ABSTRACT

The Use of Dictionaries, Glosses, and Annotations to Facilitate Vocabulary Comprehension for L2 Learners of Russian

Elizabeth Christel Todd
Center for Language Studies, BYU
Master of Arts

Technology is changing education. Just 30 years ago, instructors were using slow, inefficient technology such as projectors and reels of film, whereas today they have instant access to video from anywhere in the world. This capability has the potential to change the way that language is being taught and learned. Instead of students relying solely on their teacher and textbook for linguistic input, they have access to the Internet which holds a seemingly endless amount of information. This study was inspired by the belief that it is possible to maximize the potential benefit from that availability by implementing the theory that people learn language best when they have access to comprehensible input (Buri, 2012; Crossley, Allen, & McNamara, 2012; Krashen, 1985; Shintani, 2012; Zarei & Rashvand 2011). It also implements the belief of some second-language acquisitions theorists that subtitled video provides language learners with more comprehensible input than non-subtitled video alone (Borrás & Lafayette, 1994; Chun & Plass, 1996; Danan, 2004; Di Carlo, 1994).

Thus, this study used interactive subtitled video to investigate the effects of three word definition types on participants’ vocabulary comprehension and involved the selection of 120 Russian (L2) words of equal difficulty that were randomly sorted into one of four groups – three treatments and a control group. Each treatment group contained 30 Russian words with a different type of definition in English (L1): dictionary definitions, which provided the viewers with the definition they would find in the bilingual dictionary; glosses which provided the viewers with the exact meaning of the word only as it pertains to the given context; and annotations which provided an explanation to clarify a word’s use in different contexts or its non-traditional uses.

Participants totaled 53 men and women ages 18-30 from 4 countries, US, Canada, Germany, and Sweden, who were advanced L2 learners of Russian. To control for the possible effects of a pretest, some of the subjects took a vocabulary pretest, and then all subjects watched a film in Russian with Russian subtitles, which was immediately followed by a vocabulary posttest. Results showed that annotations were most conducive to vocabulary gains, followed by glosses, dictionary definitions, and no definition, respectively. Although this was not the case for all participants, this outcome did hold for the majority, and several possible reasons for this outcome are discussed.

Keywords: annotations, glosses, dictionary definitions, subtitles, Ayamel, Russian language learners
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Chapter 1: Introduction

The rise of the age of technology has brought with it many developments in tools and digital devices which help us complete our jobs more thoroughly and efficiently. Teachers and instructors have more resources now than ever before, and thus we are seeing an increase in the use of video during classroom instruction, which includes video use in the language classroom. Research has shown that video accompanied with subtitles facilitates language learning through the reinforcement that text adds to the visual input.

In addition, it is important that input be comprehensible in order to increase intake and retention which then raises the question as to the most effective type of definition. Effectiveness may of course vary from learner to learner, but an investigation of that issue is beyond the scope of this particular study. Several options for effective definitions include having glosses, dictionary definitions, or annotations that explain particular elements of the target language under consideration. The present study investigated the effectiveness of these different definition types on the comprehension and short-term recall of advanced L2 learners of Russian.

Significance of the Problem and its Solution

With the increasing popularity and ease of access to technology for learners, the use of foreign films in second language (L2) acquisition is a relatively new area of research. It is widely agreed that authentic materials can be effective in L2 acquisition (Baltova, 1994; Collins, 2011; Danan, 2004; Guillory, 1998; Zarei & Rashvand, 2011), and never before has so much authentic material been readily available and easy to access as in our day and age. Authentic videos can be found and watched on numerous websites, all at the click of a button, whereas in the past, materials had to be ordered, or even purchased in a target language (TL) country.

This material does students little good, however, if it is not used effectively. A student may watch an entire film in the TL, but understand very little. Does such an approach aid in his/her language learning process? Perhaps, but there is much more that can be done to utilize available
resources if developers and teachers implement them effectively. For example, research suggests that comprehensible input aids in vocabulary acquisition (Buri, 2012; Crossley, Allen, & McNamara, 2012; Krashen, 1991; Shintani, 2012; Zarei & Rashvand, 2011). Authentic video may contain large amounts of incomprehensible input that can be made comprehensible by use of subtitles and accompanying definitions (Zarei & Rashvand, 2011).

Research also suggests that instructors have differing opinions as to which specific type of word definition is generally most effective for students. One argument is that glosses are simple, straightforward and provide the meaning of a word in each specific context, thereby allowing the student to quickly comprehend and move on. This approach limits the required processing time, which is essential in reading/viewing comprehension. The longer it takes to read a passage, the less effective the reading comprehension process will be in helping the learner to move forward expeditiously. For example, the Russian word “касаться” means “to touch or concern.” This can be literal or figurative so the sentence “Это не касается к тебе” could either mean “This has nothing to do with you” or “This is not touching you.” In this case, a gloss would clarify any ambiguity without giving students a long list of various definitions that don't apply in this context.

On the other hand, some would argue that a dictionary definition aids much more in vocabulary acquisition in that it teaches the student not merely one way the word is used, but various ways. This creates a schema in the student's mind as to how a native would use this word. For example, the Russian word for “perfect” is “совершенно.” So, if a student was watching a film and encountered the phrase, “Это его совершенный сын”, it would be translated, “This is his perfect son.” However, other contexts use this word to mean “complete,” so an English speaker could not use it the same way the “perfect” is used in English. In English, one could say, “You answer was perfect!” However, this would not be an appropriate context to use the above mentioned “совершенно.” A more correct use of this word would be in the sentence “Я совершенно устал!” meaning “I am completely exhausted!”
With dictionary definitions provided, students can learn various uses of a single word and get a broader scope for that word's functions in the TL.

Finally, the effectiveness of annotations is also investigated in order to determine the most effective type of word definitions that could be used during the presentation of video for the purpose of learning a new language. The idea of comparing the effects of different definition types is a relatively new topic in the area of language, especially as it pertains to video viewing. Research has been done analyzing different definition types and their effect on reading comprehension and vocabulary acquisition during reading, but little if any research has been conducted to investigate the effects of different definition types in video viewing experiences. Annotations are undoubtedly the most expensive to produce in terms of time and money, however, some research has shown (Chun & Plass, 1996; James, 2009; Mohsen & Balakumar, 2011) that annotations might be worth the production cost if it is justified in terms of improved language learning outcomes. None of this can be determined without adequate research in the field.

The purpose of this research project was to provide evidence to help determine which type of provided definitions seem to most effectively aid in students' L2 vocabulary acquisition. The software used in this experiment, Ayamel, was developed by the ARCLITE Lab at Brigham Young University (BYU), under the direction of Dr. Michael D. Bush, Associate Director in the Center for Language Studies at BYU. This software enables users to view video with subtitles and receive definitions for words they wish to highlight and will be explained in more detail later in this chapter.

Research Question and Overview of the Study

Considerable research has been conducted analyzing the effects of various types of definitions on learners' both long-term and short-term L2 vocabulary acquisition, such as glosses, dictionary definitions, and annotations. Operational definitions of these terms can be found later in this chapter. However, few studies have investigated the effectiveness of these definition types compared to each
other, and even fewer studies, if any, have done so in the context of foreign language (FL) video viewing experiences. Thus, the questions this research addressed are as follow:

- Is providing definitions conducive to the comprehension of new vocabulary for advanced L2 learners of Russian?
- Which type of word definition seems most effective in facilitating the vocabulary comprehension of advanced L2 learners of Russian?

A careful review of the literature shows that in many instances, annotations had a more positive effect on learners’ L2 vocabulary acquisition than other types of definitions. Thus, the working hypothesis for this study is that annotations influence vocabulary acquisition more effectively than glosses or dictionary definitions. The study implemented an experimental design that involved advanced learners of Russian as a foreign language.

This experiment compares three different definition types and their influence on L2 vocabulary acquisition. The definition types we’ve selected are glosses, dictionary definitions, and annotations. Glosses provide a one-word translation into English of the selected Russian word as it pertains to the given context in the film in the given sentence in which it appears. Dictionary definitions also provide a definition in English from Russian, but provide a more comprehensive definition of the word, which may include multiple meanings that have no relevance to its use in the film. Dictionary definitions also provide the part of speech of the word, the infinitive, and perhaps some conjugations or examples of how the word is used. Annotations are short explanations in English of the selected word’s traditional meanings and how those may differ from the meanings in the film. In addition to these three treatment groups, a control group of words was also included, for which no definition was provided.

After completing a vocabulary pretest, participants viewed the Russian film *Ironia Sud’byi (The Irony of Fate)* in Russian (L2) with Russian subtitles. Selected words were highlighted in the subtitles and participants could click on them in order to retrieve a definition. Upon completion of viewing the
film, participants immediately took a vocabulary posttest. A comparison of scores was made between the pretest and posttest results to give insight into the most effective definition type.

The participants of the study were from various backgrounds and came from across the United States as well as from a few foreign countries. Their ages ranged from 18-30 years, and they were almost all university students, many of which were studying in a Russian Flagship program somewhere in the United States. They volunteered and were reached via e-mail through which they also received instructions and explanations.

This experiment differed from other studies in that participants did not receive treatments in the conventional way that most research is conducted. Participants are traditionally treated as the subjects of the experiment with a control group and one or more treatment groups. For this study target words can be said to have received the treatments in that one group of selected words was provided with glosses, another group was provided dictionary definitions, and a third group was provided with annotations. Participants processed the selected words and were given a vocabulary pretest and posttest to evaluate language acquisition, albeit short-term. Based on the participants' scores, the selected words were then given scores to determine which treatment group of words scored the highest in the recall vocabulary test.

The dependent variable in this study is the short-term vocabulary retention of the participants. The independent variables are the treatments of selected words: glossed, dictionary defined, annotated, and no treatment. To ensure reliability, selected words were assessed for their level of difficulty based on their individual frequencies in Russian. According to research (Ellis, 2009; Ellis & Larsen-Freeman, 2002; Lively, Pisoni, & Goldinger, 1994), a general estimate of a word's relative difficulty is the frequency that it occurs in the language. In other words, words that are used more often are acquired more quickly and with more ease than words that are rarely used. The frequency of the word implies more frequent encounters with the word, each time reinforcing the meaning of the word until it is eventually solidly learned and can be used by the speaker fluently in conversation and text.
Definition of Terms

The following terms appear frequently throughout the study and thus will be defined in this section.

1. Provided word definition: The definition which is provided to a reader/listener/viewer be it glossed, from a dictionary, or annotated.

2. Glosses: The meaning of a word only as it pertains to a given sentence and context.

3. Dictionary definitions: The meaning(s) of a word as it is found in a reputable bilingual Dictionary, which in this case was the *Oxford Russian to English Dictionary* which is easily available online and is similar to the type of dictionary that a learner might use (http://www.oxfordlanguagedictionaries.com).

4. Word annotations: The meaning of a word or phrase as described through explanation or images.

5. Subtitles: Subscript texts which represent what is being *said* (Jan Ivarsson, 1992)


7. Authentic material: Material produced by native of the TL for natives of the TL.

Assumptions and Limitations

In order for the study to be successful in establishing the effects of different provided word definitions on the vocabulary acquisition of L2 learners of Russian who are at the Advanced Level on the ACTFL Proficiency Scale, several assumptions and limitations were identified. First of all, although assessments of proficiency were not available, the participants were assumed to be at an advanced proficiency level in Russian according to the ACTFL proficiency guidelines, since they were all recommended by their professors as such and they were all in their third or higher year of studying
Russian at a college level or above. This level of proficiency was assumed to be necessary for adequate performance on the posttest and in addition, given that research suggests that subtitled video in language learning atmospheres is most effective with advanced learners of the TL (Borrás & Lafayette, 1994; Danan, 2004; Guillory, 1998). Nevertheless, because no proficiency exam was required, the proficiency level among subjects could not be confirmed.

Moreover, because the experiment took place online, there was little control over the environment for each subject; therefore ensuring that the subjects consistently followed the instructions proved to be a significant challenge. It should also be mentioned that the aim of the study was not to directly increase and investigate language acquisition, but comprehension, which is a vital precursor to acquisition. Finally, attrition in the study was a foreseeable limitation.
Chapter 2: Literature Review

The idea of learning language through film has been studied and researched relatively little throughout the past few decades, especially in its use of subtitles whether L1 or L2 (Danan, 2004). Yet, the use of film for language learning has been shown to facilitate learners in their quest to make form to meaning connections they acquire a new language (Borrás & Lafayette, 1994; Chun & Plass, 1996; Danan, 2004; Di Carlo, 1994). That is to say, as learners are able to create relationships between word forms and functions, they tend to learn language more effectively in groups of words, rather than isolated, unrelated terms. This type of learning, in which smaller meaningful units of language are combined to larger units of meaningful learning, is enhanced through frequency of use, which is a great factor in determining the relative difficulty of a word or phrase in a language. Groups of words are stored in memory with their own individual definitions. We will discuss below, the different advantages and disadvantages to using three common word definition types in order to facilitate the learning of new vocabulary and thus contribute to that process.

The present study analyzes the effects of different word definition types on the vocabulary acquisition of advanced L2 learners of Russian. Data from 27 participants were collected as participants took a vocabulary pretest, watched a Russian movie in Russian with Russian subtitles, then immediately completed a vocabulary posttest. During the movie, viewers were able to click on selected words, which were highlighted and provided one of four definition types including glosses, dictionary definitions, annotations, and no definition.

I will begin this review of literature by explaining and elaborating on the idea of connectionism and how it is viewed by various linguists and researchers as it pertains to the field of language. On a further, but related topic, that brings us to a discussion of “chunking” and a review of primarily what Ellis (2002) has said on the subject and its role in language acquisition. Chunking ties into the use of film in the language classroom. Video is becoming quite popular in language learning, and we will discuss what various researchers have to say on the matter. In relation to film, there are varying
opinions on the role of subtitles, whether L1 or L2, in viewing video for language learning purposes. Do subtitles impede language growth or enhance it? Which types of learners benefit most from subtitles? We will also discuss what the research has to say about on L1 and L2 subtitles in video. Word frequency affects word difficulty which influences the pre- and posttests chosen for this study and an article by Ellis (2002) again will be reviewed and analyzed. Finally, a review of research conducted on the effects of varying definition types on students’ L2 comprehension will conclude this chapter.

**Connectionism**

Connectionism, simply put, is basically what it sounds like it is – drawing connections. As one researcher has stated, “Everything we know is connected and related in some meaningful way” (Ellis, 2002, p. 70). This accounts for the man getting his hair cut who is talking to the barber and says that his wife can never get his hair just the way he wants it (Schank & Abelson, 1995). The barber responds explaining how that is similar to how his wife cooks steak. Haircut, steak? How on earth are these related? The barber drew a connection from the issue with haircuts to an issue with steaks. His wife can never cook his steak just the way he wants it. In his mind, these two topics are totally related. This is how our minds work. We build networks of connections from various areas. Indeed, everything we know is connected and related in some meaningful way.

