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SEMANTIC BIAS AS AN APPLICATION OF THE UNIVERSAL GRAMMAR
MODEL IN THE RUSSIAN LANGUAGE

by
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A thesis submitted in partial fulfillment of the requirements
for the Honors in the Major Program in Psychology
in the College of the Sciences
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ABSTRACT

The theory of the Universal Grammar developed by Chomsky has been known for many years. The main idea behind the theory was that the processing of the language does not depend on the culture but it is universal among all the languages. Further psycholinguistic studies developed the ideas about schematic comprehension of the language, giving rise to the idea of the “garden path effect”. Research focused on the processing of the ambiguous sentences and found the tendency for readers to prefer interpretations of specific sentence areas as objects. The current study summarizes the ideas of psycholinguistic study and incorporates a novel language structure to study readers’ syntactic preferences. In addition, conducting the study in Russian language accompanies previous research in other languages, also arguing in favor of the Universal Grammar model given the hypothesis was supported. It was hypothesized that readers would prefer the comparison of the two direct objects over the subjects, which would be reflected by faster reading times. Self-paced reading task was administered to the participants in order to measure their reading times. The analysis found no significant differences in the reading times of the critical area, thus hypothesis was not supported. Possible explanations, limitations, and further directions are discussed.

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CHAPTER ONE: INTRODUCTION

For several decades there has been an ongoing debate on the universality of the language processing, and whether the underlying cognitive processes involved in language production and comprehension are transferrable across languages. Chomsky was the first to introduce the idea of the universality of language mechanisms across all humans, proposing the existence of the Universal Grammar. He described it as “the system of principles, conditions, and rules that are elements or properties of all human languages. . . the essence of human language” (Chomsky, 1975). In other words, UG described the language as an innate aspect of human development. Specifically, Chomsky stated that apart from general language acquisition ability, there is a specific neurological mechanism embedded with some structural rules of the language as a phenomenon (Johansson, 1991). Given that under the condition of adequate sensory experience children adopt those rules to fit the structure of their native languages, it becomes evident that the language brain machinery is not specific to a culture, but is rather universal among all humans.

Further studies proposed cognitive models of processing (Piaget, 2001; Cruttenden, 1979) which involved the idea that language is generally dependent on cognition. Piaget also described cognitive “schemas”, relating to the general learning processes beyond the framework of the language acquisition. However, the particular development of language schemas implies that children utilize their cognitive capacity to extract rules of their native languages and build mental schematic representations. Considering all the information, language can be described as a combination of an innate universal neurobiological basement which accommodates to the native communication norms and incorporates the knowledge into the stable schemas.

Although the purpose of the schemas is to make the production and comprehension of the language more convenient and less time consuming, there are situations in which they can cause complications. Despite the fact that any given language is mainly grammatically structured, it still has a lot of internal fluidity. Such structural fluctuation results into ambiguous sentences and prevents their immediate understanding. For example, consider the following sentences:

1. a) The mathematician found the solution to the problem.

b) The mathematician found the solution to the problem was very tricky.

Up to the certain point, the set of words in both sentences does not differ; however, the syntactic roles of these words do. In the sentence 1.a) the verb (V) *found* is followed by its direct object (DO) *the solution*. In 1.b) *the solution* is no longer a DO, but a subject of an embedded clause (SC) with omitted *that* (...found *that* the solution...). According to Ferreira and Schotter (2013), readers prefer the structure in which *the solution* is a DO, over the one in which *the solution* is a SC. Indeed, Frazier and Clifton (1997) reported that the readers choose the interpretation of a noun phrase (NP) following the verb as a DO 82% of the time. One of the explanations is that such structure is perceived to subjectively simpler over other structures (Frazier, 1978; Frazier & Fodor, 1978). Trueswell and Tanenhaus (1994) developed an alternative perspective that implies that the reader chooses the more common interpretation of the NP, which is usually a DO. These findings account for the concept of verb bias, which is a syntactical predictability of the verb to be followed by a specific NP (Garnsey, Pearlmutter, Myers, & Lotocky, 1997). In the example 1. The verb *found* can be followed by both DO and SC, but the interpretation of *the solution* as a DO is supposedly easier and more commonly used.

Adopting the previous findings, Ferreira and Clifton (1986) proposed the revision schema of the processing of ambiguous sentences, implying that the reader generally chooses one interpretation and revises it only when it happens to be incorrect. When the readers proceed through the sentence, they make predictions on the possibility of the following NP based on each word they incorporate. The more words become available for comprehension, the less outcomes become available for the prediction. This phenomenon is known as a garden-path effect. Therefore, when the reader reaches the ambiguous part of the sentence and their predictions do not match the information they acquired, they “take the wrong garden path”. Considering that the language is a cognitively dependent mechanism, it becomes evident that when the reader finds themselves in the place of the sentence that does not make logical sense, they run into a cognitive discrepancy. This theory is supported by the empirical evidence of prolonged reaction times to the garden-path sentences, specifically to their ambiguous parts (Garnsey et al., 1997).

