Russian Orthodox Church, 2000). However, the mission policies of the Constantinople and the Moscow Orthodox Church Patriarchate are distinct (see e.g., The Nature and Mission of the Church, 2011). For example, The Moscow Patriarchate is sensitive towards its territorial issues, while the Constantinople Patriarchate supports the external mission. As the result, Australian Orthodox Church (ROCOR, 2016) has recently opened several Orthodox Church Associations in India (see Pavenkov, 2015). Therefore, it comes out of question that Indians might have different perception of the Orthodox concepts and specific attributes, including icons, images and photographs. Aimed at establishing new contacts between India and Russia, the Indian Orthodox community in Bangalore addresses the authors of the article to conduct a preliminary study devoted to the comparison of Indian and Russian perceptions of the Orthodox Patriarchs’ photographs.

This study is not aimed at and does not put much emphasis on the Orthodox icons identification, since the icons are recognized entirely as church possessions and attributes. The newly involved church members always have an opportunity to be familiarized with the icons as soon as the interest to Orthodox Church arises. The study is limited by the selection of photographs available in the media sources. They are usually photos of the Patriarchs as the main church officials.

As the main focus of the present paper is on Russia but not India, this explains the importance to examine the differences in the photos’ interactive meaning perception placed in Russian environment. Moreover, Indians in Russia are familiar with Russian culture and do not need to gain extra knowledge or undergo educational or explanatory procedures on what the Orthodox Church is. In addition, Indians are considered as leaders, that have already adjusted to Russian environment, and in this relation can be viewed as an advanced group. The mentioned factors stress the importance of the current paper research.

Thus, the primary aim of the study is related to the multisemiotic analysis of the Orthodox Patriarchs’ photographs with regard to the cross-cultural (Indian and Russian) differences in identifying the interactive meanings. Two main objectives have been determined.
Objective 1 focuses on the detection of the evident similarities and differences in the Indian and Russian perceptions of the interactive meanings of the Orthodox Patriarchs’ photographs;

Objective 2 focuses on the analysis, to what extent the differences in the Indian and Russian perception of the interactive meaning can influence the description of church ideology represented in the Orthodox Patriarchs’ photographs.

The hypothesis of the study is that Russian and Indian coders can code/decode photos distinctly because of the peculiarities of cultural/ideological backgrounds. In terms of statistics, it means that the level of agreement in the homogeneous Russian or Indian group of coders is higher than in the mixed Russian and Indian group of coders.

2. THEORETICAL BACKGROUND

The photo analysis is considered to be a quite complex process despite the assumed simplicity in processing and interpreting photos. “Photographs are often used to bring a sense of immediacy and reality to the text in a way that promotes interaction with the reader” (Martínez Lirola, 2006: 253). Moreover, it is difficult to describe the meaning of the photos applying analytical and research tools. This is explained by the lack of discussions conducted around the social and linguistic meaning of the photos, and little attention is drawn on the part of the social researchers. Roland Barthes supports the concern and lists some reasons for the analysis of “the air of a face”: “The air of a face is unanalyzable (once I can decompose, I prove or I reject, in short I doubt, I deviate from the photograph, which is by nature totally evidence: evidence is what does not want to be decomposed)” (Barthes, 1981: 107-109).

Roland Barthes’s contribution has been taken as a basis for the further investigation of the photographs as multimodal social phenomenon. Speaking about “the ways in which the meanings of photographs have been framed and adjudicated”, John Tagg notes that these ways are tightly connected with “the institutionalized function of the photograph as a privileged form of evidence which has been so important to certain processes of power” (Tagg, 2009: XV-XVI). From this point of view, the social aspects of the photographs cannot be examined in isolation from their ideological function. To some extent, it is a focus on ideology that recognizes the power hidden in the photos (Breckner, 2008; Schill, 2012).
In Russia there are few studies that take the similar stance. The first reason is that through the decades Russian scientists have been researching the photos of Soviet leaders with the evident reflection of the Soviet ideology (see e.g., Ventsel, 2010; Oreh, 2012). Moreover, it is generally thought that Soviet and Russian photos have been considered as the main source of power and social phenomenon. The vast majority of the research papers confirm (Pavenkov et al., 2014), that ideology is an important factor of human perception. However, there is a drawback of the researches of that kind, which is hidden in the subjectivity of interpretation. Finally, until the end of the 1990s, the majority of social researchers considered photos as material with potential gaps and weaknesses for the scientific analysis, material that lacks academic integrity, science capability and information.

In contradiction with the mentioned works that identify the ideology of the photos directly and literally, social semiotics focuses on the description of “semiotic resources” (Jewitt & Oyama, 2001: 134). Social semiotics argues that the key value of the visual resources is an ability to reproduce the potential meanings. Accordingly, resource description is not a description of the single meaning; it is a description of the limited set of possible meanings that are created by the authors and the viewers during their participation in the process of image interpretation (Jewitt & Oyama, 2001: 135).

Kress and van Leeuwen achievements in photo analysis make the scientific breakthrough in the image processing (see e.g., Kress & van Leeuwen, 2006). The scientists have developed and offered methodological tools which investigators can apply to define, extract and explain the photo meanings. While expanding the research conducted by the linguist Michael Halliday, Kress and van Leeuwen argue that the visual mode must perform certain visual and communicative metafunctions: ideational, interpersonal and textual (Kress & van Leeuwen, 2006: 42-43). Employing various visual elements, an image-producer influences the way a viewer has to eye a photograph or a picture. Ideational and interpersonal metafunctions highlight characteristics of the composition while the textual metafunction gives the possibility to explore the overall composition of the image (Kress & van Leeuwen, 2006: 40-42).

Kress and van Leeuwen have noted (2006: 14) that they seek the regularity in the usage of the different visual elements in visual communication systems. Thus, the primary goals of their investigation are not simply aimed at revealing the reasons of the usage. Respectively, Kress and van Leeuwen believe that each image contains the expression of ideological positions, and cannot be considered as an objective image of reality (2006:
14). It means that serious cross-cultural differences in interpretation are possible. In their reports, Kress and van Leeuwen point out: “Meanings belong to culture, rather than to specific semiotic modes” (Kress & van Leeuwen, 2006:2). They either write the following: “In the book we have, by and large, confined our examples to visual text-objects from ‘Western’ cultures” (Kress & van Leeuwen, 2006:3).

Taken above said into consideration the following question arises, whether it is possible to apply the multisemiotic theory to the analysis of the Orthodox Patriarchs photos, which are the product of Russian culture and Russian perception. More than that, the Indians involved in the study are also considered as representatives of non-Western cultures. However, soon after establishing the west-oriented direction and the nonuniversality of their visual grammar, Kress and van Leeuwen suggest that in spite of the specific cultural setting it can bring some benefit to non-Western cultures (Kress & van Leeuwen, 2006:3).

In respect of ideology, it can be said that, due to the perception varieties, photos in distinct cultures may establish different ideology. If the Russian photographer supposes to convey a certain meaning, the result may be completely different in another culture and the photo might create an unexpected ideology. Therefore, photos’ ideology is not a constant but provides the meaning potential where “the meaning potential is the range of significant variation that is at the disposal of the speaker” (Halliday, 1971: 171).

Since the present paper hypothesis assumes that the Russians and the Indians perceive photos differently, the current study is focused mainly on the interaction between a viewer, a producer and photos’ represented participants that focus on the interpersonal metafunction. M.A.K. Halliday was the first linguist who described the interpersonal metafunction (see Halliday and Hasan, 1985, Halliday 1978, 1985, 2003, 2014). He proposes that “Language is always also enacting: enacting our personal and social relationships with the other people around us” (Halliday & Matthiessen, 2014: 30). According to Halliday, “We inform or question, give an order or make an offer, and express our appraisal of or attitude towards whoever we are addressing and what we are talking about. This kind of meaning is more active, this is language as action. We call it the interpersonal metafunction, to suggest that it is both interactive and personal” (Halliday & Matthiessen, 2014: 30).

Relating to the image, the interpersonal metafunction is shown through the relationship between the represented participant(s) and the viewer/reader. Furthermore, the relationship is established between the image producer and
the viewer. In other words, a creator (an author) of an image may code how the viewer has to watch this image and its represented participant(s). Kress and van Leeuwen call the creator and the viewer as “interactive participants”. Interactive participants are “real people who produce and make sense of images in the context of social institutions which, to different degrees and in different ways, regulate what may be 'said' with images, and how it should be said, and how it should be interpreted” (Kress & van Leeuwen, 2006: 114). At the same time, “Producer and viewer know each other and are involved in face-to-face interaction, as when we take photographs of each other to keep in wallets or pin on pinboards. But in many cases there is no immediate and direct involvement. The producer is absent for the viewer, and the viewer is absent for the producer” (Kress & van Leeuwen, 2006: 114).

As the result three types of relations between the participants are established:”(1) relations between represented participants; (2) relations between interactive and represented participants (the interactive participants’ attitudes towards the represented participants); and (3) relations between interactive participants (the things interactive participants do to or for each other through images)” (Kress & van Leeuwen, 2006: 114). The identified relationships can be studied with the help of the relatively simple indicators, that are reflected in the photos and create the interactive meanings. They are contact, social distance and attitude (see Figure 1).

