

ENCODING OF MOTION EVENTS IN THE TWO LANGUAGES OF RUSSIAN-
ENGLISH BILINGUALS

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ABSTRACT

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Doctoral Advisory Committee Chair: Dr. Aneta Pavlenko

The purpose of the present study was to examine the encoding of motion in the two languages of Russian-English bilinguals who differed in their ages of arrival in the United States. Three groups of participants took part in the study: 38 L1 Russian speakers, 31 L1 English speakers and 30 Russian-English bilinguals who differed in the ages of arrival in the US (10 early, 10 childhood, and 10 late bilinguals). The participants produced oral narratives elicited with two books, *Frog, Where Are You?* (Mayer, 1969) and *One Frog Too Many* (Mayer & Mayer, 1975), with bilingual participants producing narratives in both of their languages. Quantitative and qualitative analyses of the data revealed several differences between L1 Russian and English speakers, including the obligatory encoding of manner of motion in Russian but not in English, where narrators also used generic motion verbs, such as *to come* or *to go*. In the context of these differences bilinguals in all three groups were shown to perform in accordance with specific language constraints in both of their languages. At the same time, Russian-English bilinguals used fewer motion verbs in L1 Russian and displayed lower levels of lexical diversity than L1 Russian speakers. The analyses revealed no effects of the age of arrival on the maintenance of L1 Russian, nor of the L1 Russian on the motion talk in L2

English. The findings of the study deepen our understanding of motion encoding in bilingual speakers. They also have important theoretical implications, suggesting that Talmy's dichotomy may be too broad in grouping together languages, such as Russian and English, which display dramatic differences in encoding of motion.

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INTRODUCTION

Background of the issue

Four years ago, a friend of mine, a Russian-English bilingual, was telling me his “life story”. He had lived in the U.S. for over 20 years and primarily used English in his everyday life, yet he still spoke Russian quite well. But then he surprised me by saying in Russian “*Я ходил во Флориду три раза*” (I walked to Florida three times). Something was not right – how can a person walk to Florida? When asked to repeat what he had just said, the young man did it in exactly the same way. After a couple of attempts, he finally burst out laughing and said “*Ну конечно не ходил, ездил*” (*Sure I didn’t walk, I went [by means of transportation]*) and then switching into English “*but it’s just go in English, that’s what I meant*”. Underlying his error is the fact that the English “to go” does not have a translation equivalent in Russian where the manner of movement has to be specified as either “walking” or “riding/driving/moving by means of transportation”. Since then my interest in bilingualism and its effects has increased tremendously and started to take a more definitive shape. What happens in the mind of a person who lives with two languages? Take this particular episode – Is it language loss? Is it a slip of the tongue? Or is it a case of one language overpowering the other?

Problem statement

Nowadays, it is widely accepted that bilinguals’ languages do not exist in their mind as completely separate entities. On the contrary, a considerable amount of positive and negative transfer between them happens all the time (De Groot, 2011; Jarvis & Pavlenko, 2008; Odlin, 1989). Research on the bilinguals’ cognitive processes goes back decades. To examine what kind of transfer occurs and how it affects bilinguals’ speech

and mind, researchers have examined a variety of domains, ranging from differences in the subadjacency parameters, in the obligatory/optional subject of a sentence (Odlin, 1989), in the collectivist/individualist orientations (Marian & Kaushanskaya, 2004), or in encoding of motion events (Brown & Gullberg, 2008, 2011; Hohenstein et al., 2006). The domain of motion is intriguing and fruitful for this type of investigation for several reasons. Motion is closely intertwined with almost every area of human life; it is fundamental to people's physical functioning, and the ability to express and understand motion events is central for human communication and interaction. Motion is perceived and expressed by all humans and thus, encoded in all languages. However, there is no universal formula for describing motion either syntactically or semantically since different languages encode motion events by different means - by special grammatical constructions or obligatory lexical selections (Berman & Slobin 1994; Hasko & Perelmutter, 2010; Hickmann & Robert 2006). The very fact that motion is universal, but varies in its encoding across languages makes motion an ideal case for investigating the issues of language processing in bilingual speakers, one of the issues being cross-language or bidirectional transfer.

We can ask a number of questions regarding motion encoding in bilingual speakers. How does one's first language (L1) affect the way people talk about motion in their second language (L2)? Does acquisition of another language affect the way in which people talk about motion in their L1? To what extent are the language systems that bilinguals have access to merged or separate? How do the characteristics of the bilinguals' languages affect the degree of transfer between them?

Purpose of the study

The present dissertation focuses on motion expression in Russian-English bilinguals in order to examine the cognitive processes in bilingual speakers, to establish the cross-linguistic influence of the two languages, and to understand how motion meanings and events are processed and represented in the respective languages of simultaneous and consecutive Russian-English bilinguals. Although there have been studies examining similarities and differences of Russian and English in motion talk (Hasko, 2010; Pavlenko, 2010), there are still unanswered questions on how users of both Russian and English acquire and maintain different patterns of motion encoding. The two languages have both similarities and differences in this domain. In both languages the manner of motion is expressed by the main verb and the path by its satellite. However, manner encoding is more obligatory in Russian than in English; moreover, English indicates path through prepositions and postpositions, while Russian indicates path through prepositions and prefixes. Both Russian and English have a category of aspect, but its meanings and functions are different in the two languages. Finally, Russian has a category of directionality which does not exist in English. These similarities and differences may affect the processes of L2 acquisition and L1 maintenance, as well as the use of L1 and L2 in different ways. For instance, under the influence of English, with a less obligatory manner encoding, bilinguals may simplify the complicated Russian structure. As a result of maintaining Russian, which has near-obligatory manner encoding, bilinguals may overuse manner verbs compared to native English speakers.

The second purpose of the study is to contribute to the literature on the role of the age of acquisition in the encoding of motion in L1 and L2 of bilingual speakers (Bylund,

2009; Bylund & Jarvis, 2010). While there has been extensive research on language maintenance and language loss in simultaneous bilinguals, less research has been carried out on these issues in consecutive bilinguals. Consecutive bilinguals' constant exposure to the L2 may create opportunities for simplification and attrition in their L1 system, or they may preserve their L1 patterns in spite of extensive contact with the second language. For example, both Russian and English encode manner in the verb; however, English has many frequently used verbs (e.g., *go* and *come*) that do not encode manner, while Russian has very few verbs like this. Under this influence, Russian-English bilinguals may simplify their Russian lexicon and encode manner improperly, or they may use fewer verbs that do not encode manner when speaking English, substituting them with the ones that do encode manner. Another difference involves path encoding. Russian employs prefixes (a bound morpheme) as one of the ways to encode path, while English has no bound morphemes at all. This may result in simplifying the variety of path encoding possibilities in Russian. The present research seeks to shed light on delineating intra-typological similarities and differences between such languages.

The third purpose of the study is to reconsider the utility of the theoretical framework commonly used in the study of motion. According to Talmy, (1991, 2000) all the world's languages can be divided into two types according to the linguistic means they employ in encoding manner and path of motion. Traditionally, Russian and English have been considered as typologically the same. However, recent research (Chen & Guo, 2009; Hasko, 2009; Hasko, 2010; Pavlenko, 2010; Rakhilina, 2010) has demonstrated that the typology does not take into account distinctive characteristics of these two languages that set them apart. Russian and English have different patterns for encoding

motion, which were not included in the description of semantic categories in the typology. The present research continues this line of investigation and attempts to reconsider characteristics of the existing typology of motion events.

Significance of the study

The investigation of encoding of motion verbs by bilingual speakers is worthwhile for several reasons. First, this study investigates the interaction of two linguistic systems within the bilingual mind, attempting to establish whether and to what extent the influence between two established languages is bidirectional. Utilizing motion as the lens through which bilingual cognitive processes can be examined, the present research explores the nature of the effects of two languages on each other in encoding motion events.

Secondly, the present research examines the differences, difficulties, and cross-linguistic effects in encoding motion in speakers of two typologically similar languages. For a long time the overall assumption of researchers has been that when learning two distinct languages, it is difficult to acquire and maintain those features of the languages that differ (Harley 1989; Kersten et al., 2003; Navarro & Nicoladis 2005; Negueruela et al. 2004). But when two languages are similar in some ways but are different in more subtle ways, the question arises whether the similarities make it easier or more difficult to acquire and maintain those idiosyncratic features in L1 and L2.

In addition, this study also challenges Talmy's (1985, 1991, 2000) widely accepted typology of motion expressions, which has been used as a framework in numerous studies (e.g., Berman & Slobin, 1994; Chen & Gui, 2009; Pavlenko, 2010; Slobin, 2003; Wilkins, 2004). Recently, questions and criticisms have started to arise

regarding the typology's descriptions of semantic categories and placement of languages into groups. By investigating both inter- and intra-typological differences between Russian and English, this study offers new evidence that allows us to treat the typology more as a set of tendencies than an established characterization of lexicalization patterns of motion talk.

Finally, the findings of this study provide important insights which may inform the fields of second language, and especially heritage language, teaching. By pointing out the areas of motion talk that are difficult to acquire and maintain, and that are prone to attrition, teachers and curriculum developers can anticipate these particular areas and supplement their instruction with more explanations, exercises, and usage in context. Reviewed materials may include a different range of motion verbs to be studied, a different order of presenting and practicing the elements of motion talk, or rethinking the time allocated for learning motion verbs. As the research focuses on bidirectional transfer in bilingual speakers, the active users of the language will benefit the most from the present study.

Overview of the study

Chapter 2 is a review of the literature concerning the frameworks utilized in this dissertation, cross-linguistic research on motion events encoding as well as findings of studies done with second language (L2) learners and bilingual speakers in this area. Chapter 3 is a comparison of Russian and English, the languages examined in this study, in the area of motion talk. Chapter 4 presents information on the participants, the methodology, the procedures and the data analysis used in the study. The results of the data analysis for each of the research questions are reported in Chapter 5, and Chapter 6

is a discussion of the findings. A summary of the findings, limitations of the study, implications, and suggestions for future research are presented in Chapter 7.

CHAPTER 2

LITERATURE REVIEW

Introduction

To date, motion talk has been studied in children and adults learning their L1 (e.g., Berman & Slobin, 1994; Choi & Bowerman, 1991; Hespos & Spelke, 2004; Hickmann & Robert, 2006;), or L2 (Hasko, 2009; Hendriks *et al.*, 2008; Inagaki, 2002), and in bilinguals using the languages they use on a day-to-day basis (e.g., Brown & Gullberg 2008; Hohenstein *et al.*, 2006; Pavlenko, 2010), with the latter population being the focus of the proposed study. This chapter presents an overview of current research on motion talk across different languages with the focus on Russian and English, the languages of interest in the present study. I will begin by introducing the typological approach to the study of motion expression proposed by Talmy (1991, 2000) and then follow-up with an overview of cross-linguistic research in this area. I will continue with a summary of the findings of studies done with L2 learners and bilingual speakers. Next, I will identify the gaps in the present literature with regard to motion talk in bilingual speakers. Finally, I will outline the similarities and differences between Russian and English, the languages examined in this study, in the area of motion talk, and present the research objectives and research questions the present study is attempting to address.

1. Theoretical framework

1.1. Talmy's typological framework and cross-linguistic differences in motion talk

An event is an abstract term and cognitive linguist Leonard Talmy (2000) explains it in the context of certain general cognitive processes - conceptual partitioning

and ascription of entityhood. In the processes of perception or conception, the human mind has the ability to extend a boundary around a portion of what would otherwise be a continuum (space, time and other domains). Then the property of being a single unit entity can be assigned to this content and one category of such an entity is conceptualized as an event. A motion event is characterized by Talmy (2000) as "... a situation containing motion and the continuation of a stationary location alike" (p. 25), which also has a particular type of internal structure and degree of structural complexity.

Talmy (1991, 2000) proposes a typology of motion events, which is valid for what he calls a macro-event. Macro-events are complex semantic structures including a main event (ME), also called a framing event, and a co-event (CE). The framing event schematizes five different domains, which are an event of motion or location in space, an event of contouring in time (aspect), an event of change or constancy among states, an event of correlation among actions, and an event of fulfillment or confirmation in the domain of realization. The co-event has a support relation to the framing event and expresses one the following relations:

- precursion (the Co-event precedes the main motion event but does not cause or assist its occurrence as in *Glass splintered over food*);

- enablement (the Co-event directly precedes the main motion event and enables the occurrence of an event that causes the motion but does not itself cause this motion as in *I grabbed the bottle down off the shelf*);

- cause (the Co-event precedes or occurs with the main motion event bringing about the occurrence of this motion as in *I squeezed the toothpaste out of the tube*);

- manner (the Co-event co-occurs with the motion event and is conceptualized as an additional activity that the figure of the motion event exhibits, directly pertaining to the motion event but distinct from it, as in *The top spun past the lamp*);

- concomitance (the Co-event co-occurs with the motion event and is conceptualized as an additional activity that the figure of the motion event exhibits, not pertaining to the motion event but can take place by itself, as in *She wore a green dress to the party*);

- subsequence (the Co-event takes place directly after the main motion event, and is enabled by, is caused by, or is the purpose of that motion event as in *I'll stop down at your office*);

The co-event is structured as a support event for the main event, which is organized as a figure-ground relation between the main-event and the co-event. The following example, in which the motion event is a macro-event, demonstrates the functions of and the relations between the main event, which is the path of motion, and the co-event, which is the manner of motion:

The bottle floated into the cave
CE ME

Flasken flød ind i hulen (Danish)
CE ME

La botella entró en la cueva flotando (Spanish)
the bottle entered in the cave floating
ME CE

Talmy (1985)

As can be seen from the example, some languages, in this case English and Danish, express the main event, which is path of motion, in the satellite and the co-event expressing manner in the verb, while other languages, in this case Spanish, map the main

event onto the verb and the co-event outside the verb, for example an adverbial expression in the above example.

According to Talmy (1985), there are several fundamental semantic elements engaged in expression of a motion event: *motion*, which is a movement per se; *figure*, which is a moving entity or an entity that theoretically can move and is located with respect to another object; *ground*, which is this other object with respect to which the figure moves; and *path*, which is the trajectory followed by the figure with respect to the ground or the site that the figure occupies. Consider the following sentence:

The pen fell off the table.

Here *fell* represents *motion*, *pen* functions as *figure*, *table* functions as *ground*, and *off* represents *path*. According to Talmy, these four basic components are obligatory, while another component, *manner*, the way the motion might progress, is optional, and therefore not encoded in all languages.

The semantic elements of a motion event (i.e., motion, path, figure, ground) can be expressed by a number of linguistic forms, such as a verb, a subordinate clause, adposition, and, what Talmy (1985) characterizes as a satellite. According to Talmy (1985), satellites are certain immediate constituents of a verb root other than inflections or auxiliaries. They can take the form of either a free word (e.g., verb particle in English) or an affix (e.g., prefix in Russian). The key idea is that a verb root together with its satellites forms a constituent in its own right that is looked at as a whole. Thus, satellites should be distinguished from prepositions: a preposition will disappear when the Ground element is omitted while a satellite remains (Talmy, 1985). Consider the following sentence:

He ran out of the house.

In this example, *of* is a preposition because once we remove the word *house*, which is a Ground element, the word *of* disappears. On the contrary, the word *out* is a satellite since it remains despite presence or absence of the Ground element, *house*.

Talmy (1985, 1991, 2000) argues that different languages put together the semantic components of motion events in different ways. Based on the characteristic patterns in which the conceptual structure of the macro-event is mapped onto the syntactic structure, Talmy (1991, 2000) suggests that all of the world's languages can be divided into two typological groups: *satellite-framed* (S-framed) and *verb-framed* (V-framed) languages. In S-framed languages, which include Germanic, Slavic, Sino-Tibetan and Finno-Ugric languages, path is lexicalized in a satellite outside the verb (i.e., a verb particle) as in *pop up*, or *come out*, while manner may be expressed by the main verb, e.g. *crawl, run, fly*. The expression of manner, however, is not obligatory. The majority of English verbs, for instance, do not express path, e.g. *go, jump, run, etc.*, though there are few exceptions - *enter, exit, pass, cross*. (Talmy, 1985). Consider the next sentence:

The boy ran into the house.

Here manner is encoded in the verb, *run*, while path is expressed in the satellite, *into*.

Romance, Turkic, and Semitic languages, as well as Basque, Korean and Japanese, are members of the V-framed group. In V-framed languages the path, the core schema, is expressed in the main verb and the manner, the co-event, is lexicalized through other means, specifically, in a subordinate verb or in an adverbial, e.g. *salir*

(*move out*), *subir* (*move up*), *sacar* (*take out*). Below is a Spanish version of the previous English sentence:

El chico entró la casa corriendo.

In this sentence the main verb, *entrar* (*to enter, to go into*), encodes the path while manner is expressed in the gerund, *corriendo* (*by running*). Since in V-framed languages motion manner is encoded separately from the main verb expression, it is often omitted in speech (Berman & Slobin, 1994). S-framed language speakers tend to express information about manner of motion more frequently compared to V-framed language speakers. The latter are inclined to provide such information only when it is important to the context.

More recently, Slobin (2003, 2006) proposed a third group of languages, which he called equipollently-framed (E-framed) languages (e.g., Athabaskan, Hmong-Mien, Hokan), where both manner and path are expressed by the elements of identical significance and salience – either by two equal verbs, each of which expresses either path or manner, or by co-verbs, each of which expresses both path and manner in the same way. Consider the following sentence in Chinese:

Qàihǎo luò zài Lín Zéxú de jiào qián.

Exactly fall at Li Zexu GEN sedan-chair front.

