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Language Text Comprehension: Differences Between Different Generations of a Society

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Abstract

The generation gap is the disagreement between one generation and another over beliefs, policies, or values. The difference between the generations is a social reality and must be examined from different angles. In this study, we examined young readers' comprehension along with the purpose of contributing to our understanding of the inventory, as well as the range of the semantic roles reproduced in the immediate oral recalls. The comprehension of an expository 200-word Russian text read by 22 Russian natives, aged nearly 10-11 years, was assessed with free recall. The revealed pattern of the inventory of the semantic roles both in the reading text and its recalls comprised two types, including main propositions and sub-propositions, the latter of which fell into agents, circumstances, and modifiers. The recalls matched the reading text in the inventory of the semantic roles defined. On the whole, the study indicated that respondents reproduce no more than 40% of the propositions in the reading text.

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1. Introduction

The term generation gap was first coined in the 1960s in Western countries to somehow describe the cultural differences between children and their parents (Bengtson, 1970). Generation gap is a concept that considers the huge psychological, social, and cultural differences and significant differences in insights, beliefs, perceptions, expectations, value orientations, and behavioral patterns between two simultaneous generations in a society (Williams & Bedward, 2001). In this study, we want to address the differences between generations in terms of linguistics and text comprehension.

Recent years have witnessed a surge of interest in reading comprehension research, and numerous approaches have been developed to measure reading comprehension. Adequate reading comprehension as the goal of reading instruction is nowadays assessed using different tests varying along many dimensions, such as the type of the reading text (Andreeva, Makarova, Gorbunova, & Lukina, 2019; Ivanov, Solnyshkina, & Solovyev, 2018; McNamara, Ozuru, & Floyd, 2011; Marina & Aleksander, 2015; Solovyev, Solnyshkina, Ivanov, & Batyrshin, 2019; Solovyev, Andreeva, Solnyshkina, Zamaletdinov, Danilov, & Gaynutdinova, 2019; Solovyev, Solnyshkina, Gafiyatova, McNamara, & Ivanov, 2019) time constraints, readers' interest and abilities (Kintsch, 1977; McDaniel, Waddill, Finstad, & Bourg, 2000) as well as the response mode. The latter is typically selected among cloze tests, answers to questions, and recalls.

The act of understanding means "the process of stringing a string of concepts derived from a word until a unit (for example, a sentence, phrase, proposition) is obtained and then continues to the next unit". (Royer & Cunningham, 1981, p. 193). According to the Construction-Integration model (Kintsch & Walter Kintsch, 1998), comprehension of a text entails two most essential levels, i.e., a surface level represented by words and syntax and a text-base level represented by propositions (McNamara et al., 2011). Several propositions in a recall are traditionally used as a measure to assess reading comprehension (McNamara et al., 2011). The difference in the number of propositions in the reading text and the text recalls is a significant metric in analyzing text comprehension (Zeng & Wen, 2018; Zwaan & Singer, 2003).

Our study examines middle-school children's comprehension of expository texts used in the classroom. We examined how respondents change, generate, and reproduce semantic roles of the reading text in their recalls. We expected that children would encounter difficulty comprehending all the semantic roles in a reading text. We also hypothesized that comprehension would depend on both respondents' knowledge and text characteristics. The present study was designed to answer two research questions:

R.Q. 1: What is the range of the semantic roles in an expository reading text?

R.Q. 2: What type of propositions are typically omitted in the recalls?

2. Theoretical Framework

Various research has been done on the subject of this article. It should be noted that there are four features that thematic role theories strive for:

- Completeness: Each argument is assigned a thematic role or another role from each verb.
- Uniqueness: Each argument of each verb has only one thematic role.
- Distinction: Each argument is differentiated from each verb by the role assigned to it from other arguments.
- Independence: Each role is given a fixed semantic definition that applies to all verbs and all situations.