Figure 1. The interactive meanings in images (Kress & van Leeuwen, 2006:149).
1. **Contact.** Usage of the “view” (gaze) assists in establishing relationships between the viewer and a certain person in the image. The concept of the contact is particularly important for the research because the prevailing majority of photographs or picture books may contain the image of a person. In this context, the view is understood as a situation where the portrayed person looks directly at the viewer. Kress and van Leeuwen (2006: 122) assert that the depicted person addresses the viewer directly and requires something from him/her. The specific nature of the established relationship between the depicted person and the viewers depends on additional information obtained by the other methods (e.g., facial expression or gestures). What is more, the gaze which is directed at something else in the image but not at the viewer is also significant. In this case, the viewer can observe the person indifferently without personal involvement excluding relationship or interaction. Thus, the “contact” can be encoded as “demand” or “offer”. For the coders “demand” can be indicated as “gaze at the viewer”; “offer” as “absence of gaze at the viewer” (see Kress & van Leeuwen, 2006: 148).

2. **Social Distance.** Social distance is described as a physical distance between the depicted people and the audience. It means that physical distance is the size of the object in the image that creates visual impression of the distance spread from the viewer to the object. Physical intimacy is established with the audience, similar to people in real life. Physical intimacy represents social proximity, close relationship between the viewer and the object.

People in the photos are often put into and associated with particular locations (e.g., the Patriarch in the Church, meeting of the Patriarch and the Pope at the airport), consequently the photographs are likely to indicate the location. The visual representation of the location distinguishes between the foreground, that means being more prominent or more salient, and the background, that means being less prominent. To illustrate this, the objects in the locations can be of different shapes and sizes. Photographs usually demonstrate not only singularity or plurality of the objects but their interaction. Eventually, three locations or three distances are known as:
1. The close distance shows the situation and the objects with the viewer involved into.
2. The middle distance supposes that the situation and objects are shown in overall dimension without much space around them.
3. The long distance where the situation and objects are shown for contemplation only.

Kress and van Leeuwen offered the following respective types of “distance”: intimate/personal, social or impersonal. Intimate/personal distance or close personal distance is the distance at which “one can hold or grasp the other person and therefore also the distance between people who have an intimate relation with each other” (Kress & van Leeuwen, 2006: 124). Social distance or far personal distance is the distance at which subjects of personal interests and involvements are discussed (Kress & van Leeuwen, 2006: 124). Impersonal distance is “public distance” (Kress & van Leeuwen, 2006: 125). In the process of coding the photos “distance” can be encoded as intimate/personal, social or impersonal. For the coders intimate/personal distance can be indicated as “close shot”, social distance as “medium shot”, impersonal as “long shot” (see Kress & van Leeuwen, 2006: 148).

3. Attitude. An attitude represents the structure that is complex and includes subjective and objectivity setting (see Figure 1). Subjectivity attitude includes two groups of indicators:
   - Involvement and Detachment;
   - Viewer power, Equality and Represented participant

An objectivity attitude refers to “scientific and technical pictures, such as diagrams, maps and charts” (Kress & van Leeuwen, 2006: 143) and is not considered in the current research.

**Involvement and Detachment**

Kress and van Leeuwen contend, that the horizontal point of view determine the level of involvement and detachment in the created image both on the part of the producer and the viewer. The level of involvement is established with the help of the angles that fall into different groups. Consequently two basic types of angles are identified:
a) Horizontal angle is “the function of the relation between the frontal plane of the image-producer and the frontal plane of the represented participants” (Kress & van Leeuwen, 2006:141). These relations can be parallel or form an angle. Kress and van Leeuwen suppose that the frontal angle acts similar to “what you see here is part of our world, something we are involved with” (2006: 143). The frontal angle is an angle of maximum involvement. It is oriented towards the action (Kress & van Leeuwen, 2006: 145).

b) The concept of “oblique points” from Kress and van Leeuwen’s point of view can be stated like “What you see here is not part of our world, it is their world, something we are not involved with” (2006: 143). In the process of coding photos in this paper, “involvement” can be indicated as “frontal angle” and “detachment” can be indicated as “oblique angle” (see Kress & van Leeuwen, 2006: 148).

**Viewer Power, Equality and Represented Participant Power**

One of the aspects of the photo analysis is the connection between the represented participants, here the Patriarchs, and the observer, called perspective. The use of the perspective includes two practical tasks:

1. Selecting a certain frame size which in practice involves selection of an angle, called the point of view.
2. Welcoming the possibility of expressing the subjective attitudes which presupposes the personal evaluation of the viewers toward the action of the represented participants (Kress & van Leeuwen, 2006:135).

The angle in the current paper deals with the notion of power, ignoring the notion of involvement. This angle is known as vertical angle and within it we have to look at the low angle, the high angle, and the eye level. The high angle makes the observed subject small and insignificant. High angles tend to diminish the individuals and humiliate them morally by reducing them to the ground level in an insurmountable determinism (Martin, 1968: 37-8). If the represented participant is viewed from a high angle or from up to down, it means that the viewer has power over the represented participant. In addition, if the photograph is placed at eye level, then the point of view is one of the equality and there is a power difference involved (Kress and van Leeuwen,
In the process of coding of the considered photos, “viewer power” can be indicated as high angle, “equality” can be indicated as eye-level angle and “represented participant power” can be indicated as low angle (see Kress & van Leeuwen, 2006: 148).

Kress & van Leeuwen (2006: 127,139) explore the term “system” for denomination “contact”, “social distance” etc. They write: “Unlike the system of “offer” and “demand”, the system of social distance can apply also to the representation of objects and of the environment”, “And, while in language one cannot easily have degrees of “ourness” and “theirness”, in images such gradation is an intrinsic part of the system of involvement. Finally, there is no “yours” in the system of horizontal angle” (see Kress & van Leeuwen, 2006: 127,139).

Thus, based on Kress & van Leeuwen (2006: 148), this research borrows the mentioned codes for the coders, who have to refer to the table descriptors during an encoding process (see Table 1).

### Table 1. Interpersonal metafunction’s codes for photos

<table>
<thead>
<tr>
<th>System</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact</td>
<td>Demand</td>
<td>gaze at the viewer</td>
</tr>
<tr>
<td></td>
<td>Offer</td>
<td>absence of gaze at the viewer</td>
</tr>
<tr>
<td>Social Distance</td>
<td>Intimate/personal</td>
<td>close shot</td>
</tr>
<tr>
<td></td>
<td>Social</td>
<td>medium shot</td>
</tr>
<tr>
<td></td>
<td>Impersonal</td>
<td>long shot</td>
</tr>
<tr>
<td>Subjectivity Attitude</td>
<td>Involvement</td>
<td>frontal angle</td>
</tr>
<tr>
<td></td>
<td>Detachment</td>
<td>oblique angle</td>
</tr>
<tr>
<td></td>
<td>Viewer power</td>
<td>high angle</td>
</tr>
<tr>
<td></td>
<td>Equality</td>
<td>eye-level angle</td>
</tr>
<tr>
<td></td>
<td>Represented participant power</td>
<td>low angle</td>
</tr>
</tbody>
</table>

### 3. Data and Methodology

In order to check the hypothesis, two-stage research has been conducted with the focus on the identification of the main differences between the Indian and the Russian perception of the ideology of the Russian Orthodox Church in the Patriarch’s photos. The selected photographs of Patriarchs Alexey II, Kirill and Bartholomew have constructed the corpus. The whole photos’ corpus includes 526 photos taken from the official Orthodox Church website. The major part of the photos presents the activity of Patriarchs Alexey II,
Bartholomew and Kirill (Gundjaev), who is well known as an active Church writer (see Gundjaev, 2009).

The research procedure of the present study goes through the following stages:

**Stage I. Coding the whole photos’ corpus by four coders.** Two Russian and two Indian students, called coders, made a special group trained on the SPSS program. Coders were instructed purposefully how to use SPSS’s program (SPSS v.17) for coding. They were provided with coding descriptors composed in accordance with Kress and van Leeuwen’ theory (see Table 1). Firstly, coders read through the codes descriptors, discussed criterions, after that two Russian and two Indian students coded 526 photographs separately. The importance of the result analysis at this stage was determined by the coding procedure.

The first stage addressed the research question whether there is a statistically significant difference in the Indian and Russian coding of the whole photos’ corpus. In order to answer this question, four coders handed coding results to the instructor in the form of sav. files (SPSS). The instructor measured the level of agreement (inter-rater reliability) between two Indians and two Russians, using the Cohen’s Kappa \( \kappa \) coefficient (Cohen, 1960, 1968; Fleiss et al., 1980; Fleiss et al., 2003). This coefficient is applicable but restricted to pair work because of its ability to measure the level of agreement between two experts. After that the level of agreement between four pairs of Russians and Indians was calculated. Finally, the excel tables were filled in and schemes organized for the results presentation.