“The (assassin) landed right in front of the sedan-chair for Mr. Lin Zexu.” (Chen & Guo, 2009, p. 1757)

In this context, manner and path of motion are both encoded in verbs, which are equally salient, - a manner verb *luò* is followed by a locative verb *zài*, expressing path.

An example that illustrates the crucial difference in encoding manner of motion in different languages is the narration of one motion scene reported by Slobin (2003). The participants of his study were presented with a wordless picture book *Frog, where are*

you? (Meyer, 1969) and asked to tell a story while describing each of the pictures in the book. One picture showed an owl flying out of a tree and a boy falling off the tree. When speakers of 12 different languages described how the owl came out of a tree, they differed dramatically in their encoding of manner. The manner was rarely, if at all, encoded in V-languages, such as French (0%) and Italian (2%), but was frequently or always encoded in S-languages, such as Thai (59%) and Russian (100%). It has also been found that languages differ in the way they linguistically encode path of motion (Slobin 2003, 2005a, 2005b, 2006), i.e. how often the speakers mention path and how complex the structures are. According to Slobin's (2005b) research findings from oral narratives, conversations, and written work, the users of S-framed languages refer to more path segments and often use more than two segments, while the users of V-framed languages refer to path with less frequency.

Talmy's (1983, 1985, 1991, 2000) work stirred interest in exploring motion meanings and structures and laid the ground for cross-linguistic research of lexical encoding of motion events. Empirical studies using a variety of linguistic and non-linguistic tasks have confirmed the typological differences in the verbal expression of motion in the speech of children (Choi & Bowerman, 1991; Berman & Slobin, 1994) and adults (Cardini, 2008; Chen & Guo, 2009; Gennari *et al.*, 2002; Naigles *et al.*, 1998; Papafragou & Selimis, 2007; Slobin, 1996) in a variety of languages, including but not limited to English, Spanish, Italian, Greek, Russian, Chinese, German, and Hebrew.

Even though Talmy's typology has been a primary framework for research on encoding of motion events, it has been subjected to criticism (Hasko, 2010; Marchetti, 2006; Pedersen, 2009; Rakhilina, 2010). These criticisms embrace a wide range of areas.

Marchetti (2006) criticizes the typology as not displaying uniformity and generalizability, saying that Talmy's method of analyzing meaning cannot be applied to all linguistic instances. Pedersen (2009) argues that the typology lacks a schematic constructional level of analysis, namely, how the principal and the secondary information are organized. He also states that even though the typology shows important patterns of lexicalization, it cannot be applied to other semantic domains. Beavers et al. (2004) state that the typology results from morphosyntactic restrictions in individual languages. They claim that manner must be encoded in a verbal or adverbial category, while path can be encoded in any category; absence of certain lexical categories (e.g., verbal particles) in verb-framed languages limits their ability to encode path. Another criticism is that even though the description and enumeration of semantic categories in the typology is very detailed, it does not take into consideration particular language features, such as directionality in Russian (Hasko, 2009; Rakhilina, 2010). Russian and English are both satellite-framed languages; however, Russian has a category of unidirectional and multidirectional verbs, which does not exist in English. The typology is quite broad and does not take into account less salient differences between the languages in encoding manner and path, thus placing languages with considerable dissimilarities in their surface structures into the same group (Hasko, 2009). These concerns have compelled scholars to take a closer look at such languages and examine the role that intra-typological differences play in actual speech production of L2 learners and bilinguals.

1.2.Event conceptualization

The focus on path and manner of motion, however, is not the only way to analyze motion events. Languages also differ in how information in discourse is organized, and

speakers of different languages select and structure information with regard to motion events in different ways. Event conceptualization has been investigated in contexts that involve processing of some visual input (a picture, a book, a video clip that contains a dynamic situation) to be converted into linguistic forms when asked to view the stimuli and describe what was happening. This line of research on event construals draws on Levelt's (1989) language processing model and its reformulations by Habel and Tappe (1999) and von Stutterheim and Nuse (2003). To express the content of a message, and in the present case, to verbalize a motion event, it is necessary to transform the knowledge relevant to the communicative intention to the linguistic format available in a language. Based on Levelt's (1989) model of human language production, Habel and Tappe (1999) propose four planning processes to activate the knowledge to such a format:

segmentation, selection, structuring and linearization.

A knowledge base in an individual's head is not organized with respect to a certain subject material, so during *segmentation* the units from this knowledge base have to be extracted into a hierarchically structured body of knowledge. This means that complex static structures are broken down into a number of states, and complex dynamic structures are broken down into smaller processes or events. Consider a situation of a woman driving to a store. The speaker can choose to segment a situation like this: *a woman is driving a car*. The speaker can also choose to present the same situation in a more fine-grained way: *a woman sits in a car, she looks straight ahead, she holds the steering wheel, and she presses the gas pedal*.

In the *selection* process, the speaker selects the units that they are going to verbalize and the components that represent the units: entities, spaces, times, properties,

or actions. Thus, deciding on the event components of a goal-oriented motion event, the speaker could choose to mention an endpoint, e.g., *a woman drives **to the store***, or to omit it, for example, *a woman is driving*. These two steps, segmentation and selection, relate to what is usually called macroplanning (Levelt, 1989), which involve deciding on what the speaker is going to say.

When *structuring*, the selected components need to be organized with regard to spatial and temporal reference frames. For example, when creating a temporal perspective, the speaker can choose to use the progressive form to focus on the course of the action: *a woman is driving a car*, or not to specify the temporal boundaries: *a woman drives a car*. The speaker must also choose an anchor point for the events (the beginning, the course, or the end) and to decide how the events are related to each other.

During the final step of the planning process, *linearization*, the speaker has to order the units that have been selected to transform them into the one-dimensional medium of language, which entails the ordering of words and grammatical components (*a woman is driving a car to the store vs. to the store a woman is driving a car*). These two processes, structuring and linearization, relate to the stage of microplanning (Levelt, 1989); they involve the perspective the speaker is taking on the content that has been selected for verbalization. While the processes of segmentation and selection involve choosing the content of speech, structuring and linearization are about a perspective taking of that content.

Several studies (Bylund, 2008; Carroll & von Stutterheim, 2003; Ireland, 2009; von Stutterheim & Carroll, 2006; von Stutterheim & Nüse, 2003) have examined different aspects of motion event conceptualization in monolingual speakers of different

languages. Von Stutterheim and Nüse (2003) and Bylund (2008) investigated patterns of *event segmentation* in aspectual languages, those that have grammaticized verbal aspect (Arabic, English and Spanish), and non-aspectual ones, in which the aspectual distinctions can only be expressed by lexical expressions (German and Swedish). The participants of von Stutterheim and Nüse's (2003) study performed three tasks, i.e. the offline retelling of the film *Quest*, online retelling of the film *Quest*, and the description of single situations (computer animations). The participants of Bylund's (2008) study retold the 14-minute fragment from *Modern Times* and a series of videoclips. For the quantitative analysis, the number of propositional units, either events or states, referring to events was counted. The results of both studies showed that speakers of aspectual languages segment events differently than speakers of non-aspectual ones. For example, when describing the scene of a man standing on a rock trying to get down, the speakers of Arabic and English, aspectual languages, mentioned more events which were smaller and unbounded (e.g., "he is scratching his head," "he is looking down," "he's swinging from the rock") while the speakers of German, a non-aspectual language, reported fewer events and instead included a bigger, "macro" event (e.g., "he wonders how he should get back down from there"[von Stutterheim & Nüse, 2003]). In the same fashion, when describing a scene of a man eating, the speaker of aspectual Spanish mentioned 13 events, while the speaker of non-aspectual Swedish mentioned only 7 events. This tendency was constant throughout the descriptions, with Spanish speakers mentioning 194 events overall and Swedish speakers only 144 when retelling a short video clip (Bylund, 2008).

A number of studies investigated cross-linguistic differences in the *selection* of event components with the focus on endpoint encoding (Bylund, 2008; Carroll et al.,

2004; Schmiedtová, et al., 2007; von Stutterheim & Nüse, 2003). The findings of these studies suggest the relationship between aspect and encoding of the endpoint of motion events. Monolingual speakers of Dutch, German, Norwegian, and Swedish (non-aspectual languages) tend to include an endpoint into their descriptions of events, while speakers of Arabic, English, Russian, and Spanish (aspectual languages) are prone to describe the ongoing event and omit the endpoint.

As for *structuring*, two patterns have been found across monolingual speakers of aspectual and non-aspectual languages (e.g., Bylund, 2008; Carroll & v. Stutterheim, 2003; Carroll et al., 2004; von Stutterheim & Nüse, 2003). The speakers of Dutch, German, Norwegian, and Swedish used an *anaphoric linking strategy*, when time of an event is established in relation to the time of the preceding event by means of anaphoric temporal adverbials. This pattern may be characterized as “event x then event y”. In contrast, the speakers of Arabic, English, and Spanish seldom made explicit the temporal sequence of the events. Their pattern of temporal point of reference may be characterized as “(now) event x (now) event y”. In the same study reviewed above, von Stutterheim & Nüse (2003) investigated the differences in how speakers of English, a language with a grammaticized verbal aspect, and German, a language without a grammaticized verbal aspect, structure motion events. In German narratives the speakers take on an event-based perspective (with the observer/narrator staying in the background); events are related to each other by linking event times. In English narratives, though, the speaker is a temporal anchor point, who opens a window on the flow of the events; the temporal relation between the events has to be inferred, or remains unspecific. It appeared that the presence

or absence of verbal aspect in the language system influenced the way speakers of those languages structure the events and relate them to each other.

The results suggest that segmentation, selection, and structuring of events have language-specific patterns and that in motion event talk, grammar, and more specifically, aspect, play an important role in and are connected with the four processes described above. Monolingual speakers of languages that have aspect in their linguistic system, such as English, French, Spanish, and Russian, constantly encode the ongoing phase of events and are sensitized towards phasal event decomposition preferring an event-internal perspective; they tend to verbalize smaller events and view events as ongoing without particular attention to endpoints. If an aspectual structure has become grammaticalized in the language, the underlying concepts are deeply rooted and highly automatized in conceptualizations of native speakers when organizing information for expression; they become a more automatized option amongst a set of options in processes of conceptualization (von Stutterheim & Nuse, 2003, Bylund, 2008). On the other hand, speakers of languages without an aspectual system, such as German, Dutch, and Swedish, do not pay a lot of attention to the internal temporal constituency of events since they resort to lexical constructions in order to express, for example, ongoingness, but the use of these constructions is not compulsory. The speakers prefer an event-external perspective and encode fewer events and are inclined to include endpoints more often taking a more holistic perspective on the situation. For example, describing the scene in which a protagonist found himself on a pillar of rocks, climbed down, and fell to the ground, an English speaker mentioned 16 events and it seemed as if they wanted to report what they see happening every two seconds or so; a German speaker mentioned only 6

events summarizing what is happening with regard to certain outcomes or intentions of the protagonist (von Stutterheim & Nüse, 2003).

There are languages that constitute exceptions to this pattern and Czech seems to be one of them. Czech is a language that has two aspects: the imperfective aspect that denotes ongoingness expressed by two forms (either the simplex imperfective or the secondary imperfective), and the perfective aspect that conveys completion. The presence of the perfective aspect may direct the speakers of Czech to a preference for endpoints in motion events with a more holistic perspective. The availability of imperfective aspectual forms should focus speakers' view on the ongoingness of the event presented, and speakers of Czech are expected to encode a high number of small events. Studies with speakers of Czech revealed that the speakers of the language prefer the holistic view of the event and do not perform as speakers of aspectual languages, such as Russian, but very similar to speakers of non-aspect languages, such as German (Schmiedtova, 2004; Schmiedtova, 2011; Schmiedtová & Sahonenko, 2008).

Another study that does not coincide with the results of previous research is the study of event construal by L1 Dutch speakers, L1 German speakers and early Dutch–German bilinguals (Flecken, 2011). Even though Dutch and German are similar in the means they employ to mark the aspectual concept (i.e., neither has a grammaticalized progressive aspect), L1 speakers of these two languages differ in the contexts when the aspectual perspective is selected and in the extent to which they chose it. As the results of the study demonstrate, Dutch speakers tend to choose progressive aspect and refer to the ongoingness of actions more than German speakers do, which may be attributed to the

fact that Dutch has a productive linguistic form that expresses the concept of ongoingness, which is not the case in German.

To sum up, monolingual speakers of different languages encode motion events in different ways with path, manner and event construal presenting three areas of difference. The next question to explore is how L2 learners acquire different patterns in encoding motion talk and event construal in their L2.

2. Motion talk in L2

2.1. Acquisition of motion talk by L2 learners

The frameworks outlined above – typological classification of motion events (Talmy 1991, 2000) and event conceptualization (Habel & Tappe, 1999; Levelt, 1989; Von Stutterheim & Nüse, 2003) have been used not only to study motion talk in monolingual speakers but in L2 learners and bilingual speakers as well. The following section outlines the findings of the studies that have investigated L1 influence on L2 motion talk in typologically different languages and then in typologically similar ones.

2.1.1. L1 influence on L2 motion talk in typologically different languages

Thoughts on language transfer, the incorporation and use of the features of a known language into the knowledge system of a language being learnt, have changed several times within the last 50-60 years (Jarvis & Pavlenko, 2008). The research on language transfer started in the 1950s when behaviorism, structuralism, and contrastive analysis had a strong influence on linguistics and related fields; at that time L1 knowledge was considered to be the most powerful factor shaping L2 acquisition (Lado, 1957). Several decades later, L1 transfer was regarded as an irrelevant and insignificant

aspect that did not affect learning L2 (Krashen & Terrell, 1983). However, since the mid-1980s, researchers again have acknowledged the importance of L1 influence in learning an L2 (Gass & Selinker, 1992). At about the same time, Sharwood Smith and Kellerman (1986) introduced a more neutral term – cross-linguistic influence – recognizing that it is not negative that learners draw on their L1, but instead is an inevitable cognitive process. This term also recognizes that not only does the L1 influence the L2 but also the L2 has an effect on the L1 as well.

When learning an L2, the learners face the challenge of acquiring new patterns of motion events encoding; the task is complicated when the semantic components of motion events in L1 and L2 are put together in different ways. To date most of the studies have focused on the effects of the L1 on the acquisition of motion talk in an L2. The assumption tested is that cross-linguistic differences between the languages shape L2 motion talk attainment. The majority of the studies compared two languages that belong to two different typological groups. Research shows that fundamental lexical similarities between L1 and L2 that do not belong to the same typological group can benefit L2 vocabulary learning and in particular how the speakers of such languages lexicalize motion in their L2. Yu (1996) conducted a study addressing the issue of acquiring a typologically different language and whether acquisition of motion talk is facilitated or impeded by the similarities and differences between the languages. His participants were 30 L1 Japanese and 30 L1 Chinese learners of S-framed English, who performed three tasks (retelling stories, describing pictures and translating). The two languages belong to two different typological groups: Japanese is a V-framed language while Chinese is an S-framed language (E-framed language according to Slobin's [2003] proposition). In each

task the participants were awarded points for their answers; for example, on a multiple choice translation task one point was awarded for each correct choice. The analysis of L1 Japanese and L1 Chinese speakers' performance in L2 English showed that the L1 Japanese group did worse (scored significantly fewer points) than the L1 Chinese group on all three tasks. These findings confirm previous assumptions that differences in lexicalization patterns in typologically different languages impede L2 acquisition of motion talk. With regard to encoding motion events, Chinese is closer to English than Japanese, as both consistently rely on manner verbs to encode manner of motion. An important finding reported by Yu (1996) is that typological similarities in the expression of motion events can assist in the learning of motion structures, even in such different languages as English and Chinese. While Yu (1996) mainly accounts for his findings by the type of instruction (e.g., usage of metalinguistic cues or absence thereof) and learner's level of knowledge of the target language, this accounting seems quite narrow. It seems important to acknowledge the differences and similarities of the languages used in the study as also being responsible for the learners' performance.

With the interest in Talmy's (1991, 2000) typology of motion events rising, the differences and similarities between the languages were studied in more detail with manner and path encoding being in the center of researchers' attention. The results of research on motion events encoding demonstrated that typologically different languages display differences that can prevent L2 learners from acquiring L2 patterns of lexicalization of motion. In one study, Inagaki (2002) examined the acquisition of L2 path encoding depending on the typological characteristics of the learners' L1. The languages under investigation, English and Japanese, belong to two different groups, S-

framed and V-framed respectively. The researcher conducted a picture matching experiment with Japanese L1 learners of L2 English with an L1 English control group and then compared their performance to his previous findings with English L1 learners of L2 Japanese (Inagaki, 2001). After the comparison, Inagaki (2002) found that Japanese learners of English had difficulties in performing the tasks. L1 Japanese speakers consistently failed to recognize a directional reading of English manner verbs with directional/location prepositions. For example, in the English sentence *Sam ran behind the house*, the combination of *behind the house* can be either the goal of Sam's running (directional) or the location of Sam's running (locational). He attributes these results to the fact that Japanese has more restrictions in encoding path (manner verbs can be used only with locative prepositional phrases and not with directional ones). In his 2001 study, he found that L1 English learners of L2 Japanese also had problems acquiring L2 Japanese motion patterns, i.e. they had difficulties learning that it is impossible to use manner-of-motion verbs with goal prepositions in Japanese and treated such structures as grammatical because they are accepted in English. Thus, the typological characteristics of the L1 played an important role in the L2 acquisition of motion talk: the differences between the languages complicated acquisition of motion encoding. Interestingly, Japanese learners of L2 English did better in Inagaki's (2001) study than English learners of L2 Japanese, suggesting that it might be easier to acquire the patterns of motion lexicalization of a language that offers more freedom in encoding motion events.