Now, consider the following sentences:

2. a) The teacher writes more reports than journals.
- b) The teacher writes more reports than the principle.

Similar to the previous example the two sentences are identical in their structures, varying in one specific point. In 2.a) the comparative clause ...*than*... involves the comparison between two DOs – *reports* and *journals*. In 2.b), however, the two subjects (S) – *the teacher* and *the principle* – are compared to each other. According to the garden-path theory, as the readers reach the word *than* they should make a prediction about the following word, whether it will be a subject or a DO. Analogous to the verb bias, the preference of the comparative binding can be defined as a semantic bias. Now, the question is: which of these structures is preferred by

the readers? The sentences in 2. are arranged in the way that the subject is “farther” away from the comparative part than the DO. Taking into consideration the fact that language processing requires a significant cognitive load, it becomes logical that it is easier for the readers to attend to the more current information because it is acquired more recently and requires less cognitive load for the recall. Therefore, it may be argued that the readers will predict the comparison between two objects because of their relative temporal closeness and choose the structure such as 2.a).

The structure in 2. is novel to the research on the topic and is promising to give a more thorough insight on the processes involved in the language comprehension. This structure is going to be used in the current study, where the presentation of subjects and objects following the word *than* will be varied. The reading times of the varying words will be considered. According to the argument on the preference of temporal closeness in the comparative clauses, and the fact that cognitive discrepancies are reflected by longer reading times, the main research hypothesis may be stated as:

The reading times of the subjects in the comparative clause will be longer than the reading times of the respective objects.

The research findings discussed above have a great contribution to our understanding of the language processing. However, a thorough work has been done on the common languages such as English and Spanish. While there is some literature on the Slavic languages, it is clearly cannot be compared to the respective research on the above-mentioned languages. Reflecting on the initial discussion of the universality of language processing, there is a certain lack of assurance for the validity of the UG model, since the range of the studied languages is rather

narrow. Therefore, the aim of the current study is to examine whether the predictions based on the studies focusing on other languages extend to Russian. By doing so, we can further argue for or against the conclusiveness of the UG.

The current study has several limitations. Cuetos and Mitchel (1988) tested the parsing strategies between English and Spanish languages and found that English and Spanish readers differ in the use of those strategies. This finding implies that some comprehension processes are language-dependent; therefore, the possibility of obtaining similar results in the current study should be considered. Another important issue is that Russian is a heavily inflected language. Most semantic decisions are based on the highly extensive morphology, which is not present in English. This aspect may interfere with the expectations of the universality of the processing due to the difference in the cues that the readers choose for the comprehension. Finally, while arguing in favor of the UG, we cannot account for the difference in the more basic processes such as letter recognition. While we expect this not to be an issue in the framework of the current experiment, the difference in alphabets can be another confounding factor that affects the primary stages of the language recognition.

CHAPTER TWO: METHODS

Participants

The total number of participants in the study was 15. All of the participants were over 18 years of age and were all college students. All participant were Native Russian speakers, with English as their second language. The participants were of different geographical descents, however all came from the countries in which Russian is the dominant language. The list of the countries of origin was as follows: Russia, Ukraine, Kazakhstan, Uzbekistan.

Participants completed the following tasks in the order described.

Language Experience and Proficiency Questionnaire.

The participants filled out a questionnaire which measured linguistic features of every participant. The information collected included levels of proficiency in each of the languages spoken by the participant, level of proficiency in the in their native language as well as any additional languages they speak. The participants will also provide the demographical information on age, gender, and country of origin. The main goal of this procedure was to obtain information about the linguistic backgrounds of the participants, and to see if the effects of immersion, multilingualism, and cultural backgrounds affect the results of the study (see Appendix C).

Self-Paced Reading Task.

The experimental software E-Prime was used in the current experiment. The software allowed for precise measurement of the reading times of each separate word in the sentence. All the materials in this task were in Russian.

In the beginning of the experiment participants saw a string of dashes. Each of the dashes corresponded to one letter in the word; sets of dashes separated by spaces represented words, thus forming a sentence. To begin reading participants had to press a “space” bar on a keyboard. After completing reading the word, the “space bar” had to be pressed again to proceed to the next word. As soon as the new word appeared, the previous word disappeared. Therefore, participants were reading the sentence in word-by-word manner, with only one word being visible at a time. After the end of each sentence participant were asked a comprehension question about the contents of the sentence. The questions were of “yes” and “no” type. To answer the question, participants pressed “C” and “N” keys on the keyboard for the “yes” and “no” answer respectively. The goal of the questions was to encourage the accuracy of reading as well as to check it.