Website Dfreelon.org was used to calculate Krippendorff’s alpha in order to check the statistically significant difference between four coders. According to the description of Krippendorff’s alpha coefficient, sufficiently high degree begins from 800. Scientists generally rely on data reliability \( \alpha \geq 0.800 \). If the data lies between \( 0.800 > \alpha \geq 0.667 \) the findings are considered as preliminary. If data reliability is low \( (\alpha < 0.667) \) the findings cannot be found.

**Stage II. Semi-structured interview with coders.** The second stage of the research process involved “face to face” semi-structured interviews, which were carried out in July 2016 in St. Petersburg. Semi-structured interviews with the Indian coders were conducted in English, with the Russian coders in Russian language, respectively. The data gained from the semi-structured interviews with two Russian and two Indian
coders made ($N_c = 4$) after their coding of the whole photos’ corpus. The second stage of the research addressed the following research question: how did two Indian coders and two Russian coders overcome problems they encountered during coding the whole photos’ corpus?

4. RESULTS

4.1. Stage I. Results of Coding the Whole photos’ Corpus ($N_c = 4$, $N_{ph} = 526$)

In line with the research question this section presents the results of the analysis of coding the whole photos’ corpus ($N_c = 4$, $N_{ph} = 526$) using data collected in the small-scale research.

4.1.1. Contact

The review of Kress and van Leeuwen theory reminds that the researchers distinguish between the pictures, where represented participants look directly at the viewers, and the pictures with the absence of gaze at the viewer. The first are named “demand” and second are named “offer” systems (see Kress & van Leeuwen, 2006: 122,148). It is important for the objectives of the present study to measure the inter-rate reliability between coders. So, the authors of this paper started with an overview of inter-rate reliability (Cohen’s Kappa $\kappa$; Krippendorff’s alpha $\alpha$) for the system of contact (see 4.1.1.1), then the results of contact coding were given (see 4.1.1.2).

4.1.1.1. Overview of Inter-Rater Reliability (Cohen’s Kappa $\kappa$; Krippendorff’s Alpha $\alpha$)

In order to test the hypothesis it is important to use Cohen’s Kappa (Cohen’s Kappa $\kappa$) coefficient, which is a statistic which measures inter-rater agreement for qualitative (categorical) items. The measure of agreement Kappa is taken because it can be used for the analysis of more subjective evaluations (see: Oleinik, Popova, Kirdina & Shatalova, 2013). Unlike Krippendorff’s alpha, the calculation of Cohen’s Kappa shows the degree of random agreement that is interpreted in terms of the constancy with which a coder conducts categorization of units of analysis (Artstein & Poesio, 2008: 561, 570). From this point of view, the final row and column of contingency
table indicate the preferences and prejudices of the coders (Perreault & Leigh, 1989: 139), although do not indicate the actual distribution of units as it happens in the case of Krippendorff's alpha. Originally Kappa is calculated for the case with two coders. The value of Cohen’s Kappa is defined as:

$$\kappa = \frac{p_o - p_e}{1 - p_e}$$

where $p_o$ is the relative observed agreement among raters, and $p_e$ is the hypothetical probability of a chance agreement, using the observed data to calculate the probabilities of each observer (Seale, 2011: 462). This formula is later generalized to the case of the plurality of coders (Siegel & Castellan, 1988: 285).

The most important assumption is that “probability that an object is assigned to a particular category does not vary across raters” (Siegel & Castellan, 1988: 291). Coders agree because they share similar opinions or similar values. Despite the subjectivity of their decisions they manage to come to an agreement.

The focus change from the natural distribution of categories (in the case of Krippendorff’s alpha) to subjective judgments of the coders (in the case of Cohen’s Kappa) leads to the resistance from apologists of Krippendorff’s alpha. It is believed that Kappa “concerned with the two individual observers, not with the population of data they are observing, which ultimately is the focus of reliability concerns” (Krippendorff, 2004: 248; see also Hayes & Krippendorff, 2007: 81). Nevertheless, Kappa and Krippendorff’s alpha can refer to different dimensions of reliability: if the first characterises the reliability of judgments, Krippendorff’s alpha mainly characterizes the reliability of data.

In order to combine two strategies in the present research, both coefficients are considered. In the case of identification of similarity/differences between two Russian and two Indian coders, Cohen’s Kappa is measured. However, there is a need to use Krippendorff’s alpha in order to show similarity/distinction between all four coders and check Cohen’s Kappa’s results. A list of Cohen’s Kappa interpretation (Landis & Koch, 1977) is given in Table 2, a list of Krippendorff’s alpha interpretation (Krippendorff, 2004) is given in Table 3.
Table 2. Interpretation of the *Cohen’s Kappa* agreement

<table>
<thead>
<tr>
<th>Cohen’s Kappa</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 0</td>
<td>Poor agreement</td>
</tr>
<tr>
<td>0.0 – 0.20</td>
<td>Slight agreement</td>
</tr>
<tr>
<td>0.21 – 0.40</td>
<td>Fair agreement</td>
</tr>
<tr>
<td>0.41 – 0.60</td>
<td>Moderate agreement</td>
</tr>
<tr>
<td>0.61 – 0.80</td>
<td>Substantial agreement</td>
</tr>
<tr>
<td>0.81 – 1.00</td>
<td>Almost perfect agreement</td>
</tr>
</tbody>
</table>

Table 3. Interpretation of the *Krippendorf’s alpha* reliability

<table>
<thead>
<tr>
<th>Krippendorf’s alpha</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>α &lt;0.667</td>
<td>data reliability is low;</td>
</tr>
<tr>
<td></td>
<td>we cannot make any conclusions</td>
</tr>
<tr>
<td>0.800&gt; α ≥ 0.667</td>
<td>preliminary conclusions</td>
</tr>
<tr>
<td>α ≥ .800</td>
<td>data reliability is high</td>
</tr>
</tbody>
</table>

The coders in the research were named like Indian 1, Indian 2 and Russian 1, Russian 2. Based on the description of statistical coefficients, the coefficients were calculated with the help of SPSS program and website (dfreelon.org). Cohen’s Kappa was calculated for “*contact*” for each pair of coders. These data are presented in Table 4.

Table 4 shows that Cohen’s Kappa between two Indians is 0.762. Value 0.762 means substantial agreement. Further, still the calculation shows p = 0.000. It is needed to note that the level of agreement between Russians coders is high (κ = 0.862). It means almost perfect agreement. The relationship is statistically significant (p = 0.000).

Table 4. Result of Inter-rater reliability (Cohen’s Kappa κ) for *Contact*

<table>
<thead>
<tr>
<th></th>
<th>Indian1</th>
<th>Indian2</th>
<th>Russian1</th>
<th>Russian2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indian1</td>
<td>X</td>
<td>0.762</td>
<td>0.582</td>
<td>0.538</td>
</tr>
<tr>
<td>Indian2</td>
<td>0.762</td>
<td>X</td>
<td>0.487</td>
<td>0.487</td>
</tr>
<tr>
<td>Russian1</td>
<td>0.582</td>
<td>0.487</td>
<td>X</td>
<td>0.862</td>
</tr>
<tr>
<td>Russian2</td>
<td>0.538</td>
<td>0.487</td>
<td>0.862</td>
<td>X</td>
</tr>
</tbody>
</table>

Note: Green colour shows Substantial and Almost perfect agreement and red colour shows Moderate and Fair agreement.
In contrast, the value of agreement’s coefficient between coders from different countries is lower, and, referring to interpretation of Cohen’s Kappa, it means moderate agreement. Between Russian 1 and Indian 1 the value of measure of Cohen’s Kappa is 0.582, between Russian 1 and Indian 2 the value of measure of Cohen’s Kappa is 0.487, between Russian 2 and Indian 1 the value of measure of Cohen’s Kappa is 0.538 and between Russian 2 and Indian 2 the value of measure of Cohen’s Kappa is 0.487. Complementary calculation of Krippendorff’s alpha assures that the degree of agreement in the encoding of “contact” between coders of international team is low (see Table 5).

Krippendorff’s alpha proves that measure of agreement ($\alpha < 0.667$) is low and difference between the Russians and the Indians are statistically significant. Thus, referring to the system of contact it means disagreement between Russian and Indian coders. At the same time, Kappa confirms the high degree of agreement between the Indians ($\kappa = 0.762$) and the Russians ($\kappa = 0.862$).

4.1.1.2. Results of Contact Coding ($N_c = 4; N_{ph} = 526$)

The results of contact coding are presented in Table 6. It is clearly stated that among Indian and Russian coders “demand” exceeds “offer” in the whole photos’ corpus. Nevertheless, the difference between the Russians and the Indians is evident (see Table 6).