However, the drawbacks of using picture matching tasks are that participants have a 50 percent chance of a correct match and that the likelihood of a correct response depends in particular on the similarities between the pictures, rather than the knowledge

of the language. Another shortcoming of this research is that some of Inagaki's (2002) findings, for example "misanalysis of relevant directional sentences as locational ones" (p. 21), were not explained at all. The final weakness of the study is the researcher's failure to control for the proficiency level of the participants. The Japanese-speaking participants did not take any tests to establish their proficiency in English and their intermediate level of English was assumed based on the years of studying English and the absence of any long trips to an English-speaking country.

To conclude, the findings of these studies are in line with Odlin's (1989) and Jarvis and Pavlenko's (2008) statements on cross-linguistic influence. The data support the notion that similarities and differences between languages can influence the acquisition of vocabulary and grammar in the L2. The L2 speakers of the studies (Yu, 1996, Inagaki, 2001, 2002) were similar in their L2 proficiency level. The question arises whether it is easier to acquire L2 patterns of motion encoding for more proficient speakers of the L2 than for less proficient speakers ones. Another focus of interest is whether less proficient speakers display stronger effect of the L1 on their L2 than more proficient speakers.

Continuing the line of research on language transfer, in particular, L1 effects on the L2 in typologically different languages, Matsunaga (2006) tested manner-of-motion verbs with goal prepositions in L2 English by advanced German and advanced and intermediate Japanese speakers. The languages belong to different typological groups since German and English express manner of motion in the main verb and Japanese expresses path of motion in the main verb. Similar to English, German allows directional prepositions (e.g., *into*, *from*) with manner-of-motion verbs, while Japanese does not.

After the participants performed a sentence-combining task and the data were analyzed, Matsunaga replicated Inagaki's (2002) findings that advanced Japanese learners of English were able to produce the correct manner-of-motion verbs with goal prepositions and actually to the same extent as German speakers. L1 influence from Japanese was observed in less proficient learners of English. Less proficient speakers of English produced the constructions possible in their L1, but seldom or never used by native speakers of English, thus displaying the effect of their L1.

Lexicalization of motion is a linguistic domain acquired early in life and thus, L2 learners find it relatively hard to follow the patterns of L2 motion encoding in both speech and gesture. Other studies include analyses of co-speech gesture and also present evidence of L1 influence and transfer of path/manner-related preferences in speech and gesture of the L1 and L2. A group of researchers investigated several aspects in the domain of motion encoding in advanced L2 learners. Negueruela *et al.* (2004) used "thinking-for-speaking" as the primary framework in their examination of the encoding of manner and path in motion verbs as well as gestures associated with these features. The researchers looked at the gestures co-occurring with verbs and satellites since speakers of different languages combine gestures with different elements of motion encoding – manner or path. When a speaker encodes manner lexically in the verb but gesturally in the satellite, the discrepancy may indicate that they use patterns from two languages – one from their L1 and another from their L2. Thus, the researchers attempted to examine whether L2 speakers shift lexically and gesturally toward an L2 "thinking-for-speaking" pattern or maintain their L1 pattern. The focus of their research is on gestures that occur simultaneously with speech and serve to amplify the meanings expressed in

speech. Spanish speakers tend to focus their path gestures on path verbs and they tend to mark manner lexically, gesturally, or through a combination of both. On the other hand, English speakers focus their path gestures on satellites and encode manner in the verb where motion and manner conflate (Negueruela *et al.*, 2004). Using narratives based on the descriptions of a picture book *Frog Comes to Dinner* (Mayer 1979), they found that the participants mainly relied on the L1 pattern. Even when the participants speaking their L2 used an L2 verb, they would still use an L1 gesture to communicate manner or path (e.g., 23% to 33% of the path gestures of the Spanish learners of English fell on the verb). L1 Spanish speakers still focused their path gestures on verbs when narrating in their L2 English. For example, one of the participants synchronizing the path gesture (i.e., her entire upper torso moved in a backward direction) with the verb, which is typical in Spanish, instead of the satellite, which would be characteristic of English path encoding, when describing a woman falling in her chair *she falls in it*. On the other hand, L1 English speakers avoided the preferred Spanish pattern, which is to synchronize path gestures with path verbs. While encoding both manner and path, some L2 speakers created their own means of dealing with typological differences between English and Spanish in order not to shift to the L2 pattern, for example L1 Spanish speakers used manner gestures in L2 English even when manner was not encoded in the verb.

All in all, the study shows that even advanced L2 speakers have difficulties manifesting L2 thinking for speaking patterns and maintain the patterns internalized in their L1. The findings, however, are constrained by the number of participants. There were only three participants in each group (L2 Spanish-L1 English, L1 Spanish, L1 English and L1-English-L2 Spanish), and thus their findings cannot be generalizable to a

bigger population. The researchers did not specify how they decided on what was counted as manner or path verbs and manner or path elements, nor did they provide the list of verbs and elements to which they refer. The examples in the discussion section are not sufficient for the reader to fully comprehend how the analysis was carried out. In addition, the elicitation procedure raises some questions. First, the participants saw only half of the story, were paired with the participants who saw another half and they retold these parts to each other. After that, they were made to retell the whole story. The procedure could create differences in the content of the obtained narratives thus making the data not very comparable.

According to the main findings from the studies presented above, the L1 plays an important role in learning and acquiring an L2 in the domain of motion, even though the degree and the characteristics of L1 influence may differ. Acquisition of motion verbs in an L2 seems to follow the same direction as learning many other aspects of a language. The speakers are learning the L2 lexicalization patterns rather quickly, but they have not learned them completely; they still apply L1 lexicalization patterns while encoding motion events in an L2, especially those with lower proficiency in the L2. They have difficulties in identifying the ungrammaticality of sentences or producing grammatically correct sentences utilizing their L1 patterns. The results also indicate that higher proficiency in L2 facilitates the learning of motion events encoding. The data from other studies demonstrate that L2 learners can acquire a different pattern of the L1 effects on the L2 motion talk.

A certain number of studies in the acquisition of L2 in the domain of motion demonstrate that learners may manage very well to follow target-like preferences in

encoding motion events. The lexicalization of motion events in the oral narratives of L1 English-L2 Spanish adult speakers was examined by Navarro and Nicoladis (2005). The researchers were interested in how L2 Spanish learners encoded path verbs, manner verbs, and adverbial constructions in L2 Spanish. The participants, ten L1 English-L2 adult proficient Spanish speakers and ten L1 Spanish speakers, had to retell in Spanish the stories from two video excerpts. The results showed that although the L2 Spanish speakers closely approximated the L1 Spanish pattern when describing motion events, there were still some remnants of English grammatical patterns in their narratives. For example, the L2 Spanish speakers produced more intransitive path verbs, such as *caminar* (to walk) or *ir* (to go), followed by a post-verbal phrase and fewer post-verbal manner expressions, such as *corriendo* (by running), than L1 Spanish speakers, which can be attributed to the influence of their L1, English.

However, the researchers' argument that the participants showed a "trend towards a complete acquisition of the Spanish typology (p. 106)" is problematic as it is not necessarily supported by the data. Spanish is not rich in expressing manner of motion and the researchers based their claim mainly on the count of manner and path verbs in the participants' narratives, rather than performing statistical analyses to find out whether the differences were significant or not. One of the major weaknesses of the study is that the researchers did not make explicit which verbs they considered to be manner verbs and what they counted as path and manner elements (satellites). Since it is not known what criteria were used for placing the verbs and satellites into the two groups, manner and path, it is very difficult to compare these results with other studies. Additional criticism of the study is that no monolingual English control group was included, and thus, it is

difficult to evaluate cross-linguistic differences in L2 Spanish-speaking participants. Control groups provide a baseline for comparison and without them there is no basis for knowing if the obtained result is due to the influence of the L1 in the L2 or to some other factors. Moreover, the decisions were based on the researchers' judgments only, who are Spanish-English bilinguals, and their bilingual system of motion event encoding could be different from L1 and L2 linguistic system.

While Navarro and Nicoladis (2005) argued that L2 learners can acquire motion structures even when they are differently encoded in their native language, this does not coincide with the main findings from the previous studies that show that L1 effects are evident and that the argument structure of the L1 constrains motion expressions in the second language. The differences may be related to the proficiency level of the participants, or to the characteristics of the L1s and L2s in those studies. Moving from a language rich in manner verbs to a language that does not frequently express manner of motion will naturally result in native-like encoding of the manner of motion. Kellerman (1995) calls it "transfer to nowhere", when the linguistic expressions of the L2 may go ignored and the transfer is not licensed by the similarity to the L2.

Nevertheless, Navarro and Nicoladis's (2005) study demonstrates that despite belonging to different typological groups, it is possible for L2 learners to acquire L2 patterns of lexicalization of motion events very close to native-like degree. Similar to Navarro and Nicoladis (2005), other researchers found similar evidence regarding the influence of the L1 on the encoding of motion events in the L2. Cadierno and Ruiz (2006) examined written performance of three groups of speakers: S-language learners of V-language (L1 Danish learners of L2 Spanish); (b) V-language learners of V-language

(L1 Italian learners of L2 Spanish); and (c) native speakers of Spanish, a V-language. The participants were asked to write in Spanish a story based on a picture book. The findings of the overall type/token analysis of motion verbs showed significant differences between both L2 learner groups and the native speaker group, but not between the two learner groups. After analyzing encoding manner and path of motion by the participants, the researchers came to the conclusion that the L1 Danish learner group did not differ significantly from the L1 Italian learner group in expressing manner of motion, but demonstrated a higher degree of elaboration of the semantic component of path of motion, which might be the result of the influence of their L1. Overall, Cadierno and Ruiz (2006) argue that the results show a limited role of the L1 in expression of motion events, thus questioning L1 thinking for speaking patterns in advanced L2 learners.

The results of the study are limited, however, because of weaknesses in the research design as well as in the analysis of the results. The L2 proficiency level of the participants was not measured but assumed; thus, speakers with a high L2 proficiency level might have been wrongly placed in a lower L2 proficiency level group. Most likely, such learners could have performed closer to the L2 lexicalization patterns and the results of the study might have been contaminated. While the researchers claimed to analyze manner and path of motion, it is not clear why they included into their analysis action verbs such as *mirar* (*to look*) and *ver* (*to see*), which do not really count as motion verbs and do not express manner or path. The problem arises that the inclusion of such verbs into the manner or path group verbs could have distorted the picture of the frequency of manner and path encoding in the languages. Another reason for highly L2-like performance may involve typological differences between the languages in question.

Moving from an S-framed language (L1 Danish) rich in manner of motion expressions to a V-framed language (Spanish) poorer in manner of motion verbs, it was practically impossible to demonstrate L1 influence in the manner of motion. If the opposite transition had been investigated (moving from the V-language L1 Spanish to the S-language L2 Danish), the researchers might have obtained different results.

The research appears to support the assumption that the difference between the languages complicated acquisition of motion in the L2. The difficulties come from the syntactic complexity of the target motion lexicalization patterns and from the typological features of the L2. In a recent study of L1 English learners of L2 Chinese by Wu (2011), 55 U.S. university students (intermediate and advanced level of L2 proficiency) as well as 20 L1 speakers of Chinese were administered a controlled composition task and a picture-cued written task. As expected, the source of the difficulties was the differences and similarities in typology and in semantics of spatial categorization between the languages. In English, an S-framed language, path is encoded only in satellites while in Chinese, an E-framed language, directional complements, namely, six types of them, can encode path and also function as independent verbs. Wu (2011) found that L1 English learners acquire directional complements in the order of increasing cognitive linguistic complexity in producing the directional complements forms from simple ones, which closely resemble English linguistic forms, to very complex ones, which are non-existent in English. Wu (2011) also divided the participants into heritage Chinese speakers and foreign Chinese language learners. He found that the amount of exposure (greater for heritage speakers) positively correlated with the participants' performance. The L2 learners in his study, under the influence their L1 English, used fewer directional

complements than L1 Chinese speakers; L2 learners also displayed some degree of inappropriate use of directional complements. Unfortunately, no L1 English group was used in the experiment, the absence of which makes it impossible to trace the inappropriate use of directional complements to certain linguistic features in their L1 English.

To sum up, previous research has shown varying degrees of L1 influence on the acquisition of motion talk in an L2. Learning a typologically different language may create difficulties for the L2 acquisition (Inagaki, 2001, Negueruela *et al.*, 2004), while learning a language that is similar to the L1 may have no effect on or even facilitate it (Cadierno and Ruiz 2006; Navarro & Nicoladis 2005). While these studies shed light on the influence (or absence thereof) of the L1 on encoding of motion events in the L2, they are not without flaws, such as the quality of screening and number of participants, data elicitation procedures, insufficient description of data analysis, and lack of detailed attention to the characteristics of comparable languages. In future studies, it would be useful to investigate the effect of positive evidence on the acquisition of motion talk in the L2, and of explicit versus implicit teaching of motion verbs, as well as to involve a wider range of languages and learners of different levels of proficiency in the target language.

2.1.2 L1 influence on L2 motion talk in typologically similar languages

Fewer studies of motion talk have been conducted with L2 learners of languages that belong to the same typological group as the L1. At first glance this makes sense because in the context of typological similarities one expects only facilitation and not interference (Navarro & Nicoladis, 2005; Yu, 1996). However, this is not the case with

some languages within the same typological group that may differ in finer details of motion encoding. In such situations even highly proficient learners keep struggling with the domain of motion (Hasko, 2009). Russian and English constitute a case in point. Despite belonging to the same S-framed group of languages, encoding of both manner and path has significant dissimilarities not accounted for in the typology. Aspect can also be added to the list of differences; when talking about motion events, aspect creates specific patterns of the space and time continuum, which are not expressed in English in the same way as in Russian.

One of the few studies investigating motion talk in typologically similar languages was Hasko's (2009) study, who examined the use of Russian verbs of motion by highly proficient American learners of Russian. Her study was two-fold: the researcher looked at general difficulties of Russian motion verbs for English speakers, and examined a unique characteristic of Russian motion verbs, directionality, in the use of L2 speakers. 60 college students - 30 L2 learners of Russian (residing in the U.S.) and 30 native speakers of Russian (residing in Russia) - took part in the study. The L2 Russian participants were at the highest level of proficiency in the Middlebury Russian school or enrolled in graduate level Russian courses. Their advanced level of proficiency was determined by using the participants' placement test scores - a simulated Oral Proficiency Test (SOPI), computerized grammar, speaking, and listening exams, and an essay. These scores coincided with the participants' self-assessment questionnaire administered during the study. The wordless picture book *Frog, where are you?* (Meyer, 1969) was used as a visual stimulus for the elicitation of spontaneous narratives. The participants also participated in post-experimental interviews, where they talked about the

difficulties and problems encountered during the task. The researcher carried out frequency counts and error analyses, as well as qualitative analysis of the narratives. The participants' performance showed that L2 Russian speakers demonstrated insufficient encoding of manner nuances, and L1 influence on the lexicalization patterns for path encoding and resistance to L2 shift. Thus, the selection of a contextually appropriate manner of motion was still a problem even for highly proficient learners of Russian, as well as the underuse of path prefixes and the choice between multi-directional and unidirectional verbs. The results were confirmed by the participants' comments of their restricted motion verb repertoire. While the researcher anticipated the task to be challenging, the high percentage of errors for such a proficient group of learners was unexpected. The amount of errors was explained by the fact that the learners are exposed only to a restricted group of motion verbs, mainly multidirectional ones with rare mentioning of unidirectional verbs. One of the drawbacks of her study was the absence of statistical analysis, which could have revealed whether the differences between the performance of L1 and L2 Russian speakers were significant; also, the absence of statistical analysis limited generalizability of its findings.

Hasko's (2009) study is important for motion talk examination as it challenges the widely accepted typology in that it demonstrates that languages that are in the same typological group can have significant differences in lexicalization of motion. Those differences create difficulties for L2 learners in understanding and verbalizing motion events and impede acquisition of motion verbs. While several studies reviewed previously have shown that membership in the same typology serves as a helping or

hindering factor in L2 acquisition, the results of Hasko's (2009) study provide evidence that typological theories should be applied to practice only after their rigorous testing.

Motion verbs seem to be a difficult linguistic area to acquire while learning an L2 in adulthood. However, the higher L2 proficiency level of learners is, the better they seem to perform in the encoding of motion verbs in their L2. An early start to learning an L2 may help learners to achieve native-like proficiency in the domain. As Russian and English belong to the same typological group, Gor et al. (2010) examined whether acquiring Russian verbs of motion was comparably difficult for those who began learning Russian early and late. They investigated acquisition of motion verbs by heritage (early learners) and non-heritage (late learners) speakers of Russian establishing whether high proficiency American learners of Russian process motion verbs in the same way as heritage speakers of Russian of a similar proficiency level. 36 adult L1 English learners of Russian, 24 heritage speakers of Russian living in the U.S., and 10 adult L1 Russian speakers took part in the study. The researchers used a grammaticality judgment test (GJT), a restricted control test, and a sentence completion test to measure the participants' perception and production of motion verbs. The results indicate that both heritage and non-heritage speakers did not attain the same level of accuracy in perceiving and producing motion verbs as L1 speakers of Russian. The difficulties for the two groups were different: unidirectional unprefixated verb of motion (VoM) (e.g., *bezhat* [run]) were most problematic for heritage speakers while multidirectional prefixated VoM (e.g., *ishofit'* [through-walk]) caused difficulties for non-heritage learners of L2 Russian. The possible explanation of this finding is the fact that expression of directionality and prefixation is specific for Slavic languages and thus, harder to master for non-heritage

speakers. However, there were also similarities in how the two groups differed from L1 Russian speakers. Both heritage and non-heritage speakers favored multidirectional verbs when the context required unidirectional verbs; they also used more generic verbs instead of manner of motion verbs underrepresenting manner of motion in their narratives.