The structure of the self-paced reading task was organized the following way. Each participant read 72 sentences: 24 experimental and 48 filler sentences. Out of the 24 experimental sentences, 12 were in the “subject” condition, and 12 were in the “object” condition. Each sentence was followed by the comprehension question. The participants were offered to take a break in the middle of the experiment to minimize the effects of fatigue.

Experimental sentences. 24 pairs of sentences (48 total), with 9 words each were included in the experiment (see Appendix A). All of the sentences followed the same structure;

however, each of the sentences in the pair fell in one of the two conditions: the first sentence in the pair was in the “object” condition (had comparison between the two objects), while the second sentence was in the “subject” condition (had comparison between the two objects). The structures of the sentences were as follows:

- a. (S) – (V) – (*more*) – (DO1) – (*than*) – (DO2) – (NP).
- b. (S1) – (V) – (*more*) – (DO1) – (*than*) – (S2) – (NP).

While the reading times of each word of the sentence were recorded, the critical area that was specifically studied was the word 6. This was the independent variable of the experiment and was presented either in the form of the subject of the object. It was expected that the reading times of the word 6 in the “subject” condition would be significantly longer than in the “object condition”. To eliminate the possibility that the difference in reading times was due to the word length, the words with no significant difference in the number of letters were selected.

24 pairs of the sentences were divided into the two self-paced reading files. The sentences were arranged following a Latin Square design. Therefore, the first sentence of the pairs 1-12 (“object” condition) and the second sentence of the pairs 13-24 (“subject” condition) were placed in the File 1; the second sentence of the pairs 1-12 (“object” condition) and the first sentence of the pairs 13-24 (“subject” condition) were placed in the File 2. Participants with odd and even order numbers received File 1 and File 2 respectively.

Filler sentences. To prevent participants from experiencing learning tendencies throughout the experiment, filler sentences were introduced. These sentences differ in the structure from the experimental sentences (see Appendix B). Group A consisted of sentences with elements of ambiguity which limited immediate comprehension. Group B contained

sentences with the word *than* outside the comparative clause. Independently of the experimental file assignment, each participant received all of the experimental sentences.

Lexical Decision Task.

LDT was introduced to the experiment as a reliability measure. In order to justify that the difference in the reading times of the word 6 is caused by the processing variability and not by the lexical knowledge.

The task started when a participant pressed an “enter” key on the keyboard. One word would appear on the screen. Participant’s goal was to determine whether the word was a real word (was semantically correct) or not (had no semantical meaning). Participants were encouraged to answer as fast as they could; without any response within 2 seconds the word automatically disappeared and next word appeared. To mark the word as real, participants pressed “C” key, and to mark the word as nonexistent they pressed “N”. Correct response as well as response times were recorded. There were 96 words in total; 48 were real, and 48 were not real.

Production Task

This task measured personal preferences of each participant to use either subject or an object to in their speech. It also measured the frequency of both conditions to identify prevalence of one type of choice over the other.

Participants were presented with the list of sentences. The sentences used in this task were the experimental sentences from the self-paced reading task. There were total of 24 sentences (1 sentence from the pair), since all the words after word 5 (*than*) were removed (the

words 1-4 were identical within one pair). Participants were then asked to complete the sentences with any word than they believed was the best suitable for the sentence. The words were later identified as “subject”, “object”, “other”.

CHAPTER THREE: RESULTS

Language Experience and Proficiency Questionnaire.

The analysis of the Language experience and proficiency questionnaire determined the following demographic characteristics of the participants. The mean age of the participants was 21 years old ($SD = 1.64$). $N = 8$ participants were female and $N = 7$ were male. $N = 5$ participants were from Russia, $N = 6$ were from Kazakhstan, $N = 3$ were from Ukraine, and $N = 1$ participant was from Uzbekistan. All participants were bilinguals, with Russian being their native language, and English being the second language. One participant also reported speaking French. $N = 15$ participants were college students spending in average $M = 3.37$ years in university ($SD = 0.93$). $N = 5$ participants reported having minor vision problems, all corrected through the wear of eyeglasses or contact lenses.

Self-Paced Reading Task.

The analysis of the self-paced reading data included several steps. The first step included the elimination of the sentences that were considered ineligible since participants did not read the sentence carefully or could not comprehend information properly. This was determined by the answers to the comprehension questions. The answers to comprehension questions were coded 1 and 0 for correct and incorrect responses respectively. Those coded 0 were not included in the further analysis.

Next, general reading times were considered. Those reading times below 350 ms were not included in the analysis because of the general consideration that the brain cannot process information under this threshold. Additionally, reading times above 2000 ms were eliminated as

well, since it was considered too long for comprehension of one word. MANOVA was performed on the reading times of each word. Reading times of words 1-9 were analyzed separately. Two conditions were introduced: subject and object. Analyses of variance was performed to identify whether there was a significant difference in reading times of each word between the two conditions. Descriptive statistics and the results of MANOVA for words 1-9 are presented in the Table 1. As it can be seen from the table, there was no significant difference in the reading times of subjects and objects in the critical area, which was the word 6. In addition, there was no significant difference in the reading times of any other words in the sentence.