Connectionism in language learning works exactly the same way. Students only acquire vocabulary insofar as it is connected to something meaningful to them. Furthermore, connections must be made between form and meaning in order for new material to be retained. For example, James (1890) states that “Objects once experienced together tend to become associated in the imagination, so that when any one of them is thought of, the others are likely to be thought of also, in the same order of sequence or coexistence as before” (p. 91). Understanding this concept should play a vital role in how we teach language.
When students encounter a word or phrase that is connected to an image, the language is more deeply solidified in the mind than had the word or phrase come with no further reinforcement (Baltova, 1994; Cohen & Johnson, 2011; Collins, 2011; Danan, 2004; Ellis, 2006). In a study conducted by Collins in 2011, eighty, 4- and 5-year-old native speakers of Portuguese who were second language learners of English were read two books in English three times in the course of three weeks. In other words, these two books were read once a week for three weeks. During reading time, the children were taken to a quiet place away from the rest of the class and the instructor read the book to them. For the treatment group, the instructor pointed to the illustrations of the target words, gave a general definition of the words, provided a synonym, made a gesture of the words when applicable, and used the words in a context different from that of the book. The teacher read to the control group without gestures, explanations, or any other comprehension aid.

The results revealed that four- and five-year-old English learners acquired meanings for 33% of the new words in stories by simply hearing the words in their story context. The mean number of words learned reached 50% when rich definitions were included, thus supporting the notion that students seemed to make stronger connections to new words' forms when the meanings were reinforced with imagery (Ellis, 2006) and explanations.

In the context of film, multiple researchers have found that subtitling greatly facilitates the language learning process. A primary reason for this is that subtitles in the L2 help students visualize what they hear, especially if the input is not too far beyond their level (Danan, 2004). With its rich context, video enables learners to establish connections between form and meaning. Audiovisual material is a powerful instructional tool that motivates, increases attention and time on task, and has a high impact on viewers, in turn facilitates auditory processing (Baltova, 1994). Needless to say, due to the connection-promoting characteristics of visual aids, images help solidify vocabulary (Cohen & Johnson, 2011).
Connectionist models support the use of film in language learning in that film facilitates drawing connections between meaning and form, just like most connectionist models suggest. Chun and Plass in a study conducted in 1996 found that video plus text yielded higher vocabulary retention than strictly static pictures plus text. The following is a review of several studies which investigated the effects of film in language acquisition.

**Chunking**

A significant amount of research suggests that “chunking” is the natural method our brain uses in order to remember information, particularly as it pertains to language acquisition (Ellis, 2002; Newell, 1990). As defined by Newell (1990), a chunk is “a unit of memory organization, formed by bringing together a set of already formed elements (which, themselves, may be chunks) in memory and welding them together into a larger unit” (p. 7). One may think of chunking as “meaningful strings of [language] that are committed to memory” (Zimmer, 2010, p. 30). At its smallest level, a chunk is two letters commonly found together, for example, “un.” In English we see this chunk in multiple places. What are some of the first words you think of when you see the chunk “un”? Unhappy? Unorganized? Unimportant? The same principle applies to phrases. Who would have trouble completing this phrase: “What goes up __________.”

Ellis (2002) claims that chunking accounts for the fact that it is much easier to remember letters in common patterns (e.g., AGREEMENTS, FAMOUS) or familiar number strings, such as phone numbers (801-299-3435) than to remember more random sequences “(e.g., 4957-632518, CXZDKLWQPM)” (p. 102). We are therefore, able to process language that we expect to occur based on the probabilities that we have unconsciously analyzed more quickly than language that seems to break regular patterns. Thus, definitions are essential in building a repertoire of expectations in the learners’ minds upon which they can rely as they encounter new contexts and situations.

In summary, word definitions can facilitate the acquisition of new language by enabling the creation of comprehensible “chunks” of language in the mind of the learner. Chunks are effective
because meaning can be stored and applied in groups rather than individually, allowing learners to more quickly and more efficiently build their repertoire of new words and phrases in a language. Then later, the learners can reflect on the break-down of the chunks learned and come to a deeper knowledge of the construction and use of the language. In fact, Ellis (2002) goes on to say that the acquisition of a language is really the acquisition of chunks. In its most basic form, chunks of letters which form words, then chunks of words that form phrases, and so forth.

**Film**

The use of film in language learning is a relatively new and growing source of activities for language courses. In the past, using video in the classroom was complicated and time-consuming. So much time has been wasted trying to fast-forward, or rewind to the desired spot in a film, that some language teachers don't consider it worth the effort to incorporate film into their courses, given the limitations that classroom use can pose. This loss of great learning opportunities deprives students of rich authentic material, through which students can view authentic scenes presented in the target language and thus acquire language that has practical uses beyond the classroom. Such an experience can combine linguistic, cultural, and visual elements into a delivery mechanism that is story-based and engaging.

As such, video can be considered a crucial element in language learning in that it provides authentic language in a context-rich setting unlike what is possible with any other instructional technique. It provides abundant paralinguistic cues such as facial expressions, gestures, and actions which can provide important insights into word meaning for learners. Computers and various other digital technologies in our current day have advanced to the point where access to video is simple and almost effortless. As previously discussed, images combined with text lead to greater L2 comprehension, and video used in language learning provides authentic non-linguistic cues that are difficult to find elsewhere. Video can transport a student to the target culture and give them a full immersion-like experience which can only be exceeded by physically visiting the country yourself.
When this immersion-like experience comes with accompanied text such as subtitles in the L2, incidental vocabulary acquisition can be assumed to accelerate as will be discussed in the following section.

**Subtitles.** Many researchers agree that subtitled video, whether L1 or L2, in language learning enhances incidental L2 acquisition more than video that is merely dubbed, meaning the TL audio is overlaid on top of the video, with no subtitles (Borrás & Lafayette, 1994; Chun & Plass, 1996; Danan, 2004; Di Carlo, 1994). One such example is a study conducted by Borrás and Lafayette (1994) that implemented as the experimental treatment a courseware package developed by Borrás, Practicing Spoken French (PSF). This program allows users access to individual practice of two video-based oral tasks—description and narration. The study involved forty-four students from the three sections of French (an advanced reading course) and from one of the four sections of French (an advanced conversation course) at Louisiana State University (LSU). Students in these intermediate courses are typically at Intermediate High on the ACTFL Proficiency Scale. Subjects were randomly assigned to various treatments based on the combination of the subtitling variable (intralingual, i.e. target-language subtitles vs. no-subtitles) with the oral task level variable (more advanced task level vs. less advanced task level). The independent variable was subtitled video, which made it unnecessary for a control group to be used in this experiment. The no-subtitles condition of the independent variable also served as a control for no-treatment effects.

The subjects viewed a video segment at least two times in the classroom and had control over the video playback features. The segment was either subtitled or without subtitles according to the particular subject's treatment. After viewing, the subjects then answered the questions about the information seen and heard in the video segment from one of two units at random, either “A game” (Description Unit) or “A quiz” (Narration Unit). Subjects then wrote summaries as preparation for producing an oral sample to be based on the segment they had seen, which they then recorded. They were allowed to use their written draft as a reference, but not necessarily to read it out loud. It is not
stated how many did read theirs audibly. Students were allowed a maximum of three minutes for the preparation of each of five recordings.

Analysis of the experimental data revealed statistically significant effects for subtitling, the independent variable of primary interest. Compared to the no-subtitles condition, the subtitles condition resulted in significantly higher overall oral performance scores. The subtitles condition also resulted in four significantly higher sub-scores: effectiveness, accuracy, organization, and fluency. In addition, an attitude questionnaire was distributed which revealed that students’ attitude turned out to be significantly more positive for the subtitles subjects than for the no-subtitles ones. The descriptive data collected during this study also contributed to the existing research knowledge on the following CALL issues: (1) the effects of type of control on performance; (2) the informational value of time on task; (3) the effects of word processing on quality of written production quality; and (4) the relationship between attitude toward and performance with multimedia courseware. Participants had active involvement in two actions that were left to their control – recording and entering an optional path. The data collected in this study seem to indicate that (1) PSF was cost-effective; and (2) PSF motivated subjects to make use of the cognitive strategies that had been incorporated in the package's design.

In addition, results from this study show that there is a positive impact of word processing on the quality of written production and on attitudes toward the writing process. Subjects who used word processing were more organized and accurate than those who wrote by hand. Also, subjects who typed on the computer seemed to enjoy the process of revising their drafts. In addition, findings from this study on attitudes show that subjects' attitudes toward the speaking practice with PSF were very positive but correlated poorly with subjects' oral performance. The findings also show that subjects with little experience in using computers reacted as favorably toward the computerized speaking practice as did those with more experience. In all, this study has shown that allowing fifth-semester college students of French the possibility of seeing and controlling subtitles may increase their performance on video-based oral communicative practice tasks delivered via multimedia courseware.
Further rationale for using subtitles to promote vocabulary acquisition in adult L2 language learners comes from Roger Schank's conceptual dependency theory (1972). This theory provides useful evidence of the importance of connecting form to meaning in the manner in which Schank describes the various ways that the brain processes input and produces output. He claims that “there is a conceptual base that is interlingual, onto which linguistic structures in a given language map during the understanding process and out of which such structures are created during generation” (p. 554). That is to say that humans process language not as letter, words, and phrases, but as concepts that arise from patterns of speech. Each word or phrase that language learners acquire is processed into a concept which is mapped out onto the conceptual base, which is similar to the idea of a schema that pervades second language acquisition literature. As a student thinks about a concept, their mind is drawn to this plane of connections. For example, when a person hears the word *door*, several other words will likely come to mind. *Slam, open, close, lock, shut, wood, hard, brown*, etc. No one would likely think of *sea lion* unless they had some background or personal experience that has related *sea lion* to *door*. Schank claims this as evidence of the existence of what he calls a conceptual plane.

Related to the idea of conceptual plane, the concept of schema also applies to the use of subtitles in video viewing in that as students receive audio input, they are forming networks and connections to the visual, non-linguistic input on the screen as well as to the textual input provided as well. As far back as the 19th century, William James, in his book *The Principles of Psychology* (1890) states, “Objects, once experienced together tend to become associated in the imagination so that when any one of them is thought of, the others are likely to be thought of also, in the same order of sequence or coexistence as before” (p. 91). So when viewing a film with subtitles about a lake, viewers will see the lake, hear the L2 word for “lake” and be exposed to all sorts of different vocabulary which goes along with talking about a lake. Next time they see a lake, they are more likely to think of the new words they learned, thus connecting the concept of a lake to its form in the L2.
Nevertheless, not all studies have shown that subtitles coupled with video are beneficial. Karakas and Sariçoban (2012) conducted a study with 42 ESL participants randomly assigned to one of two groups: Group A watched cartoons with English subtitles and Group B watched the same cartoons without subtitles. 18 target words were selected (all verbs) and students were given both a pretest and a posttest to assess vocabulary gains. The pretest was administered a week before the video viewing, and the posttest took place a week after the video viewing. Results showed that the two groups performed at about the same level with no significant difference. Even so, the authors suggest that the contextual aids provided by the cartoons account for the vocabulary gains reported.

**Advanced learners and subtitles.** Although the research described above suggests that viewing subtitles simultaneously with film facilitates language learning, viewers seem to require a certain level of language proficiency before the benefit of viewing video with subtitles can be realized. Much research indicates that subtitled video is most effective with advanced learners of a language (Boehler & Sidot, 1981; Borrás & Lafayette, 1994; Danan, 2004; Guillory, 1998; Neuman & Koskinen, 1992). Advanced learners of an L2 already have a well-established vocabulary and have mastered basic principles of the grammar and syntax, and are therefore more able to absorb the new vocabulary that is presented, as long as the ratio of unknown to known is not too overwhelming. Thus subtitles are most beneficial when the input is not too far beyond viewers' linguistic abilities (Danan, 2004). This is likely due to the fact that simultaneous activation of listening and reading skills by the subtitles is more cognitively demanding than reading or viewing alone (Borrás & Lafayette, 1994).

Another study, conducted by Neuman and Koskinen (1992), involved 129 ESL students in seventh and eighth grade who were mostly at the advanced level and watched nine five- to eight-minute segments of a video program on science that was created for American children. A series of increasingly complex tests were administered to the participants. These and ranged from weekly word recognition exercises that required participants to distinguish written target words from non-word distractors, to sentence anomaly exercises which assessed word comprehension and meaning.
identification of words presented in isolation (1992, p. 101). Subtitles were found to be highly beneficial to vocabulary recognition and acquisition, whereas traditional television viewing was found significantly less helpful. However, the subtitles only aided those who were at a more advanced level. This seems to support Krashen's $i+1$ hypothesis, in that input to learners must be appropriate for their level, pushing them just a little beyond what they know (Krashen, 1985, p. 2).

**L1 vs. L2 subtitles.** When considering the use of subtitles during video-viewing in order to acquire vocabulary, one must also consider the effects of L1 subtitles as opposed to L2 subtitles. Research tends to support the use of L2 subtitles more when the goal is vocabulary acquisition (Bisson, Van Heuven, Conklin, & Tunney, 2012; Boehler & Sidot, 1981; Danan, 1992; Danan, 2004). One such study was conducted by Hu (2005) and showed that reading subtitles during video viewing experiences had significant and positive effects on ESL learners' L2 vocabulary acquisition. In this study, thirty-two Chinese ESL sophomores are randomly assigned to one of two groups. The first group viewed two 15-minute English videos two times with English (L2) subtitles and then completed a vocabulary posttest. The second group watched the same two 15-minute English videos, but with Chinese (L1) subtitles. The second group also completed the vocabulary posttest. Both groups were exposed to new or target vocabulary in the L2 before the films, with the words projected for five seconds, one-by-one on a screen in front of the class while the teacher said the word aloud. Participants in both groups also completed a survey about this experience.

The vocabulary posttests and surveys revealed several interesting finding. First, according to the survey taken, 78.1% of the participants did not enjoy watching English films without subtitles. On the same survey, 68.75% of the participants stated that they paid more attention to the audio track of a film when L2 subtitles were displayed and that they found L1 subtitles distracting. The survey revealed that 90% of participants felt that they learn more words and expressions by viewing videos with L2 subtitles because they are able to hear the words and see them written. From the surveys, we can see that most of the learners have a positive attitude towards watching videos with subtitles, especially in the L2. They
reported that watching film with L1 subtitles enhanced comprehension, but distracted from the audio.

The post-viewing vocabulary tests revealed that participants who watched the English films with L2 subtitles performed better than those who watched the English films with L1 subtitles.

But once again, not all studies provide support for viewing subtitles in the L2. For example, Bisson, Van Heuven, Conklin, and Tunney (2012) found no significant differences in vocabulary acquisition among four groups while viewing television in the L2. The learners were native speakers of English learning Dutch as a foreign language who were divided into four groups as follows:

- DA-NS = Dutch (L2) video/ audio, no subtitles
- DA-DS = Dutch (L2) video/ audio, Dutch (L2) subtitles
- DA-ES = Dutch (L2) video/ audio, English (L1) subtitles
- EA-DS = English (L1) video/ audio, Dutch (L2) subtitles

Results showed that no significant vocabulary gains were made while either viewing with subtitles or without. The author suggests developing more sensitive measures of vocabulary acquisition or to lengthen out the period of the study to test long-term vocabulary retention. Also, perhaps a more appropriate vocabulary test would yield different results.