In the current study, when we talk about semantic roles, we usually refer to semantic roles for events or objects. To achieve the semantic composition, that is to extract the semantic representation of sentences from the lexical senses, we must know the possible semantic relations between the two constituents and assign a semantic role to the dependent constituents that best describes the semantic relations for its spiritual meaning. According to Gómez-Moreno, Faber, and Castro (2013, p. 510): "Representation of specialized knowledge naturally includes semantic properties that help describe the nature of objects and events. However, there is

a set of relationships that has a specific semantics". These relationships define the relationship between objects and events or other events. Linguistically, this is reflected as the relationship between the verb and its arguments, which are ordinary roles activated by the predicate. Semantic roles are generally a set of characteristics that a verb has for a particular argument. Although most linguists believe in their existence, there is much disagreement about their function, nature, and number. This inevitably raises the question of what abstract or specific semantic roles should be. According to Van Wallin (2004), semantic roles have been studied at three levels of generalities: (1) specific roles; (2) thematic relations, which are generalizations in specific roles of the verb. (3) semantic macros, which are generalizations in thematic relations. The list of semantic roles used in FrameBank includes 91 roles and is based on the following principles (see here for more discussion):

• Roles are related to the semantic classification of the dictionary. Traditionally, "broad" roles, such as representative or patient, have to be labeled differently in different semantic classes. Destructive agent vs. speech vs. motion

• The role of words close to the concept should be systematically matched or systematically different.

• The complete list of roles should cover all vocabulary areas.

• The inventory is hierarchically organized to provide flexible search options (see role network at http://marker.framebank.ru/ GraphSemRoles.pdf). The semantic role domain follows the principle of the prototype and its surroundings. For example, a patient prototype is a participant who is physically affected by a changing factor. Peripheral examples (patient in non-physical process, disease that does not change, disease resulting from a physical operation) receive special labels (theme, result, etc.) and are considered as specific types of patient.

The notion of 'proposition' is applied in numerous research to assess comprehension (Fauconnier, 1994; Kintsch, 1977; Zwaan & Singer, 2003). A proposition is viewed as an ideal unit in a text (McNamara et al., 2011). The concept of a proposition originated from the philosophical category of logic and progressed to the theories of language. Maitra (2017) argues that when studied in a discourse, a proposition (1) is to be considered as an analytical representation of that part of an utterance (or a text) that reflects a particular state of affairs narrated or described; it is a direct derivative from an utterance apprehended in a speech act; (2) it is a cognitive-semantic structure which at the conceptual level shows the state of the world through a language; (3) it is a symbolic mental structure with reference to a situation model; (4) it is a meaning of an argument of a predicate.

A proposition is viewed as a mental unit correlated with an ontological situation, able to reduce the content parameters of a mental model to a formalized predicate-argument structure (Fauconnier, 1994). Fillmore describes the nature of a proposition as 'a timeless set of relations between verbs and names (and insertion clauses, if any), separated from the modal constituent of a sentence' (Fillmore, 1968). As an idea unit of a text, a proposition is correlated with predicates and nominal units (Valgina, 1973). Predication is viewed as an essential component of a proposition. Valgina (1973) claims that a proposition reflects denotative content in a syntactic unit, primarily manifested and formed by a predicate – a central part/core of a proposition. The proposition as a mental or idea unit is formed, primarily based on predication structures within a text.

Although the term "proposition" may sometimes be used in everyday language to refer to a linguistic proposition that may be true or false, the technical philosophical term, which differs from mathematical usage, has exclusively a non-linguistic meaning behind the proposition it has. The term is often used very broadly and may refer to various related concepts in both the history of philosophy and contemporary analytic philosophy. It may generally be used to refer to some or all of the following: the main carriers of truth values (such as "true" and "false"); objects of belief and other propositional attitudes (i.e., what belief, doubt, etc. exists); the references to "it" (for example, "it is true that the sky is blue" and "I believe that the sky is blue" are both statements of the blue sky). And the meanings of declarative sentences. Since propositions

are defined as the common objects of attitudes and the main carriers of truth and falsehood, this means that the term "proposition" refers to specific thoughts or specific utterances (which in various cases are not flexible). Propositional logic is primarily concerned with propositions and the logical relationships between them (Zalta, Nodelman, Allen, & Anderson, 2005).