Table 6 presents the number of photographs encoded by the Indians as “demand”. It is ranged from 81.2% to 81.6%. In comparison, the coding of “demand” by the Russians fits the diapason from 64.1% to 66.5%. The analysis of the differences reveals the examples of the full consent and the full absence of agreement in encoding. Thus, Figure 3 “The meeting of the Patriarch with Naryshkin in Patriarch’s residence” and Figure 4 “The meeting of the Patriarch with a foreign delegation” are examples of full agreement in the coding of “contact” between Russian and Indian coders. Presumably, it is caused by the fact that Patriarch and his guests look directly at the viewer, and there is no doubt that it is a “gaze at the viewer” (see Figures 3, 4).
Table 6. Results of coding of Contact

<table>
<thead>
<tr>
<th></th>
<th>Indian 1</th>
<th>Indian 2</th>
<th>Russian 1</th>
<th>Russian 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand</td>
<td>81,6</td>
<td>81,2</td>
<td>66,5</td>
<td>64,1</td>
</tr>
<tr>
<td>Offer</td>
<td>18,4</td>
<td>18,8</td>
<td>33,5</td>
<td>35,9</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

The presented below pictures cause particular difficulties in identification. An ambiguity in the pictures is recognized as it is not easy to identify whether the Patriarch looks straight at the viewer or not. It has to be noted that in both figures (see Figures 5, 6) the Indian coders’ preferences lie with “demand”, while the Russians mention “offer”. Presumably, the Indians evaluate miniature eye movements as inconsiderable. On the other hand, from certain angles it seems that the Patriarch looks at the viewer. As for (see Section 5) the Russian coders, they demonstrate the tendency to encode “contact” as “offer” in all controversial cases.

Figure 3. The meeting of the Patriarch with Naryshkin.
Note: The Russians and the Indians encoded this photograph as “demand”.
Figure 4. The meeting of the Patriarch with the foreign delegation.
Note: The Russians and the Indians encoded this photograph as “demand”.

Figure 5. During the Liturgy.
Note: The Russians and the Indians encoded the given photographs differently: The Indians have chosen “demand”, while the Russians have chosen “offer”.
4.1.2. Distance

Referring to section 2, “distance” according to Kress and van Leeuwen can be encoded as intimate/personal, social or impersonal. For the coders intimate/personal distance can be defined as “close shot”, social distance as “medium shot”, impersonal as “long shot” (see Kress & van Leeuwen, 2006: 148). Below the results of “distance” coding by two Russian and two Indian coders are given. The whole photos’ corpus comprises 526 (N_ph = 526) items.

4.1.2.1. Overview of Inter-Rate Reliability (Cohen’s Kappa \( \kappa \); Krippendorff's Alpha \( \alpha \))

The results of encoding are presented in Table 7. It is evident, the Cohen’s Kappa agreement between two Indians is 0.941, that means substantial agreement (\( p = 0.000 \)). It is needed to note that the level of agreement between Russians coders is either high (\( \kappa = 0.968 \)). It means almost perfect agreement. By comparison, statistical significance is \( p = 0.000 \).

In contrast, the level of agreement between coders from India and between coders from Russia is rather low. For example, the Cohen’s Kappa agreement between Russian 1 and Indian 1 is 0.599, between Russian 1 and Indian 2 is 0.632, between Russian 2 and Indian 1 is 0.608, while between Russian 2 and Indian 2 is 0.641. It is worth mentioning that the encoding of “distance” gives the highest level of Krippendorff's alpha agreement throughout the whole photos’ corpus. Table 8 below shows the Krippendorff's alpha for distance.
system. Krippendorff’s alpha has values from 0.776 (Krippendorff’s alpha ordinal) to 0.788 (Krippendorff’s alpha ratio). However, despite the Krippendorff’s alpha is 0.776/0.788, this value is less than 0.800. Provided it is higher than 0.800, social scientists can rely on the data.

In general, respectively high level of general agreement does not lead to a complete lack of distinction. In comparison, Cohen’s Kappa $\kappa$ shows that agreement between the Indians is 0.941, between the Russians is 0.968 while between the Russians and the Indians it varies from 0.599 to 0.641. Thereby, the conclusion can be made that the system of distance shows little difference in coding between the Russians and the Indians.

4.1.2.2. Results of Distance Coding ($N_e = 4$; $N_{ph} = 526$)

Table 9 presents the results of distance coding. There is a tendency among the Indians to code most of the photos as intimate/personal, while the Russians put more emphasis on impersonal distance (see Table 9). Considering the coding as impersonal the difference reaches 13,1%-14,1% for the Indians and 22,2%-22,4% for the Russians. In contrast, the difference in intimate/personal coding is less and varies from 12.2% for the Indians to 9,5%-9,7% for the Russians. The difference might be detected because of the size of the photographs’ corpus ($N_{ph} = 526$). Both groups encode the majority of photos as social distance at the same time (from 68.1% of Russians to 73.8-74.7% of Indians).

Table 7. Result of Inter-rater reliability (Cohen’s Kappa $\kappa$) for Distance

<table>
<thead>
<tr>
<th></th>
<th>Indian1</th>
<th>Indian2</th>
<th>Russian1</th>
<th>Russian2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indian1</td>
<td>X</td>
<td>0.941</td>
<td>0.599</td>
<td>0.608</td>
</tr>
<tr>
<td>Indian2</td>
<td>0.941</td>
<td>X</td>
<td>0.632</td>
<td>0.641</td>
</tr>
<tr>
<td>Russian1</td>
<td>0.599</td>
<td>0.632</td>
<td>X</td>
<td>0.968</td>
</tr>
<tr>
<td>Russian2</td>
<td>0.608</td>
<td>0.641</td>
<td>0.968</td>
<td>X</td>
</tr>
</tbody>
</table>

Note: Green colour shows substantial and almost perfect agreement, red colour shows Moderate agreement.

Table 8. Value of Krippendorff's alpha for the system of Distance

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>N coders:</th>
<th>N cases:</th>
<th>N decisions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Krippendorff's alpha (ordinal)</td>
<td>0.776</td>
<td>4</td>
<td>526</td>
<td>2104</td>
</tr>
<tr>
<td>Krippendorff's alpha (interval)</td>
<td>0.779</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Krippendorff's alpha (ratio)</td>
<td>0.788</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 9. Results of the system of Distance coding (%)

<table>
<thead>
<tr>
<th></th>
<th>Indian 1</th>
<th>Indian 2</th>
<th>Russian 1</th>
<th>Russian 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intimate/personal</td>
<td>12.2</td>
<td>12.2</td>
<td>9.7</td>
<td>9.5</td>
</tr>
<tr>
<td>Social</td>
<td>74.7</td>
<td>73.8</td>
<td>68.1</td>
<td>68.1</td>
</tr>
<tr>
<td>Impersonal</td>
<td>13.1</td>
<td>14.1</td>
<td>22.2</td>
<td>22.4</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

The photos with full consent and full divergence in coding have been chosen to illustrate slight disagreement with the Russians and the Indians “distance” coding. The physical distance in Figures 8 and 9 are measured as dissimilar, but the Indians and the Russians encoded it like identical.

In the provided photos the Patriarch is seen in full length, at least the most part of his body is visible. The event where the Patriarch blesses parishioners does not distract from the adequate code description. For Russian coders this procedure tends to be rather controversial, only if they accept this religious event as personal (see Figures 8 and 9). In some cases they could evaluate the distance as “intimate/personal” in Figure 9.

Figure 8. The Patriarch is in front of the departed bishop.
Note: Both the Russians and the Indians encoded the photograph as “social distance”.

Figure 8 explains why the coders refuse to code “distance” as “intimate/personal”, and justify their refusal. It is open to question why the distance in Figure 9 is not coded by the Russians as “intimate/personal”. During the
coding of Figure 11 they perceive distance as more remote and evaluate it as the maximum “impersonal distance”. In contrast, the Indians encode this distance as the “social” (see Figure 11).

Figure 9. The Patriarch blesses archimandrite before ordination in bishop.
Note: Both the Russians and the Indians encoded the photograph as “social distance”.

Figure 10. Communication between the Patriarch and the future bishop.
Note: The Russians and the Indians encoded the photograph differently: The Russians have chosen “social distance” and the Indians have chosen “intimate/personal distance”.
The Russians demonstrate consistency in the analysis and in most of the cases (more than 40 photos) consider the distance as a far location (see e.g., Figures 10 and 11). The situation indicates that the Russians comprehend the Patriarch as more distant than the Indians. The ambiguity creates uncertainty, whether Russian coders intend to distance themselves from the religion or quite the opposite: whether they get involved in religious life and, therefore, consider the Patriarch as a person who belongs to this world either. Nevertheless, the factors that influence their choice in controversial situations are still unknown. For example, the Russians treat the Patriarch like a spiritual figure, the Indians on their part equals the Patriarch with an ordinary person (see Figure 9). The authors of this article evaluate the participants’ attitudes and highlight the influence of ideology. In all circumstances, further research is recommended in order to get more accurate results.

4.1.3. Attitude: Involvement and Detachment

Section 2 allows us to indicate “attitude: involvement” as “frontal angle” while “attitude: detachment” can be indicated as “oblique angle” (see Kress and van Leeuwen, 2006: 148). In this sub-section, the results of coding “attitude” are given: “involvement and detachment”, conducted by two Russian and two Indian coders (the whole photos corpus equals to Nph = 526, Nc = 4).
4.1.3.1. Overview of Inter-Rater Reliability (Cohen’s Kappa $\kappa$; Krippendorff’s Alpha $\alpha$)

The results of coding by two Russian and two Indian coders are presented in Table 10. Table 10 shows the value of measure of agreement Kappa that makes 0.924 between two Indians. Value 0.924 means substantial agreement. Calculation has either figure $p = 0.000$. It is needed to note that the level of agreement between Russian coders is also high ($\kappa = 0.954$), what means almost perfect agreement. At the same time the relationship is statistically significant ($p = 0.000$).