Filler sentences and comprehension questions were not included in the analysis.

LDT.

The analysis of the Lexical Decision Task involved comparing the reading times of words and non-words. The results of the paired-sample t-test indicated that there was no significant difference between the two conditions ($t(14)=-1.67, p=.118$). Nevertheless, the average reading times of words ($M=754.40, SD=165.43$) were much faster than those of non-words ($M=1886.96, SD=2607.28$).

Production Task.

The words that the participants used to complete the sentence were grouped into 3 types: subject, object, and other (e.g. verb). Only “subject” and “object” were included in the analysis. Number of items in each category was counted. The results of paired-sample t-test suggested that there was no significant difference between the use of subjects ($M=11.47, SD=6.70$) and objects ($M=11.73, SD=6.99; t(14)=-.076, p=.94$).

Table 1: Descriptive Statistics and Results of MANOVA for Words 1-9

Word #	Condition	N	Mean	SD	F
1	Object	14	620.37	193.13	.889
	Subject	14	625.33	169.57	
2	Object	14	564.47	131.17	.497
	Subject	14	580.65	112.14	
3	Object	15	494.81	75.60	.268
	Subject	14	522.96	72.78	
4	Object	15	580.32	130.26	.219
	Subject	15	542.05	109.55	
5	Object	15	484.42	131.99	.430
	Subject	15	453.79	62.18	
6	Object	14	567.48	148.30	.497
	Subject	13	574.56	164.76	
7	Object	14	463.97	71.46	.106
	Subject	15	446.91	46.37	
8	Object	14	532.92	124.79	.192
	Subject	14	504.35	97.31	
9	Object	15	555.20	126.79	.701
	Subject	14	578.50	119.25	

CHAPTER FOUR: DISCUSSION

Despite the promising theoretical background, the results indicated that the hypothesis of the study was not supported. There are multiple reasons that might have influenced the outcome, some of which are discussed in this section. Afterwards, limitations of the study as well as the suggestions for the future research are considered.

One of the reasons why the results of the current study did not align with the plain of the previous research is the fact that previous studies mostly focused on the languages such as English and Spanish. There are, however, multiple aspects that differ these languages from Russian. Firstly, English and Spanish belong to the Germanic and Italic language groups respectively, while Russian belongs to the Slavic group. This factor accounts for different linguistic features including lexicon, grammar, morphology, and semantics. What is more, unlike the other two languages, Russian is a highly inflected language. As a result, language comprehension is highly dependent of morphology, whereas other languages may rely on word order, etc. This aligns with the findings by Cuetos and Mitchel (1988) who suggested that the reading comprehension is language dependent.

Another contributing factor contributing was the nature of the reading task. Specifically, the procedures involved in the self-paced reading task do not represent natural reading experience. Firstly, natural reading does not involve pressing the space bar to switch over to the next word. Secondly, fluent reading usually involves “overseeing” several words in the sentence at the same time, which was not the case in the experiment. Finally, the participants were unable to go back and re-read the sentences if comprehension difficulties occurred.

Furthermore, the experimental sentences themselves were to some extent semantically unnatural. Due to the high degree of morphological control, some sentences, although making logical sense, did not represent the native way of speaking.

Overall, the participants showed the tendency to comply with the goals of the experiment. However, since for the experimental purposes the participants could not have been introduced to the actual aim of the study, some of them came up with their own strategies. For example, some participants self-identified the goals of the study as measuring the reading speed or checking the response-accuracy rate of the comprehension questions. As a result of self-identifying these strategies, the participants did not perform in the manner that was expected in this study.

There have been other features of the participants that might have influenced the results. First, differences between the groups of English, Spanish, and Russian speakers have not been taken into account. There is a possibility that it is a cultural trait or the specific of the Russian language that does not differentiate between the comparisons of subjects and objects. Also, despite the previous findings, it might not be the case that the comparison of the two objects is easier or more common in the Russian language.

Not only are the Russian speakers different from the Spanish and English speakers, but they are also very different among themselves. In the current study involved participants from 4 countries of origin (Russia, Ukraine, Kazakhstan, Uzbekistan) within the sample of 15 people. Different ethnic groups of Russian speakers may be exposed to different dialects of the language and different immersion effects within their countries (Ukrainians also speak Ukrainian, and Kazakhs speak Kazak, etc.) In addition, all of the participants indicated different periods of time during which they stayed in the US. Again, different degrees of immersion in the American

culture may have accounted for the lack of difference between the two conditions, as those participants who came earlier, and thus spent more time in the English-speaking environment, had slower reading times than those who came later.