Perception refers to both a set of empirical phenomena and a theoretical structure. Phenomena are not properly defined because the concept of perception that psychologists use in everyday language is ambiguous, as are such concepts. In practice, however, most psychological research on comprehension has focused on understanding discourse. In understanding discourse for skilled adult readers, analytical reasoning is only necessary when the normal process of comprehension is lost: natural reading or listening is more like perception than problem-solving (Kintsch & Walter Kintsch ,1998). Understanding the text is a complex process and requires the involvement of many different components, relying on different types of information and complex mental representations. None of the chapters can examine each process in detail, considering its importance and complexity. Instead, we hope to have modest goals of highlighting the inherent complexity of text comprehension, familiarizing the reader with several basic processes underlying comprehension, and referring to relevant literature for more interested readers. In fact, many of the processes mentioned here have significant research that has been conducted to understand how each component works. Almost all existing research in the field of comprehension focuses on identifying and examining the various components of the component separately, which has continued to make great progress (Kintsch & Walter Kintsch, 1998). Researchers developed different approaches to control text comprehension: meanings of each word in a text, the ability to assemble words into sentences, and the number of propositions recalled (Robeck & Randall, 2017). Propositions or idea units (Carroll, 1978; Clark & Clark, 1977; Townsend & Bever, 1982; Zwaan & Singer, 2003) were identified by Kintsch (1977) in the study of story comprehension. McDaniel et al. (2000) pursued a propositional analysis to test attentional demands for texts and interest induced among readers. Linking the number of propositions recalled to the interest, McDaniel et al. (2000) suggest that less interesting stories require more resources to keep attention focused on encoding the individual propositions, thereby rendering additional proposition-specific processing becomes redundant.

Psychological and linguistic studies suggest that the number and inventory of propositions affect reading time, comprehension, and memorizing a text, thus the complexity of a text (McKoon & Ratcliff, 1992; Zwaan & Singer, 2003). Kintsch (1977) breaks the information in each sentence of a text into the main propositions and subpropositions. The main propositions contain the main idea. In contrast, the sub-propositions comprise information about the details pertaining to the main idea. Predicates are viewed as the main constituents of propositions (see 'Propositions' above) implemented in the Russian language, primarily in verbs, verbal nouns, and descriptive adjectives (Mustajoki, 2007). Nominal units denote objects and participants of the situation and bear semantic roles of '*Agents*'. *Circonstants* nominate time, place, cause, purpose, conditions, etc. (Valgina, 1973).

The syntactic environment, viewed as a central constituent of a proposition, is formed by elements with assigned semantic roles. The term 'a semantic role', introduced by Fillmore (1968) to label participants of a situation model, has been widely used to describe participants' text semantics. The range of different semantic role types has been studied, identified, and extended for many languages (Fillmore, 1968; Dowty, 1991). Griffith, Ripich, and Dastoli (1986) and Zwaan and Singer (2003) follow the theories of structural grammar and use the term 'argument' to refer to a noun, functioning as an 'agent', 'patient', 'instrument', 'goal', 'beneficiary' which complement a predicate (Griffith, Ripich, & Dastoli, 1986; Zwaan & Singer, 2003).

Numerous researchers apply a detailed approach to the description of semantic role types and label the roles performed by an agent. Russian linguists defined 88 semantic roles grouped into the following categories: Agent, Patient, Experimenter, Instrument, Addressee, and Circumstances, such as Possessor, Place, Time, Parameters, Manner,

Cause, Target, Source, and Resource (Karpova et al., 2010; Karpova et al., 2011).