The level of agreement between coders from India and Russia is essentially low. Between Russian 1 and Indian 1 the value of measure of agreement Kappa is 0.296, between Russian 1 and Indian 2 the value of measure of agreement Kappa is 0.288, between Russian 2 and Indian 1 the value of measure of agreement Kappa is 0.292 and between Russian 2 and Indian 2 the value of measure of agreement Kappa is 0.283. Additional calculation of Krippendorff’s alpha $\alpha$ is conducted in order to insure that the degree of agreement in the encoding of “attitude: involvement and detachment” between members of international team is really low; data reliability is $\alpha = 0.491$ (see Table 11). In addition, there is a strong disagreement between the Russians and the Indians regarding the system of “attitude: involvement and detachment”.

### Table 10. Result of Inter-rater reliability (Cohen’s Kappa $\kappa$) for Attitude: Involvement and Detachment

<table>
<thead>
<tr>
<th></th>
<th>Indian 1</th>
<th>Indian 2</th>
<th>Russian 1</th>
<th>Russian 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indian 1</td>
<td>X</td>
<td>0.924</td>
<td>0.296</td>
<td>0.292</td>
</tr>
<tr>
<td>Indian 2</td>
<td>0.924</td>
<td>X</td>
<td>0.288</td>
<td>0.283</td>
</tr>
<tr>
<td>Russian 1</td>
<td>0.296</td>
<td>0.288</td>
<td>X</td>
<td>0.954</td>
</tr>
<tr>
<td>Russian 2</td>
<td>0.292</td>
<td>0.283</td>
<td>0.954</td>
<td>X</td>
</tr>
</tbody>
</table>

### Table 11. Value of Krippendorff's alpha $\alpha$ for the system of Attitude: Involvement and Detachment

| Krippendorff's alpha (ordinal) | 0.491 | N coders: 4 |
| Krippendorff’s alpha (interval) | 0.491 | N cases: 526 |
| Krippendorff's alpha (ratio) | 0.491 | N decisions: 2104 |
To sum up, the following section makes an attempt to reveal the reasons for the difference occurrence. The system of “attitude: involvement and detachment” points out the difference in agreement between the Russians and the Indians. The level of inter-rate reliability among the Indian coders is high (0.924). The same situation is true for the Russian coders (0.954). Overall, it can be seen that the level of inter-rate reliability among the group of Indian coders and among the group of Russians coder is quite high throughout the procedure of coding. However, the level of agreement between the Russians and the Indians is ranged from 0.288 to 0.296; Krippendorff's alpha α (ordinal, interval, ratio) has quite low value 0.491 with four coders.

In the case of "attitude system: involvement and detachment" demonstrate the highest level of differences and the lowest degree of agreement between Indian and Russian coders is demonstrated. Thus, the code system, developed by Kress and van Leeuwen as subjectivity involves measurement of subjective evaluation and attitude. Nevertheless, the description codes “frontal angle” and “oblique angle” clear up and simplify the encoding process.

4.1.3.2. Results of Coding of Attitude: Involvement and Detachment

The results of the system of “attitude analysis: involvement and detachment” are presented in table 12. Cohen's Kappa κ and Krippendorff's alpha α show that the cases, when both Russians coders chose other value than both Indians, are frequent. Table 12 and Figure 12 tell about the significant differences between the Russians and the Indians in the evaluation of “attitude: involvement and detachment”. According to both Indian and Russian coders, “detachment” prevails in the full corpus of photographs. However, the Russians prefer “involvement” more often than the Indians. The Indians perceive the photographs angles as more detached. In general, both Russians coded 84 photos from the whole photos’ corpus as “involvement”, whereas both Indian coders have chosen “detachment”.

The selected photographs with complete agreement and significant disagreement between two groups of coders illustrate the differences. Figures 13 and 14 present the complete agreement between the Russians and the Indians in the coding of “attitude: involvement and detachment” in the provided photographs. Accurate description of “oblique angle” facilitate coding of photographs as “detachment”.

Table 12. Results of encoding of the system of Attitude: Involvement and Detachment (%)

<table>
<thead>
<tr>
<th></th>
<th>Indian 1</th>
<th>Indian 2</th>
<th>Russian 1</th>
<th>Russian 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involvement</td>
<td>12,5</td>
<td>13,5</td>
<td>28,3</td>
<td>29,5</td>
</tr>
<tr>
<td>Detachment</td>
<td>87,5</td>
<td>86,5</td>
<td>71,7</td>
<td>70,5</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 13. The future bishop takes an oath in front of the Patriarch before ordination. Note: The Russians and the Indians encoded this photograph equally; they both have chosen “detachment”.

The apparent examples of “attitude” coding discrepancy: involvement and detachment photographs between the Russians and the Indians are the following (see Figure 15a). The Russians have chosen “involvement” while the Indians have chosen “detachment”. “Detachment” seems to be either true for Figure 15, where “frontal angle” is seen. However, the big icon in the centre can be taken for “frontal angle” (see Figure 15a). Russian coders were invited to give comments (see Section 4.2.).
Figure 14. The Patriarch and bishops before ordination. Note: The Russians and the Indians encoded this photograph equally; they both have chosen “detachment”.

Figure 15a. The Patriarch’s service in Cathedral of Christ the Savior in Moscow. Note: The photograph was encoded by the Russians and the Indians differently: The Russians have chosen “involvement” but the Indians have chosen “detachment”.

Mariia Rubtcova, Oleg Pavenkov and Julia Varlamova
4.1.4. **Attitude: Viewer Power, Equality and Represented Participant Power**

The study of interactional metafunction shows that (Section 2, Table 1) “attitude: viewer power” can be indicated as “high angle”, “attitude: equality” can be indicated as “eye-level angle” and “attitude: represented participant power” can be indicated as “low angle” (see Kress and van Leeuwen, 2006: 148). The following part of the paper presents the results of encoding “attitude: viewer power, equality and represented participant power” by two Russian and two Indian coders (the whole photos’ corpus Nph = 526, Nc = 4).

4.1.4.1. **Overview of Inter-Rater Reliability (Cohen’s Kappa κ; Krippendorff’s alpha α)**

The results of encoding by two Russians and two Indians coders are presented in Table 13 below. The value of agreement Cohen’s Kappa κ between two Indians is 0,873. It means substantial agreement with statistical significance p = 0.000. It is worth attention that the inter-rater reliability of the level of agreement between Russians coders is also high (κ = 0.837). It means almost perfect agreement, statistically significant (p = 0.000).

<table>
<thead>
<tr>
<th></th>
<th>Indian 1</th>
<th>Indian 2</th>
<th>Russian 1</th>
<th>Russian 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indian 1</td>
<td>X</td>
<td>0.873</td>
<td>0.251</td>
<td>0.278</td>
</tr>
<tr>
<td>Indian 2</td>
<td>0.873</td>
<td>X</td>
<td>0.321</td>
<td>0.345</td>
</tr>
<tr>
<td>Russian 1</td>
<td>0.251</td>
<td>0.321</td>
<td>X</td>
<td>0.837</td>
</tr>
<tr>
<td>Russian 2</td>
<td>0.278</td>
<td>0.345</td>
<td>0.837</td>
<td>X</td>
</tr>
</tbody>
</table>

**Table 14. Value of Krippendorff’s alpha α for system of Attitude:**

**Viewer power, Equality and Represented participant power**

<table>
<thead>
<tr>
<th></th>
<th>Krippendorff’s alpha (ordinal)</th>
<th>N coders:</th>
<th>N cases:</th>
<th>N decisions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Krippendorff’s alpha</td>
<td>0.5</td>
<td>4</td>
<td>526</td>
<td>2104</td>
</tr>
<tr>
<td>Krippendorff’s alpha</td>
<td>0.54</td>
<td>N</td>
<td>526</td>
<td></td>
</tr>
<tr>
<td>Krippendorff’s alpha</td>
<td>0.62</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In contrast, the value of measure of agreement Kappa between Russian 1 and Indian 1 is only 0.251, it makes 0.321 between Russian 1 and Indian 2, it is 0.278 between Russian 2 and Indian 1, while it is 0.345 between Russian 2
and Indian 2. The Krippendorff’s alpha is also low (α <0.667) (see Table 14). There is a need to show significance of the study, so measure of agreement between two groups of coders is lesser than measure of agreement between coders of one group. It also took place in the previous measurements of inter-rater reliability in the coding of the systems of “contact” (See Section 4.1.1.), “distance” (See Section 4.1.2.) and “attitude: involvement and detachment” (See Section 4.1.2.). The emerged tendency remains steady throughout the research.

4.1.4.2. Results of Coding of Attitude: Viewer Power, Equality and Represented Participant Power (N_c = 4; N_ph = 526)

The results of the system of power analysis are given in Table 15. As it is shown in the table below (see Table 15) the differences in evaluation between two Russian and two Indian coders emerge only with regard to equality and representation power. As for power representation the same differences appear twice: The Indians coded 20.7-25.3% from the whole photos’ corpus as “representation power”, while the Russians do the same for 47.1-47.4% of photos. According to the Indians the coding of 67.1-71.4% photographs are characterized by equality, but the Russians encoding mentions equality in reference to 44.6-45% of photographs. In the case of viewer power, there is no difference in encoding: 7.6-7.9% of the whole photos’ corpus for Indian coders and 7.6-8.3% for Russian coders.