The main limitation of this study was the insufficient sample of the participants. Consequently, the suggestion for the future research is to consider recruiting more participants in order to obtain more comprehensive results. Another way to increase the accuracy of measurement is to use a different timing method, namely eye-tracking. Not only does this method provide more precise time measurement, but also participant with the more natural procedure of reading and the researchers with the more referential data. In order to further increase reading convenience and make the sentences more native-looking more morphological variability can be introduced.

Future analysis can also focus on controlling for participants' features. For example, the results obtained from participants should be analyzed in the context of their countries of origin. It might be informative to see if the Russian-speakers from Russian behave differently than those from Ukraine, Kazakhstan, etc. Additionally, participants with different levels of immersion (in the US) should be separated for the analysis. As noted earlier, it might be the case that people who have spent more time living in the English-speaking community have different reading attitudes towards their native language compared to those who has recently come to the US.

Last but not least, it is interesting to note that the production task yielded no results indicating the difference in the use of subjects and objects, while in the comprehension task it was expected that the readers would prefer one condition. This phenomenon, however, has a possible explanation. When the person is speaking or writing, they have an internal intention to

convey a specific message. However, when the person is listening, they only make predictions based on the information that they heard (garden-path effect). Therefore it is logical to assume that the ambiguity comes from the person who is comprehending, while the speech producer experiences no cognitive discrepancies.

Overall, the current study generated several ideas that contributed to the collective pool of the language research. First of all, the experiment succeeded in narrowing the gap in the research on Slavic languages, specifically Russian. In addition, a novel sentence structure was introduced to test comprehension differences, which creates future opportunities for the research in other languages. Finally, new knowledge on the specifics of the language comprehension has been obtained, as it now became more evident that the processes involved in the understanding of written and spoken words is less universal and more language-specific than previously thought.

**APPENDIX A: EXPERIMENTAL SENTENCES
AND COMPREHENSION QUESTIONS (WITH TRANSLATIONS)**

1. а) Начальники покупают больше компьютеров чем телефонов для их бизнеса.

б) Начальники покупают больше компьютеров чем сотрудники для их бизнеса.

Q: Покупают ли начальники компьютеры для их бизнеса?

2. а) Малыши едят больше пряников чем блинов в обеденное время.

б) Малыши едят больше пряников чем школьники в обеденное время.

Q: Едят ли малыши варенье во время ужина?

3. а) Фотографы делают больше снимков чем видеороликов для творческого проекта.

б) Фотографы делают больше снимков чем операторы для творческого проекта.

Q: Делают ли фотографы снимки для творческого проекта?

4. а) Студенты читают больше журналов чем комиксов в свободное время.

б) Студенты читают больше журналов чем адвокаты в свободное время.

Q: Читают ли студенты книги во время летних каникул?

5. а) Уборщики моют больше ковров чем столов в рабочее время.

б) Уборщики моют больше ковров чем спасатели в рабочее время.

Q: Моют ли уборщики ковры в рабочее время?

6. а) Строители красят больше полов чем потолков на строительном участке.

б) Строители красят больше полов чем электрики на строительном участке.

Q: Красят ли строители стулья в гараже?

7. а) Поэты публикуют больше стихов чем монологов в городской газете.

б) Поэты публикуют больше стихов чем танцоры в городской газете.

Q: Публикуют ли поэты стихи в городской газете?

8. а) Спортсмены смотрят больше фильмов чем сериалов по местному телеканалу.

б) Спортсмены смотрят больше фильмов чем редакторы по местному телеканалу.

Q: Смотрят ли спортсмены новости в интернете?

9. а) Художники рисуют больше квадратов чем треугольников в художественной школе.

б) Художники рисуют больше квадратов чем химики в художественной школе.

Q: Рисуют ли художники квадраты в художественной школе?

10. а) Дедушки смотрят больше сериалов чем мультфильмов на старом телевизоре.

б) Дедушки смотрят больше сериалов чем внуки на старом телевизоре.

Q: Смотрят ли дедушки комедии на компьютере?

11. а) Музыканты посещают больше концертов чем банкетов в выходные дни.

б) Музыканты посещают больше концертов чем инженеры в выходные дни.

Q: Посещают ли музыканты концерты в выходные дни?

12. а) Детективы получают больше вопросов чем ответов на плановом собрании.

б) Детективы получают больше вопросов чем ювелиры на плановом собрании.

Q: Получают ли детективы премию в конце месяца?

13. а) Археологи находят больше динозавров чем фараонов на древних раскопках.

б) Археологи находят больше динозавров чем физики на древних раскопках.

Q: Находят ли археологи динозавров на древних раскопках?

14. а) Гонщики получают больше кубков чем дипломов за заслуженную победу.

б) Гонщики получают больше кубков чем лётчики за заслуженную победу.

Q: Получают ли гонщики медали когда заканчивают гонку?