A. Mustajoki (2007) distinguishes between the following semantic role types: **'Agents'**: (1) *Agent* (produces and/or controls the action), (2) *Experiencer* (feels an emotion or physiological state), (3) *Theme* (or neutral) (an event denoted by the predicate), (4) *Object* (an Agent towards which concrete or abstract action is directed or which appears as a result of such action), (5) *Theme* (an Agent which the Agent of speech is talking about), (6) *Place* (refers to a locative element obligatory for the state of affairs) (Mustajoki, 2007).

3. Methodology

Reading is the basis of students' success in many areas. The assessment process is one of the areas that require reading skills. There are also many national exams, the TIMSS and PISA international exams, which assess students' general success levels in specific subjects. The items are in writing and can be understood by reading these tests, which generally include multiple-choice items. Therefore, comprehension is an essential type of skill for assessing the level of knowledge in different areas. Reading requires cognitive and motor skills. A written text is transmitted to the brain through the sense of sight, and comprehension is done through mental analysis of the signs in the text (Arıcı, 2012). However, comprehension is possible primarily through cognitive processes. The process of reading comprehension can be accomplished by making connections between elements in the text and prior knowledge. During this process, signs of text are linked and organized in mind. Reading is a personal activity. The main goal of the reader is to fully and accurately understand the messages in the text (Demirel, 1990). Understanding involves processes such as achieving the main idea and sub-ideas, distinguishing the hidden dissertation, and creating ideas about the author's goals by going beyond words and sentences. Although defining understanding, Bloom (1995) also emphasizes the reader's attention to ideas that are not expressed by the author and expands the scope of thinking. Hence, comprehension involves not only achieving clear content expressed in words but also comments between and outside the lines. During the process of comprehension, which is related to the cognitive aspect of reading, the reader's expectations and prior knowledge play a special role (Yalçın, 2001). The reader is responsible for retrieving the information given by decrypting the message contained in the text, which acts as a tool to form comprehension and by linking it to previous information. To achieve this, the reader needs a certain amount of information about the subject and the code to analyze the text. Previous knowledge enables the reader to infer access to the information contained in the text. The success of comprehension depends mainly on three sets of parameters: the characteristics of the reading text, the selected response mode, and the linguistic and cognitive abilities of the readers.

Thematically, the text correlates with household and family resources. It aims at fostering care and reasonable use of family resources, in particular, gas, electricity, and money. The following descriptive metrics of Text 55A computed with the help of RusAC (http://tykau.pythonanywhere.com): the number of words 160, sentences 20, nouns 83, verbs 20, adjectives 16, adverbs 4, pronouns 30, average sentence length (ASL) 8.0 words, average word length (AWL) 2.65 syllables and Text readability SIS 6.1 confirm the appropriateness of the text for 5th graders (Solovyev, Solnyshkina, Ivanov, & Batyrshin, 2019).

The experiment was held with 22 respondents, 10 – 11-year-old Russian natives, including 13 boys and 9 girls. The respondents were selected for the study based on the results of the General Knowledge subtest of WISC, having an average G.K. index (11 – 17). We provided information about the study as well as the schedule of testing sessions and requested parents to sign an approval letter. The study was designed in four Stages. On Stage 1, the results of the General Knowledge subtest of WISC were obtained (Kaplan & Saccuzzo, 2017). On Stage 2, each of the subjects read Text 55A with the reading time being not limited; the average time span registered in Time protocol was 5 minutes. On Stage 3, after reading, each participant recalled the text. This mode of response was selected to assess respondents' comprehension based on the direct and integrative character of the immediate oral recall (Chang, 2006). On stage 4, the recalls were recorded, and the audio files

were later transcribed. The recall analysis assessed the number of propositions recalled by respondents. Prior to the assessment of recalls, Text 55A was propositionalized, that is, each sentence was described by the number of propositions and the range of semantic roles. The inventory of the semantic roles comprised the following: main propositions, Agents/agents, circumstances, and modifiers. The semantic role of Agent/agent was further subdivided into Agent, Object (Patient), Possessor, Theme, Instrument/Tool, Experiencer, Recipient (see Figure 1, Figure 2 for the detailed data).