<table>
<thead>
<tr>
<th></th>
<th>Indian 1</th>
<th>Indian 2</th>
<th>Russian 1</th>
<th>Russian 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viewer power</td>
<td>7.9</td>
<td>7.6</td>
<td>8.3</td>
<td>7.6</td>
</tr>
<tr>
<td>Equality</td>
<td>71.4</td>
<td>67.1</td>
<td>44.6</td>
<td>45</td>
</tr>
<tr>
<td>Representation power</td>
<td>20.7</td>
<td>25.3</td>
<td>47.1</td>
<td>47.4</td>
</tr>
<tr>
<td>Total</td>
<td>100,0</td>
<td>100,0</td>
<td>100,0</td>
<td>100,0</td>
</tr>
</tbody>
</table>

One of the essential distinctions in the perception of “represented participant power” has been revealed. Interpretation of “represented participant power” as “low angle” given to coders seems to be a bit confusing as it deals more with photo’s geometry than power. In order to comment on the mentioned episodes, the photographs with complete agreement and total difference in coding were selected. The Russians and the Indians demonstrate full agreement while encoding “attitude: viewer power”, “equality” and
“represented participant power” in the following photographs (Figure 18 and 19).

The perfect examples of differentiation in encoding of power between two Russians and two Indians are provided below (see Figures 20, 21).

**Figure 18.** The Patriarch wears mitra during the Church service. Note: The Russians and the Indians encoded the photograph as “represented participant power”.

**Figure 19.** The Patriarch blesses laity using dikiri and trikiri. Note: The Russians and the Indians encoded the photograph as “represented participant power”.
Figure 20. The Patriarch’s prayer.
Note: The photograph was encoded by the Russians and the Indians differently: the Russians have chosen “represented participant power” while the Indians have chosen “equality”.

Figure 21. The Patriarch in the Cathedral.
Note: The photograph was encoded by the Russians and the Indians differently: the Russians have chosen “represented participant power”, while the Indians have chosen “equality”
The significant differences exist between the Russians and the Indians in the coding of “attitude: viewer power, equality and represented participant power”. The Russians and the Indians evaluate “viewer power” similarly. However, in respect to “equality” and “represented participant power”, their reports contain serious disagreement. Thus, the authors of this paper call the necessity in specifying the coders’ position and feelings during the coding (see Section 4.2.).

4.2. Stage II. Results of Semi-Structured Interview with Coders

The semi-structured interviews with four coders were conducted to reveal the problems arised during the coding process and answer the second research question that sounds: How did two Indian coders and two Russian coders overcome problems they encountered during the coding of the whole photos' corpus? Over the semi-structured interviews the Indian coders were questioned in English language, while the Russian coders communicate in Russian. As the result, socio-demographical characteristics of the coders are presented in Table 16.

Following the guide of semi-structured interview with coders, a set of open questions were asked. All the questions are related to the main problems, ideas or emotions during encoding.

Table 16. Socio-Demographical Characteristics of Coders

<table>
<thead>
<tr>
<th></th>
<th>age</th>
<th>gender</th>
<th>job or profession</th>
<th>religion</th>
<th>time of coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indian 1</td>
<td>26</td>
<td>m</td>
<td>Student, the restaurant worker</td>
<td>Don’t mention</td>
<td>A week</td>
</tr>
<tr>
<td>Indian 2</td>
<td>23</td>
<td>f</td>
<td>Student, the restaurant worker</td>
<td>Indian traditional</td>
<td>A week</td>
</tr>
<tr>
<td>Russian 1</td>
<td>24</td>
<td>m</td>
<td>Master student, unemployed, the part-time guide</td>
<td>Orthodox</td>
<td>Two-three days</td>
</tr>
<tr>
<td>Russian 2</td>
<td>23</td>
<td>f</td>
<td>Master student, part-time office-worker in an advertising agency</td>
<td>Don’t mention</td>
<td>Five days</td>
</tr>
</tbody>
</table>
4.2.1. Common Problems of Coding

Actually, each coder reports some problems with coding. The common problems of coding reported by Indian coders are presented in Table 17. The considerable problems mentioned by the coders are as the following: the lack of time, the difficulty of coding task and freakish photos (see Table 17).

The lack of time and the difficulty of the task can be taken for granted while coding 526 photos’ corpus. More than that, the Indians claim that the strangeness of photos can be justified by the character of cultural traditions. The photos of the Russian Patriarchs are culturally dependent and rooted in the Russian culture exclusively, consequently, the Indians may perceive them critically. The Orthodox Patriarchs’ photos are not only unusual and odd for perception, but also can challenge Indian tradition. The latent negative attitude to Orthodox ideology appears because it does not match Indian culture and, as the result, are seen inadequate during the photo perception. It means that the Orthodox Patriarchs’ photos are not considered like an image of someone or something but are reckoned as ideological. Moreover, a photographer probably did not anticipate how the photo ideology can be perceived. In the case of the Indian coders, this ideology is perceived quite negatively and influence Indian coders to work slower and without enthusiasm.

As for Russian coders, they also face problems (see Table 18). The most significant problems mentioned are: problems with the use of English, English-Russian translation, the link between the name and the description of codes and the usage of the inadequate Western theory for the current task. In addition, the following problems are mentioned by one of the Russian coders: poor knowledge of SPSS, the difficulty with the task coding, gender inequality, lack of instructions for coding.

It is obvious that Russian coders in comparison with Indians highlight plenty of problems, but only one problem marked as the difficulty with coding coincides with the Indians’. The problem difficulty of the coding task is mentioned only by one Russian coder and deals mostly with the SPSS programme but not with photos’ coding. The vast majority of problems are focused on cultural differences in coding. The Russians do not distinguish accurately, whether these problems are related to the translation, or they are influenced by Western experience that is invalid for the Orthodox Patriarchs’ photos analysis. To sum up, both Russian coders come to conclusion that the Kress and van Leeuwen’s theory cannot be applied. This idea is absent in the answers of the Indian coders who call photos as inadequate and odd looking. Nevertheless, both groups of coders face problems while interpreting the notion “inadequacy”.

Two groups offer their interpretations of “inadequacy”. While Indian coders explain it as a wrong approach in the Patriarch’ behavior and dominance (one Russian coder names dominance as “gender inequality”), Russian coders take “inadequacy” as a concept gap between the name and the code descriptions. The authors of this article claim absolutely different perception of the coding problems among coders. Presumably, the Russians concern about “instructions were not enough for coding” can partially explain the divergence of views. However, it is wrong to assume that more detailed and prolonged instructional period may guarantee clearness in evaluation. On the contrary, more differences in perception are emphasized at the early stage of the study.

Table 17. Common problems of coding according to the Indian coders

<table>
<thead>
<tr>
<th>Problems</th>
<th>Transcript excerpts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indian 1</td>
<td></td>
</tr>
<tr>
<td>time</td>
<td>To be honest…(pause) I did not have enough time to complete this task.</td>
</tr>
<tr>
<td>task difficulty</td>
<td>This work was… really-really difficult for me.</td>
</tr>
<tr>
<td>uncustomary photos</td>
<td>These photos probably look rather strange to people unfamiliar with the Patriarch, etc... It takes a lot of time … to find him, to see… Here is a rather strange thing that look nothing like … these photographs have nothing to do with the Indians…(pause)</td>
</tr>
<tr>
<td>Indian 2</td>
<td></td>
</tr>
<tr>
<td>time, task difficulty</td>
<td>Actually, I am studying in Medical Academy and at the same time I work in restaurant “Tandoor” in Saint Petersburg. So after work I come back home and feel very tired and it was needed to force myself to do this encoding …to be honest during coding of some photos I could not find who the Patriarch is....among all these people. Then I called my friend and asked him. He told me that Patriarch dressed in green vestments.</td>
</tr>
<tr>
<td>uncustomary photos, odd looking photos</td>
<td>I face no problems apart from the odd looking photos… Almost all of them are odd looking</td>
</tr>
</tbody>
</table>
Table 18. Common problems of coding according to the Russian coders