In relation to viewing subtitled video for language acquisition, Paivio (2006) wrote much about the effect that receiving input from two different sensory channels, in the case of this study, viewing the language in text, and hearing it in speech, can have on learners’ ability to comprehend and recall more effectively. He claims that readers learn to read much more quickly when the words are paired with referent pictures or images, than when only coupled with the pronunciation. He states that “Concrete verbal material enhances reading comprehension and recall in children and adults” (p. 11). His dual-coding theory thus reinforces the notion that viewing subtitled video increases comprehension and recall for learners of foreign languages.
Frequency

Not surprisingly, frequency of word exposure affects the ease at which new word meanings are acquired (Ellis, 2002; Ellis, 2009; Lively et al., 1994). A significant amount of research on frequency effects on vocabulary acquisition (Ellis, 2002; Ellis, 2009), demonstrates that the more often a student is exposed to a word in the target language, the easier it becomes for him/her to remember it. As part of his overview of the concept, Ellis explains the difference between token frequency and type frequency in language (2002). Token frequency is how often certain words or phrases appear in a language, and, on the other hand, type frequency refers to the frequency of “different lexical items [to which] a certain pattern or construction is applicable” (p. 68). An example of this is the English past tense, “ed” which is found in many verbs such as called, billed, laughed, and jumped. Small children pick up on this type frequency and incorrectly use the observed pattern as they create their own sentences. For example, often a child may say, “I falled on the floor,” with the type frequency playing a role in their determination of how to say what they have in mind. Verbs that have a very high type frequency are acquired before verbs with lower type frequency, such as swam, rung, bought. Ellis even goes so far as to say that frequency is a key factor in the language acquisition process.

Criss, Aue, and Smith (2011) conducted a study that supports Ellis' frequency hypothesis. The participants in their study engaged in a series of activities consisting of 20 study trials where participants studied new material, a 60-second distractor task to change their focus, a 20-second trial test list to determine what the participants remembered, and a 90-second break to avoid fatigue in that order, repeated multiple times. Pairs of words were shown to participants who then either created a sentence out of the pair and graded how difficult that was on a scale from 1 to 9, or judged the degree of association between the pair of items also on a scale from 1 to 9. The researchers manipulated the word frequency of the targets in order to determine the effect that frequency has on vocabulary recall. Later, a recall test was administered in which a word from any pair was presented randomly on a
screen, and the participants were asked to write the word with which it appeared. The results showed that high frequency target words were more accessible and more likely to be correctly recalled.

Frequency may also affect the comprehensibility of input, which, according to various researchers input (Buri, 2012; Crossley, Allen, & McNamara, 2012; Shintani, 2012; Zarei & Rashvand 2011), is absolutely essential in language acquisition. Comprehensible input is defined as “structures that are a bit beyond learner's current level of competence” (Krashen, 1985, p. 121). If the learner's current level of competence is “$i$,” his/ her next level of competence (yet to be acquired) is “$i+1$”.

**Comparison of Definition Types**

The most popular and, according to many researchers, perhaps the most effective method of facilitating comprehensible input is through looking up word definitions. In this section, we will review research which has been conducted investigating the effectiveness of various types of definitions. We will focus on three basic types including dictionary definitions, glosses, and annotations. Some studies we review focus on one type while others compare definition types to determine which seems more effective. The purpose of this section is to review, at least in part, previous research and what has already been learned.

**The value of definitions.** Before discussing the benefits of the varying definition types, this section will examine the value of definitions with language learning. Although many believe that definitions can help students gain vocabulary and build their proficiency, some instructors perhaps believe that definitions are detrimental to building proficiency in a language. Indeed, many have argued for the direct method of teaching, which assumes that students learn best from total exposure to the L2, never encountering a word or an explanation in their native language, learning as we do in our L1, completely from L2 input, whether comprehensible or not (Bovee, 1919; Donaldson, 1922; Sears, 1931; Young, 1922).

Much research has shown that the use of dictionaries and definitions is an efficient and practical method for increasing vocabulary skills (Al-Shehra & Gitsaki, 2010; Laufer & Hill 2000; Luppescu &
Day, 1993; Meara, 2012; Nation, 2003). For example, a study by Al-Shehra and Gitsaki (2010) involved twenty ESL students at the intermediate level who were studying at the Australian language institution. The researchers divided them into two groups- one that had access to an online dictionary and one that did not. All students were then assigned the same reading comprehension task and afterward completed a vocabulary posttest. Results showed that those who had access to the online dictionary outperformed those who did not have access. Those with the dictionary also spent more time reading, thus had higher amounts of time on task. Thus, the authors concluded that students more effectively acquire new vocabulary when they have access to a dictionary. The students did not waste time looking up every unknown word (which is the fear of many foreign language instructors (De Leeuw, 1997; Stryker & Leaver, 1997; Prince, 1996), but focused on completing the comprehension task, which required the knowledge of only certain key words.

Similarly, in a study conducted by Jenkins, Matlock, and Slocum (1989), researchers assigned 135 students in fifth grade to two groups- one group was taught unknown words by explicit explanation, while the other group was taught to derive the meaning of unknown words based on the context and surrounding words. Students were then tested for vocabulary gains, and the group that had received explicit definitions achieved a higher mastery of new vocabulary and demonstrated greater accuracy in their understanding its use. In conclusion, the researchers suggest a balanced combination of the two methods in order to fully maximize students’ vocabulary learning.

Finally, a third study with noteworthy results comes from Luppescu and Day (1993) who examined the vocabulary gains of 235 ESL students in Japan who had studied English for seven to eight years. They were given a short story in English and asked to read it, not being told beforehand that there would be a vocabulary test upon completion. Students were divided into two groups- one group was given dictionaries, although the choice to use the dictionary was left to the individual student, and the other group was not given dictionaries. The vocabulary test was in multiple choice
format, and participants were asked not to guess, but to select the option “I don’t know” for any words for which they did not know the meaning. Results showed that the group that was provided dictionaries performed higher on the vocabulary posttest and selected “I don’t know” less often than the group without dictionaries. Additionally, the dictionary group took about twice as long to complete the reading than the non-dictionary group. The authors conclude that this may suggest that using the dictionary increases time on task and comprehension.

Thus we can see that there is evidence of great benefits for students to use dictionaries in order to increase their vocabulary acquisition in an L2. In fact, relatively little has been published in the last several decades advocating otherwise. This is the assumption that underlies the framework of this study, which we will discuss in the following chapters.

**Comparisons of definition types.** The three definition types compared in this section include glosses, dictionary definitions, and annotations. Marginal glosses were compared to bilingual dictionary use in a study by Hulstijn, Hollander, and Greidanus (1996), in which participants were randomly assigned to 1 of 3 groups including a control group which received no definition opportunity. There were 78 advanced learners of French as a foreign language who read a short story with either marginal glosses, access to a bilingual dictionary, or no additional resources. 16 target words were chosen from the text that were estimated to be unfamiliar to the participants based on extensive piloting. Of the target words, eight appeared three times, and eight appeared only once. Participants' vocabulary acquisition was then tested, and the results showed that incidental learning is positively affected by frequency of word occurrence when glosses or dictionary access are available. Those in the group who were provided marginal glosses scored higher than the other two groups. This is probably due to the fact that the dictionary group rarely looked up words. However, students who did look up words in the dictionary had greater vocabulary recall scores than those who were provided marginal glosses. Those lacking either resource tested significantly lower in vocabulary acquisition. This study
also enhances the above stated claim that providing word definitions is most effective in advanced learners of an L2.

Similarly, Laufer and Hill (2000) found that varying dictionary definitions types were highly beneficial to the vocabulary retention of students studying ESL at universities in Hong Kong and Israel. The results of 72 participants contributed to the data of this study, 32 of which were studying at the University of Haifa in Israel, and 40 of which were studying at the University of Hong Kong. All participants had 7-8 years of English training in secondary education systems and were studying English at the university level for academic purposes. All participants were roughly the same level of proficiency in English, even though two were English majors. All could read without difficulty except for the target words which were proven to be unfamiliar to them via pretests.

The procedure consisted of three stages including a pretest, tutorial, and vocabulary recognition test. The pretest occurred as soon as participants logged in to the data collection site. They were shown the list of 12 words and asked if they recognized any of them, and if so, to provide some sort of definition. From this, researchers determined whether or not participants had any prior knowledge of the target words. Participants who were familiar with more than one of the target words were eliminated from that sample.

The tutorial was then administered which presented the short story with the 12 target words highlighted. Participants were told to read the text in preparation for a comprehension task. They were also informed that while reading the text, they would be able to receive definitions for the highlighted words by clicking on them, or they could choose to look the words up in a hard copy dictionary. The clicks were recorded by the system that administered the reading passage. After completing the reading, subjects were given an unexpected vocabulary posttest (on paper). The test provided the list of target words and asked students to indicate knowledge of the words by filling in the meanings of the words in either L1 or L2. Afterward, they were given a 6-question comprehension quiz, as announced in the beginning.
Results showed that dictionary use had a positive effect on incidental vocabulary learning. However, often students chose not to look up words in the hardcopy dictionary because of the time it takes, flipping through pages, and the interruption of reading flow. The majority, 97% of the students from Hong Kong reported favorably towards electronic definitions. The authors state that if a certain pedagogical tool is popular among students, the chances are it will also be beneficial for their learning. They also suggest conducting a study comparing the effectiveness of the use of electronic dictionaries on vocabulary acquisition to the effectiveness of the use of hardcopy dictionaries.

Another study that showed the effectiveness of providing word definitions on vocabulary acquisition was conducted by Yanguas (2009), who sought to find the most effective type of gloss for learners of a foreign language. He involved 133 students of fourth-semester Spanish at the university level and narrowed them down to 94 according to high scores on pretests, indication of outside exposure during the study on the debriefing questionnaire, failure to produce think-aloud protocol, failure to attend all sessions, and failure to record answers. Students were to read the given authentic online news article which was chosen to be very current, so as to eliminate chance of prior exposure.

Subjects were randomly assigned to one of four conditions that determined the type of assistance as they read the article: text glossing, picture glossing, text plus picture glossing, and a control group which received no glossing. The researcher treated 21 target words and then assessed vocabulary gains by a series of recognition and production pretests, immediate posttests, and delayed posttest. The same tests were used in all three testing sessions which took place immediately before the reading task, immediately after the reading task, and three weeks after the reading task. Recognition tests required students to match the English meaning of a given Spanish word in the form of multiple choice questions. These were administered after the production tests in order to avoid test influence on production assessment. In production testing participants were given a word in English and asked to provide its equivalent in Spanish.
Results showed that participants exposed to glossing noticed the target words significantly more than those in the control group. However, no significant difference was found in the type of gloss to which they were exposed. Production testing revealed that there was no significant difference between the performance of the subjects who were provided glosses and subjects in the control group. On the other hand, the recognition testing revealed that subjects who read under a glossing condition, no matter which type of glossing condition, significantly outperformed those in the control group.

Conclusions from this study reinforced the importance of providing definitions, in this case, glosses, to the recognition component of vocabulary acquisition as well as text comprehension. The study posited that had vocabulary assessment been possible over a longer period of time, the observed differences between the glossed conditions would have perhaps been significant.

**Dictionary use in vocabulary learning.** Arguably, the most common way of getting a word definition is the traditional method of resorting to a dictionary. Some believe that dictionary definitions are too overwhelming, while others argue that the dictionary definition provides a more full and complete definition for a word. For some teachers this is their worst nightmare: to have students have access to a dictionary and then proceed to over-rely on them by looking up every word they encounter. However, research shows that dictionary use can enhance vocabulary acquisition (Bruton 2007; Hulstijn et al., 1996; Laufer, 2003; Wang, 2012; Yuzhen, 2011). One such study involved 176 participants who were English majors at Chinese universities who had all passed the Test for English Majors (TEM). Participants were randomly assigned to one of three conditions and then during two regular class sessions over two consecutive weeks they read a text. The three conditions consisted of: access to an electronic bilingual dictionary (EBLD), access to a paper bilingual dictionary (PBLD), and no access to a dictionary. Participants were allotted 25 minutes to complete the reading task, which was a short story followed by comprehension questions. The text contained 10 target words, all of which were marked in bold type. After students completed the task and handed in dictionaries, an
unannounced vocabulary recall test was immediately administered in which students were given the target words (L2) and asked to provide their meanings either in L1 or L2.

One week later, the participants took a delayed retention test which was exactly the same as the immediate recall test except for questions were given in a rearranged order. An analysis of the data revealed that the participants in the EBLD group scored the highest on the tests and the no dictionary (ND) group scored the lowest. The results of the study strongly support the use of bilingual dictionaries for acquiring vocabulary. Results from the tests also suggest that the use of bilingual dictionaries increases vocabulary comprehension more than contextual guessing. Their use also facilitates vocabulary retention and pedagogical implications for pedagogy that suggest that students have the opportunity to access word definitions in order to enhance their language learning experiences.

Gonzalez (1999) conducted a study that was more in the qualitative vein in which participated his students who were all ESL students in his university course. On average, they had all lived in the United States 3 to 4 years, 40% of whom were Latino, 33% Asian, and 27% Haitian. Students were assigned to participate in a 12-week project in which they were to collect three articles weekly from the New York Times according to their interests and motivations. The objective was for them to identify high-interest articles that would promote vocabulary learning among students. Students were to write a brief summary or comments about each article and select five unknown words in context, which they considered to be of high importance or necessary for comprehension and to either guess the meaning of the words according to context or refer to a dictionary. At the end of the 12-week period, students had collected over 36 articles and over 180 vocabulary words with definitions.

From interviews held with students, Gonzalez learned that students considered consulting a dictionary time-consuming, but necessary. Some students responded that the dictionary did not provide adequate definitions, or they did not understand the meaning of the words they found in the dictionary. Nevertheless, the author concluded that dictionary look-up aids in L2 learners' vocabulary development, stating that “Dictionary consultation is the initial step in learning a new word. It provides
fast and reliable support for learners who have vocabulary and language limitations” (p. 266). He suggests that these learning strategies be further researched in order to clarify the vocabulary building process.

**Glosses compared to other types of definitions.** Although dictionary look-up has been the most popular and traditional type of word definition in language learning, providing glosses is becoming more and more popular, perhaps due to its effectiveness in promoting vocabulary acquisition. Research shows that glosses may be more effective in vocabulary acquisition than dictionary definitions (Abraham, 2008; Lenders, 2008; Lomika, 1998; Poole, 2012; Salaberry, 2011; Sanders, 2002; Zarei & Rashvand, 2011). The dictionary provides a more complete definition for words, which may include several varying meanings, whereas a gloss is an additional reading resource, usually accompanying the text which provides the meaning of a word only as it pertains to that particular context in which it is being read. Some believe that glosses are more effective because they provide a short and simple meaning, relevant to the text, while dictionary definitions can be long and overwhelming, slowing down reading comprehension, and consequently retention.