The study was not without flaws, however. First, the range of age of the participants in each group was very high – the youngest participants were in their early twenties and the oldest participants were in the mid-fifties. The issue is that different generations may use various linguistic forms, motion verbs in particular, differently, thus forming a problem of creating a base-line in using motion verbs for the researchers. The researchers used a set of highly controlled experiments, such as a Sentence Completion Task, a Restricted Control Task, and a Grammaticality Judgment Task, without employing free or guided narratives. Even though these tasks (such as GJT) provide certain insights into high-proficiency processing of VoM, this kind of data elicitation is not representative of language use in a communicative context.

In spite of these weaknesses of the study (Gor *et al.*, 2010), its findings support earlier claims that Russian verbs of motion are not fully acquired even among highly proficient L2 speakers (Hasko, 2009), and they tend to be less proficient than heritage speakers in most categories of their acquisition. The data show that there are certain linguistic forms that are harder to acquire than others (e.g., unidirectional verbs are underused by L2 learners of Russian) and that it is easier to attain high proficiency in other linguistic forms encountered at an earlier age (e.g., multidirectional prefixed verbs by L2 heritage speakers of Russian). The question that arises then is what causes the difficulties in acquisition? Can salience of semantic features influence the degree and the

speed of acquisition? Bondarchuk and Derwing (2009) investigated the relative salience of the main semantic features that distinguish motion verbs and their use. The participants, 47 L1 Russian speakers, 20 L1 Bulgarian learners of L2 Russian, and 20 L1 non-Slavic learners of L2 Russian, were administered a sorting task, in which they had to sort verbs into two groups on the basis of some shared property. The findings show that a salience hierarchy exists among the four features investigated for the Russian VoM – definite or indefinite verbs and whether the action was performed to or away from the object. The surprising factor was that the language background of the participants did not play an important role. The two L2 Russian learners groups were speakers of typologically different languages with Bulgarian being an S-framed language like Russian and non-Slavic languages being V-framed ones. The participants favored almost the same features as L1 Russian speakers. Moreover, all three groups performed very similarly to each other, whether the sorting was based on intuitive knowledge as in the case with L1 Russian speakers, or on overt knowledge gained in a formal classroom as in the case with L1 non-Slavic L2 learners of Russian.

While the results of the study are interesting, the problems with the selection of participants make them of rather limited value. The age range of the participants was very wide – from 13 to 56 for the L1 Russian group, 16-51 for the L1 Bulgarian group, 16-65 for group the L1 Non-Slavic group. Since the participants had different levels of education, different levels of metalinguistic awareness and probably employed various linguistic forms, it was difficult to establish a baseline of what can be considered a standard. Another issue with the participants arises from the fact that the speakers in the third group were from different language backgrounds. Since previous research

demonstrated the importance to consider L1 effect on the acquisition of the L2, the results obtained by the researchers may have been contaminated and the generalizability of the findings is limited.

The choice of the task assessing the salience of the semantic features distinguishing motion verbs seemed problematic. Sorting cards task required the usage of explicit knowledge as well as background knowledge by the participants. Thus, the results may have painted a distorted picture since some of the participants learned Russian in the classroom and the results may have reflected learned grammatical rules, while others, i.e. L1 Russian speakers, have acquired the language in a non-formal setting.

Based on the studies discussed above, the transition between typologically similar languages appears to be not as smooth as it has been believed to be by some researchers (e.g., Navarro and Nicoladis, 2005; Yu, 1996). The findings from previous studies with L2 learners (Gor *et al.*, 2010; Hasko, 2009) demonstrate that the differences in encoding motion events between languages of the same typological group cause difficulties in L2 acquisition. The languages differ in the frequency of manner encoding, in the characteristics of aspect encoding as well as containing certain linguistic features that do not exist in another language belonging to the same typological group (the category of directionality in Russian). As a result of these differences, even highly proficient learners do not attain high level of L2 motion verbs acquisition. Under the influence of their L1, L2 learners overuse multidirectional verbs and underrepresent manner verbs or use them incorrectly. Languages that belong to the same typological group deserve more attention

from researchers in trying to detect the dissimilarities between them and the extent of the effect they play in the speech of L2 users.

Conclusion

The review of the literature on the acquisition of motion talk confirmed the strength of the L1 influence on L2 learning in this area, and demonstrated the complexity of motion talk. Talmy's typology has been a useful foundation for conducting studies on the acquisition of motion talk in L2. Since typological distinctions often reflect tendencies rather than absolute differences between languages (Berman & Slobin, 1994), it would be overly idealistic to expect Talmy's typology to describe motion structures of each individual language accurately and precisely. However, new findings (Hasko, 2009) point to the need to reconsider or at least to have another look at it. The studies summarized in this section established that speakers of different languages lexicalize motion events differently, and that L1 patterns may influence L2 motion talk both in typologically different languages and in languages that belong to the same typological group, such as Russian and English.

In all those studies, speakers used their L1 in everyday life employing their L2 only temporarily and not for a long period of time. Yet in light of the findings a question may arise regarding the relations between a person's L1 and L2 when two different grammatical systems and two different patterns of motion talk are both used on a day-to-day basis. Does one system substitute for another and, if so, which one prevails? Or do both systems co-exist with a certain distribution of duties? Or maybe there is a blend of the two systems that in turn has created a third unique system? Bilingual populations can

offer a fruitful ground for an investigation of the relationship between the two systems in encoding motion events.

2.2. Bidirectional crosslinguistic influence in motion talk of bilingual speakers

While Second Language Acquisition (SLA) studies have focused primarily on L2 performance, bilingualism researchers have examined bilinguals' performance in the L1 (possibly undergoing attrition) or in both languages. Bilinguals are people "who use two languages in their daily lives, be it simultaneously... or consecutively... regardless of respective levels of proficiency in the two" (Pavlenko, 2006, p. 2). So far, research in the area of bilinguals' motion talk has been mostly devoted to lexicalization of motion events with the focus on the effects of the L1 on the acquisition of L2 motion verbs (e.g., Slobin, 2006), L2 influence on L1 (i.e., Pavlenko, 2010), cross-linguistic influence of L1 and L2 (Brown & Gullberg, 2008; Hohenstein *et al.*, 2006), as well as event conceptualization, with the focus on the effects of the grammatical features of the L1 and the age of onset of L2 acquisition on end-points encoding (Bylund, 2009; Bylund and Jarvis, 2011) and on event segmentation (Schmiedtova *et al.*, 2011; Bylund, 2010). The following section consists of an overview of the research on L2 influence on the L1, the effect of the onset of L2 learning on performance in the L1, and bidirectional transfer in the acquisition and maintenance of motion talk.

2.2.1. L2 influence on L1

Until the 1990s, the research on language competence had focused mainly on L2 competence of L2 users with little attention given to their L1 (Odlin, 1989). However, in the beginning of the 21st century, the field of bilingualism started considering the effect of the L2 on the L1 in late bilinguals (Pavlenko, 2000) followed by the first volume

devoted completely to this subject (Cook, 2003). Thus far, L2 influence on L1 has been studied in such areas as phonology, morphosyntax, semantics, as well as emotions, self-construal and autobiographical memories.

Bilinguals' motion talk in the L1 has received significant attention from researchers in the past several decades. Event construal, encoding of path and manner and the effect of the age of acquisition (AOA) have been in the center of attention. This line of research examines the changes in the bilinguals' L1 under the constant use of the L2. The assumption is that coexistence of two languages changes the conceptualization of motion events towards the L2 system taking over the L1 system or the convergence of the two systems. Bylund and Jarvis (2011) investigated the effects of L2 on L1 event construal. At the center of their study was endpoint encoding in languages belonging to different groups with regard to grammatical aspect: Spanish, which expresses aspect through verbal morphology, and Swedish, which lacks aspect. Based on previous research (Bylund, 2009; von Stutterheim, 2003; von Stutterheim & Nüse, 2003) they predicted a relationship between grammatical aspect and event conceptualization, i.e., the speakers of non-aspectual language would mention more endpoints than speakers of a non-aspectual one. The researchers examined the influence of L2 Swedish on L1 Spanish oral narratives, and also took into consideration whether such factors as age of onset of L2 acquisition, length of residence in the L2 environment, and overall L1 grammar knowledge affect performance in any way. 40 L1 Spanish-speaking active users of Swedish (experimental group) and 15 adult native speakers of L1 Spanish (control group) participated in the study. They retold several video clips and took an aural GJT, with both tasks performed in Spanish. The results showed that bilinguals mentioned endpoints

significantly more frequently than the monolingual control group. This suggests that bilingual active users of Swedish, a non-aspectual language, use endpoints more often in their L1 Spanish (even though an aspectual language) than the L1 speakers of an aspectual language. Furthermore, the bilinguals who were weaker in discrimination of aspectual errors on the grammaticality judgment test were more prone to mentioning endpoints in their narratives.

The findings supported the hypothesis of interconnectedness between grammatical aspect and event conceptualization. It seems that bilinguals are affected by the L2 schemas of event construal, specifically, they are less attentive to features of ongoing actions but encode endpoints more often than monolingual controls. Unfortunately, this is another study that does not provide details on the language proficiency assessment the researchers were using. As a part of the experiment, a GJT was used to measure the participants' formal language skills in L1; however such tests can provide only limited insights. It is assumed that a native speaking adult can easily identify and correct an error while in fact, there can be considerable divergence of opinion on grammaticality even among native speakers. Moreover, GJT mainly examines the linguistic knowledge but not use of the language in a context. Overall, the results of Bylund and Jarvis' (2011) study demonstrates that the L1 of L2 speakers, whose languages belong to different typological groups, may undergo changes approximating L2 norms and that their knowledge of L1 grammatical aspect correlates with the L1 endpoint encoding – the better their grammatical knowledge of L1 was, the more their performance approximated the performance of monolinguals in the number of endpoints used in the narratives.

It appears that the process of event conceptualization is as prone to L1 effects as other domains and it is a normal part of the course of acquiring a second language. Yet, there are other aspects in the domain of motion to be investigated in order to understand whether and to what extent multiple linguistic systems interact. Motion verbs are a multifaceted domain, in which different areas, such as encoding of manner, path, directionality, etc., may be affected differently by learning an L2.

As a case in point, the differences between the languages, especially in the ways they lexicalize motion, may influence the degree of L1 influence on the L2. It is possible that the more similar the languages are in motion encoding patterns, the less interference of the L1 might be observed in the encoding of motion in the L2; however, supportive transfer may still be detected. The results obtained in Pavlenko's (2010) study, who investigated the influence of the L2 on expression of motion events in L1 speech in late Russian-English bilinguals, were different from the findings in Bylund and Jarvis' (2011) study. The languages under investigation belong to the same typological group (according to Talmy's typology). Even though they share the presence of aspect in their linguistic systems, they are different in the encoding of manner of motion – while it is near-obligatory in Russian, it is optional in English (details on how obligatory manner is in Russian and in English will be discussed in more detail in Section 3.2). In Pavlenko's (2010) study the participants (70 late Russian-English bilinguals and 4 Russian-English childhood bilinguals) reported the content of short films or of the picture book *Frog, where are you?* (Meyer, 1969). The researcher found only a few instances of L2 influence in the L1 narratives, mostly in areas which do not have direct equivalents in the participants' L2, English (e.g., in marking the beginning of action, monolingual Russian

speakers would use prefixes, but the bilingual participants used the word *nachat* [*to start*] without a prefix in the verb) and those instances demonstrated simplification of the L1 motion lexicon in aspect, manner, and directionality. As there were not many such cases, the findings of the study suggest that the L1 motion lexicon is relatively stable and resistant to L2 influence.

Thus, this study suggests that in some cases the domain of motion in L1 might not be affected greatly by the acquisition of L2. This supports previous claims that motion components are acquired quite early in the course of language development (Berman & Slobin, 1994; Papafragou, 2010; Selimis, 2007). Bilinguals may have already acquired motion talk by the time they start learning another language and thus, no changes can be observed in their motion talk in the L1. However, it is necessary to point out that it may not be the case with simultaneous bilinguals, who are acquiring two languages at the same time and may not enjoy an opportunity to have their L1 motion talk fully established.

One variable that might affect the degree of influence of L2 on the L1 is the age of onset of learning the L2. In the case of Pavlenko's (2010) study, the participants were late bilinguals, which may explain relative stability of the motion lexicon in their L1. Bylund (2009) examined the role of AOA in endpoint encoding and temporal perspective in goal-oriented motion events. The languages in question belonged to two different groups – S-framed Swedish and V-framed Spanish. 31 L1 Spanish–L2 Swedish bilinguals with different AOA living in Sweden created narratives based on a picture book. Bylund found that patterns of event conceptualization are affected in the same way as formal language skills, i.e. they highly depend on the age when the speakers started

learning their L2. Participants with an AOA<12 produced narratives that were different from the monolingual Spanish speakers' performance, i.e. bilinguals mostly overproduced the endpoint and the starting point in their narratives, which would be more characteristic of Swedish speakers. His participants with an AOA>12 completely converged with the monolingual controls. Thus, the results provide evidence that AOA is indeed a strong factor in maintaining L1 patterns of motion event encoding. However, it is necessary to remember that Bylund (2009) examined endpoint encoding while Pavlenko (2010) looked at manner, path, directionality and aspect. Therefore, the differences in the areas under investigation may explain the differences in the effects found by the researchers.

The studies discussed above examined the production of motion verbs by bilingual speakers. The languages that people speak and their linguistic structures also regulate the way people perceive motion events. The results from previous studies (e.g., Bondarchuk & Derwing, 2009) demonstrated that L2 learners are capable of perceiving motion events very similar to L1 speakers no matter how they learned a language – intuitively, like L1 speakers do, or in an educational setting with explicit teaching of the language. Will the results hold the same for bilingual speakers? Czechowska and Ewert (2011) focused on bilinguals' nonverbal perception of motion, specifically of two aspects – manner and path. Polish and English, the languages under investigation belong to the same S-framed typological group. However, manner is more salient in Polish (motion is rarely expressed by a verb not marked for manner, while English has generic high-frequency non-manner motion verbs) and path is more salient in English (English has a variety of path verbs, e.g., *enter*, *exit*, *cross*, while Polish has very few path verbs). The

researchers administered GJT and a similarity rating task to five groups of participants: L1 English speakers, L1 Polish speakers, L1 Polish learners of L2 English with intermediate proficiency in the L2, L1 Polish learners of L2 English with advanced proficiency in the L2, and Polish-English bilinguals, who are actively using their L2 English. What makes this study stand apart from other studies on bilinguals' encoding of motion is that no linguistic cues were given to the participants and the whole experiment was based on pictures; the participants had to choose the pictures that were most similar to each other. Not surprisingly, the most advanced group of speakers, L2 users of English, performed differently from ESL learners and their performance provided evidence that conceptual change is taking place. Bilingual participants were desensitized to the manner of motion and performed closer to the L1 English speakers attending to path more frequently than L1 Polish speakers. Another interesting finding was that the participants were more sensitive to cues of the language they used less. Advanced L2 English learners behaved more in an English-like manner, even though they had only limited contact with the language. Polish-English bilinguals, who were obtaining education in their L2 English only, behaved more in a Polish-like manner, although they use their L1 Polish less frequently than other speaker groups.

It appears then that the findings of L2 influence on L1 in bilinguals vary from study to study. However, even though several areas were investigated, none of the researchers examined the effect of L2 on the lexical richness of L1 motion verbs. It might be that even though no strong effects have been found in how the participants encode manner or path, their motion vocabulary – breadth and depth – could have undergone changes due to crosslinguistic influence. Previous studies demonstrated that L2 does

influence lexical diversity in L1 speech (e.g., Dewaele & Pavlenko, 2003; Vermeer, 2001) and written expression (e.g., Laufer, 2003). Since motion verbs are a part of a general vocabulary, it is most likely that the richness of bilinguals' L1 motion vocabulary experiences some kind of influence.

To sum up, the studies to date have established that the degree to which bilinguals process and express motion events depends on when the L2 is learned. Late bilinguals seem to be relatively resilient to L2 influence on L1, while early bilinguals, who are dominant in L2, shift more easily to L2 patterns. The findings also suggest that the difference or similarity between the bilinguals' languages affect the degree of L1 influence on L2. Most often, however, the effect the languages produce is reciprocal; the bilinguals incorporate linguistic structures of L1 in the L2 at the same time as they would use linguistic forms of the L2 in their L1.

2.2.2. Bidirectional transfer

So far the studies discussed above have dealt with either L1 maintenance or L2 proficiency in encoding motion events; some researchers have gone further and investigated bidirectional crosslinguistic influence. In other words, they wanted to see whether there is bidirectional transfer, and, if so, what the nature of the cross-linguistic influence of the languages is. Previous studies have documented bidirectional transfer in a variety of domains from sentence processing (e.g., Su, 2001), to speech production (e.g., Flege, 1987), to pragmatics (e.g., Tao & Thompson, 1991).