<table>
<thead>
<tr>
<th>Problems</th>
<th>Transcript excerpts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russian 1</td>
<td>I have never heard of SPSS before. So it was rather difficult for me to use this program. Also..... honestly, it was very boring and monotonous. I encoded in English, but at the same time there were many problems with these codes.</td>
</tr>
<tr>
<td>poor knowledge of SPSS</td>
<td>I find difficulties with translation some words into Russian... For example, what is “detachment”? It is the first time when I see this word. I translate it as a non-involvement. Why our encoding is in English when the photos are Russian?</td>
</tr>
<tr>
<td>task difficulty</td>
<td>All the code names are... very strange... It seems these codes does not fit their names. The codes’ names look incorrect.</td>
</tr>
<tr>
<td>problems with the use of English or English-Russian translation</td>
<td>I can see that “demand” and “offer” are also ideological names, they are borrowed from the Western facial expressions study. In turn, the Western experience of facial expressions is based on the Western ideology, for example, the American positive thinking. However, for other countries “gaze at the viewer” cannot be combined with “demand”. It is the irrelevance of the Western theory without suitable alteration.</td>
</tr>
<tr>
<td>absence of the link between the name and description of the codes</td>
<td>I think instructions have to focus on controversial situations. After our meeting and instructions, I think everything is ok. However, when I just start my coding, I have found many controversial situations that are difficult for clear evaluation. Instructions should be longer with many details.</td>
</tr>
<tr>
<td>Russian 2</td>
<td>Some of the photographs depict the Patriarch and the women in a way that they look not equal. The Patriarch is always above the women. The Patriarch always initiates the main action. There aren’t any photographs where women are initiators of an action.</td>
</tr>
<tr>
<td>gender inequality</td>
<td>Here at once, problems with understanding and translation of these terms arise. Although I coded in English, the link between the name and the description of the code cannot be understood. So I relied on the description of the code and tried to find some angles.</td>
</tr>
<tr>
<td>poor instructions for coding</td>
<td>It seemed that problems appeared because the Western theory was used as you told us before. So, this theory can’t be effectively applicable in Russia.</td>
</tr>
</tbody>
</table>
4.2.2. Problems of coding of Contact, Distance and Attitudes

After the description of the main problems, the coders were asked to give comments on each system of coding contact, distance and both attitudes. The results of the Indian coders are presented in Table 19.

Table 19. Problems of coding of Contact, Distance and Attitude by the Indian coders

<table>
<thead>
<tr>
<th>System</th>
<th>Transcript excerpt</th>
</tr>
</thead>
</table>
| Indian 1     | contact
               distance: No problems
               It was not easy to measure “social distance” in the photographs. Interpretation of “social distance” which was given by Kress and van Leeuwen was not clear for me. What I think is… that… “social distance” is not a physical distance between the photographer and participants, but “social distance” is connected with interaction between people presented in the photographs

               attitude: involvement and detachment
               Almost all photographs of the Patriarch have oblique angles. A viewer is an observer of the events or actions on the participants part. A photographer hasn't aligned himself with the Patriarch. He is always on the side…(pause)

               attitude: viewer power, equality and represented participant power
               In my opinion, the Patriarch is a common person… For the faithful he is a religious leader. For me, he is just a man. I see the Patriarch in photographs as a person equal to me… |

| Indian 2     | contact
               “contact” was easy. What can be difficult in “offer–demand”?

               distance
               If a person looks more attractive, the distance seems less

               attitude: involvement and detachment
               I cannot remember any problem

               attitude: viewer power, equality and represented participant power
               I do not believe that the Patriarch has special religious power. For instance, I can believe that Ganesh is more powerful than Christian God… Actually, if some person is higher than another person it does not mean that he is more powerful. There is the same situation with the Patriarch. Photographers often depict the Patriarch as a person high authority. It irritates me because he is also human like me… |
Both Indian coders don’t mention any problem with the coding of “contact”. At the same time, both face the problem with “distance” coding. The more Indian 2 attempts to describe the image of the Patriarch as amiable the more evident it leads to coding the distance as less, e.g., as “intimate/personal”. At the previous stage of the present research we have found that the Indians see “distance” as more near/proximal than the Russians (see Table 9). Thereafter the semi-structured interviews confirm this tendency.

Regarding “attitude: involvement and detachment”, one of the Indian coders confirms that the Indians find more photographs of the Patriarch with oblique angles: “Almost all photographs of Patriarch has oblique angles”. Compared to the results of encoding of the whole photos’ corpus (see Table 12), some differences in perceptions of “oblique angles” between the Indians and the Russians are evident. The Indians refuse to explain and state the problems considering them “as default”.

Regarding “attitude: viewer power”, “equality” and “represented participant power” the Indians unexpectedly begin to report about their relation to the power of the Patriarch, but not about the problems in coding, insisting that the Patriarch is an individual equal to them. As one of the Indians claims: “The most important thing is how people interact with each other, and where these people are placed in the photograph. I was very dissatisfied when the Patriarch’s face always takes the central position in the photos. The Patriarch for me is the same person like other people. Why is he always placed in the centre? Why does he often look taller than other people? I do not understand is it really needed to make a focus on one person”. This saying determines the main reason why the reported results on power perception of encoding of the whole photos’ corpus (see Table 15) between Indians and Russians differs significantly. Despite the fact that both Indian and Russian coders are totally engaged with codes description, the eccentric reaction of Indians can be taken for the indirect evidence that coders also consider the meaning of the names of the codes (e.g., Power), the same is true for the Russians. The results for Russian coders are presented in Table 20.

The Russian coder 1 might treat coding too emotional; he always evaluates the procedure as “inappropriate” tool as the rational coding violates some important ideological items. Throughout the interview, he expresses a deep concern which means that he considers the Patriarch photos as ideology. At the same time he, in the line with the other coders, confirmed that the description from Table 1 is weighty for his coding.
Table 20. Problems of coding of Contact, Distance and Attitudes by the Russian coders

<table>
<thead>
<tr>
<th>System</th>
<th>Contact</th>
</tr>
</thead>
</table>
| Russian 1 | It seems that these codes do not match their names. If I looked at the code’s name such as “offer” or “demand” I would have made inaccurate encoding. Therefore, controversies were decided with the second coder after looking at the description. The code names look incorrect. If the Patriarch does not see photographs, it does not mean that he demands something. He is being used of God and people who are present in Church. Even such word as “offer” is better than “demand” because “offer” of faith and service is the thing which Orthodox Church really gives to people. So, “offer” is more good characteristics of the Patriarch’s behavior and all Orthodox Church…we have a choice: we can see the description and we can see the name of the code. If we should choose the description, for example, “gaze at the viewer”, then we should use a wrong nomination “demand”. I can see that “demand” and “offer” are also too ideological names, they based on the Western facial expressions. In turn, the Western experience of facial expressions based on the Western ideology, for example, the American positive thinking. However, for other countries “gaze at the viewer” cannot combine with “demand”.

<table>
<thead>
<tr>
<th>System</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance</td>
<td>I cannot understand why “social distance” was written twice as the common name of all group and as a particular name of “medium shot”.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System</th>
<th>Attitude: Involvement and Detachment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude: Involvement and Detachment</td>
<td>I think some words can’t be translated into Russian… For example, what is “detachment”? It is the first time when I can see this word. I understood it as a non-involvement. I feel “involvement” in Liturgical actions which are often present in the photographs. I like to participate in Liturgical prayer. When I see these photographs I have the intention to pray. So for me, “involvement” does not connect with the angles. It is connected with situation and action which can be more interesting for me.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System</th>
<th>Attitude. Viewer power, Equality and Represented participant power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude. Viewer power, Equality and Represented participant power</td>
<td>The Patriarch for me is not just a person. He is the leader of the Church; he is responsible for all Orthodox Christians in Russia. The photographs often depict the Patriarch as a lovable father. And I agree with it… A lot of photographs were knowledge oriented. Even the depiction of the Patriarch’s presence during the Liturgy is the source of knowledge about Liturgy.</td>
</tr>
</tbody>
</table>
Table 20. (Continued)

<table>
<thead>
<tr>
<th>System</th>
<th>Transcript excerpt</th>
</tr>
</thead>
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<tr>
<td>Russian 2 Contact</td>
<td>The same problem arises with “offer” and “demand” because there is requirement with gaze (don’t say)</td>
</tr>
<tr>
<td>Distance</td>
<td>Church photographers does not like to use frontal angles because during Liturgy they can’t stay in front of the Patriarch. It is forbidden in Orthodox Church to stay between a priest or a bishop and an altar. So, they make photographs according to the church rules and regulations. I don’t fully understand this division between “involvement” and “detachment”. How can front angle be connected with “involvement”? “Involvement” for me means the participation in the process, but I can feel myself as a participant of the process depicted in photos without the frontal angle. The frontal angle does not give new information. Always the Patriarch should be in the center... Why? For example, I noticed a large icon in the center of the Church (Note: see Figure 15a).</td>
</tr>
<tr>
<td>Attitude: Involvement and Detachment</td>
<td>The power of the Patriarch is not actually his power. It is a spiritual power which is given from God. The photographs can’t reflect this spiritual power. However, photographer can try to depict the Patriarch not as a bearer of some administrative resource but as a bearer of the grace of God. Some of the photographs are successful, in this regard.</td>
</tr>
</tbody>
</table>

Regarding the system of “contact”, both Russian coders have always confused codes “offer/demand” and interpret them more subjectively than stated in the description “for other countries gaze at the viewer cannot combine with demand” (Russian 1). Moreover, they evaluate the names of the codes “offer” and “demand” as more or less positive. For instance, the coder Russian 1 says “So, “offer” is more good characteristics of Patriarch’s behavior and the Orthodox Church”. Despite their belief that the coding is based on the description, a certain influence of cultural attitude can be seen in Table 6. “Results of coding of Contact”. It is evident that the Russian coders prefer “offer” more often than the Indians. The authors of this paper recognize it as cultural difference in perceptions of both the photos and the system of coding.