Abraham (2008) conducted a study on the effects of glossing in which he analyzed existing research related to glossing in order to learn of the general overall conclusions being made regarding studies investigating glossary effects on both L2 reading comprehension and L2 incidental vocabulary acquisition. Studies were found from a search on electronic databases looking for keywords such as “gloss,” “glosses,” “glossary,” “dictionary,” “electronic dictionary,” “language learning,” “reading,” “reading comprehension,” “second language learning,” etc. Abraham initially retrieved 125 articles, which he then narrowed down to 82 studies by excluding studies that did not consist of an experimental group in which learners had access to glosses and read and authentic or researcher-produced text. In the third phase of finding articles, Abraham compared studies to make sure that they were similar enough for inclusion, yet “not so different from each other that they could have been considered
incommensurable and could have confounded the comparisons of effect sizes of experimental and control groups” (p. 201).

The author and second researcher independently read and coded each of the 82 studies according to a predefined coding book and coding instructions. They created categories for L2 reading comprehension, L2 incidental vocabulary learning, and multimedia learning. Means, standard deviations, and sample sizes were extracted for each vocabulary posttest, whether immediate or delayed, and reading comprehension test and transformed into a standardized mean difference between an experimental and control group in order to obtain a statistically independent set of effect sizes for the 82 studies. Results of this meta-analysis showed that overall, glossing had a medium effect on reading comprehension and a large effect on immediate vocabulary recollection skills. The author concludes that generally, learners who have access to glosses have significantly higher reading comprehension and even higher vocabulary retention. They found in these 82 studies that glossing had a very positive effect on language learning and state that this evidence is important for enhancing L2 acquisition.

Another study which yields significant support to the use of glossing to enhance reading comprehension and vocabulary building was conducted by Lenders (2008). He involved participants at an upper-intermediate and advanced level of English (levels B2 and C1 according to the Common European Framework of Reference for Languages) and administered electronically glossed reading tasks to them. Lenders allowed them three weeks to familiarize themselves with the software and then spent the fourth week observing and recording log data. Upon completion of the reading tasks, participants completed Likert scale questionnaires and semi-structured interviews on the basis of the questionnaires. This study was carried out for four consecutive terms, with interviews and questionnaire occurring after each term.

Results showed that two thirds (67%) of the subjects found the reading tasks appropriate for their level and learning needs. They also reported that “the glosses were helpful or very helpful thus
making the input comprehensible” (Lenders, 2008, p. 475). Of all participants who reported glosses as helpful or useful, two thirds in reality consulted the glosses frequently or very frequently when they came upon an unfamiliar word. The author concludes that learners use electronic glosses in autonomous vocabulary learning. Overall, positive attitudes were shown towards glosses, which enhances motivation and facilitates language learning.

**Annotations and vocabulary acquisition.** The third and final type of definition, we will review in this study is that of annotations. These differ from other types of word definitions in that they provide a rich explanation of the use of words outside the normal scope one may get from a dictionary or gloss. Annotations can be textual, pictorial, incorporating video or a combination of any of the above. Some instructors argue that annotations take up too much time and space to make any significant difference, while others argue that the information provided with an annotation does more for a learner than any simple gloss or dictionary definition could do alone. Yet, in spite of instructors who do not find sufficient value in annotations in order to implement them, researchers have found this type of word definition to be very beneficial in language learning, and perhaps more so than glossing and dictionary look-up (Chun & Plass, 1996; James, 2009; Mohsen & Balakumar, 2011).

A key study conducted by Chun and Plass (1996) has been often cited and shows the effectiveness of annotations on L2 vocabulary acquisition. In this study, researchers analyzed three studies done with 160 university German students who read a short story in German, later took a vocabulary test, and then wrote a short summary of the story in their L1. Before reading the story in German, participants were trained on how to use the software, and watched a short preview of the story they were to read. Vocabulary tests among the three studies varied in that two were production tests and one was a recognition test. Since the studies varied in sample size, study 2 is used to draw explicit conclusions, it being the largest sample size (103). Studies 1 and 3 had 36 and 21 participants, respectively, and were used to provide initial indications of specific effects.
The vocabulary tests yielded higher results for participants who received annotations which included text + picture than those whose annotations were text + video. These visual annotations yielded higher immediate recall scores than annotations which were merely textual. In studies 1 and 3, the unannounced delayed vocabulary tests showed higher scores than the immediate vocabulary tests. The author gives a possible explanation for this saying that the so-called hypermnesia effect may have been present. This states that the students may have had “better recall of pictures over time, compared to words, as words tend to be forgotten” (Chun and Plass, 1996, p. 190). This accounts for the words that were annotated with images+ text and the lack of improvement of annotations which were text only. However, an opposite effect was found in the group who experienced video + text annotations. The author suggests that this may be due to the fact that a static picture allows viewers to look as long as desired, thus creating a concrete mental representation of a word, whereas video is transient and time-based requiring the viewer to create a more dynamic mental model. Overall, the studies yielded higher retention results than expected (approximately 25% accuracy in production tests and 77% in recognition tests). Thus conclusions were drawn that annotations significantly facilitate vocabulary acquisition in L2 learners.

A more recent study conducted at Brigham Young University in Provo, Utah likewise showed positive results on vocabulary acquisition from multimedia annotations (James, 2009). Subjects consisted of 35 third- and fourth-year students of Japanese studying at the university level who read a short story in Japanese using an online application which included annotations. 27 target words were chosen a third of which were provided an English text definition; another third provided an English text definition plus a visual image; and a third provided an English text definition plus a video illustration. Upon completion of the reading, participants were given an unannounced posttest to measure vocabulary gains.

Since Japanese has various writing systems, the posttest assessed word recognition of each target word twice, once in the kanji form, and once in the kana form. Tests were in multiple choice
format, providing the English equivalent of each target word and asking students to select its corresponding Japanese form from the options given. Results differed from those found in the Chun and Plass (1996) study cited above. The James study showed higher retention scores for those who experienced video plus text annotations than those with picture and text annotations and those with only text annotations. In fact, picture plus text annotations received the lowest scores of the groups. However, these results pertain only to *kanji* target words, and *hiragana* produced different results. The author states that differing orthographies are thus learned in different ways, at least by L2 learners. Overall, higher than expected vocabulary retention was found in those who received imagery annotations during reading, whether pictorial or video.

**Summary**

In summary, the purpose of this study is to investigate the effectiveness of various definition types on the vocabulary recognition of advanced L2 learners of Russian. Previous research has established the usefulness of film and dictionary definitions, glosses, and annotations in language learning as these definitions provide multiple channels of input which reinforces new material. Connectionism, chunking, and dual-coding theories further provide a foundation for using film and subtitles in L2 acquisition. Many studies have explored the effects of various types of definitions on vocabulary building. However, little, if any, research has been reported that compares dictionary definitions to glosses and annotations. This issue is significant in that dictionary definitions are easy and relatively inexpensive to provide, whereas creating glosses and, especially annotations, is a very difficult time-consuming and expensive process. As many have asked, we are driven with the desire to discover the answer to the question, “Is glossing and annotating worth the effort?” Thus, the proposed study will address the following research questions:

- Is providing definitions conducive to the comprehension of new vocabulary for advanced L2 learners of Russian?
 Which type of word definition seems most effective in facilitating the vocabulary comprehension of advanced L2 learners of Russian?

Based on previous research, our hypothesis is that providing definitions is conducive to vocabulary acquisition, and we predict glosses to produce the highest gains of the three. These definition types will be tested for their effectiveness in facilitating L2 comprehension in a digital media setting, using video and electronic definitions. Thus, the current study aims at providing insights to the most effective use of video material for teachers and students in L2 learning environments.
Chapter 3: Research Design and Procedures

Overview of the Study

The current study was designed to investigate the effects of different definition types on the vocabulary comprehension and recognition of advanced L2 learners of Russian. The gains made in vocabulary were measured by administration of a pre- and posttest. In order to account for the pretest, the pretest consisted of only half of the selected words at random, while the posttest tested all of the selected words in order. Considerations regarding the pretest effect suggest that participants might perhaps perform better on the posttest because the pretest introduced them to the selected words and they were thus more alert when encountering these words in the film. Since only half of the selected words were shown in the pretest, and all of the selected words were shown in the posttest, results were analyzed in an effort to account for any effect the pretest may have had on posttest performance.

Participants watched the Russian film, Ironia Sud'byi or The Irony of Fate in Russian with Russian subtitles. All selected words were found in the subtitles under one of four conditions, three treatments and a control group. The three treatments are as follows watching film with subtitles accompanied with access to (1) glosses, (2) dictionary definitions, and (3) annotations. In addition, accessing the control group of words provided no access to definitions. Participants were asked to complete a pre-viewing survey which collected basic demographic and linguistic information for the study. A vocabulary pretest and posttest were administered to measure vocabulary gains.

This chapter will introduce materials and instruments used in the study, including pre-viewing and post-viewing surveys, the software used for administering the treatment and collecting the data, and the vocabulary pretest and posttest. It will then review the design of the study, describing specific viewing experiences which participants may have encountered. The unique feature about this study is that the participants are not treated as subjects or as observational units. Instead, the 120 selected words’ treatments acted as the subjects or observational units. The participants were not split into treatment and control groups, but rather the words were assigned into one of the four categories.
Participants acted as raters, judging the effectiveness of the word treatments based on their scores on the vocabulary tests. This will be further discussed later in the chapter.

**Participants**

The process of selecting the subjects for the study followed several important criteria. First, participants in this study were recruited from various universities and Russian Language Flagship programs across the United States. We contacted instructors at these institutions and they passed on the information to their students. Interested pupils contacted the researchers. Additionally, participants were found via social media. People in social media groups that traveled to Russia, either for a religious or humanitarian mission, were contacted and given the opportunity to participate. In all, over 4,000 individuals were contacted and invited to participate. Initially, 147 volunteers began participation in this research. However, only 71 participants completed all portions of the research. Of those 71, only 27 participants made adequate contributions that could be used in the analysis. This may show a bias in the participants, as those who gave valid data were probably detail-oriented and good at reading, understanding, and following instructions.

We assumed that all participants advanced speakers of Russian, having formally studied the language for three or more years or lived in the country for at least a year. Furthermore, they all had lived in a Russian-speaking country, anywhere from nine to thirty months. Not all participants were currently students, but all had higher education experience in Russian. Participants were currently living in various states across the U.S. as well as three participants from Canada. Most participants were male, however five females chose to participate as well. None of the participants were heritage learners and they all rated themselves advanced in Russian reading, writing, speaking, listening, and grammar. Several participants had official proficiency ratings, all of which were at the Advanced Level on the ACTFL Proficiency Scale.
Materials and Instruments

Survey 1. The present study was fully administered online and included five distinct phases and instruments. Participants first completed a preliminary survey which gathered basic demographic and linguistic information administered through the Qualtrics software (see appendix).

Vocabulary Pretest. After completing the first survey, participants were automatically redirected to the vocabulary pretest which consisted of 60 words, 15 selected from each of the four treatment groups. This study implements a modified version of the Solomon Four Group experimental design which provides the means to account for any effect the pretest might have. Such a design calls for participants to be tested on only half of the selected words in the pretest, then later tested on all selected words in the posttest. The data can then be analyzed to determine if participants scored higher on the words which also appeared on the pretest due to heightened awareness of those words while viewing the film.

Ayamel. The key component of this research is a video software system that includes a subtitle editing system. This system allows for annotations that are textual, pictorial, and even video. The Ayamel software was developed in the ARCLITE Lab in the Center for Language Studies at Brigham Young University (BYU) in Provo, Utah, under the direction of Michael D. Bush, Associate Director in the Center for Language Studies at BYU. The purpose of this software is to allow instructors to make video available to students in the courses they teach. As most any language teacher knows, valuable time has been wasted in many language classrooms as teachers try to fast-forward and rewind a video cassette to find the exact location of pedagogically sound material to provide for the classroom, so much so that many teachers avoid the use of video altogether and stick with reading materials only for input. This deprives students of context-rich input that can be engaging and authentic.

The Ayamel system further allows users to click on unfamiliar words or phrases and retrieve an instant definition from either a built-in dictionary, from Google Translate, or from WordReference.com. In addition, words can be annotation in various ways as will be discussed below.
A transcript is also provided next to the video for users to follow along in a linear manner if preferred (see Fig. 1).

![Ayamel video viewing software featuring linear transcript to the right and subtitles at the bottom of the video screen](image)

**Figure 1.** Ayamel video viewing software featuring linear transcript to the right and subtitles at the bottom of the video screen

The transcript allows users to click on any line in order to skip the video to that utterance. Another function on the website allows users to have the previous utterance repeated which participants were allowed to use as desired. All activity on the site is monitored and recorded and can been analyzed upon participants' completion of viewing the video. For the purposes of this study, dictionary look-up functions were disabled and all treatments were created using the annotating function of the software, which allowed the researcher to provide definitions for only the selected words, including dictionary definitions, glosses, and annotations. Thus for this study, participants were only allowed to receive a prescribed definition for pre-determined words.

All selected words appeared highlighted, which indicated to the participants that a definition was possibly available for look-up if desired. Although one fourth of the selected words did not receive
any treatment, given that they were the control group, references in the text appeared in the same color so as to avoid attention being paid to one type of treatment over the others.

Vocabulary posttest. After viewing the film, participants then completed the vocabulary posttest which assessed their recognition knowledge of 120 selected words which were found in the film. There were thirty selected words tested from each of the four treatment groups. This differs from the pretest which tested only fifteen selected words from each of the four treatment groups, randomly selected for each participant. In the vocabulary posttest, participants were tested on all selected words.

The tests for this study were designed to measure the ability to recognize vocabulary following exposure to the various types of treatments. The multiple-choice, recognition format of the tests in the present study are similar to the format of the posttest in the third and final study of Chun and Plass's (1996) study. While the first two studies on which Chun and Plass (1996) reported employed tests of vocabulary production, these two researchers ultimately decided to utilize a multiple-choice, recognition test in the final study. They explained that this format would better fit the nature of the treatment, which involved incidental learning and vocabulary recognition rather than production. Note that the recognition test developed for that study used the target annotation of each keyword as a test prompt: an English text definition for text-only words, the picture from the glossary for text-plus-picture words, and the video from the glossary for text-plus-video words. The present study, however, uses only English text definitions of the keywords as prompts for every item, regardless of definition type encountered in the film.