The idea of bidirectional transfer first came from Sharwood Smith and Kellerman in 1980s, where they defined it broadly as “the interplay between earlier and later acquired languages” (Sharwood Smith & Kellerman, 1986, p. 1). Pavlenko and Jarvis

(2002) took a new view on cross-linguistic influence and the nature of transfer (L1→L2, L2→L1 or bidirectional) in several categories, (e.g., linguistic frames, word order, word choice, etc.). 22 Russian-English bilinguals residing in the U.S. participated in the study. The participants watched two short films without words and then recalled in English and in Russian what they saw in them. The data were recorded, transcribed and then analyzed for potential language transfer. The authors analyzed morphosyntax, lexis, and semantics in the narratives. The analysis was carried out within two dimensions – paradigmatic and syntagmatic, each divided into several types. Some categories provided evidence for their claim of the bidirectional transfer; also the researchers made a conclusion that bidirectional transfer can be simultaneous or synchronic. On the basis of their findings, the researchers argued that language transfer is not unidirectional as it has generally been investigated; in their view both languages influence each other.

Pavlenko and Jarvis' (2002) framework of bidirectional transfer served as a basis for further research on cross-linguistic influence. With regard to motion events encoding, bilinguals should demonstrate a shift towards L2 in conceptualization and representing motion if the languages they use differ in the strategies to lexicalize motion events. Their performance in the L1 may reveal the presence of L2 structures; on the other hand, L1 patterns may appear in their performance in L2. Also, they may be in between the monolinguals' performance of both languages. Specific factors, for example the language environment, amount and quality of exposure to each of the languages, and AOA can influence lexicalization patterns of motion events encoding in both languages. Several studies have investigated the linguistic encoding of motion events in both languages of bilingual speakers and the factors that may affect it. Hohenstein *et al.* (2006) examined

bidirectional transfer with 18 early and 19 late adult speakers of L1 Spanish, a V-framed language, and L2 English, an S-framed language. Hohenstein *et al.* (2006) showed several video clips to their participants and asked them unexpected questions about the clips to elicit the description of what was happening in the clips. The researchers examined the amount and syntactic patterns of manner verbs in describing motion events, the presence of cross-linguistic transfer and its dependence on the AOA. Their findings suggest that while for the most part bilinguals' patterns of motion description resemble those of monolinguals in each language, they also displayed cross-linguistic influence in lexical domain, i.e. in Spanish, bilinguals used more manner verbs than Spanish monolinguals and, in English, more path verbs than English monolinguals. While both early and late L2 bilinguals showed L2 influence on L1 lexical choice, L2 lexical choice was affected by the L1 only in the performance of late bilinguals. Interestingly, while the transfer was bidirectional lexically, grammatically the participants displayed only L1-to-L2 transfer. In other words, the participants displayed deviations (e.g., loans, semantic transfer) in the usage of *words* in both languages, but they only transferred L1 structures when speaking their L2 and not L2 structures when speaking their L1. Thus, Hohenstein *et al.* (2006) supported previous findings of the effect of AOA on not only L2 attainment but also L1 maintenance.

In another study, Brown & Gullberg (2008) tested Japanese and English monolinguals and Japanese-English bilinguals with the help of 6-minute long animated cartoons. Investigating the encoding of manner in speech and gesture, Brown and Gullberg documented cross-linguistic influence in the performance of intermediate level participants. The researchers were very careful in assessing the participants' proficiency

level and employed a number of widely-used tests (e.g., grammar section of the Oxford Placement Test). The researchers found that there were statistically significant differences in how monolinguals and L2 learners encoded manner in speech and gesture, but no such difference was found in the Japanese-English bilinguals when narrating in their respective languages. Regarding encoding of manner in speech and gesture, L2 performance was midway between target and source languages. Japanese-English bilinguals encoded manner less frequently than their monolingual English controls but more often than monolingual Japanese speakers. The reason for this phenomenon was not the lexical difficulty, but rather the fact that less attention to manner was paid as a result of lexicalization patterns in the L1; the L2 participants were quite targetlike in terms of their lexical inventory for manner expression.

Another finding was that the bilinguals do not use gesture as a learner-specific compensatory strategy to replace manner in speech or to refine existing manner information. This finding differs from Negueruela *et al.*'s (2004) results; in the latter study some participants created their own ways while gesturing about manner and path not to shift to the L2 pattern. Some native Japanese speakers in Brown & Gullberg's (2008) study with knowledge of English modulated manner through gesture (i.e., encoded manner in speech but at the same time gestured about path) in both the L1 and L2. Remarkably, the bilinguals' performance in the L1 and L2 did not produce significant differences, although they were speaking two languages that involve significantly different patterns in monolingual discourse. This finding offers evidence for the convergence of English and Japanese linguistic systems in the domain of encoding manner in speech and gesture. Of great interest is the fact that no significant differences

have been found between Japanese-English bilinguals living in Japan and those in the U.S., suggesting that foreign language learners do not differ drastically from functional bilinguals in how they encode motion events in either language. These findings suggest, preliminarily, that it is not the new culture but the new language that leads to a change of gesture viewpoint, but these findings need to be confirmed by other studies.

Examination of the construal of motion events in relation to path in the same Japanese-English participants (Brown & Gullberg, 2011) with the same stimuli brings evidence of restructuring, even at modest levels of L2 proficiency. Path is encoded differently in the two languages: Japanese speakers encode path primarily in verbs, while English speakers encode path primarily in adverbials. Also, speakers of Japanese use significantly more path expressions per clause than speakers of English. The results of the study demonstrated direct effects of cross-linguistic influence. The bilinguals' lexicalization of motion was somewhere in between the two monolingual control groups, especially in the usage of adverbials. Overall, the bilingual participants performed more similarly to L1 Japanese speakers when they were speaking Japanese and more similarly to L1 English speakers when they were speaking English. However, in Japanese the bilinguals used more adverbials than L1 Japanese controls to encode path, whereas in English, they used less adverbials than L1 English controls. Another interesting finding, which was similar to Brown & Gullberg's (2008) findings, may point to the influence of both languages in the minds of bilinguals. The Japanese-English bilinguals in Brown & Gullberg's (2011) study used more goal expressions than any of the monolingual groups. The researchers suggest that this might be the evidence of restructuring, i.e., while processing two different languages, bilinguals redirect their attention to other lexical

features creating their own strategies characteristic of the pairing of these two particular languages. Finally, similar to their previous results (Brown & Gullberg, 2008) no difference was found in the performance of bilinguals' residing in Japan and in the U.S., which points to the absence of the influence of the dominant language environment. However, the low number of the participants in each speaker group, especially in the two bilinguals groups (15 and 13), means that caution must be applied when generalizing the results, since the data from other studies showed similar outcomes in some aspects but different outcomes in other aspects.

One such study, carried out by Daller *et al.* (2011), also examined the encoding of path of motion in bilinguals' narratives. The participants of the study were L1 German speakers, L1 Turkish speakers, German-Turkish bilinguals residing in Germany and German-Turkish bilinguals residing in Turkey after having lived in Germany. The two languages belong to different typological groups with German being an S-framed language, which encodes path in a satellite usually paired with a manner verb, and Turkish being a V-framed language, which encodes path in the main verb. Similar to Brown and Gullberg's (2011) study, the researchers found that their German-Turkish bilinguals used various lexical strategies to encode path, and the frequency of their usage was between L1 German and L1 Turkish control groups norms. Both bilingual groups produced utterances appropriate in Turkish, but the participants still did not completely acquire the typical Turkish patterns to construe a motion event. However, an important difference from Brown and Gullberg's (2011) study was that the bilinguals who stayed in Germany performed more German-like, while those who returned to Turkey performed more Turkish-like. The researchers explained these findings not only by cross-linguistic

influence, but also by the transfer of conceptualization and lexicalization patterns from the dominant language of the environment. The language the bilinguals are exposed to and use most often and the patterns they rely on daily are deeply engrained in the bilinguals' linguistic system, and are activated even when speakers are planning their utterances in their non-dominant language.

Similar results in the effect of the dominant language of the environment was observed by Kersten *et al.* (2010) in the perception of motion events by Spanish-English bilinguals tested in two language contexts. The participants, L1 English speakers, L1 Spanish speakers, and Spanish-English bilinguals, were shown a series of animated events and had to place the event in a category categorized by novel verbs with characteristics of manner or path in each of the languages under investigation. The results demonstrated that when the bilingual participants were interviewed in an English language context, they attended to manner more than when interviewed in a Spanish language context, since manner is more salient in English. The researchers also found the effect of AOA, with early bilinguals performing similarly in both language contexts and late bilinguals showing contextual variation.

The studies with bilingual speakers demonstrated bidirectional transfer in the description of motion events in speech and gesture (Brown & Gullberg 2008; Brown & Gullberg 2011; Daller *et al.*, 2011; Hohenstein *et al.*, 2006). The bilinguals in most studies performed in between the L1 groups in most areas and also created their own strategies in encoding motion events specific to the combination of two particular languages. Another finding is that overall the manner of motion is mentioned less in event descriptions in the L2 than in the L1 (Brown & Gullberg, 2008; Hohenstein *et al.*,

2006). However, the L1 and the L2 in these studies belonged to different groups in Talmy's typology: Spanish, Japanese, and Turkish are V-framed languages, while English and German are S-framed languages. Even though languages may belong to the same typological group, they possess not only similarities but also many differences (e.g., Russian and English differ with regard to expression of manner of motion, grammatical aspect, and directionality). The question arises whether the bilingual speakers of such languages show evidence of a shift towards a more frequently used language, or signs of restructuring producing forms that deviate from typical monolingual lexicalization patterns. Alternatively, will the concurrent usage of both languages help them maintain lexicalization structures and perform native-like in at least some aspects of motion event construal?

3. Gap in the research

Motion events in bilingual production have been chosen for this study for several reasons, one of which is that cross-linguistic differences in motion event description are both lexical and grammatical in nature (e.g., Berman and Slobin, 1994). Previous SLA research (Hasko, 2009; Hendricks *et al.*, 2008; Rakhilina, 2010; Wu, 2011; Yu, 1996) has documented that motion talk is a complex area to master in an L2, and verbs of motion are acquired later and with more difficulty than other verbs. It has also been documented that manner of motion is a persistent problem when learning any language, even one that belongs to the same typological group as the L1 (Hasko, 2009), and at any level of L2 development. Moreover, the typological features of an L1 have a great impact on the acquisition of motion talk in the L2, i.e., they can impede or facilitate the learning

process (Inagaki, 2001, 2002; Yu, 1996), though some findings provide evidence for an overall restricted role of the L1 (Cadierno & Ruiz, 2006).

As for bilinguals' motion talk and their encoding of motion events in two languages, the findings are scarcer and less unified. The effect of AOA has been reported as a strong factor in both acquisition of patterns of motion event lexicalization in the L2 and maintenance of the L1 patterns (Bylund, 2009; Bylund & Jarvis, 2010). Late bilinguals are more resistant to L2 influence while early bilinguals are more prone to it (Bylund, 2009; Hohenstein *et al.*, 2006; Pavlenko, 2010). The results of these empirical studies provide evidence of bidirectional transfer with the L2 influence on the L1 resulting in convergence (Brown & Gullberg, 2008), or simplification of the system (Pavlenko, 2010). Differences and problems have been reported on lexical and grammatical levels with the transfer more likely to be L1 to L2.

The studies to date have both limitations and weaknesses. The first set of weaknesses involves the characteristics of the participants. Some studies lack a control group (Navarro & Nicoladis, 2005) or have a low number of participants (e.g., 12 in the Negueruela (2004) study). The proficiency level of the participants was sometimes not even measured but assumed (Inagaki, 2002). Finally, the studies mostly focused on intermediate or highly proficient L2 learners (Brown & Gullberg, 2008, 2011).

Another weakness involves the limited explanations of the findings. For example, Inagaki (2002) only stated that the participants confused directional sentences as locational ones, but did not explain the reasons for the observed phenomenon. It might have happened because both directional and locational meanings can be expressed in one English verbal phrase while only locational reading is allowed in a similar Japanese

phrase. In Cadierno and Ruiz's (2006) study, the researchers attributed the L2-like performance to the limited role of the L1 thinking for speaking patterns in advanced adult language learners. An alternative explanation could have been the fact that the L1 of the participants is rich in manner of motion, while their L2 is poor in manner of motion language. This is a situation of "transfer to nowhere" (Kellerman, 1995) because the speakers do not have an option to transfer their rich lexicon but have to reduce it.

One more limitation of the studies to date is the lack of attention to detailed explanation of the data analysis procedure. For example, Navarro and Nicoladis (2005), Negueruela *et al.* (2004) and Yu (1996) described how they analyzed the data in general terms, but little information was given about what were considered to be manner verbs, path verbs or elements, how they made those decisions, or how they treated the verbs that were exceptions to the rules (e.g., verbs with path semantics in English). These details are essential for other researchers to carry out studies that build on each other and to be able to obtain comparable results.

Given the scarcity of the studies to date, there also remain unanswered questions about how bilingual individuals acquire motion talk and what changes their L1 may undergo. No research has been done yet on the lexical richness of motion vocabulary in either L1 or L2 of bilingual speakers. Also, the majority of the studies compare the languages of typologically different structures, S-framed and V-framed languages, or different aspectual systems, i.e. those which have and do not have this category. However, a few studies revealed that even languages that belong to the same typological group, such as Russian and English, may display significant differences (Hasko, 2009; Pavlenko, 2010), suggesting a need for further investigation.

Another area that requires further investigation is bidirectional transfer. To date, bidirectional transfer has been investigated in such areas as acquisition and maintenance of emotional talk (Pavlenko & Jarvis, 2002), lexicon, grammar, and pragmatics (e.g., volumes by Cook, 2003 and Döpke, 2000), and even in extra-linguistic aspects, such as gestures (Brown & Gullberg, 2008). Yet only a small number of studies have addressed the issue of cross-linguistic influence in bilinguals' motion talk (Brown & Gullberg, 2008; Hohenstein *et al.*, 2006), and it has not been explored at all in previous studies of motion talk in Russian-English and English-Russian bilinguals. Examining bidirectional transfer in the speech of Russian-English bilinguals will extend this research in a new direction.

One more limitation of the current research on motion talk is that there are only a very small number of studies on the effects of AOA and LOE on the maintenance and learning of motion verbs in bilingual individuals. Though they have been reported as having a great impact on learning the L2 in general, more empirical studies are needed to make more specific conclusions on how AOA and LOE affect encoding of motion talk in different languages.

The present study attempts to add to insights into the existing literature on bidirectional transfer in bilinguals' encoding of motion events and the effect of AOA in the domain of motion. One of the objectives of the study is investigation of lexical diversity of motion vocabulary of the L1 speakers and both of the languages in bilinguals' narratives, which has not been examined before. The study includes two control groups and involves a number of participants sufficient for statistical analyses. The researcher intends to give detailed explanations of research procedures, data analyses

and results, including a list of motion verbs produced by all participants involved in the study, as well as attempts to present comprehensive clarifications and discussion of the findings obtained.

CHAPTER 3

THEORETICAL FRAMEWORKS:

MOTION TALK AND EVENT CONCEPTUALIZATION IN ENGLISH AND RUSSIAN

This chapter is devoted to outlining the theoretical framework of the study, which will be followed by a comparative analysis of encoding of manner, path, directionality, and aspect in Russian and English. In her review of motion talk in a foreign language, Cadierno (2008) summarizes the differences between S-framed and V-framed languages, and reports that speakers of S-framed languages use a greater variety of motion verbs, employ a higher degree of elaboration on the path and manner of motion, and pay more attention to the dynamics among the paths. Since Russian and English both belong to the S-framed group, they are expected to be similar in these characteristics. Contrary to these expectations, however, the two languages display several critical differences which place them on opposing sides of the S-framed languages continuum and, as shown earlier, create difficulties for speakers of L1 English acquiring L2 Russian (Hasko, 2009). Thus, Talmy's typology does not take into consideration certain features and cannot account for a number of differences between the languages within the same group which are discussed below.

3.1. Theoretical framework

As discussed in Chapter 2, the theoretical framework of the study that follows is based on three approaches. The first one is Talmy's (1991, 2000) typological classification of complex event constructions. An event is considered to be a motion event when it involves translational motion in which an object's basic location shifts

from one point to another in space (Talmy, 2000). His analysis of motion events has four basic semantic components: *ground*, *figure*, *path* and *manner*. Based on the grammatical encoding of the two semantic components of the motion event (i.e., manner and path) across languages, he developed a typology of how manner and path are expressed. Talmy (2000) distinguishes two types of languages, satellite-framed and verb-framed, depending on which linguistic component encodes path and which encodes manner. According to this classification, both English and Russian are characterized as satellite-framed languages, in which manner is expressed in the main verb and path in a satellite.

The second approach that the present study is based on is Levelt's (1989) language processing model and its reformulations by Habel and Tappe (1999) and von Stutterheim and Nuse (2003). According to the model, four planning processes - *segmentation*, *selection*, *structuring* and *linearization* – are necessary to express the content of a message or to verbalize a motion event. Further elaborations on the model suggest the connection between one of the processes, event segmentation, and the presence or absence of aspect in the grammatical system of a language. Speakers of aspectual languages choose an event-internal perspective (i.e., the event is depicted in first person, as it was experienced by the protagonist) and tend to verbalize smaller events and view events as ongoing, while speakers of non-aspectual languages prefer an event-external perspective (i.e., the event is described in third person as it was observed by the speaker), encode fewer events, and take a more holistic perspective on the situation.

Finally, Pavlenko and Jarvis' (2002) framework of bidirectional transfer also guided the present study. Their analysis of morphosyntax, lexis and semantics in the narratives of Russian-English bilinguals was carried out within two dimensions –

paradigmatic and syntagmatic, each divided into several types. Thus, a number of points of contrast were developed, such as framing transfer, semantic extension, or subcategorization transfer. The framework is unique for the combination of Russian and English when analyzing narratives of bilinguals with languages other than Russian and English, different points of contrast may be identified.