In contrast, regarding the system of “distance”, both Russian coders do not find any serious problems, while Indians are puzzled by non-attractive Patriarch’s view that leads to its perception as more distant. At the same time,
regarding the system of “attitude: involvement and detachment” both Russian coders find problems similar with contact. In this case, they are discouraged by the word “involvement” and insist that involvement cannot be associated with “frontal angle”; “How can front angle be connected with involvement” (Russian 2). Finally, Table 12 shows “Results of encoding of the system of Attitude: Involvement and Detachment”, despite the Russians’ assumption that it has no influence on their coding.

Regarding the system of “attitude: viewer power, equality and represented participant power”, the situation differs but slightly from the Indians. The Russians mention Patriarch’s Power however, they do not take the Patriarch for an average person. The coding of “attitude: viewer power, equality and represented participant power” states drastic controversy between the Indians and the Russians (see Table 15). Russian coders perceive the Patriarch as the bearer of spiritual authority, while the Indians consider him as equal.

The above said confirms the influence of ideology on the perception of the photographs in different cultures exists. All coders, involved in the study, position themselves as ideologically neutral. However, a significant impact of the Orthodox ideology on Russian participants is evident. The Russians express more understanding towards the Church rules than the Indians and retain it during encoding. Over the interview the Russians associate themselves as action participants depicted in the photographs. The Indians take the Patriarch as an ordinary person; however, the image of Ganesh causes unconscious comparison of the Russian religious photos with the Indian religious photos. According to Russian’s point of view, the photographs depict the Patriarch as the “father” of an Orthodox believer.

In fact, both groups, the Indians and the Russians, constantly appeals to the domestic culture and cannot make coding without it. Despite their efforts to be objective and follow the instructions of the coding, they represent their cultural and ideological differences.

**DISCUSSION AND CONCLUSION**

The analysis is based on the issue whether it is possible to avoid the impact of cultural/ideological differences in coding when the ideal system of codes is provided, that enable to measure eye position or angle using computer program. The obtained answer is positive, but the authors cannot ignore the
perception of free viewers which are not under control of the code book and
the computer program.

Culture and ideology influence photo perception that is vital for photo
producers. The role of the photograph in cultural/ideological/political affairs is
likely to grow because of the increased importance of the internet, TV, 3D,
virtual environment. Competing with video streaming, photographs still play a
foundational role in communication process, however, little is still known
about viewer’s perception. This research tries to expand the understanding of
photograph’s role by focusing on how interactive meaning of photograph’s is
created, processed and interpreted by the representatives from non-Western
cultures.

This study points out the importance of the Kress and van Leeuwen
“visual grammar” in studying interactive meanings in photograph’s. The
authors of this paper share the view that the social semiotics’ approach applied
to the analysis of different forms of cultural communication allows to explore
less known aspects of the very influential cultural/ideological institutions
which “symbolic” power is depended on the use of visuals.

At the same time the problems faced during this research supply new ideas
for the further understanding of cultural differences. Kress and van Leeuwen
repeatedly focus our attention on the limitations of their theory based on
Western examples (see e.g., Kress and van Leeuwen, 2006: 148). Despite this,
the present study applies the theory in non-Western environment. It can be
justified, firstly, by the need in tools for comparing different cultures, and
secondly, to reveal and measure similarities that exist between cultures. So,
this section highlights similarities and then proceeds to differences.

Similarities in the Russian and Indian perceptions of the Patriarch
photographs’ are explained by utilizing geometrical proportions. Russian and
Indian perceptions of geometrical angles and distance are almost similar. Its
worthiness opens possibilities for the expanded research based on the Kress
and van Leeuwen theory. In the present research, all problems with
interpretation of angles and distance are connected with ideological/cultural
reasons and requests that results from interpretations. However,
ideological/cultural reasons exist and their influence on the outcome of the
research is rather strong. First challenge deals with the names of Contact’s
codes that are “demand” and “offer”.

In spite of the fact that both Russia and India are non-Western countries, it
is wrong to think that they are the same. From this point of view, the term
“non-Western” calls something unknown, hidden from the Western analytical
sight, a demarcation of white spot on the map of consciousness, than it is an
explanation of something that is really “non-Western”. For example, our Russian and Indian coders and respondents employ different strategy in coding/evaluating of “demand” and “offer”. Surprisingly the Indians shows understanding of “demand” with slight similarity to “Western” as it is described in the Kress and van Leeuwen theory. At the same time, the Russians consider “demand” as a problem as it can not be clearly described geometrically. “Demand” and “offer” for Russians are different types of behavior when “demand” is a strong request “offer” expresses a soft request.

Coming back to offer/demand problem the question is stated whether Russian understand offer/demand wrongly. Halliday describes “demanding” as: questions (ask, demand, inquire, query) or commands (call, order, request, tell, propose, decide; urge (‘command: persuasive’), plead (‘command: desperate’), warn (‘command: undesirable consequences’)) (Halliday & Matthiessen, 2014: 514). Only part of these meanings of “demanding” can be understood in Russia correctly. Russians can understand “demanding” as commands. Most part of the commands’ meaning is acceptable for the Russians. However, the interpretation of “plead” (‘command: desperate’) also carries the meaning “offer” either.

The meaning of “demanding” as request is polysemnatic. For example, a teacher can apply to students with “demand” and a police officer can apply to humans with “demand”, but they should confer power to perform like this. It means Russian “demanding” (“trebovanie”) is tightly connected with the hierarchy and the power. Without the hierarchy and the power “demand” cannot be accepted in any case without any dependency of eye position or angle.

Looking through the Patriarch photos the following paradox is seen. While the Indians code the Patriarch photos as “demand”, the Russians place a refusal. Suppose it happens because the Indians employ the exact meaning of “demand” in English, whereas the Russians rely on its literal translation into Russian as a “requirement” - “trebovanie”. The Russians explain the ignorance in coding “demand”/”trebovanie” as the power of the Patriarch spreads in the other dimension. It means that the Patriarch has the sacral power, thus, evaluation his actions as administrative power is unacceptable. Therefore, the Russians’ interpretation of “demand” means not abstract power, but an administrative power. As the result, the Russians code/evaluate the Patriarch actions as “offer”. For example, one of the Russian coders (Russian 2) notes: “Power of Patriarch is not actually his power. It is a spiritual power which is given from God”. So, van Leeuwen’s concept: “They do not look at the camera and therefore there is no social interaction with the reader” (van Leeuwen,
The influence of ideology is found in coding/evaluation of “distance” and “attitudes”. Regarding system of “distance” the Indians and the Russians have contradiction in evaluation “more personal”/“more impersonal” distance. While Indians evaluate the Patriarch as an ordinary person and tend to “more personal” distance, the Russians treat the Patriarch as a spiritual person and, as a result, evaluate distance as impersonal because they do not count the Patriarch as an entity of the real world.

Regarding the system of “attitude: involvement and detachment” Indians and Russians experience contradiction around the term “part-whole relations”. “Involvement” is considered like part-whole relation (see e.g., Halliday & Matthiessen, 2014: 295). The results say that the Indians try to exclude themselves from the religion process depicted in the Patriarch’s photos and prefer “detachment” if the situation is controversial. Whereas the Russians are fully engaged with the church actions and chose “involvement”: “I feel involved in Liturgical actions which are often presented in the photographs”. In addition, some Russian coders fail to understand the meaning of the word “detachment”, it is witnessed in the saying: “For example, what is “detachment”? It is the first time when I see this word. I understood it as a non-Involvement. Why our encoding was in English when they are our Russian photos?”. This ideological and linguistic divergence lead to the significant differences in the photos’ evaluation as “involvement” or “detachment”.

Regarding the system of “attitude: viewer power, equality and represented participant power” Indians and Russians are faced with different interpretations of equality and represent participant power. The situation is almost similar to the “distance” evaluation/coding. Based on the vision of Patriarch as an ordinary person the Indians try to evaluate photos as “equality”, while the Russians prefer to see “represented participant power”. The Russians vision of “represented participant power” has a weak focus on Kress recommendations of angle because power for the Russians can be represented from both angles: high and low. Moreover, visualization from a high angle can represent the Patriarch as a “lake” where people may float to as streams down the mountains.

Thus, throughout the research both Indian and Russian coders and respondents have attempted to introduce their opinions about the photos orally, however, they come across problems like the choice of appropriate linguistic tools to describe visual phenomena. On the one hand, photos of different
cultures cannot be described/compared non verbally, on the other, words and their equivalents in different languages can lead to the “wrong”/peripheral/unusual interpretation and processing. In this research evaluation of the problems as culturally and ideologically determined is accepted. So, it is believed that words make ideology transparent as shown in the examples where the Russian is influenced by the Orthodox ideology and the Indian attempts to reconfigure the ideology according to Indian traditions. The Russians and the Indians do not provide unanimous opinions throughout all the codes. All codes are characterized by discrepancies in opinions of the Russians and the Indians. The angle geometry allows us to identify similarities in coding, but little is said about the photos’ perception. All the other cases of photo interpretation are strongly influenced by the ideology.

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