15. а) Инженеры проектируют больше моторов чем домов на своих компьютерах.

b) Инженеры проектируют больше моторов чем дизайнеры на своих компьютерах.

Q: Проектируют ли инженеры моторы на своих компьютерах?

16. a) Кондитеры пекут больше тортов чем пирогов для голодных клиентов.

b) Кондитеры пекут больше тортов чем программисты для голодных клиентов.

Q: Пекут ли кондитеры печенье для себя?

17. a) Парни срывают больше сорняков чем плодов на дачном огороде.

b) Парни срывают больше сорняков чем мальчики на дачном огороде.

Q: Срывают ли парни сорняки на дачном огороде?

18. a) Старики едят больше супов чем пирожков для их здоровья.

b) Старики едят больше супов чем юноши для их здоровья.

Q: Едят ли старики котлеты на обед?

19. a) Депутаты посещают больше судов чем театров в центральном районе.

b) Депутаты посещают больше судов чем туристы в центральном районе.

Q: Посещают ли депутаты суды в центральном районе?

20. a) Астрономы находят больше астероидов чем метеоритов в солнечной системе.

b) Астрономы находят больше астероидов чем переводчики в солнечной системе.

Q: Находят ли астрономы планеты а других галактиках?

21. a) Врачи пишут больше отчетов чем рефератов для их руководства.

b) Врачи пишут больше отчетов чем биологи для их руководства.

Q: Пишут ли врачи отчеты для их руководства?

22. a) Механики чинят больше мотоциклов чем велосипедов в своих гаражах.

b) Механики чинят больше мотоциклов чем хирурги в своих гаражах.

Q: Чинят ли механики машины в мастерской?

23. а) Фермеры сажают больше помидоров чем огурцов на овощных грядках.

б) Фермеры сажают больше помидоров чем бармены на овощных грядках.

Q: Чинят ли механики машины в мастерской?

24. а) Журналисты носят больше блокнотов чем альбомов в своих рюкзаках.

б) Журналисты носят больше блокнотов чем массажисты в своих рюкзаках.

Q: Носят ли журналисты тетради в маленьких сумках?

Translations:

1. а) Bosses buy more computers than telephones for their business.

б) Bosses buy more computers than the workers for their business.

Q: Do bosses buy computers for ir business?

2. а) Babies eat more cookies than pancakes at the lunch time.

б) Babies eat more cookies than the schoolchildren at the lunch time.

Q: Do babies eat jam for dinner?

3. а) Photographers take more pictures than videos for the arts project.

б) Photographers take more pictures than the operator for the arts project.

Q: Do photographers take pictures for art project?

4. а) Students read more magazines than comics at the free time.

б) Students read more magazines than lawyers at the free time.

Q: Do students read books during summer holidays?

5. а) Cleaners clean more carpets than tables at the working time.

б) Cleaners clean more carpets than lifeguards at the working time.

Q: Do cleaners wash carpets at work?

6. a) Builders paint more floors than ceilings at the construction site.

b) Builders paint more floors than the electricians at the construction site.

Q: Do construction workers paint chairs in garage?

7. a) Poets publish more poems than monologues at the city newspaper.

b) Poets publish more poems than the dancers at the city newspaper.

Q: Do poets publish poems in the city newspaper?

8. a) Sportsmen watch more movies than soap operas at the local TV channel.

b) Sportsmen watch more movies than the editors at the local TV channel.

Q: Do sportsmen watch news on Internet?

9. a) Artists draw more squares than triangles at the arts school.

b) Artists draw more squares than the chemists at the arts school.

Q: Do artists paint squares in art schools?

10. a) Grandpas watch more soap operas than cartoons on the old TV set.

b) Grandpas watch more soap operas than the grandsons on the old TV set.

Q: Do grandpas watch comedies on computer?

11. a) Musicians attend more concerts than banquets at the weekends.

b) Musicians attend more concerts than the engineers at the weekends.

Q: Do musicians attend concerts on weekends?

12. a) Detectives receive more questions than answers during the planned meeting.

b) Detectives receive more questions than the jeweler during the planned meeting.

Q: Do detectives receive a reward in end of month?

13. a) Archeologists find more dinosaurs than pharaohs at the excavation sites.

b) Archeologists find more dinosaurs than the physicists at the excavation sites.

Q: Do archeologists find dinosaurs at excavation sites?

14. a) Racers get more cups than diplomas for the deserved victory.

b) Racers get more cups than the pilots for the deserved victory.

Q: Do racers get medals when y finish race?

15. a) Engineers design more engines than houses on their computers.

b) Engineers design more engines than the designers on their computers.

Q: Do engineers design engines on their computers?

16. a) Confectioners bake more cakes than pies for the hungry customers.

b) Confectioners bake more cakes than the programmers for the hungry customers.

Q: Do confectioners bake cookies for themselves?