The number of propositions and range of semantic roles in Text 55A provided benchmarks for which we compared the number of propositions that children generated in their recalls after reading Text 55A. Every recall proposition was matched against the propositions contained in Text 55A, so that we could evaluate which semantic roles were omitted and which propositions were reproduced. For instance, the main proposition for the sentence "an intelligent man saves electricity" consists of the notion that people save things. The sub-propositions consisted of the notions that of all the people, only the intelligent save electricity. In cases where respondents repeated words or sentences, each proposition was counted only once.

4. Results

Based on the information in the respondents' recalls of Text 55A, we formed three groups of semantic roles: 1. Main propositions; 2. Agents; 3. Circonstants. The complete inventory of the semantic roles specified in Text 55A is provided in Figures 1 and 2.

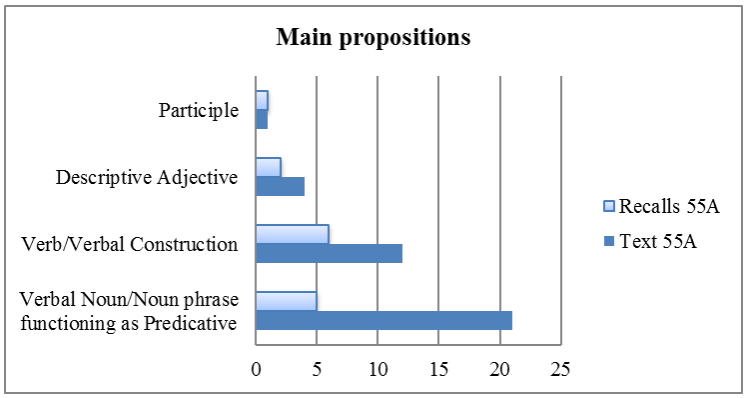

Figure 1

The Inventory of Main (Verbal) Propositions in Text 55A and its Recalls

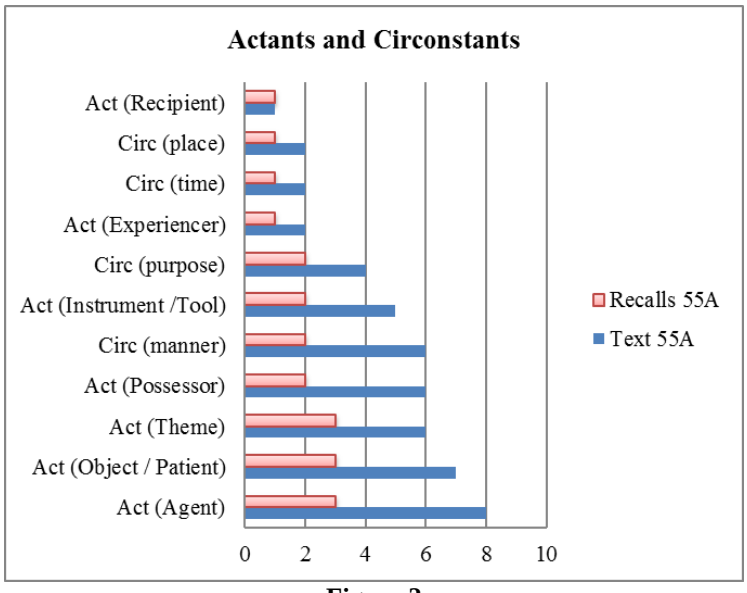

Figure 2

The Inventory of Actants and Circonstants in Text 55A and its Recalls

The research shows that Verbal Nouns (21) are the most frequent among the main propositions, whereas in recalls, the most frequent are verbal constructions. The least frequent was the Participle (1 / 1), both in recalls and in the text.