This divergence from the Chun and Plass methodology brings the present tests into further agreement with the purpose of the experimental treatment. The ultimate objective of the Ayamel software system, if it were deployed in language courses, would be to increase subjects' verbal recognition of target language words. Further, using picture or video prompts that are unique to the present treatment might not accurately reflect how well subjects could apply their learning from the Ayamel software to other contexts.
The six possible answers for any given test item consist of the correct answer and five distractors which were chosen randomly from the pool of other keywords in the text (see Fig. 2). The researcher decided on this course for two reasons: First, it ensures a more equal difficulty between test items, rather than intuitively choosing distractors for each item with similar pronunciation. Second, although the distractors do not necessarily bear close resemblance to the correct choice, both the correct choice and the distractors would have been recently read and heard by the participant during the video viewing. The researcher hoped that this would provide enough of a similarity to make the other choices effective distractors for a participant who was unsure of the correct choice.

**Post-viewing survey.** The post-viewing survey was designed with the purpose of learning about participants’ overall experience with the research. Here, they expressed their opinions on the software and the treatments. The survey consisted of five questions (see Appendix E) and was administered via the Internet using the Qualtrics survey administration system that allowed participants
to indicate on a scale from 0 to 100 how much they agreed with the given statements, 0 meaning they
did not agree at all and 100 meaning they agreed fully (see Fig. 3).

![Survey Ratings](image)

**Figure 3.** Post-viewing survey

**Design of the Experiment**

This study implemented a Solomon-four experimental design which is a way of avoiding some
of the difficulties associated with the pre- and posttest design. The design contains two extra control
groups, which serve to reduce the influence of confounding variables and allow the researcher to test
whether the pretest itself has an effect on the subjects. While this design type is much more complex to set up and analyze, it combats many of the internal validity issues that can plague research. It allows the researcher to exert simple complete control over the variables and allows the researcher to check that the pretest did not influence the results.

**Solomon four group experimental design.** The first two groups of this design are designed and interpreted in the same way as in the pre- and posttest design, and likewise implement randomization (see Fig. 4).

![Figure 4. Solomon Four Group Design](image)

The comparison between the posttest results of groups C and D, marked by line 'D', allows the researcher to determine any potential effects of pretesting influenced the results. If the difference
between the posttest results of groups C and D is different from the groups A and B difference, then the researcher can assume that the pretest has had some effect upon the results. The comparison between the Group B pretest and the Group D posttest allows the researcher to establish if an external factors have caused any distortion over time and injected bias into the analysis.

The comparison between Group A posttest and the Group C posttest allows the researcher to determine the effect that the pretest has had upon the treatment. If the posttest results for these two groups differ, then the pretest has had some effect upon the treatment, and the experiment is flawed. The comparison between the Group B posttest and the Group D posttest shows whether the pretest itself has affected behavior, independently of the treatment. If the results are significantly different, then the act of pretesting has influenced the overall results and is in need of refinement.

**Experimental groups.** The current study is unique and different from most studies conducted in the field of language acquisition in that the subjects, or observational unit of this study, are the treatments of the selected words. The 120 selected words occurred in the subtitles of the video the participants viewed in the study and were assigned into one of four treatment groups: dictionary, glossed, annotated, and control group. The relative difficulty of words was calculated based on their frequency of use in the language, and evenly distributed into the various categories. According to Tharp (1939) and Ellis (2002), a word's relative difficult can be estimated by its frequency of occurrence in the target language.

Thus, frequency of occurrence has been taken into account in choosing the target words for this study. All words chosen have a token frequency in the film of one appearance. Regarding overall frequency in the language, target words have been chosen from a wide variety of frequency of appearance, but they are distributed equally among the treatment groups. That is to say that each group has five rare words, and five common words, and the frequency of a word was used as an estimate of its relative difficulty. This is supported by James Tharp (1939) who stated that “The coming of
vocabulary frequency counts has furnished a measuring unit to establish the relative difficulty of reading texts in terms of those frequencies” (p. 173).

**Dictionary definitions.** Thirty selected words were placed into the dictionary group, which means that when clicked on in the film, the system provided a dictionary definition for the viewer. A dictionary definition is what you would find if you were to look the word up in a dictionary, which means that this approach could include many different meanings for the same word. It also includes the part of speech, pronunciation guide, and perhaps an example or two of the word’s use. All dictionary definitions came from the *Oxford Online Bilingual Russian to English Dictionary* (http://www.oxfordlanguagedictionaries.com). Below is an example of a dictionary definition.

```plaintext
унимать (уйми)
унять, уйму, уймешь, past унёл, унелла, унелло of унимать
Referred from "унимать"

1. v. (успокоить) to calm, soothe, pacify
2. v. (боль, кровотечение, слёзы) to stop
   y. пожар = to stop a fire
3. v. (чувства) to suppress
```

**Glosses.** Thirty selected words were placed into the glossed group, which means that when clicked on in the film, they provided a gloss for the viewer. A gloss is the meaning of a word *only* as it pertains to the specific context in which it is being used. This is often a one-word translation. All glosses were provided by the English version of the subtitle track which came with the film. Below is an example of a gloss.

Макушка

**Annotations.** Thirty selected words were placed into the annotated group, which means that when clicked on in the film, they provided an annotated definition for the viewer. An annotation is an explanation or a side note that gives further knowledge or clarifies the item. In this study, our annotations provided not only a gloss along with perhaps the literal translation of the word but also a
brief explanation of how the word is being used in the given context and how that might differ from its traditional use. The annotations in this study required an average of 5 minutes per annotation, in total amounting to 60 minutes of creating annotations, whereas the average time for finding a gloss was about 1 minute, and dictionary definitions required only a matter of seconds. Annotations within the Ayamel software can include text, pictures, and even video. However, for the purposes of the present study, only textual annotations were used. Below is an example of an annotated definition.

Typically, мировая is used to mean “worldly” or “global,” or some connotation of world-wide as in Вторая мировая война (World War II). However, in this context, мировая means “goodly,” as in “Моя свекровь – замечательная женщина, «мировая мама»!”

Procedure

The present study consisted of five stages including (in order) (1) the initial pre-viewing survey which collected demographic and background knowledge information from the participants, (2) a vocabulary pretest, (3) viewing a Russian video, (4) a vocabulary posttest, and (5) a short post-viewing survey which gathered information about participants’ overall experience with the research and their impressions of the new software used therein. Since all data collection took place via the Internet, participants were free to participate when it was convenient for them.

After completing the pre-viewing material, participants watched the first half of the classic Russian film Ирония Судьбы или С Лёгким Паром or in English The Irony of Fate or Enjoy your Bath. The first half of the film runs for one hour and thirty minutes. During this step, participants viewed the video in Russian accompanied by Russian subtitles. The selected words appeared in the subtitles as highlighted text indicating to viewers that there may be a definition available for those words. All activity on the website was monitored and recorded for later analysis through the Ayamel activity tracker. This activity tracker also revealed when participants paused, rewound, fast-forwarded, etc.
Upon completion of viewing the film, participants were tested on all 120 selected words from the film. Questions in the vocabulary posttest were in the same format as the pretest but in a newly randomized order for each participant. Posttest results were designed to reveal any pretest effect as well as measured vocabulary gains made during the viewing process. After completing the vocabulary posttest, participants completed a short survey reviewing their experience and attitude toward the tools used during the study. The final page of the survey thanked students for their participation and asked them not to reveal the existence of the vocabulary posttest to others who might participate.

Data Analysis. Total rates of vocabulary acquisition were determined with simple descriptive statistics. Pretest and posttest scores were figured for each participant, who acted as a “rater” to judge the effectiveness of a word treatment by whether or not they answered the word correctly on the posttest. Clicks on words by participants during the movie were tracked to determine whether or not they were exposed to the treatment at all. These clicks were analyzed both individually for each participant as well as collectively for each word. Clicks were also analyzed per word treatment (annotated, glossed, dictionary, control). Gains in vocabulary were determined according to participants’ posttest scores when compared to their pretest scores. Scores were analyzed both individually by participants and then by word, as well as collectively by treatment group.

Determining the effects of definition type on participants’ vocabulary acquisition required more sophisticated inferential statistics. In this analysis, definition type was the independent variable in four ways: annotation, dictionary definition, gloss, and no definition. The dependent variable was the score on the vocabulary posttest, which was a measure of the extent to which participants recognized after viewing the film. Since the response being measured by this study took the form of a proportion, a logistic regression was chosen as the inferential statistical test. Additionally, since the research design was blocked by participants, in other words, each participant was exposed to all treatments, a mixed model was run. Thus, the researcher decided upon a mixed models logistic regression.
Implementing the materials, procedures, and statistical tools discussed above, the researcher administered a multimedia annotating treatment to a group of advanced L2 learners of Russian. Their vocabulary posttest scores were recorded and analyzed, along with their activity during the movie, and are reported in the following chapter.
Chapter 4: Results

Research Questions and Overview of Study

The research questions for the present study were: Is providing definitions conducive to the comprehension of new vocabulary for advanced L2 learners of Russian? and Which type of word definition seems most effective in facilitating the vocabulary comprehension of advanced L2 learners of Russian? In this study, participants ages 18-30 across the United States learning Russian as a second language provided the data that were analyzed to obtain the results presented in this chapter. Participants first completed a survey collecting basic demographic and linguistic information about them. They then took a vocabulary pretest where they were tested on their knowledge of half of the selected words which they would later see in the film. Upon completion of the vocabulary pretest, participants viewed the Russian film Ironia Sud’byi (The Irony of Fate) in Russian (L2) with Russian subtitles.

During the film, participants were free to click on any selected words they wanted in order to receive a definition in English. The different definitions they could have received were glosses – usually a one-word translation into English providing the meaning of the word only as it pertains to the given context- dictionary definitions – the definition in English according to the Oxford Online Bilingual Russian to English Dictionary (http://www.oxfordlanguagedictionaries.com), which could include several meanings which were not relevant to the given context in the film- and annotations – a short explanation of the word’s use in the film and how that might differ from its traditional uses. A fourth of the selected words were placed in a control group which provided no definition when selected. After viewing the film, the participants immediately completed the vocabulary posttest which tested their recollection of all of the selected words.

The data from these tests and surveys were analyzed along with data retrieved from their activity on the website, i.e. which words they clicked on and how many times different words were clicked on. Analyses were done to calculate the significance of the scores as they differ from one
treatment to another and to calculate the significance of the number of clicks that each word received in relation to participants’ scores in the vocabulary posttest.

**Vocabulary Test Scores**

As described above, vocabulary acquisition was calculated as proportions of answers correct on the posttest that were not answered correctly on the pretest. The results for vocabulary comprehension and recall across definition types, along with total number of clicks by treatment group are given below in Table 1. As shown there, while annotations proved to yield the highest gains in comprehension and recall, dictionary definitions and the control group actually had negative gains.

Table 1

*Vocabulary Posttest Scores and Number of Clicks during Video*

<table>
<thead>
<tr>
<th></th>
<th>Annotated</th>
<th>Glossed</th>
<th>Dictionary</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td># Clicks during film</td>
<td>19.8</td>
<td>27.5</td>
<td>33.9</td>
<td>24.5</td>
</tr>
<tr>
<td>Pretest mean</td>
<td>57%</td>
<td>50%</td>
<td>64%</td>
<td>54%</td>
</tr>
<tr>
<td>Posttest mean</td>
<td>61%</td>
<td>64%</td>
<td>55%</td>
<td>47%</td>
</tr>
<tr>
<td>Gains in vocabulary</td>
<td>14%</td>
<td>10%</td>
<td>-9%</td>
<td>-7%</td>
</tr>
</tbody>
</table>

Figure 5 provides a visual presentation of those data and shows pretest scores compared to the posttest scores for the different treatment groups. As we see here, scores for the dictionary and control groups were lower for the posttest than for the pretest.
A mixed models analysis of covariance blocking on subjects produced the results shown in Table 2. Pretest scores and total clicks per treatment group were analyzed as covariates, which yielded the finding that although some words were not clicked on as frequently as others, the posttest scores remained consistent throughout the treatment types.

Table 2

*Significance of Pretest Effect and Number of Clicks*

<table>
<thead>
<tr>
<th>Effect</th>
<th>DF</th>
<th>DF</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre_test</td>
<td>1</td>
<td>76</td>
<td>113.45</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Total_clicks</td>
<td>1</td>
<td>76</td>
<td>0.51</td>
<td>0.4771</td>
</tr>
<tr>
<td>Treatment</td>
<td>3</td>
<td>76</td>
<td>25.56</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

Furthermore, although participants were exposed to half of the selected words during the pretest, they seemed to have paid no closer attention to those words than any other selected words while viewing the film, thus the pretest had no effect on their vocabulary gains which are measured in the vocabulary...
posttest. A post-hoc Tukey analysis revealed that neither the pretest nor the number of clicks on a word affected the vocabulary gains in any condition.

**Gains in Vocabulary**

As stated above, the vocabulary pretest had no significant effect on the vocabulary acquisition of the participants. However, there were significant differences found between the different treatment and control groups. Figure 6 below shows the gains in vocabulary acquisition across all treatment groups. As shown there, the glossed treatment group had the greatest gains in vocabulary comprehension, and annotations had positive gains as well. On the other hand the dictionary and control groups had negative gains, but as shown in Table 4, those differences were not significant.

![Gains in vocabulary](image)

*Figure 6. Vocabulary gains across Treatment Groups*

Although the overall response to the dictionary group resulted in negative gains in vocabulary, the individual data revealed that a few participants actually improved in vocabulary more in the dictionary group than any other group.
Table 3

*Differences of Least Squares Means (Tukey-Kramer Adjusted p)*

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Treatment</th>
<th>Adj p</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>C</td>
<td>0.0075</td>
</tr>
<tr>
<td>A</td>
<td>D</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>A</td>
<td>G</td>
<td>0.1183</td>
</tr>
<tr>
<td>C</td>
<td>D</td>
<td>0.0703</td>
</tr>
<tr>
<td>C</td>
<td>G</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

Table 4 also shows that the both the annotation and gloss groups had statistically higher scores than both the dictionary group and the control group. We also see there that the dictionary group and control group were not significantly different from each other.

**Post-viewing Survey**

Upon completion of the vocabulary posttest, participants answered a short 6-question survey about ability to complete their participation and about their experience and opinions on viewing subtitled video for language learning. Participants used electronic scales to rate their experience moving the scale anywhere from 0, meaning they disagreed with the statement, to 100, meaning they fully agreed with the statement. According to the results, on average, participants enjoyed viewing the film with subtitles. Table 5 displays the means, medians, and modes of participants’ answers pertaining to their attitudes towards video with subtitles.