17. a) Guys pick more weeds than fruits at the countryside.

b) Guys pick more weeds than boys at the countryside.

Q: Do guys pick weeds at countryside?

18. a) Old men eat more soups than pastries for their health.

b) Old men eat more soups than the youngsters for their health.

Q: Do old men eat meatballs for lunch?

19. a) Politicians attend more courts than theatres in the central district.

b) Politicians attend more courts than the tourists in the central district.

Q: Do politicians attend courts in central district?

20. a) Astronomers find more asteroids than meteors in the solar system.

b) Astronomers find more asteroids than the translators in the solar system.

Q: Do astronomers find planets in or galaxies?

21. a) Doctors write more reports than essays for their supervisors.

b) Doctors write more reports than the biologists for their supervisors.

Q: Do doctors write reports for their supervisors?

22. a) Mechanics fix more motorcycles than bicycles in their garages.

b) Mechanics fix more motorcycles than the surgeons in their garages.

Q: Do mechanics fix cars in workshop?

23. a) Farmers plant more tomatoes than cucumbers on the garden beds.

b) Farmers plant more tomatoes than the bartenders on the garden beds.

Q: Do farmers plant tomatoes on garden beds?

24. a) Journalists carry more notebooks than albums in their backpacks.

b) Journalists carry more notebooks than the massagers in their backpacks.

Q: Do journalists carry copybooks in small bags?

**APPENDIX B: FILLER SENTENCES
(WITH TRANSLATIONS)**

Group A:

1. Женщина позвонила врачу мужа который был за границей.
2. Бабушка связала свитер внуку который был маленький.
3. Парень увидел сестру подруги которая была красивой.
4. Механик починил дверцу машины которая была сломана.
5. Пилот полетел на остров в океане который считался опасным.
6. Мужчина прочитал статью в газете которая была популярной.
7. Мария почувствовала запах хлеба который был повсюду.
8. Художник нарисовал портрет актёра который стал знаменитым.
9. Турист поставил палатку на поляне которая стала мокрой от дождя.
10. Ученый обдумывал теорию коллеги которая была необычной.
11. Строитель заделал дыру в стене которая появилась недавно.
12. Учитель выбрал задачу из книги которая была трудной.
13. Хозяйка поставила кувшин в шкаф который стоял на кухне.
14. Дирижер обозначил начало выступления которое было незабываемым.
15. Генерал получил медаль за службу которую он никогда не забудет.
16. Спортсмен выиграл приз на конкурсе который считался престижным.
17. Лесник прошел по тропе к реке которая была извилистой.
18. Девушка выбросила свитер с рисунком который ей не нравился.
19. Таксист заехал в район города который он хорошо знал.
20. Ребенок достал конфету из вазы которая была высоко.
21. Прохожий заметил сарай около дома который выглядел пустующим.

22. Студент нашел кошелек в автобусе который принадлежал Дмитрию.
23. Журналист познакомился с заместителем мэра который стал президентом.
24. Мужчина встретил дочку сестры которая была молода.

Translations:

1. The woman called the doctor of the husband who was abroad.
2. The grandma knitted a sweater for the grandchild that was small.
3. The guy saw the sister of a friend who was pretty.
4. The mechanic fixed the door of the car that was broken.
5. The pilot flew to the island in the ocean that was considered dangerous.
6. The man read an article in the newspaper that was popular.
7. The teacher felt the smell of the bread that was everywhere.
8. The painter drawn a portrait of the actor that became famous.
9. The tourist put a tent on the law that was wet from the rain.
10. The scientist thought about the theory of the colleague that was unusual.
11. The maintenance worker fixed the whole in the wall that appeared recently.
12. The teacher chose the problem rom the book that was difficult.
13. The host put a jug in the sideboard that was on the kitchen.
14. The conductor marked the beginning of the show that was unforgettable.
15. The general received a medal for the service that he will never forget.
16. The sportsman won a prize for the competition that was considered prestigious.
17. The woodsman followed the trail to the river that was winding.
18. The girl threw away the jacked with a print that she did not like.

19. The taxi driver came to the district of the city that he knew well.
20. The child picked a candy from the vase that was high.
21. The passerby noticed the shed next to the house that looked empty.
22. The student found a wallet in the car that belonged to the old man.
23. The journalist met a deputy of the mayor who soon became a president.
24. The man met a daughter of the sister who was young.

Group B:

1. В этом месяце компания заказала больше компьютеров.
2. На банкете в честь окончания года было больше закусок.
3. В летнее время года выпадает больше осадков.
4. С понедельника я буду больше заниматься спортом.
5. Вам нужно больше времени проводить на свежем воздухе.
6. Мама пошла на рынок чтобы купить больше яблок.
7. В наше время молодежь проводит больше времени за компьютером.
8. Девушка не могла больше нести тяжелую сумку с продуктами.
9. Девочка больше не хотела заниматься пением в музыкальной школе.
10. После плотного обеда солдат больше не был голоден.
11. Чтобы купить новую машину, семье нужно было больше денег.
12. Если ты хочешь достичь успеха, нужно больше работать.
13. После ссоры дети сказали, что они больше не друзья.
14. Для ремонта старого дома нужно больше строительных материалов.
15. С развитием технологий люди больше полагаются на различные устройства.