The semantic roles of 'Theme' (2 / 2) and 'Recipient' (1 / 1) are few in the text and recalls. e.g., 'Theme' – Text 55A '*dlya zhitelei nashei strany vazhen* ***vopros*** *ob energosberezhenii*' (*the* ***issue*** *of energy saving is important for the residents of our country*), Recall '*kazhdyi razumnyi chelovek* ***budet znat' kak*** *sekonomit' na energii*' (*every reasonable person* ***will know how*** *to save on energy*)); e.g., 'Recipient' – Text 55A and Recall '*pravil'noe vedenie hozyaistva dayot vsem* ***chlenam sem'i*** *neobhodimoe*' (*proper household management gives all* ***family members*** *everything they need*)).

One of the most frequent words used in the reading text is '**sem'ya**' (family) which functions as an experiencer, possesser, agent. The most frequent role revealed for the word '**sem'ya**' (family) is that of a possessor which is registered in six syntactic contexts in the reading text and two recalls. E.g. '*resursy* ***semiyi*** *' (****family*** *resources); 'hozyajstvo* ***semiyi*** *' (****family*** *household); 'imushchestvo* ***semiyi*** *' (****family*** *property)*. For example, *'Resursy* ***semiyi****, kak pravilo, ogranicheny' (****Family*** *resources are usually limited)*; *'Hozyajstvo* ***semiyi*** *– eto imushchestvo* ***semiyi*** *' (A* ***family*** *household is a* ***family*** *property)*. The average frequency of a possessor in recalls is 2 (total n = 32). The range of lexical substitutions of '**sem'ya**' (family) as a possessor in the recalls include the following: (1) possessive pronouns **eyo** (its) (e.g.. *'Hozyajstvo semiyi eto* ***eyo*** *imushchestvo' (The household of a family is* ***its*** *property),* (2) noun **chelovek** (person) (e.g. *'Hozyajstvo* ***cheloveka*** *– eto imushchestvo* ***cheloveka*** *' (A* ***person's*** *household is a* ***person's*** *property),* (3) noun **dom** (house) (e.g., *'Resursami* ***doma*** *obychno byvayut den'gi, predmety byta' (Resources of the* ***house*** *are usually money, household items).*

In their recalls, the respondents reproduced 40% of the reading text information (see Table 1 below), which is viewed above average (Kausler, 2012).

Table 1
The Distribution of Semantic Roles in Text 55A and Recalls 55A

Text 55A Recalls			Text 55A
Main propositions	17%	44%	Main propositions
Actants	15%	35%	Actants
Circonstants	6%	14%	Circonstants
Modifiers	1%	4%	Modifiers

5. Discussion

The recalls match the reading text in the inventory of semantic roles defined as nominators of the main propositions, verbs, and verbal phrases are prevalent in recalls, whereas the nominal phrases are dominant in the text. The study was pursued to assess and contrast the inventory and range of the semantic roles in a Russian expository text and its recalls done by 10-11-year-olds.

The findings indicate that, on average, recalls contain 40% of the reading text information: 36.8% of the main propositions, 41% of agents, and 42.8 % of circonstans. The pattern and inventory of the semantic roles in recalls are similar to those in the reading text: The main propositions amount for 41.7% in the reading text and 38.8% in recalls. The range of the forms in the reading text to constitute main propositions involve verbs, modal verbs, participles, verbal nouns, and descriptive adjectives. The respondents demonstrated a preference for verbal to nominal constructions.

The semantic roles of Agent provided most of the semantic roles of reading text and recall, at 42.8% and 44.4%, respectively. The set of the semantic roles of an agent both in the reading text and recalls include an experiencer, possessor, theme, sender, recipient, and instrument. The roles of time, place, goal, theme are poorly generated in the recalls (15%).

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