Most individuals scored their experience at 100/100 and only a few scored their experience below 50. Interestingly, a few participants who reported not to have enjoyed subtitles with the film, also reported to have built their Russian vocabulary through viewing with subtitles. Almost all participants reported to prefer watching the Russian film with Russian subtitles rather than English subtitles, and only three participants reported to have rather watched the film with no subtitles.
Table 4

*Participants' Attitudes towards Viewing Subtitled Film*

<table>
<thead>
<tr>
<th>Question</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>I enjoyed watching this movie with subtitles</td>
<td>77.6</td>
<td>87</td>
<td>100</td>
</tr>
<tr>
<td>Watching this movie with subtitles helped me understand what was being said better than if there had been no subtitles.</td>
<td>81.45</td>
<td>91</td>
<td>100</td>
</tr>
<tr>
<td>Watching this movie with subtitles helped me to build my Russian vocabulary.</td>
<td>72.31</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>Watching this movie with subtitles helped me to understand better how Russian words are used and pronounced.</td>
<td>71.72</td>
<td>81</td>
<td>100</td>
</tr>
<tr>
<td>I would rather have watched this movie with English subtitles.</td>
<td>16.18</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>I would rather have watched this movie without subtitles.</td>
<td>15.86</td>
<td>7</td>
<td>0</td>
</tr>
</tbody>
</table>
Chapter 5: Discussion and Conclusions

This study sought to determine whether or not the provision of definitions is conducive to the comprehension of new vocabulary, which in turn should lead to incidental vocabulary learning of advanced L2 learners of Russian. In addition, also sought to determine which of three types of definitions were most effective to that end. Participants first completed a survey providing basic demographic and language learning information followed by a vocabulary pretest which tested their prior knowledge of half of the Russian selected words. They then viewed the Russian film *Ironia Sud’byi (The Irony of Fate)* in Russian (L2) with Russian subtitles. During the film, they were able to click on highlighted words that had been selected to receive a definition which was in one of the four treatment or control groups. After viewing the film, participants immediately took a vocabulary posttest to measure their recall of the meanings of L2 vocabulary and to determine the most effective definition type for facilitating L2 vocabulary comprehension and short term recall.

Contrary to what one might expect about dictionary use, the results of the study revealed that dictionary definitions had a negative effect on participants’ recall, while both annotated and glosses had a positive effect. It is important to remember that the focus of this study was not aimed at language acquisition, but language comprehension, which is a necessary precursor to acquisition. As some may have expected based on previous literature, the control group treatment had a negative effect on recall of that particular group of words. This chapter will discuss the implications of these results for future research and discuss some of the limitations in the present study.

Discussion

The outcomes of the statistical analyses suggest that annotations and glosses improve the possibilities for vocabulary acquisition. These results are similar to those of Lomika (1998) Lenders (2008) and others (Abraham, 2008; Lenders, 2008; Lomika, 1998; Poole, 2012; Salaberry, 2011; Sanders, 2002; Zarei & Rashvand, 2011), who also found that students who had access to glosses performed significantly better on measures of recall than those who had no glosses. This research also
supports our findings that the provision of no definition may not have been conducive to vocabulary acquisition. The present study showed in fact that participants experienced negative gains with the control group of words, which goes contrary to Krashen’s (1985) theories, which hold that input is sufficient for language to occur. This result may have been expected, however, given that the selected words were chosen from low-frequency words which occurred in the film only once. An equally plausible expectation, however, would be that scores should undergo no change. Based on results from the pretests, we can assume that these selected words were previously unknown, thus encountering those words in the film only slightly increased the chance of learning the selected word, yet this in most cases did not happen, perhaps because of insufficient frequency of occurrence. In fact, in many cases, the scores decreased from the pretest to the post test, which may also indicate that many of the correct answers on the pretests were mere guesses.

Those possibilities notwithstanding, the researcher did not expect to see a negative gain in vocabulary acquisition in the dictionary treatment group, but rather, an increase. According to prior research (Bruton, 2007; Hulstijn et al., 1996; Laufer & Hill 2000; Wang, 2012; Yuzhen, 2011), obtaining a dictionary definition for unknown or less known words enhances learners’ vocabulary acquisition. Even if the dictionary definition were considered the least effective definition type, one would expect it to be more effective than no definition at all.

As mentioned in the limitations section of this paper, many external factors could have influenced the outcomes of this study including tester’s fatigue, introduction to unfamiliar technology, subjects not following instructions, and exposure to multiple types of word definitions. Since the control over the context of this experiment was low, it is difficult to draw sure conclusions from the gathered results.

One possible reason why annotations and glosses were more effective in facilitating the comprehension of new vocabulary is perhaps because they provide a straightforward definition for the specifically given context in which the words are encountered. Dictionary definitions require some
problem solving skills in order to deduce the appropriate meaning for the context in which it is being used in the film. However, glossed and annotations are easier to apply to the given context and thus more easily recognized in a later situation. Perhaps the results would be different if vocabulary posttests required participants to produce the selected words instead of merely recognize them.

Another possible reason for greater gains from annotations and glosses than dictionary definitions is related to what was explained above: When viewers take time to figure out the appropriate dictionary definition that fits the given context, their concentration flow for comprehending the story line is interrupted. This interruption may be lengthy enough to prevent the viewer from making a solid connection between the new word and its meaning in the real-life context portrayed in the film. If viewers are pausing the film and taking time to shift their comprehension mindset over to a problem-solving mindset, valuable time is wasted when they must re-orient their attention back to the film, preventing strong links from being formed between words and their uses.

Yet another possible reason for the negative gains seen in the dictionary definitions category may be due to the fact that participants had been exposed to glosses and annotations in the same film. The shorter and more concise definitions may be more appealing to learners since it provides an instant definition with little or no problem solving required to understand the word in context. This differs from dictionary definitions in that these can be lengthy and require critical thinking in order to understand the word in the correct context. Since dictionary definitions can come with several meanings, possibly ten or more meanings, learners are required to read through the entire list of definitions and come to a conclusion as to the best fit for the given context. Although this might provide learners with a more complete definition and cognitive foundation for a word, glosses and annotations are shorter and quicker to understand and require no extra cognitive processing to figure out how the word is being used in the particular context in question. Thus, viewers, having been exposed to shorter and quicker definitions, may have chosen to skip past the dictionary definitions for the sake of time, knowing that shorter definitions of other words would be provided later.
data revealed that some learners actually had the most positive gains in the dictionary definition category. Thus, we might assume that some learners respond to varying techniques differently, as was shown in a study by Chapelle and Jamieson (1986).

Tester’s fatigue is a possible source of participant-related variation: since participants were asked to complete their portion in one sitting, and the overall duration of their participation is estimated to have been three or more hours. After having completed a pre-viewing survey, a 60-question vocabulary pretest, participants were then expected to watch a movie which lasted an hour and a half. Add to that the necessity of pausing to read definitions for words, taking a 120-item vocabulary posttest, and then completing a short 6-question post-viewing survey, viewers were likely fatigued by the end of their participation and therefore performed progressively worse as the vocabulary test proceeded.

Finally, a possible reason for the unexpected negative gains for the dictionary group may have been due to the nature of the vocabulary testing itself. Since the test was in the format of multiple choice questions, each participant had a one in six chance of getting any given question correct whether or not they actually knew the correct answer. Without implying that this was a probable reason for the unexpected results, it is therefore possible that participants happened to have guessed more answers correctly on the pretest, than they did on the posttest, thus creating a negative gain. In other words, the small differences observed could have occurred by chance.

**Implications**

As stated in the results section, there was no significant difference found between the effects of annotations and glosses. This may be due to the fact that both definition types are very straightforward and easily understood, given that they were created for each specific context in which they appeared. Such an approach to development renders the two categories of definitions similar to each other, which should provide useful insights to the field of second language acquisition, considering the time required to produce either definition type is very different. Glosses take time to create and must be done by
hand, however they are usually one-word translations, whereas annotations also must be created by hand to fit each specific context, but they provide additional information such as explanations, clarifications, and sometimes even examples, all of which take a great deal more time than glosses require.

Along the same lines, the working hypothesis at the outset of this research was that dictionary definitions would be equal to or greater than glosses in terms of efficacy in vocabulary acquisition. Since dictionary definitions are automatically available with today’s technologies for many languages, much time and money could be saved by providing them rather than glosses or annotations, which are much more expensive. In contrast with glosses or annotations, dictionary definitions do not require hand-created translations specific to the given contexts, thus enabling instructors and materials developers to spend more resources in other areas that would be beneficial to learners.

The results of the present study, however, do not necessarily support the use of dictionary definitions, but reinforce the familiar concept of the more time the teacher contributes to creating materials, the less effort is required by students to learn. Often, instructors find that the more time they spend creating activities, assignments, and tests for their students, the easier it is for students to understand the concepts and engage in the language. So it seems to be the case with word definitions – if an instructor will dedicate the time and effort to creating glosses and annotations, their students will more likely acquire more vocabulary in the target language than if the instructor were to merely provide a dictionary definition.

Based on the data and efforts to understand what they mean, several pedagogical implications for instructors become evident. First, the data suggest that students who are provided glosses as an aid when exposed to new vocabulary would have greater recognition rates than those who do not have such aids. This is consistent with many studies as discussed in the review of literature. This suggests that students would greatly benefit from their instructors putting time into creating and providing glosses
for the texts they assign to their students, or, as in the case of this study, providing glosses for the movies they are assigning their students to view.

Russian literature teachers, in particular, may wish to consider taking advantage of glossary-enabled texts when possible. With respect to achieving greater vocabulary acquisition, previous research on glossing, as well as the present study point toward the benefits of glosses in general, and multimedia glossing in particular. We may conclude that a multimedia, glossary-enriched reading curriculum could, with few or no additional assignments required of the teacher or learner, increase students’ vocabulary acquisition.

Second, consistent with previous studies, it appears that multimedia definitions of various types have different effects on vocabulary acquisition. However, when it comes to the specifics of these results, the data from the present study diverge somewhat from previous studies. Based on the results presented here, annotations had no significantly different effect from glosses which would imply that spending time creating textual annotations may not be worth the time and effort they require when glosses appear to be just as effective for vocabulary learning. This information can save teachers much time and labor, which can be better utilized in various aspects of their language instruction.

Although dictionary definitions appeared to not be helpful in the present study, further investigation will be required to clarify this unexpected result. For example, future studies could test whether or not training learners how to read and interpret dictionary definitions has an effect on how useful dictionary definitions are for vocabulary acquisition. Perhaps a different dictionary type would be more useful than the Oxford Online Bilingual Russian to English Dictionary version used in this study (http://www.oxfordlanguagedictionaries.com).

If the findings of the present study are replicated in future research, designers of Russian instructional materials and instructors of Russian as a foreign language may wish to consider incorporating more video-based glosses into their electronic reading tasks, while avoiding dictionary definitions and using annotations only when absolutely necessary. Note that although the annotations
also yielded positive gains in vocabulary acquisition, these are more difficult and costly to supply, therefore the more efficient choice for providing definitions would be glosses. However, if dictionary definitions are available at no extra cost, instructors may see great benefits in providing those to students as well, since there may be a difference in effectiveness among different students with different personalities and learning aptitudes.

Third, although the results of this study showed dictionary definitions to result in negative gains in building learners’ Russian vocabulary, students all learn individually in unique ways, thus implying that many could still possibly benefit from receiving dictionary definitions for unfamiliar vocabulary. As stated above, data collected in this study did show that several participants did actually improve more in the dictionary definition category than they did in any other definition category. Due to the limited number of participants for this study, results may have been different under different circumstances, as previously explained. A more controlled environment may have had a positive effect on the results in vocabulary comprehension during this study, and turn may have proven dictionary definitions to be more effective than other categories. For example, researchers may find different results from conducting the experiment live in front of participants who have gathered to a single location. Live instruction and monitoring may affect the outcomes differently from the method used in this study, which allowed participants to contribute from home. Taking the tests and watching the movie at home may have allowed for external distractions or greater fatigue, given that the participant may have chosen to engage in the study late at night or near children.

In addition to the lack of control of the testing environment, most of the participants chose to participate in the study around the Christmas and New Year holiday season. Most were from America and this being a busy time of year for most Americans, which could have affected the data collection in an unexpected way. Further research will need to investigate the legitimacy of these possible variations.

And finally, the results of this data would suggest that subtitled video is conducive to learners’ vocabulary acquisition of a foreign language, as has been previously shown in earlier research. Most of
the participants responded positively to viewing a subtitled film and indicated that they felt it improved their acquisition of Russian vocabulary. According to Roger Schank’s book *Tell me a Story* (1990), humans understand the world terms of stories they have already understood. Students are more prone to connect meaning to form when they learn in terms of stories and experiences that they can relate to their own lives, thus making video an invaluable resource for language learners. This possible connection of ideas to language forms is also illustrated in Schank’s conceptual dependency theory (1972), which was discussed in Chapter 2. This theory states that new information is stored in the mind when a concept is connected to the new information, or in the case of language learning, when meaning is attached to words and phrases, instead of isolated words that are memorized rotely as translations without context or relation to other concepts. Thus, with an engaging storyline and meaningful language connections, students exposed to subtitled video learn new words by seeing the word’s orthography, hearing its pronunciation produced by native speakers of the target language. Learners see the meaning of the word in terms of actions and emotions, and thereby draw stronger and more solid connections between meaning and the form, functions, and structure of the language.

**Limitations**

The present study had several limitations, the most serious of which would be the lack of diversity among participants. Almost all participants in the study were from America, with the exception of three from Canada. Initially, there were also participants from Germany and Sweden, however they did not participate throughout the full length of the study and their data could therefore not be included in the analysis. Therefore, the generalizability of these results is limited to advanced L2 learners of Russian in the United States. That said, American participants came from a wide variety of places in the United States including Utah, California, Idaho, Nevada, Washington, Colorado, Virginia, Kentucky, Illinois, Nebraska, Georgia, and New York.

In addition to the lack of national diversity of participants in this study, no data was collected as to participants’ socioeconomic status as well. We do not know the social class or other personal
information pertaining to the participants of this study other than the information they provided in the initial survey, thus it is unclear how far we can generalize the results found. Data and future research should include ways to ensure that results are as applicable for one group of people as they are for others, in order to draw more generalizable conclusions.

Another significant limitation of the present study was the lack of control over the research environment of the various participants. Since the materials and information was fully administered online, the amount of distractions or disturbances that learners faced while completion their portion of participation is unknown. As stated above, the time when most participants contributed to the study was around the American Christmas and New Year holiday season. This is a time of tight schedules, busy atmosphere, and many outside responsibilities and expectations. Perhaps had participation been possible during the spring or summer seasons, the results would have been different, thus leading to different outcomes.

Furthermore, the timing for the conducting of the study might well have prompted participants to quickly skim the dictionary definitions. In doing so, subjects may not have dedicated the time needed to deduce the appropriate meanings to the words which they had looked up, thus not really learning or understanding the words. In this case, glosses are logically more effective for people with busy lives who are under time constraints. Glosses are straightforward and require no problem solving skills or extra time to judge the correct definition for a word, seeing as there is only one definition provided. In addition to the timing of the research, this study was also short in length as it required only three hours of participants’ time. Future research should investigate learners’ language gains over a longer period of time, perhaps over a semester or two.

The lack of control over the testing environment also may have led to confusion in the instructions for the testing. Several participants’ data had to be ignored because they did not follow the instructions given with their participation guidelines. Since Ayamel is a new and developing system, participants did not know how best take advantage of its capabilities, which led to several learners not
enabling subtitles during the movie. It also perhaps led to several learners not completing their participation, since the instructions indicated that there were surveys to complete after viewing the film. Thus, although 147 participants viewed the film, only 71 participants completed the surveys after viewing the film. This could have possibly been avoided had there been more control over the research environment.