3.2. Manner of motion

The first difference between the two languages lies in the expression of the manner of motion. In both languages manner is most commonly encoded (when the speaker chooses to express manner) in the main verb. However, in Russian the marking of manner in verbs is near-obligatory, while in English it is optional; therefore, the semantic repertoires of Russian and English for encoding manner of motion are not parallel. The data from Hasko's (2010) study demonstrated that manner and its encoding is more salient in Russian than in English. While English has the means to express manner of motion in a variety of ways, English speakers may opt not to do so because in English there are several high frequency verbs, like *to go*, *to get*, *to come*, *to take*, *to bring* that are not marked for manner. Consequently, in Driagina's (2007) study, 80% of the participants depicting a scene where an owl was flying out from the hole in the tree used the verbs *come out* and *appear* or did not use a motion verb; only 20% used manner verbs like *fly out*, *pop out*, and *stick out*.

In contrast, almost all Russian verbs encode some information about manner of motion with very few exceptions, which are *pribyt'* (to arrive) or *otpravit'sya* (to set off) (Pavlenko, 2010). Russian does not have an equivalent translation for English verbs, such as *go*. In such cases Russian speakers have to differentiate between the verbs, e.g. *hudit'*

(to walk on foot) or *ehat'* (to ride). Moreover, Russian motion verbs can encode a wide range of meanings, some of them being types of locomotion (e.g., on foot or on vehicle), semantic characteristics of circular motion (e.g., controlled or uncontrolled rotation, inner or outer axis of rotation as in *krutit'(sia)*, *vertet'(sia)*, *vrashchat'(sia)*, *kruzhit'(sia)*, roughly translated as *spin* or *rotate*), subject (human, animal, artifact, etc.), type of transportation (e.g., by car, by plane or by ship), or type of displacement (e.g., put something vertically or horizontally as in *postavit'* and *polozhit'* correspondingly) (Levontina & Shmelev, 2005; Rakhilina, 2010). In English these details can also be communicated, but they are not obligatory and often will not be revealed. For example, English has a general verb *put* to denote that something has been relocated, while in Russian such verbs as *stavit'* (to put standing up), and *klast'* (to put lying down) are used (Lubensky *et al.*, 2001; Rifkin, 1996).

In short, a manner-of-motion lexicon exists in both languages; however, they are different in how obligatory manner is encoded in the verbs. While manner is a highly salient and important domain for speakers of Russian, it is a less elaborate domain for English speakers, whose language allows them more options of verbs not marked for manner. In addition, some Russian manner-of-motion lexical items do not have direct counterparts in English. However, without conducting a comparative empirical study it may be difficult to compare the size of manner-of-motion lexicon of the two languages as well as the degree with which manner distinctions are made in everyday speech.

Several predictions can be made about what can happen to the manner of motion lexicon in the speech of Russian-English bilinguals, though the effects will be different for simultaneous and late bilinguals, and they will also depend on what language

environment bilinguals are residing in. Since manner is near-obligatory in Russian but not in English, everyday use of L2 English may decrease lexical diversity of manner of motion verbs in L1 Russian. Findings from the studies with heritage Russian language speakers (Bermel & Kagan, 2000; Pereltsvaig, 2008; Polinsky, 2008b) suggest that simultaneous Russian-English bilinguals' system of manner encoding undergoes simplification, and their performance contains errors in encoding of manner in Russian. This might happen because English does not encode such details of the manner of motion that Russian motion verbs do. The results of Pavlenko's (2010) study demonstrated the loss of obligatory distinctions in Russian between pairs of verbs that differ in directionality (e.g., *idti/hodit'* [to walk to a single direction/to walk back and forth or regularly]) in late bilinguals. A more pronounced effect of the L2 English on the L1 Russian is expected in early bilinguals since they have been using their L1 less and exposed to the L2 more than late ones. On the other hand, the constant need to encode manner in Russian may force a bilingual to encode manner in English more often than an English monolingual would. Moreover, the longer bilinguals resided in the L1 Russian environment and, consequently, the shorter their exposure to L2 English was, the more they might be prone to use manner verbs instead of generic, non-manner verbs in English.

3.2. Directionality

Directionality is another characteristic that separates the two languages – it is not encoded in English but constitutes an intrinsic feature of Russian motion verbs and is grammatically obligatory for a number of motion types. Directionality indicates whether the action proceeds in a single or in multiple directions (Mahota, 1996; Murav'eva, 1986), or whether the action is completed in one or more takes (Vinogradov *et al.*, 1960).

Two types of verbs are distinguished regarding directionality: unidirectional and multidirectional (non-unidirectional) verbs. Very often the verbs come in pairs; that is, a unidirectional verb most likely has a multidirectional verb with the same meaning (e.g., *plyt'* [to swim in one direction] is a unidirectional verb and *plavat'* [to swim back and forth or as a habit] is a multidirectional verb).

Unidirectional verbs are characterized as actions that are straightforward as they occur in one/certain direction at one given moment (Foote, 1967), e.g. *poezd shel na iug* (the train was going/walking to the south) or *zavtra my letim v Tver* (tomorrow we are flying to Tver). Multidirectional verbs are characterized as actions and processes that happen not in a single direction but rather as random or habitual motion (Foote, 1967), e.g. *mal' chiki begaiut po doroge* (the boys are running on the road [back and forth]) or *Moia doch' khodit v shkolu* (my daughter goes to school [every day, repeatedly]). This characteristic, directionality, is attributed not only to the spatial direction but also the temporal and aspectual features of motion verbs. Thus, one English verb may have four equivalent Russian verbs – unidirectional imperfective, unidirectional perfective, multidirectional imperfective, and multidirectional perfective. For example, the verb *to walk* will have the following translations in Russian: *idti* [to walk in a single direction], *poiti* [to set off walking], *hodit'* [to walk back and forth] and *pohodit'* [to walk back and forth for a while] (Pavlenko, 2010).

Given that English does not have this grammatical feature, Russian-English bilinguals may start making mistakes in encoding directionality in Russian after some period of active usage of English. Previous research documented such errors in the speech of heritage Russian speakers (Gor et al., 2010; Polinsky, 2008b), who sometimes

opted for unidirectional verbs in contexts that required multidirectional ones. However, Pavlenko's (2010) participants, who were late Russian-English bilinguals, favored multidirectional verbs. The differences might be accounted for by the age of L2 acquisition and the lengths of exposure to the L2. Importantly, the possible problems may be observed only in Russian, and English will not be affected in any way since English does not have this verb characteristic.

3.3. Path of motion

English and Russian also differ in how they mark path of motion. According to Talmy's (1991, 2000) typology, in S-framed languages the core schema, the path, is expressed by a satellite alone or by the combination of a satellite and a preposition, or by a preposition alone (yet, both Russian and English have several verbs that encode path). Satellite is "the grammatical category of any constituent other than a nominal or prepositional-phrase complement that is in a sister relation to the verb root" (Talmy, 2000, p. 222). However, satellites in English and Russian are different grammatical forms: verbal particles in English and prefixes in Russian (Talmy, 2000). Both languages have other means to express path, such as prepositions, prepositional phrases, prefixes, adverbs, etc., but they are not counted as satellites.

In English path is mostly framed by using verbal particles, which are satellites, (e.g., *run in*, *drive off*) or by prepositions (e.g., *run to the house*, *jump on a rock*) with very few exceptions for example, when path is encoded in the verb such as with *enter*, or when it is encoded in prefixes such as with *over-* [*overlay*]. Verb-satellite combinations are often used in English to build phrasal verbs (Biber *et al.*, 1999) such as *float out* or *come in*. In addition, prepositions sometimes serve to locate a figure and its path in

relation to a reference object (ground). These are also frequently found in multi-word combinations in English, for example *as far as* or *in front of* (Huddleston, 1998). In this way, a verb with preposition phrases (phrases that consist only of prepositions as in *look down*), and prepositional phrases (phrases that consist of a preposition and a noun (e.g., *look in the jar*), allow fine granularity and are often used in English in expressing path (Slobin, 2003).

In Russian, satellites are prefixes attached to the verb (*vyletat'* [fly out]) and therefore the ability to use motion verbs, and to encode path in particular, depends on understanding the role of these prefixes (Murav'eva, 2006). These prefixes have specified meanings, some of which are straightforward (e.g., *pere-* has the meaning of “over” as in *pereletet'* [fly over]), but others are not easy to understand (e.g., as a preposition, *pod* has the meaning of “under”, but as a prefix *pod-* means “to” as in *podletet'* [fly to]). Some prefixes will have the same general meaning but encode varying nuances. For example, both *u-* and *vy-* (*ushel* and *vyshel*) mean “leaving”, but the latter refers to the motion out of an enclosed space and the person will most likely come back (Mahota, 1996; Murav'eva, 2006).

Prefixes are not the only way path can be encoded in Russian verbs; prepositions and prepositional phrases, though not considered satellites, can be used to specify path of motion and locate it in relation to a ground. Their meanings are dynamic and they change depending on the semantic role of the locative argument (Mahota, 1996). For example, the preposition *pod* (under) may indicate the goal of motion as in *pod stol* ([to go] under the table), as well as location as in *pod stolom* ([to be] under the table). Therefore, since Russian uses case markings, the same preposition can be used in different meanings

while in analytic (non-inflectional) English this is not common. In addition, in Russian path will be more often encoded in a combination of a satellite (prefix) and a preposition/prepositional phrase (*v'ehat' v* [come into]). Prepositions have assigned meanings with some duplicating the meaning of a prefix, e.g. *otoiti ot stola* (step [away-step] away from the table) (Vinogradov, 1947) and some having different semantics, e.g. *naletet' na derevo* (crash [in-fly] into a tree) (Kniazev, 1999).

It is important to remember that in Russian a combination of a prefix and a preposition may be required in cases where only a preposition is used in English, (e.g., he jumped over the fence. vs. *on pereprygnul cherez zabor* (he over-jumped over fence) (Driagina, 2007). The combination of prefixes, prepositions, and case marking results in a lexicalization pattern in Russian that combines encoding of path and location of the object (figure) in relation to the ground. Another characteristic is that the same lemma and the same preposition but different prefixes in Russian will correspond to completely different verbs and prepositions in English, e.g., *priehat' k domu* - to arrive to the house [by transportation] vs *pod'ehat' k domu* - to approach the house [by transportation] vs *s'ezdit' k domu* - to drive/ride to the house and back (Pavlenko, 2010).

To sum up, even though in the cross-linguistic literature Russian and English are described as having a similar structure of path lexicalization patterns, expression of path in Russian is more varied both semantically and structurally. Although in English path is characterized by a stable pattern of a bare verb with a path satellite(s) or preposition both following the verb, in Russian it is often a verb with an attached prefix-satellite and a preposition, which duplicates the meaning of the satellite. The limited correspondence between the meanings of basic Russian prefixes and prepositions and English particles

and prepositions may cause simplification and attrition of path encoding in REBs' Russian narratives manifested in incorrect prefix assignment, limited variety of prepositions and erroneous combination of prefixes and prepositions. The participants of Pavlenko's (2010) study preserved the markers of path in Russian relatively well; several instances when the bilinguals misused prefixes involved prefixes with less apparent meanings and absence of direct equivalents in English. Thus, even though some effect of L2 English is expected, it may be limited. The participants may assign Russian prefixes incorrectly or use a preposition that does not duplicate the meaning of a prefix satellite. As for English, the partial equivalence of Russian and English path markers may result in incorrect usage of particles.

3.4. Aspect

Another difference between the two languages lies in their aspectual systems. Grammatical aspect defines the temporal flow (or lack thereof) in the described event or state with the speaker's perspective or view of the situation, and Talmy (2000) considers it to be one of the semantic elements of a motion event. Though both English and Russian are S-framed languages and they both have the category of aspect, its encoding, functions, and meanings differ in these two languages.

In English, lexical aspect can be built into verb roots and it is a part of the inherent properties of verb meanings (Comrie, 1976). For example, the verb *hit* implies a single act while the verb *beat* can refer to a continuous act. English also has grammatical aspect, which expresses the speaker's perspective or view of the situation. English has two main types of grammatical aspect, perfect and progressive. Aspect is usually combined with tense and events can be presented as in progress at certain time or over a

particular period of time - progressive aspect (e.g., *The boy is climbing onto the rock*), or taking place during a period leading up to the specified time - perfect aspect (e.g., *The frog has left the jar*) (Binnick, 1991). Structurally, progressive aspect is marked by the auxiliary verb *be* + *-ing* particle and perfect aspect is marked by the auxiliary verb *have* + past participle. Both aspects can be combined with present, past or future tense and neither is marked in the infinitive. It is also possible to have zero aspect in English, i.e. the verb lacks grammatical aspectual marking, a situation that is very common in English (Biber et al., 1999). In fact, aspect in English is marked grammatically only 10% of the time (Driagina, 2007).

In contrast, all Russian verbs obligatorily encode aspectual nuances in all forms of the verb, including infinitives, imperatives, and participles (Chertkova, 1996; Vinogradov, 1972) and aspectuality in Russian is connected with directionality. Russian verbs also have two aspects: imperfective and perfective. Imperfective aspect is used to describe events presented as a process and not as a completed action, and all multidirectional verbs are imperfective (e.g., *Za nim letela sova* [The owl was flying after him]); perfective aspect is used to describe completed action and accomplishments (e.g., *Mal'chik zalez na derevo* [The boy climbed on the tree]) (Bussmann, 1996; Zalizniak & Shmelev, 2000). The majority of verbs have aspectual imperfective-perfective pairs, for example *delat'-sdelat'* [to do – to have done]. Unlike English, in which any aspect can be combined with any tense, Russian perfective verbs are usually used in past and future, while imperfective verbs can be used in any tense. Prefixes provide additional information about how the events unfold procedurally, and in fact they play an important role in perfectivization in Russian – adding a prefix to a verb changes its aspect

(Driagina, 2007). For example, *bezhal* is the imperfective form of “ran/was running”; when the prefix *po-* is added (*pobezhal*), it becomes a perfective verb marking the beginning of an action (to start running).

Aspect in English does not correspond to the aspectual nuances in Russian. Each English verb can have two corresponding verbs in Russian which creates difficulties in preserving or using the correct pattern in the languages in question (Polinsky, 2008a, 2008b). For example, an English sentence “They went to the forest” can be translated into Russian as *Oni poshli v les* (once) and *Oni khodili v les* (several times or repeatedly). Russian imperfective aspect only partially matches English progressive aspect but has an additional meaning of repeated action, which in English is encoded by either tense markers or additional lexical items. Thus, a Russian sentence *Oni letali za mal’chikom* can be translated into English as “They were flying after the boy” or “They always/all the time/constantly flew/chased after the boy”. Russian verbs possess imperfective-perfective distinctions while English verbs do not have such a dichotomy. In several cases Russian-English bilinguals in Pavlenko’s (2010) study used an imperfective verb following the English pattern when the perfective one would be the correct form. An example of this substitution would be the sentence *mimo neye proezhala mashina* (by her was riding/driving a car), when the appropriate lexical choice should be *proehat’* (to have driven by).

The differences described above can lead to confusion and deviations from the correct form. A number of studies on how heritage Russian speakers (Pereltsvaig, 2008; Polinsky, 2008a, 2008b; Zemskaia, 2002) encode aspect provide evidence that the speakers are prone to losing the differences between perfective and imperfective aspects

in Russian. They tend to substitute prefixes denoting perfective aspect with auxiliary verbs, demonstrating the influence of their L2 English. Late bilinguals in Pavlenko's (2010) study sometimes opted to substitute Russian perfective verbs with imperfective ones; however, as Pavlenko (2010) states, it is difficult to make conclusions that bilinguals always favor imperfective verbs since there were not many instances of such substitution. Depending on the age of L2 acquisition, bilinguals may vary in the degree to which they simplify the complicated Russian aspectual system.

3.5. Event conceptualization

As Russian and English differ in their aspectual systems, the two languages also differ in how events are conceptualized, and in particular in how events are segmented. When planning what they want to express and how they are going to do it, speakers have to attend to grammaticalized conceptual categories, in particular the concept of ongoingness in the language system, which is expressed by the presence or absence of grammatical aspectual markers. As discussed earlier, both English and Russian are aspect languages, yet they have different aspectual nuances as well as how obligatory it is to mark a verb for aspect.

Table 1 (based on Dahl's (1985) study) demonstrates that in fact there is very little in common between the Russian and English aspectual systems. The first three categories, *imperfective*, *progressive*, and *secondary imperfective*, refer to an ongoing action or event, while the fourth one, *perfective*, is a grammatical aspect used to describe a non-temporary situation, a situation viewed as a simple whole, a unit without internal structure. Perfective aspect is different from perfect, which is a grammatical form and is also considered as a tense by some linguists (Meyer, 2005). In perfective, the beginning

and the end of the situation is known and relevant; a central characteristic of perfective is the internal temporal structure of the situation described. Perfect, which is a combination of aspect and tense, looks at the relevance of the event at a certain point of reference, which is fixed by the speaker, and has nothing to do with the internal temporal structure of the situation. Due to the differences in the central focus, a sentence in the perfective aspect in English cannot be in the perfect and vice versa; what can be considered as perfective in English is simple past, but not the perfect (Meyer, 2005). English can anchor the event in the domain of discourse specifying the temporal perspective and unfolding the event in a certain place and time. Progressive (the only category English has in opposition to the simple form) gives information on the specific time of the statement.