16. В будущем люди будут больше летать в космос.
17. Чем больше готовишься к экзамену, тем лучше его сдашь.
18. Учительница сказала школьнику чтобы он больше так не делал.
19. После ссоры мужчина пообещал, что больше так не будет.
20. Если больше клиентов будут пользоваться нашими услугами, прибыль возрастет.
21. Я не могла положить больше вещей в чемодан.
22. На заводе больше не производят детали такого типа.
23. В холодное время года люди склонны кушать больше.
24. Следующий раз будь осторожней, чтобы больше не ошибаться.

Translations:

1. This month the company bought more computers.
2. At the banquet at the end of the year were more appetizers.
3. In the summer time there is more precipitation.
4. On Monday I will start to do more exercise.
5. You need to spend more time in the open air.
6. The mother went to the market to buy more apples.
7. At the modern time young people spend more time at the computers.
8. The lady could not carry the heavy bag any longer.
9. The girl no longer wanted to attend singing classes in the musical school.
10. After the heavy lunch the soldier was no longer hungry.
11. To buy a new car the family needed more money.
12. If you want to succeed you need to work more.

13. After the fight the kids said that they are no longer friends.
14. To fix an old house more materials are needed.
15. As the technology develops people are more dependent on various devices.
16. In the future people will travel to space more.
17. Th more you study for the exam, the better score you will get.
18. The teacher told the pupil not to do so anymore.
19. After the quarrel the man promised not to do so anymore.
20. If more customers use our services, the income will increase.
21. I could not put more clothes in the suitcase.
22. The factory does not produce the details of that type anymore.
23. I the wintertime people tend to eat more.
24. Next time be more careful in order not to make mistakes.

**APPENDIX C: LANGUAGE EXPERIENCE
AND PROFICIENCY QUESTIONNAIRE**

Last Name		First Name		Age	
Gender:		Date of Birth		Home Country	
My father was born in		My mother was born in			

(1) Please list all the languages you know in order of dominance:

1	2	3	4	5
---	---	---	---	---

(2) Please list all the language you know in order of acquisition (*your native language first*):

1	2	3	4	5
---	---	---	---	---

(3) Please list what percentage of the time you are currently and on average exposed to each language.

(Your percentage should add up to 100%)

List language here					
List percentage here					

(4) When choosing to read a text available in all your languages, in what percentage of cases would you choose to read it in each of your languages? Assume that the original was written in another language, which is unknown to you.

(Your percentage should add up to 100%)

List language here					
List percentage here					

(5) When choosing a language to speak with a person who is equally fluent in all your languages, what percentage of time would you choose to speak each language? Please report percent of total time.

(Your percentage should add up to 100%)

List language here					
List percentage here					

(6) How many years of formal education do you have?

(7) Please select your highest education level (or the approximate US equivalent to a degree obtained in another country):

(Less than high school / High school / Professional training / Some college / College / Some graduate school / Masters / PhD, MD, or JD)

(8) How many years have you been living in the U.S.?

(9) Have you ever had any of the following?

vision problem Yes / No

hearing impairment Yes / No

language disability Yes / No

learning disability Yes / No

If yes, please explain (including any corrections):

The following set of question is repeated for each subsequent language listed in the previous section.

Language:

This is my (native / second/ third / fourth / fifth) language.

All questions below refer to your knowledge of [language].

(1) Age when you...:

Began acquiring [language]:	Became fluent in [language]:	Began reading in [language]:	Became fluent reading in [language]:

(2) Please list the number of years and months you spent in each language environment:

	In Months
A country where [language] is spoken	
A family where [language] is spoken	
A school and/or working environment where [language] is spoken	

(3) On a scale from zero to ten, please select your level of proficiency in speaking, understanding, and reading in [language] from the scroll-down menus:

Speaking		Understanding		Reading	
----------	--	---------------	--	---------	--

(4) On a scale from zero to ten, please select how much the following factors contributed to you learning [language]:

Interacting with friends		Language tapes/self-instruction	
Interacting with family		Watching TV	
Reading		Listening to the radio	

(5) Please rate to what extent you are currently exposed to [language] in the following contexts:

Interacting with friends		Language lab/self-instruction	
Interacting with family		Watching TV	
Reading		Listening to the radio	

(6) In your perception, how much of a foreign accent do you have in [language]?

(0 = none, 9 = extremely heavy)

(7) Please rate how frequently others identify you as a non-native speaker based on your accent in [language]:

(0 = never, 10 = always)

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