One more limitation caused by lack of control over the testing environment is the lack of enforcement of the rules of the study. Participants were asked to complete their portions of the study in one sitting, so as to avoid vocabulary attrition after viewing the film. Since no researchers were present at the time of learners’ participation, there is no sure way of telling whether participants actually completed their portions all in one sitting, or whether distractions or interferences obscured the data collected from their performance. This is one aspect of activity that the Ayamel activity tracker cannot determine, though one may speculate based on time lapses between activities.

Additionally, participants were told not to use an outside dictionary for looking up words during the movie. They were told to only use the dictionaries and definitions provided. Again, since no researchers were present to enforce this rule, participants may have used an outside dictionary at their own will, or even may have missed this point of instruction before completing their participation in the study. We assume that based on their responses from the surveys, however, they followed the instructions fully and adhered to the rules of the study.

Finally, another limitation that may have affected the results of this study is the concern over tester’s fatigue. The pretest consisted of 60 multiple choice questions, after which participants viewed a movie clip which was an hour and a half long, not including pauses to look up selected words provided, and then were asked to complete a 120-question vocabulary posttest. It is estimated that full participation in this study probably required three or more hours to complete. We can logically assume that two hours and forty minutes into the study, participants were tired of being tested and may have not dedicated their usual amount of effort by the end of the study. Therefore, results from their
posttests, or at least from the latter end of their posttests, may not have accurately reflected the amount of new vocabulary that they comprehended from viewing the film and being exposed to varying definition types.

Indeed, the comments received from many participants upon completion of the study indicated that their participation took much longer than they anticipated. Many (68%) expressed negative feelings in this regard, thus we can conclude that the length of the study may have influenced participants negatively and altered their performance from what it might have been. The length of the study also proved to be a frequent cause of participants failing to complete their portions, as revealed in the comments.

**Recommendations for Future Research**

Future research in this area could eliminate some methodological weaknesses of the present study. One aspect about the current study which resulted in loss of participants was the format in which instructions were conveyed. Due to the wholly online nature of the study, instructions were given in a text plus picture format, which resulted in about seven pages of instructions. This seems to have either deterred some participants or caused confusion in their performance throughout the study, resulting in researchers eliminating data provided by several participants. As stated in the section above, 147 participants completed the first two surveys and watched the film, however only 71 participants continued on to complete the vocabulary posttest and post-viewing survey. This was likely due to the fact that participants did not read all of the instructions, which clearly stated that after viewing the film, participants needed to follow the provided link to complete their participation in the study. The researcher contacted several participants after the study had ended, and some confirmed that this was the case for them.

We suggest that future research provide more effective instructions, either by creating a video tutorial that participants may more likely follow to the end, or by gathering participants into a single location in order to complete their participation in the study. The latter option would allow the
researcher to explain the steps of participation in plain terms while simultaneously showing examples of how to access various parts of the study on the screen at the front of the testing room. Having a researcher present during participants’ activity in the study would also allow for learners to ask questions during the course of their participation and possibly even to report problems that they may encounter with the computer or software.

Furthermore, we suggest gathering participants into a centralized location for testing in order to control their testing environment. This may result in fewer participants, but the quality of the data collected from them could prove more reliable, given that live instruction and monitoring could reduce the number of errors in the data collected. Conducting such research in a more common language such as Spanish may result in more participants than proved to be available for Russian. Creating a testing environment for participants would ensure that distractions and disturbances would be kept to a minimum and students would have a more stress-free, calm environment in which to complete their participation. This would also control for the time of day that participants contribute to the study. Our data revealed that many participants completed their video viewing and vocabulary tests late at night or even into the early morning hours. This may have affected their testing abilities and attention to learning while participating in the study. A prescribed testing location would possibly eliminate participants’ activity during less-effective hours of the day, thus improving the quality of their brain activity and learning abilities.

Subsequent research to explore the current research questions among Russian language learners should also address users’ long-term vocabulary retention. The present study investigated only the effects of vocabulary comprehension and short-term vocabulary learning. Immediately after participants viewed the film, they were tested on new vocabulary introduced and perhaps looked-up in the film, and the results therefore showed that glosses and annotations were most effective. However, a more longitudinal study might yield different results. The attrition rates from different definition groups would give great insight to the most effective definition type for vocabulary comprehension.
Another important aspect of the effect of definition types on L2 vocabulary acquisition is the production abilities that are gained during the process. The current study tested only participants’ recognition abilities as a first step towards vocabulary acquisition, but acquisition is not complete without the ability to also produce new vocabulary. Thus future research should investigate the effects of various definition types on vocabulary production ability of new L2 words for learners.

Although valuable data were collected in the present study, it is not as generalizable as we would hope, having primarily tested American L2 learners of Russian. It is quite possible that various definition types will have different effects on L2 learners of Russian from countries other than America and Canada. Instructors would greatly benefit from research conducted among participants from various countries throughout the world to come to a more complete understanding of the most effective definition types for learning a foreign language. Along those same lines, it would also be useful to test the effects of these various types of definitions among L2 learners of various languages, not only Russian or Slavic languages. L2 learners of Asian or character-based languages may benefit differently from these definition types than for alphabetic, orthographic languages such as Russian. That said, it would also be useful to test the effects of definition types for Romance languages and other languages across the globe. Results would be not only interesting, but imperative for creating more effective learning materials and textbooks.

Future research should also address the issue of the length of the research. Since our aim in this study was to treat words as subjects that receive various types of treatment with respect to definition categories provided, we gathered a great number of selected words to be tested. The end result was to be able to produce somewhat more generalizable results with fewer human participants. However, this seemed to be quite taxing on the participants and many dropped out, likely due to the time required for the study. Perhaps a more limited research scope which would be a better fit for participants’ time constraints, thus enabling researchers to receive data from more participants. This would increase the
population size of the study and make results more significant across the wide spectrum of language learners.

Moreover, the study could be somewhat condensed by reducing the number of variables under observation. The present study had four independent variables: annotations, glosses, dictionary definitions, and a control group which had no definitions available. In order to provide a sufficient quantity of data for analysis, it was necessary to test at least 15 selected words in each category, thus bringing the total number of selected words to 60 words. Then, in order to account for the pretest effect, it was necessary to double that number so that half of the words could appear on the pretest and half would only be encountered during the film, which raised the number of selected words to a total of 120. By the end of the study, participants had answered 180 difficult test questions, which took each person about an hour or more total to complete. This number could be greatly reduced by individually testing two treatments at a time, for example, comparing dictionary definitions with glosses.

A final recommendation for future research of multimedia glossing, has to do with the control group. In the present study when subjects clicked on words in the control group, no definition appeared. Participants were not informed that this would happen, so often they assumed it was a software error and clicked multiple times on the same word, only to give up, perhaps frustrated, and move on. We would suggest replacing the blank space where the definition should show up, with a short statement informing viewers that there is no definition available for the given word. Comments collected after the study revealed that there was confusion in this regard that could have been avoided with this simple explanation.

**Conclusions**

There are several conclusions that can be drawn from the findings of this research, perhaps providing a foundation for future materials development. We conclude that video paired with subtitles enhances language learning, especially vocabulary acquisition. In the present study, L2 subtitles were found to be beneficial for students and enjoyable. Although subtitles are greatly beneficial, they are of
little help without comprehension. Learners are able to build their vocabulary best when they understand what is being said in the film and are able to relate that to background knowledge that they have in their L1.

We can also conclude that various definition types have different effects on L2 learners. The significance of the differences found in this study indicates that not all definition types are equal and that special consideration should be given in the decisions as to which definition types to provide along with reading and/or listening materials in the L2. Although the data from this study indicate that glosses and annotations are most effective, it would be wise to conduct further research on this topic in order to come to a more decided conclusion in this regard.

This study provides a framework for other studies that can address the various issues mentioned above as well as different word definition types. More data would provide greater insight into the most effective definition type for L2 vocabulary building. From the present study, we conclude that annotations and glosses are effective in building advanced L2 learners’ Russian vocabulary, and that dictionary definitions, as well as the absence of a definition, are not effective. Because no other known research of this type has apparently been conducted, perhaps this innovative research design will open the way for more research that can provide additional insights into various instructional strategies.

It is clear that language learners enjoy watching film with subtitles, and watching films as a part of a language curriculum can be an effective instructional tool. It is also clear that the functionality associated with the definitions made available by the Ayamel software has merit and requires further testing. With this study, as with all experiments, it is the process and not necessarily the end results that provides maximum understanding and insight to the field.
References


Appendices

Appendix A: Informed Consent Form

This study is being conducted by Elizabeth Todd, a graduate student in the Master's Program in Second Language Teaching at Brigham Young University, working under the direction of Dr. Michael Bush and Dr. Alan Melby. The purpose of the study is to determine how various word look-up methods affect vocabulary growth. You are invited to participate because you have learned the Russian language.

Procedures

Prior to the research you will be asked to complete a short survey along with a vocabulary pretest. During the research you will be asked to watch the provided film in the Russian language with Russian subtitles which lasts about 1 hr. 30 min. Upon completion of the experimental portion of this study, you will be asked to complete a comprehension posttest.

Risks/ Discomforts

There are no known risks for participation in this study.

Benefits

By participating in this study it is very likely that you will improve your reading and listening skills in Russian as well as greatly extend your vocabulary knowledge.

Confidentiality

All information provided will remain confidential and will only be reported as group data with no information that can be used to identify individuals. All data will be stored electronically solely for the purposes of the research. Only the small number of researchers directly involved with the study will have access to any data collected.

Participation

Participation in this research study is voluntary.

Questions about the research
Elizabeth Todd: elizabeth.todd4@gmail.com; 801-688-2504
Prof. Michael Bush: michael_bush@byu.edu; 801-422-4515

Questions about your rights:
BYU IRB Administration
A-285 ASB
Brigham Young University
Provo, UT 84602
Phone: 801-422-1461
Email: irb@byu.edu

I have read, and understood the above consent and desire of my own free will to participate in this study.

- Yes
- No
Appendix B: Pre-viewing Survey

Q1 What is your gender?

☐ Male (1)

☐ Female (2)

Q2 What country are you from?

Q23 Are you currently studying Russian formally? (i.e. in college, in an official program, receiving regular tutoring, etc.)

☐ Yes (1)

☐ No (2)

Answer If Are you currently studying Russian formally? (i.e. ... Yes Is Selected

Q22 Where are you studying Russian?

Answer If Are you currently studying Russian formally? (i.e. ... Yes Is Selected

Q10 Please indicate which courses

Q3 How long have you studied Russian formally?

Q4 Why did you decide to learn Russian?

Q5 How many years of higher education (post-high school) have you spent studying Russian?

Q6 Have you ever lived in a Russian-speaking country?

☐ Yes (1)

☐ No (2)

Answer If Have you ever lived in a Russian-speaking country? Yes Is Selected

Q7 Which country did you live in?

Answer If Have you ever lived in a Russian-speaking country? Yes Is Selected

Q8 How many months did you spend in this country?
Q24 Have you received an official proficiency rating for any of your Russian abilities?

☐ Yes (1)

☐ No (2)

Answer: If Have you received an official proficiency rating for any ... Yes Is Selected

Q25 Please indicate which ratings you received along with the tests taken and the years in which they were taken.

Q11 Please indicate your proficiency in Russian in the following areas, 0 meaning "not proficient at all" and 100 meaning "native-like proficiency."

_____ Speaking (1)

_____ Listening (2)

_____ Reading (3)

_____ Writing (4)

_____ Grammar (5)

Q13 Are you a heritage learner?

☐ Yes (1)

☐ No (2)

Q12 When you enter the video-viewing website, Ayamel, you will be asked to create an account using an email address or BYU ID. Please enter the email address or BYU ID that you wish to use:
Appendix C: Instructions for Participants

Instructions

Summary of Research

Here is a quick summary of the basic flow of this research. You should automatically be redirected to various surveys or site, but in case an error occurs, you can access the surveys and site here:

Flow

Survey one: https://byu.qualtrics.com/SE/?SID=SV_79fxGi4gpKijQy1
Survey two: https://byu.qualtrics.com/SE/?SID=SV_er2X0dIIG2SDCK1
View video: http://ayamel.byu.edu/content/1036
Survey three: https://byu.qualtrics.com/SE/?SID=SV_81bY3EiX7QEZzpP
Survey four: https://byu.qualtrics.com/SE/?SID=SV_6Dwe93msCmDSJgh

Welcome to Ayamel!

Many free resources for language learning await you! First, here's a quick tutorial about how the site works:

Get Adobe Flash

Before we start, make sure that you have the latest version of Adobe Flash available on this computer. If it is not, open a new tab. It can be downloaded for free by clicking here.

Clear Cache

Once you do that, go back to the Ayamel tab. Make sure you clear your cache. The instructions for doing so can be found at this website. You should have taken a survey before now. If you haven’t please do so by following this link.

If any of these links are not working, please stop and email me immediately elizabeth.todd4@gmail.com
Once you have made it to the AYAMEL screen, here’s what you’ll need to do:

**Sign in**

The first screen you see asks you to create an account using your Google account or BYU ID or any email address that you have (don't worry, you don't get signed up for newsletters or spam or anything like that).

Enable Subtitles

Now that you see the video on the screen, take a moment to get oriented. At the bottom of the video screen, you'll see a “cc” button (closed captioning). Click this and select the option given (Russian).

If the video is not loading or showing, try opening it on a different browser (Firefox seems to work best).
Click anywhere outside the movie screen to get rid of the selection box.

Getting Definitions

As you view the video with subtitles, you’ll notice words highlighted in yellow. These upon clicking on these words, you can access a definition for the word.

Under the “annotations” section listed to the right of the video. To return to view the transcript for the movie, simply click on the “transcript” tab which is located to the left of the “annotations” tab.
Transcripts

Next, notice the white area to the right of the movie screen. This is where you can view transcriptions from the movie.
After the movie

When the movie finishes, copy and paste the URL found below the video in this spot:

Or you can simply click on it here: https://byu.qualtrics.com/SE/?SID=SV_8IbY3EiX7QEZzpP

Rules

Here are some simple guidelines we ask you to follow in order to properly contribute to this study:

- **Rewinding is Allowed** – Feel free to rewind and repeat as much as you'd like. A feature at the bottom left of the screen (just right of the play button) allows for users to have the previous subtitle track repeated. Double clicking this button takes you one track further back.
- **Complete in One Sitting** – We ask that you complete your participation in one sitting without the use of a dictionary. You will be asked to watch only half of the movie, but will be able to finish the rest if you so desire upon completion of the post-viewing survey. The duration of your portion of the movie is about an hour and a half. Total participation time including surveys should not take more than three hours. You may complete the first survey and pretest in a different sitting from when you start the movie viewing, but once you start the viewing process, we ask that you complete the rest of the requirements in one sitting so as to answer the following survey questions as accurately as possible.