Table 1. Russian and English aspectual systems

	Imperfective	Progressive	Secondary Imperfective	Perfective
English	No	Yes	no	no
Russian	Yes	No	yes	yes

In Russian the ongoingness can be conveyed by two forms – *imperfective* and *secondary imperfective* in contrast to *perfective*, which specifies that the action has been completed. *Imperfective* aspect is a morphologically basic form representing a simple activity as in *lit'* (to pour, to be pouring). A prefix is attached to a bare imperfective form to produce a *perfective* form representing a simple accomplishment, as in *raz-lit'* (to pour out, to spill). The *secondary imperfective* is formed by adding a suffix to the perfective verb representing a complex accomplishment as in *raz-li-vat'* (to pour out, to be spilling) Importantly, unlike English, Russian lacks an option of not to convey the aspect;

whenever a verb is used the speaker must decide which aspect to use - *perfective* or *imperfective*.

Even though the languages belong to the same typological group and have aspect in their language system, it does not mean that the speakers of such languages may behave similarly when conceptualizing events. The speakers of aspectual Czech conceptualize goal-oriented events similar to non-aspectual German and different from aspectual Russian (Schmiedtova 2011, Schmiedtova *et al.*, 2010). Flecken (2011) also found that her participants, monolingual speakers of Dutch and German, two non-aspectual languages, behaved differently when conceptualizing motion events. The speakers of Dutch were more sensitive to the specific temporal characteristics of situations than the speakers of German; the expression of ongoingness in Dutch is more frequent.

Since Russian and English differ in the category of aspect, dissimilarities in how the speakers of two languages conceptualize events are expected. Due to the optional marking of aspect, English speakers may opt to use simple forms and tend to take a more holistic view of the event. In this case, the event reported in English will not be segmented into as many smaller units as, for example, in Russian. Russian speakers may prefer more fine-grained event segmentation patterns while English speakers may exhibit a more explicit marking of the temporal sequence of events.

If native speakers of Russian and English demonstrate differences in conceptualizing motion events, bilinguals' event segmentation in both languages may also be affected. Previous research demonstrated that in languages that both have or lack aspect but differ in event conceptualization patterns, conceptual restructuring towards the

L2 is limited even in advanced L2 speakers (Schmiedtova, 2011). In Schmiedtova's (2011) study, Russian and Czech L2 speakers of German succeeded in learning L2 forms and their functions, but were resistant to conceptual shifts towards the L2. Similar results were reported by Flecken (2011), whose German-Dutch bilinguals learned the appropriate forms to express progressive aspect in Dutch, but differed from monolingual speakers in the patterns of usage. Thus, Russian-English bilinguals may segment an event into fewer units in their L1 Russian than monolingual Russian speakers do. At the same time, under the influence of their L1 Russian, their L2 English narratives can differ from L1 English narratives by the finer segmentation of a motion episode and thus mention more events.

3.6. Conclusion

Even though languages may belong to the same group according to certain criteria, e.g. how languages encode manner and path, it does not necessarily mean that they are absolutely the same in every characteristic of this group; certain differences may not be revealed in such coarse classifications. This seems to be the case with motion encoding in Russian and English. This section addressed the differences underlying the elements involved into expression of motion events, i.e. manner, directionality, path, aspect and event segmentation.

With regard to manner of motion, both languages have means to express it in the main verb; however, Russian marks nearly all motion verbs for manner, while English contains several motion verbs, many of them are high-frequency ones, that do not encode manner at all; thus, the domain of manner seems to be more salient and specific in Russian. Based on this, it could be hypothesized that these differences in encoding

manner of motion in Russian and English can cause simplification in the speech of Russian-English bilinguals when speaking Russian and inclusion of extra, abundant information when speaking English. Since Pavlenko (2010) demonstrated that no such simplification happened in the L1 of late Russian-English bilinguals, it is hypothesized that the age of acquisition plays an important role in maintaining encoding of manner, and unlike late bilinguals, early ones may exhibit loss of nuances in the encoding of manner in Russian.

Directionality is a unique feature of Russian verbs and since it is not expressed in English, it is challenging for L2 learners of Russian (Hasko, 2009). As for Russian-English bilinguals, the influence is expected only in one direction, from the L2 to the L1, resulting in a simplification of the Russian system as a result of contact with English. Following the English pattern, they may prefer multidirectional verbs when a unidirectional one is expected (Pavlenko, 2010).

Lexicalization of path is also different both morphosyntactically and semantically in these languages. While English employs verbal particles and prepositions, Russian uses prefixes and prepositions and there is no one-to-one correspondence between the two. Moreover, the same preposition in Russian can be used for different locative functions while in English it would be quite unusual. These differences open up multiple possibilities for attrition and simplification in L1 Russian and for misuse or repetitive words in L2 English.

Another striking difference is in the aspectual systems of the languages. In English aspect is often not marked grammatically, whereas the Russian verbal system is dominated by aspect, i.e., every verb must be marked as perfective or imperfective.

Moreover, the two systems do not coincide. Russian involves perfective/imperfective distinctions while English is marked for progressive. These differences in aspectual systems may cause differences in how the speakers of Russian and English conceptualize events, in particular the degree of granularity (event segmentation). With regard to Russian-English bilinguals, this may lead to either preference for one language structure or an amalgamated strategy when conceptualizing (in this case, segmenting) events.

Having established the differences between the two languages, several questions arise regarding L1 maintenance and L2 acquisition. One set of questions concerns whether the Russian verb systems remains intact or experiences changes as a result of regular contact of L1 Russian and L2 English in an English speaking environment. The second set of questions is whether English patterns of motion talk are acquired fully under the influence of continuing use of L1 Russian.

4. Research questions

The first objective of this study is to investigate similarities and differences in the expression of motion talk in the L1 and L2 speech of bilingual users of the languages that differ in the requirement for manner encoding. The second objective is to examine crosslinguistic influence in bilinguals' motion talk. The third objective is to investigate the effects of AOA on bilinguals' motion talk. The following research questions will be addressed in the study:

1. What are the similarities and differences in encoding of motion events, represented by event segmentation, lexical diversity, manner and path of motion, and directionality, by native speakers of Russian and English?

2. In the context of cross-linguistic differences, what are the similarities and differences in encoding motion events by Russian-English bilinguals in their two languages?
3. How does the age of arrival (AOA) affect Russian-English bilingual participants' performance in the two languages?

CHAPTER 4

RESEARCH DESIGN

This chapter presents a description of the research methodology used in this project. Section 1 describes the study participants; section 2 offers an explanation of the data elicitation materials and procedure; and section 3 addresses the specifics of data analysis. The study was conducted within the framework of the larger project, *Object and color categorization in Ukrainian, Russian, and English as a first and second language*, designed and carried out by Dr. Aneta Pavlenko. Consequently, some of the data discussed below were collected by the author of this dissertation and other data by Dr. Pavlenko and other research assistants and collaborators on the project. Only a subset of the data collected within the larger project was used in this research project, specifically, the data from the narratives collected with the picture-book stimulus in two languages. The analyses discussed here were conducted solely by the dissertation author.

4.1. Participants

The narratives analyzed in this study were collected from (1) 31 native speakers of Russian interviewed by another researcher in Tomsk, Russia; (2) 38 native speakers of English interviewed by the dissertation author and Dr. Pavlenko, professor of TESOL at Temple University; and (3) 30 Russian-English bilinguals also interviewed by the dissertation author and Dr. Pavlenko (See Table 2). The participants of the present study were chosen as a sample of convenience. All native speakers of Russian, all native speakers of English and 18 Russian-English bilinguals participated in the larger project, *Object and color categorization in Ukrainian, Russian, and English as a first and second language*; twelve Russian-English bilinguals were interviewed specifically for the

dissertation study by the dissertation author. Following Pavlenko (2010), the terms “L1 Russian” and “L1 English” speakers are used to refer to members of the first two groups since they are not true ‘monolinguals’ –these participants were exposed to other languages in secondary school and in college, even though they reported low levels of competence in those languages. The participants were recruited through flyers, in-class announcements, and word-of-mouth.

Table 2. Participants’ background data in the three corpora

Group	# of participants	Education	Gender	Mean age
L1 English	38	Temple University, undergraduate, freshmen-senior	28 females, 10 males	21.3
L1 Russian	31	Tomsk University, Russia, 3 rd -6 th academic year	10 females, 21 males	20.3
RE bilinguals	10 early	U.S. universities, Philadelphia area (24 undergraduate students, 6 graduate students)	7 females, 3 males	21.3
	10 childhood		9 females, 1 male	19.6
	10 late		6 females, 4 males	25.1
Total RE bilinguals	30		22 female, 8 males	22

4.1.1. L1 Russian corpus

Group 1, the L1 Russian speakers, includes 31 participants (21 males, 10 females) aged between 19 and 23 years (*Mean age* = 20.7, *SD* = 1.14), all of them undergraduate students at Tomsk State University in Russia. The participants’ academic year ranged from third to sixth, and due to the peculiarities of academic programs in Russia, it is impossible to differentiate between undergraduate and graduate programs. All participants reported that Russian was their native and dominant language; all participants also reported having some (instructed) knowledge of English. Several

participants had additional knowledge of other languages, such as German (7 participants), Kazakh (4 participants), Buriat (1 participant), French (1 participant) and Japanese (1 participant). The data were collected by Nina Vyatkina, Assistant Professor of German at the University of Kansas and collaborator on Dr. Pavlenko's project.

4.1.2. L1 English corpus

Group 2, L1 English speakers, includes 38 participants (10 males, 28 females) aged between 18 and 22 years (*Mean age* = 19.6, *SD* = 1.1), all of them undergraduate students at Temple University in Philadelphia, PA. Academically the participants ranged from freshmen to seniors. All participants reported that English is their native and dominant language. The majority of the participants reported levels of competence in a foreign language – Spanish (22 participants), French (6 participants), German (2 participants), Italian (2 participants), Japanese (1 participant) and Latin (1 participant). Only 9 out of 38 participants were studying foreign languages at the time of the interview in college, and others reported taking a foreign language some years ago in high school. The data were collected by the dissertation author and Dr. Pavlenko.

4.1.3. Bilingual corpus

Group 3, the Russian-English bilinguals (REB), included 30 participants (8 males, 22 females) aged between 18 and 32 years (*Mean age* = 22, *SD* = 4.5), who were undergraduate and graduate students from various colleges and universities in the Philadelphia, area (Temple University, Chestnut Hill College, and Bryn Mawr College). The data were collected by the dissertation author and Dr. Pavlenko.

For data analysis purposes, RE bilinguals were divided into three groups based on their age of the arrival (AOA): 10 early bilinguals (AOA under 6 years of age), 10

childhood bilinguals (AOA between 7 and 13 years of age) and 10 late bilinguals (AOA above 14 years of age). The ages of 6 and 13 were chosen as dividing points following the biological schedule that is tied to the maturation of the infant's brain. Children usually develop almost normal speech in their native language by age 6, when a large portion of the vocabulary and structures have been internalized (Clark, 2009). As for the second number, which is 13 years of age, there appears to be a critical period for language acquisition that corresponds roughly to the time before puberty, which is around 13 years old. After that, the acquisition of a second/foreign language may become more difficult (Bylund, 2009; Hyltenstam & Abrahamsson, 2003; Singleton & Ryan, 2004).

Early bilinguals (3 males, 7 females) were between the ages of 18 and 32 (*Mean age* = 21.3, *SD* = 4.3). Their age of arrival varied between 0 and 6 years (*Mean AOA* = 3.3, *SD* = 2.1). They came to the U.S. as members of Russian-speaking immigrant families from Russia (6 participants), Ukraine (2 participants), and Uzbekistan (1 participant); one participant was born in the U.S. The length of exposure (LOE) to English in the U.S. varied between 14 and 28 years (*Mean LOE* = 17.9, *SD* = 4.5). All participants grew up in Russian-speaking families, used Russian at home with their family members and relatives, while two of the participants used Russian with their friends, and one also used Russian at work. They did not typically engage in regular leisure activities in Russian – two participants read books in Russian occasionally and only one on a regular basis; five participants watched movies and TV in Russian when they were with their families. They used English outside their home for interactional and educational purposes and with their friends, including Russian-speaking ones. Almost all participants reported using at least some English with their family members and relatives

as well. Five participants took from one to several trips to Russia or some other Russian speaking countries with one participant going to Russia every summer. They all learned English after they arrived in the U.S., and all attended elementary, middle and high schools in the U.S. The data above were collected through interviews and a language background questionnaire. In the questionnaire the bilinguals were asked to rate their proficiency level in listening, speaking, reading, and writing in English and Russian based on a 1-7 scale, with 0 equal to having no proficiency, and 7 being native or native-like (See Appendix 1). All the participants stated that their listening, speaking, reading, and writing skills in English were native-like ($M = 7$ for all four skills), while their Russian language proficiency varied. Their writing skills in Russian had the lowest ratings ($M = 2.92$), followed by reading and then speaking skills. The participants rated their listening skills to have the highest rating, although, this was still lower than the highest possible score of seven ($M = 6.3$). (See Tables 3 and 4)

Table 3. Self-reported Russian language proficiency (reported Means out of 7)

	Listening	Speaking	Reading	Writing
Early REB	6.3	4.95	3.25	2.92
Childhood REB	6.5	5.8	4.6	4
Late REB	7	6.9	6.5	6.4

Table 4. Self-reported English language proficiency (reported Means out of 7)

	Listening	Speaking	Reading	Writing
Early REB	7	7	7	7
Childhood REB	6.9	6.8	6.9	6.5
Late REB	5.75	5.3	5.9	5.3

The childhood Russian-English bilinguals (1 male, 9 females) were between the ages of 18 and 26 ($Mean\ age = 19.6, SD = 2.4$). The background information was

collected through interviews and a language background questionnaire. Their AOA varied between 7 and 12 years ($Mean\ AOA = 9.2, SD = 1.4$). They all came to the U.S. as members of Russian-speaking immigrant families from Russia (2 participants), Ukraine (3 participants), Moldova (2 participants), Belarus (1 participant), Georgia (1 participant) and Latvia (1 participant). Their LOE to English in the U.S. varied between 8 and 14 years ($Mean\ LOE = 10.5, SD = 2.2$). They used Russian at home with their family members and relatives; two participants reported using Russian with their friends as well, and one participant used Russian in church. All participants watched either movies in Russian or Russian TV (most often in their relatives' houses), but only two of them mentioned reading books in Russian, and even in these cases not very often. They all used English everywhere (as they stated themselves) outside the home including with some Russian-speaking friends. Only two participants took trips to a Russian-speaking country, going there every summer. Seven participants learned English after they arrived in the U.S., while three started learning English in school in their country of origin. All attended middle and high schools in the U.S.; one also attended elementary school. The participants stated that their listening, speaking, reading, and writing skills in English were close to native like ($M = 6.9, M = 6.8, M = 6.9, M = 6.5$, correspondingly), while their Russian language skills demonstrated more variety. Similarly to the early bilinguals, their Russian writing skills had the lowest rating ($M = 4$), followed by reading and then speaking skills. The participants rated their listening skills to have the highest rating, while still lower than the highest possible score of seven ($M = 6.5$) (See Tables 3 and 4).

The participants in the late bilinguals group (4 males, 6 females) were between the ages of 19 and 31 ($Mean\ age = 25.1, SD = 4.8$). Their AOA varied between 14 and 29

years (*Mean AOA* = 19.5, *SD* = 4.6). They came to the U.S. from Russia (2 participants), Ukraine (2 participants), Kazakhstan (2 participants) and Belarus (4 participants). Four participants came to the U.S. as members of Russian-speaking immigrant families, four came as students, and two came alone as green card holders. Their LOE to English in the U.S. varied between 2 and 12 years (*Mean LOE* = 5.5, *SD* = 2.7). They all used Russian with their family members in the U.S. or on the phone and with their Russian-speaking friends; two participants also used Russian in a university, and two used Russian at work. Four participants stated that they used Russian regularly for various leisure activities (books, TV, movies, Internet), while two others mentioned that they only occasionally read books in Russian, and two participants only watched movies and cartoons. They used English for everyday interactional purposes, education, with their English-speaking friends and four participants also used English for work. Four participants took from two to five trips to a Russian-speaking country. Seven participants had studied English in secondary and higher education institutions in Russia and other post-Soviet countries (e.g., Ukraine, Belarus, and Kazakhstan). Three participants attended high school in the U.S., four came to the U.S. for college, and the other three decided to go to college here in the U.S. The data above were collected through interviews and a language background questionnaire. The participants stated that their listening, speaking, reading, and writing skills in Russian were native-like ($M = 7$), while their English language proficiency demonstrated more variety. Their English writing and speaking skills had the lowest ratings ($M = 5.3$), followed by listening skills. The participants rated their reading skills to have the highest rating ($M = 5.9$). (See Tables 3 and 4)

4.2. Data elicitation

The data collected in this project consist of narratives that were elicited with the use of non-verbal stimulus, i.e. a wordless picture book. Pavlenko (2008) outlines several benefits of elicited narratives for research on L2 acquisition. First of all, they approximate language use in context; telling a story is an activity in which people are engaged every day in real life situations, for example, when talking with friends, discussing movies and books, or reading to children. Thus, they allow researchers to study such linguistic features that can appear only in connected speech (e.g., cohesiveness). At the same time, elicited narratives can be controlled for topic, structure, and, to a certain extent, items that the speakers might produce, and they also lead to comparable language samples among the participants. Hence, such data make the contrastive analysis and analysis of intra- and inter-group similarities and differences possible. Oral narratives, rather than written data, were collected as they are more representative of spontaneous speech.

4.2.1 Materials

To collect the narratives, a wordless picture book, *Frog, where are you?* (Mayer, 1969) was used. The book contains 24 pictures of a boy and a dog, who are looking for a frog that had escaped from a jar in the boy's room. During their search the boy and the dog go through the woods meeting different animals and having accidents. Finally, they find their frog among a family of frogs, take one frog with them and leave.