- **No Dictionary** – In order to gather results on language acquisition, we ask that you do not use any dictionary for the duration of this viewing.
• **Allow to buffer** – Before you start viewing the film, click play and then pause and allow some time for the film to buffer (2-3 minutes should be plenty). You may work on other things while you are waiting, but it shouldn't need more than a few minutes.

• **Link at the End of Film Clip** – at the end of the video clip, a link is provided which will take you to the final survey. If you do not see it or it is not working, it can be accessed by clicking here.

• **Questions?** – if you have questions or problems during your portion of video viewing, please email me at elizabeth.todd4@gmail.com and I will respond to you as soon as possible. This is a developing site and software, so we appreciate your patience with potential bugs that may occur.

• **Confidentiality** – Your participation and results are kept 100% anonymous and cannot be traced back to you as an individual. Your personal information will not be shared or publicized.
Appendix D: Vocabulary Test

Q187 What email address/ID do you plan on using to login to view the video?

<table>
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<th>Q39 to move</th>
<th>Q52 to play the fool</th>
<th>Q3 foreign</th>
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</thead>
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Q40 innate

<table>
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<th>Q11 indignation</th>
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<td>соревноваться (4)</td>
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Q42 to cram into

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<th>Q78 stalemate</th>
<th>Q4 to pull</th>
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<td>посинеть (4)</td>
<td>безвыходный (4)</td>
<td>шарить (4)</td>
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Q45 to weigh

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<th>Q80 careless</th>
<th>Q5 to wave</th>
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Q51 to break (in pieces)

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<td>вещать (1)</td>
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<td>торчать (4)</td>
<td>цепляться (4)</td>
<td>прогнать (4)</td>
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<td>сплющь (5)</td>
<td>разлечься (5)</td>
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<td>выручать (6)</td>
<td>догнать (6)</td>
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Q9 trifle
- мегера (1)
- холостяк (2)
- пустяк (3)
- ширина (4)
- хлопушка (5)
- похмелье (6)

Q12 (being on) duty
- брысь (1)
- дежурство (2)
- венник (3)
- селедка (4)
- болван (5)
- предлог (6)

Q18 dull-witted
- безвыходный (1)
- дерзкий (2)
- отзывчивый (3)
- посторонний (4)
- настырный (5)
- недалекий (6)

Q19 top
- попугай (1)
- похмелье (2)
- болван (3)
- макушка (4)
- забулдыга (5)
- венник (6)

Q20 amateur activities
- самодеятельность (1)
- мегера (2)
- возмещение (3)
- наваждение (4)
- безобразие (5)
- нелепость (6)

Q21 to grope about
- шарить (1)
- разлекаться (2)
- вламывать (3)
- потрить (4)
- скромничать (5)
- мелочиться (6)

Q27 to break in
- запихнуть (1)
- драчаться (2)
- трепыхать (3)
- врываться (4)
- расхрабриться (5)
- шарить (6)

Q28 absurdity
- брысь (1)
- пустяк (2)
- тряпость (3)
- наваждение (4)
- нелепость (5)
- возмещение (6)

Q29 boorishness
- хамство (1)
- холостяк (2)
- тахта (3)
- банда (4)
- бручершафт (5)
- совпадение (6)

Q30 idiot
- холостяк (1)
- хлопушка (2)
- попугай (3)
- проходишцев (4)
- хищник (5)
- болван (6)

Q32 delusion
- наваждение (1)
- тахта (2)
- воспаление (3)
- жулик (4)
- клумба (5)
- откровенность (6)

Q33 to evaporate
- разбудятся (1)
- вращаться (2)
- умыкнуть (3)
- цепляться (4)
- догнать (5)
- испариться (6)

Q75 to revolve
- потрить (1)
- чесать (2)
- погорячиться (3)
- вращаться (4)
- приютить (5)
- кривляться (6)

Q153 bachelor
- тахта (1)
- забулдыга (2)
- холостяк (3)
- прошмешечк (4)
- проходишцев (5)
- балда (6)

Q179 to get away
- засунуть (1)
- обнажать (2)
- надуться (3)
- пропасть (4)
- убрать (5)
- опасаться (6)

Q38 grateful
- тронутый (1)
- положительный (2)
- современный (3)
- признательный (4)
- безлendirный (5)
- мировой (6)

Q311 all the more so
- более, чем (1)
- более того (2)
- более или менее (3)
- больше чем (4)
- тем более (5)
- более всего (6)

Q132 to scream
- совпасть (1)
- одолеть (2)
- кричать (3)
- шарить (4)
- трепыхаться (5)
- похвастаться (6)
Q133 to register
- одолжить (1)
- прописать (2)
- совпасть (3)
- обойтись (4)
- запихнуть (5)
- валять (6)
Q134 tablecloth
- постель (1)
- охота (2)
- примета (3)
- скатерть (4)
- клуба (5)
- забулдыга (6)
Q135 to become tradition
- повести (1)
- ворваться (2)
- совпасть (3)
- опасаться (4)
- одолжить (5)
- закатывать (6)
Q136 to be sulky
- валять (1)
- пропасть (2)
- ударять (3)
- обойтись (4)
- убрать (5)
- дуться (6)
Q137 blockhead
- хлопушка (1)
- попугай (2)
- холостяк (3)
- дно (4)
- мегера (5)
- балда (6)
Q138 bottom
- совпадение (1)
- клумба (2)
- нрав (3)
- дно (4)
- скатерть (5)
- охота (6)
Q139 laughing stock
- посещение (1)
- скатерть (2)
- красота (3)
- забулдыга (4)
- сверху (5)
- проходящий (6)
Q140 tablecloth
- прибавить (1)
- обалдеть (2)
- убирать (3)
- вывести (4)
- выручить (5)
- сметь (6)
Q141 to become tradition
- повести (1)
- образоваться (2)
- пропасть (3)
- выстрелить (4)
- обалдеть (5)
- повести (6)
Q142 information
- свидание (1)
- нелепость (2)
- сверху (3)
- наваждение (4)
- дежурство (5)
- ребро (6)
Q143 blockhead
- попугай (1)
- забулдыга (2)
- тахта (3)
- дно (4)
- снизу (5)
- ребро (6)
Q144 bottom
- совпадение (1)
- положительный (2)
- сообразительный (3)
- безумный (4)
- мировой (5)
- признательный (6)
Q145 tablecloth
- прихватить (1)
- провалиться (2)
- совпадать (3)
- опасаться (4)
- запихнуть (5)
- убрать (6)
Q146 to become tradition
- обмануть (1)
- проходить (2)
- наблюдать (3)
- одолеть (4)
- запихнуть (5)
- убрать (6)
Q147 information
- свидание (1)
- нелепость (2)
- сверху (3)
- наваждение (4)
- дежурство (5)
- ребро (6)
Q148 blockhead
- попугай (1)
- забулдыга (2)
- тахта (3)
- дно (4)
- снизу (5)
- ребро (6)
Q149 bottom
- совпадение (1)
- положительный (2)
- сообразительный (3)
- безумный (4)
- мировой (5)
- признательный (6)
Q150 tablecloth
- прихватить (1)
- провалиться (2)
- совпадать (3)
- опасаться (4)
- запихнуть (5)
- убрать (6)
Q151 to become tradition
- повести (1)
- образоваться (2)
- пропасть (3)
- выстрелить (4)
- обалдеть (5)
- повести (6)
Q152 information
- свидание (1)
- нелепость (2)
- сверху (3)
- наваждение (4)
- дежурство (5)
- ребро (6)
Q153 blockhead
- попугай (1)
- забулдыга (2)
- тахта (3)
- дно (4)
- снизу (5)
- ребро (6)
Q154 bottom
- совпадение (1)
- положительный (2)
- сообразительный (3)
- безумный (4)
- мировой (5)
- признательный (6)
Q155 tablecloth
- прихватить (1)
- провалиться (2)
- совпадать (3)
- опасаться (4)
- запихнуть (5)
- убрать (6)
Q156 laughing stock
- посещение (1)
- скатерть (2)
- красота (3)
- забулдыга (4)
- сверху (5)
- проходящий (6)
Q157 to become tradition
- обмануть (1)
- проходить (2)
- наблюдать (3)
- одолеть (4)
- запихнуть (5)
- убрать (6)
Q158 to go crazy
- ненавидеть (1)
- образоваться (2)
- пропасть (3)
- выстрелить (4)
- обалдеть (5)
- повести (6)
Q159 information
- свидание (1)
- нелепость (2)
- сверху (3)
- наваждение (4)
- дежурство (5)
- ребро (6)
Q160 beauty
- совпадение (1)
- хоть (2)
- мерзавец (3)
- тахта (4)
- краса (5)
- мегера (6)
Q161 goodly
- отзывчивый (1)
- положительный (2)
- сообразительный (3)
- безумный (4)
- мировой (5)
- признательный (6)
Q162 extra
- посторонний (1)
- тронутый (2)
- вспыльчивый (3)
- безвыходный (4)
- сверху (5)
- охота (6)
Q163 to manage (with)
- одолжить (1)
- выстрелить (2)
- ударять (3)
- пустить (4)
- дуться (5)
- обойтись (6)
Q164 to get up/ off
- ненавидеть (1)
- пропасть (2)
- выручить (3)
- умькнуть (4)
- возражать (5)
- пустить (6)
Q165 to dare
- разламываться (1)
- дурачиться (2)
- сметь (3)
- шарить (4)
- пропасть (5)
- испариться (6)
Q166 edge
- попугай (1)
- забулдыга (2)
- тахта (3)
- булу (4)
- наваждение (5)
- ребро (6)
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<th>Q175 to have</th>
<th>Q66 shoo! (to a cat)</th>
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<td>болтун (1)</td>
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<td>иметь (6)</td>
<td>брысь (5)</td>
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<th>Q60 to sprawl</th>
<th>Q67 drunkard</th>
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<td>разлечься (1)</td>
<td>клумба (1)</td>
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<td>потянуть (2)</td>
<td>болтун (2)</td>
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<td>выметаться (4)</td>
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<td>посинеть (5)</td>
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<td>испариться (6)</td>
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<td>дурачиться (1)</td>
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<td>краса (2)</td>
<td>чесать (2)</td>
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<td>талон (3)</td>
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<td>криляться (4)</td>
<td>жулик (4)</td>
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<td>фокус (6)</td>
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<td>побежденный (1)</td>
<td>забулдыга (1)</td>
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<td>признательный (5)</td>
<td>попугай (5)</td>
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<td>омерзительный (6)</td>
<td>хлопушка (6)</td>
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</table>

| Q174 to fool (around) | Q64 brotherhood | |
|-----------------------|-----------------||
| пропасть (1) | хамство (1) | |
| чесать (2) | авантюрист (2) | |
| убрать (3) | брuderшафт (3) | |
| раскречьться (4) | забулдыга (4) | |
| валять (5) | жулик (5) | |
| испариться (6) | бандероль (6) | |
Q88 cowardice
- прелесть (1)
- воспаление (2)
- безобразие (3)
- совпадение (4)
- откровенность (5)
- трусость (6)

Q94 outgoing
- признательный (1)
- омерзительный (2)
- вспыльчивый (3)
- тупой (4)
- летальный (5)
- отзыывчивый (6)

Q97 to roll out
- закатывать (1)
- развлекать (2)
- ворваться (3)
- торчать (4)
- дернуть (5)
- разбуян ться (6)

Q99 chatterbox
- трусость (1)
- забулдыга (2)
- тахта (3)
- проход  ец (4)
- болтун (5)
- хлопушка (6)

Q100 clever
- легкомысленный (1)
- сообразительный (2)
- настырный (3)
- густой (4)
- своеобразный (5)
- прирожденный (6)

Q101 to catch
- зарасти (1)
- рехнуть (2)
- жать (3)
- унимать (4)
- разламываться (5)
- стукнуться (6)

Q103 rogue
- попугай (1)
- проходимец (2)
- хлопушка (3)
- брудершафт (4)
- бандероль (5)
- забулдыга (6)

Q105 to fear
- кривляться (1)
- возражать (2)
- трястись (3)
- опасаться (4)
- заводиться (5)
- сродниться (6)

Q107 stupid
- тупой (1)
- посторонний (2)
- густой (3)
- легкомысленный (4)
- настырный (5)
- тронутый (6)

Q109 to flash
- мелькать (1)
- разламываться (2)
- расхрабриться (3)
- мелочиться (4)
- разлечься (5)
- зарасти (6)

Q110 coincidence
- прелесть (1)
- совпадение (2)
- наваждение (3)
- безобразие (4)
- воржение (5)
- похмелье (6)

Q115 to break in
- сплывть (1)
- жать (2)
- приютить (3)
- ворваться (4)
- возражать (5)
- умыкнуть (6)

Q118 to steal
- прогнать (1)
- умыкнуть (2)
- вещать (3)
- выручать (4)
- посипеть (5)
- похвастаться (6)

Q121 scoundrel
- болван (1)
- нахал (2)
- дал (3)
- пустьк (4)
- мерзавец (5)
- макушка (6)

Q122 flowerbed
- клумба (1)
- трусость (2)
- талон (3)
- выих (4)
- мегера (5)
- прелест (6)

Q124 bygone
- положительный (1)
- былый (2)
- отвратительный (3)
- непутёвый (4)
- современный (5)
- недалекий (6)

Q129 morals
- мерзавцы (1)
- невесты (2)
- приметы (3)
- нравы (4)
- ощущения (5)
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Appendix E: Post-viewing Survey

Q6 What email address/ID did you use to access the video?

Q1 Did you complete the study (completing the study means viewing the video in its entirety and clicking on unknown words to get a definition, then taking the vocabulary posttest)?

☐ Yes (1)
☐ No (2)

Answer If Did you complete the study No Is Selected

Q2 Why were you unable to complete the study?

☐ I did not understand the instructions (1)
☐ The video was too difficult for me (2)
☐ I did not have enough time to watch the video in its entirety (3)
☐ I experienced technical difficulties with the websites (4)
☐ I lost interest in the video (5)
☐ I forgot about this project (6)
☐ Other (please specify) (7) ____________________
Q3 Please indicate to what level the following statements are true about how you feel watching this movie with subtitles:

_____ I enjoyed watching this movie with subtitles (1)

_____ Watching this movie with subtitles helped me understand what was being said better than if there had been no subtitles. (2)

_____ Watching this movie with subtitles helped me to build my Russian vocabulary. (3)

_____ Watching this movie with subtitles helped me to understand better how Russian words are used and pronounced. (4)

_____ I would rather have watched this movie with English subtitles. (5)

_____ I would rather have watched this movie without subtitles. (6)

Q4 Did you end up using a different email address or ID to log in to view the movie than you stated in the first survey?

○ Yes (1)

○ No (2)

Answer If Did you end up using a different email address or ID to log in to view the movie than you stated in the first survey? Yes Is Selected

Q5 What is the first email address/ ID that you reported in the first survey?

Q7 Comments
### Appendix F: Complete Summary of scores

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