This book was chosen because it was shown to be useful for collection of motion narratives in previous research. In the past two decades it was used to collect data from monolingual and bilingual children and adults in more than 70 languages (Berman &

Slobin, 1994; Cadierno & Ruiz, 2006; Hasko, 2009; Kellerman & van Hoof, 2003; Pavlenko, 2010; Slobin, 1996, 2003; Stromqvist & Verhoeven, 2003; Verhoeven & Stromqvist, 2001). As the stimulus contains descriptions of different motion events, the participants were expected to produce diverse motion descriptions of various types.

Socio-demographic data were collected from the participants through a language background questionnaire (Appendix A). Bilingual participants also participated in interviews conducted prior to the narrative task. The questionnaire consisted of 8 items; items 7 and 8 were subdivided into 5 subparts (self-assessment of their language skills). The questionnaires collected information about the participants' age, gender, educational status, proficiency in their second/third/foreign languages (self-assessed on a scale from 1 to 7), and for the bilingual participants, their learning histories, socialization patterns (how often, who with and in what contexts bilingual participants maintained, learned and used their two languages), and also their proficiency in both the L1 and L2 (self-assessed on a scale from 1 to 7). The purpose of the interviews was to collect additional information about their language learning and language maintenance history. They were semi-structured interviews, which lasted between 5 and 10 minutes, with mostly open-ended questions. The participants were asked to tell the researchers about where, when, and how they learned their L2 English, how they have been maintaining their L1 Russian, what difficulties they had while learning and maintaining the languages, in what languages they read books, watched TV and movies, and when and with whom they were using their two languages.

4.2.2 Procedure

The L1 English and bilingual participants were interviewed at Temple University, Philadelphia, USA, and L1 Russian speakers at Tomsk State University, Tomsk, Russia. L1 Russian speakers performed all tasks in Russian. The L1 English speakers performed all tasks in English. REB speakers performed all tasks twice – first in Russian and then in English. The data were elicited by three researchers who themselves are Russian-English bilinguals.

In data elicitation from REB participants, language mode was taken into consideration. According to Grosjean (2008), language mode is “the state of activation of the bilingual’s languages and language processing mechanisms” (p. 39) at a particular time. Depending on the situation, people spoken to, and the content of the interaction, one language may be active and another may vary from deactivation to relative activation. As this affects perception and access to one or two lexicons, it is important to control for language mode.

RE bilinguals reside in the U.S., their everyday language mode is English, while at home and with some friends they use both Russian and English. During the first interview they were greeted in Russian by a bilingual researcher and had a conversation in Russian about their language learning trajectory, all the instructions were given in Russian, and all the tasks were performed in Russian. During the second interview they were greeted in English by the same Russian-English bilingual researcher; all the instructions were given in English and all the tasks were performed in English. When the bilingual participants did not know a word or a phrase in Russian or in English they asked the researcher for that word or phrase.

During the interview each participant first signed the consent form and permission to be audio-recorded, then filled out a language background questionnaire; the bilingual participants were also interviewed orally about their language learning and language maintenance history during their first interview, which was in Russian. The first interview was always conducted in Russian and the second one in English. The interviews were conducted with an interval in between from a minimum of two weeks to a maximum of two years. Since the narratives were collected as part of a larger project *Object and color categorization in Ukrainian, Russian, and English as a first and second language*, the participants performed six subsequent tasks (four picture descriptions and two story retellings), the fifth of which was the description of *Frog, where are you?* The retelling of the “Frog story” lasted between five and ten minutes. The participants were asked to describe each picture and to tell the researcher what was happening in the story. The whole interview lasted approximately 20-25 minutes. Eleven participants did not participate in the bigger project and they performed only the descriptions of *Frog, where are you?* book. In these cases the first interview in Russian lasted approximately 10-15 minutes and the second interview, in English, lasted about five to ten minutes.

Not all of the bilingual participants performed the tasks in both languages; only those bilinguals who performed the retelling of *Frog, where are you?* in both English and Russian were included in this research project. All interviews were audio-recorded and then transcribed by the researcher, who is bilingual in Russian and English; the transcriptions were then double-checked by another Russian-English bilingual researcher. All participants were paid for their participation in the study at the rate of \$20 per full session (25 minutes), or \$10 for a reduced session (15 minutes).

Overall, 129 narratives collected from 99 participants were analyzed. 38 narratives were collected from L1 English speakers in English, 31 narratives were collected from L1 Russian speakers in Russian, 60 narratives were collected from RE bilinguals, out of which 30 narratives were in English and 30 narratives were in Russian.

4.3. Data analysis

To analyze the data, both quantitative and qualitative analyses were employed. Quantitative analysis provides numerical information and examination of whether statistically significant differences occur between groups. This type of analysis demonstrates how often the phenomena occur, and establishes the level of confidence in the validity of the working hypothesis. Qualitative analysis then offers a more in-depth examination of the data about the nature of the differences and sheds light on the results of the quantitative analyses. This analysis also reveals various factors that may cause group differences, such as influence of other languages known by the participants and their language learning histories.

In this section the analyses that were carried out in this research are described. First, I describe the process of identification of motion verbs in the participants' narratives. After that, I define the ways of analyzing similarities and differences of motion event segmentation by the L1 Russian, L1 English, and Russian-English bilingual participants. I then explain the procedures to compare the lexical richness of the motion lexicon in the L1 Russian, L1 English, and Russian-English bilingual participants' narratives. Next, I describe the analysis of manner of motion encoding by the participants, which is followed by the examination of their path encoding. After that, I outline the analysis of directionality in the narratives of L1 Russian speakers and

Russian-English bilinguals, followed by the effect of AOA on motion talk in two languages of the bilingual participants. Finally, I detail the qualitative analysis performed to gain insights into the nature of cross-linguistic influence of the two languages, and identify the patterns of lexical preferences of encoding motion events.

4.3.1. Identification and categorization of motion verbs

Prior to performing the data analysis, all motion verbs were identified in the text. As pointed out by Cadierno and Ruiz (2006), researchers analyzing similar areas of motion events but working on different languages have at times provided different classifications of “identical” verbs across languages. For example, an English verb *escape* has been categorized as a manner verb while the corresponding Spanish verb *escapar* has been classified as a path verb, Zlatev & Yangklang (2004) indicated that the same verb *fall* received different categorizations in different studies, lexicalizing either manner or path of motion. Another difficulty is that few studies specify what verbs are coded as motion verbs, or the reasons of excluding certain verbs from the analysis.

This study follows Pavlenko’s (2010) approach in identifying motion verbs. Only voluntary motion verbs were considered, in which the actor changes position or location, for example English *go, run, come out*, or Russian *hodit’ (walk), bezhat’ (run), vylezti (crawl out)*. Unlike Pavlenko’s (2010) study, verbs referring to a patient changing position or location were not included in the analysis. Verbs that encode caused motion, such as *push, carry, and open* were not included in the analysis, nor were verbs not encoding specified movement from one place to another (e.g., *search*), nor were verbs encoding movement of a single body part rather than the whole body (e.g., *wave*) since such verbs may or may not involve a change of location for the actor. Verbs representing

voluntary motion were chosen since this type of motion constitutes the basis for the typology, i.e. “a situation containing movement of an entity or maintenance of an entity at a stationary location.” (Talmy, 1985, p. 60). Discussion of caused motion would include investigation of types of causation (e.g., placement, force, onset causation, and object-maneuvering causation) and this discussion was outside of the scope of this research. The motion verbs used by the participants in their narratives are included in Appendices B-E.

Additional issues were considered in the identification of Russian motion verbs. In Russian a number of perfective verbs, such as *sest'* (*to sit down*), *lech* (*to lie down*), which are motion verbs as they describe change in the position or location of an object/person, have an imperfective pair *sidet'* (*to sit*), *lezhat'* (*to lie*), which are not motion verbs because they describe the state of an object/person and not motion. Only perfective verbs from such pairs were included in the analysis because only perfective verbs describe motion and not state. In English there is no such distinction between perfective/imperfective verbs and the same verb, e.g. *to sit*, will be used in both cases but an adverb, e.g. *down*, will be used to encode the motion process. Thus, in English only phrasal verbs, e.g. *sit down*, *stand up*, were included, as only such verbs encode voluntary motion for the actor, and the verbs *sit* or *stand*, which refer to states (Appendices B, D), were excluded.

Once all of the verbs were identified, they were divided into types. In this study, the decision was made to follow the Russian perspective of identifying types of motion verbs. Since prefixes and suffixes contain information that change the meaning of the verb (e.g., *ubezhat'* means *to run away*, while *pribezhat'* means *to arrive by running*),

verbs with the same root but different prefix are considered to be different verbs. Thus, in Russian, verbs with different prefixes and/or suffixes encoding different paths (even the ones that have the same root) were treated as separate types, as well as perfective/imperfective pairs and unidirectional and multidirectional verbs. For example, the verbs *vybezhal* (*ran out*), *ubezhal* (*ran away*), and *pribezhal* (*arrived by running*) have the same root but different prepositions encoding different paths, thus the verbs were counted as three different types. The verbs *vyprygivat'* (*to be jumping out*) and *vyprygnut'* (*to have jumped out*) have the same root but differ in aspect indicated by different suffixes, and thus, were considered as two different types. In a similar fashion, the verbs *letet'* (*to fly in one direction or once*) and *letat'* (*to fly back and forth or several times*) have the same root but since they use different suffixes encoding different directionality, they were tallied as two different types. To be consistent, English verbs with different satellites (adverbials), for example, *come along*, *come back* and *come out*, were treated as different types because English adverbials serve a similar function Russian prefixes do. Since Russian motion verbs with different prefixes were treated as different types, the same principle was applied to English motion verbs.

Identification of motion verbs was carried out by the author of this dissertation together with the primary investigator on the project who is also a Russian-English bilingual. The procedure the researchers agreed upon did not involve independent ratings and partial agreement. The procedure involved discussion and 100% consensus. When the two researchers disagreed, they consulted with other Russian-English bilinguals and native speakers of respective languages. The verb was included into the analysis if the

two researchers agreed on its inclusion. If one party disagreed that the verb under discussion was a motion verb, this verb was rejected.

4.3.2. Quantitative analysis

In the quantitative analysis three types of statistical tests (i.e., independent samples *t*-tests, one-way ANOVA analyses, and paired samples *t*-tests) were performed to determine whether there were statistically significant differences in how motion is encoded by L1 Russian speakers, L1 English speakers, REB participants speaking Russian, and REB participants speaking English. Also, a set of statistical analyses (i.e., Kruskal-Wallis analysis of variance by ranks) was performed to establish whether there were statistically significant differences in how motion is encoded by early, childhood, and late bilinguals in both Russian and English. Tables 5-8 present all the statistical analyses performed in this research project. All the analyses will be described in detail later in the chapter.

Table 5. Statistical tests performed on the L1 English and L1 Russian data

Testing component	Test conducted (dependent variable)	Groups compared
Distribution of VoM in the narratives	Independent samples <i>t</i> -test (percentage of VoM to total number of words)	L1 Russian and L1 English
Event segmentation	Independent samples <i>t</i> -test (number of VoM)	L1 Russian and L1 English
Lexical diversity	Independent samples <i>t</i> -test (Uber index)	L1 Russian and L1 English
Manner of motion (number of manner VoM)	Independent samples <i>t</i> -test (number of manner VoM)	L1 Russian and L1 English
Variety of manner encoding	Independent samples <i>t</i> -test (types of manner verbs)	L1 Russian and L1 English
Path of motion	Independent samples <i>t</i> -test (number of path segments)	L1 Russian and L1 English

Table 6. Statistical tests performed on the Russian-English bilinguals' data

Testing component	Test conducted (dependent variable)	Groups compared
Distribution of VoM in the narratives	Paired samples <i>t</i> -test (percentage of VoM to total number of words)	REB in Russian and REB in English
Event segmentation	Paired samples <i>t</i> -test (number of VoM)	REB in Russian and REB in English
Lexical diversity	Paired samples <i>t</i> -test (Uber index)	REB in Russian and REB in English
Manner of motion (number of manner VoM)	Paired samples <i>t</i> -test (number of manner VoM)	REB in Russian and REB in English
Variety of manner encoding	Paired samples <i>t</i> -test (types of manner verbs)	REB in Russian and REB in English
Path of motion	Paired samples <i>t</i> -test (number of path segments)	REB in Russian and REB in English

Table 7. Statistical tests performed on the L1 English, L1 Russian, and Russian-English bilinguals' data

Testing component	Test conducted (dependent variable)	Groups compared
Distribution of VoM in the narratives	One-way ANOVA analysis (percentage of VoM to total number of words)	L1 Russian, L1 English, and REB in English
	One-way ANOVA analysis (percentage of VoM to total number of words)	L1 Russian, L1 English, and REB in Russian
Event segmentation	One-way ANOVA analysis (number of VoM)	L1 Russian, L1 English, and REB in English
	One-way ANOVA analysis (number of VoM)	L1 Russian, L1 English, and REB in Russian
Lexical diversity	One-way ANOVA analysis (Uber index)	L1 Russian, L1 English, and REB in English
	One-way ANOVA analysis (Uber index)	L1 Russian, L1 English, and REB in Russian
Manner of motion (number of manner VoM)	One-way ANOVA analysis (number of manner VoM)	L1 Russian, L1 English, and REB in English
	One-way ANOVA analysis (number of manner VoM)	L1 Russian, L1 English, and REB in Russian
Variety of manner encoding	One-way ANOVA analysis (types of manner verbs)	L1 Russian, L1 English, and REB in English
	One-way ANOVA analysis (types of manner verbs)	L1 Russian, L1 English, and REB in Russian
Path of motion	One-way ANOVA analysis (number of path segments)	L1 Russian, L1 English, and REB in English
	One-way ANOVA analysis (number of path segments)	L1 Russian, L1 English, and REB in Russian
Directionality	Independent samples <i>t</i> -test (number of unidirectional verbs)	L1 Russian and REB in Russian
Directionality	Independent samples <i>t</i> -test (number of multidirectional verbs)	L1 Russian and REB in Russian

Table 8. Statistical tests performed on the Russian-English bilinguals' data for the age of arrival effect

Testing component	Test conducted (dependent variable)	Groups compared
Distribution of VoM in the narratives	Kruskal-Wallis test (percentage of VoM to total number of words)	Early REB, childhood REB and late REB in English
	Kruskal-Wallis test (percentage of VoM to total number of words)	Early REB, childhood REB and late REB in Russian
Event segmentation	Kruskal-Wallis test (number of VoM)	Early REB, childhood REB and late REB in English
	Kruskal-Wallis test (number of VoM)	Early REB, childhood REB and late REB in Russian
Lexical diversity	Kruskal-Wallis test (Uber index)	Early REB, childhood REB and late REB in English
	Kruskal-Wallis test (Uber index)	Early REB, childhood REB and late REB in Russian
Manner of motion (number of manner VoM)	Kruskal-Wallis test (number of manner VoM)	Early REB, childhood REB and late REB in English
	Kruskal-Wallis test (number of manner VoM)	Early REB, childhood REB and late REB in Russian
Variety of manner encoding	Kruskal-Wallis test (types of manner verbs)	Early REB, childhood REB and late REB in English
	Kruskal-Wallis test (types of manner verbs)	Early REB, childhood REB and late REB in Russian
Path of motion	Kruskal-Wallis test (number of path segments)	Early REB, childhood REB and late REB in English
	Kruskal-Wallis test (number of path segments)	Early REB, childhood REB and late REB in Russian

4.3.2.1. Segmentation of motion events

To understand how and to what degree speaking two languages affects bilinguals' cognitive processes and how information in discourse is organized in a bilingual mind, I examined the ways speakers of different languages select and structure information with regard to motion events. Event segmentation may be explained as breaking down a complex dynamic situation into a number of events or processes. To investigate similarities and differences in event segmentation by the L1 Russian, L1 English and REB participants, I analyzed whether REB participants differ from L1 speakers and whether they experience the influence of one language on another in how they conceptualize and segment motion events.

To analyze how the participants segment motion events, the degree of event granularity (the level of detail that characterizes an object or activity) in each participant's narrative was calculated by tabulating the number of motion verbs used by the participants. First, all the suitable motion verbs in the narratives were identified, and then the total number were calculated. In order to exemplify this process, below is a typical example of one of the obtained narratives produced by an L1 English speaker. In the scene chosen for this illustration, the boy disturbed a deer, who then chased him to the water, and finally he and his dog ended up in a pond.

Participant EF1, female, 19 years old

01 *the little boy is on a deer. Now the deer is running away with the little boy still on him*

02 *and the dog running with them.*

03 *The deer shoots him off of his head into water and the dog is falling too.*

04 *Then they fall into the water*

05 *and then the little boy has the dog on his head and they're sticking out of the water looking.*

This segment contains five motion events represented by five motion verbs (*run away, run, fall, fall, stick out*). Following the method of data analysis used in Bylund's (2011) and Stutterheim and Nüse's (2003) studies, references to states (e.g., *the little boy is on a deer*) were not included in the analysis. As discussed in Section 5.3.1., only voluntary motion verbs were considered, while caused motion verbs were not counted (e.g., *the deer shoots him off*).

To decide whether REB participants segment the events in the same manner in their two languages and compared to L1 speakers of a corresponding language, I analyzed whether there are significant differences in the number of motion events the four groups encoded in their narratives. As the data contain two independent groups (L1 Russian and L1 English participants) and one group that has been interviewed twice (REB in Russian and in English), a simple one-way ANOVA could not be used. Thus, after calculating the total number of motion events in each narrative, four tests had to be conducted to assess whether L1 Russian, L1 English and REB participants conceptualize and segment the events differently: an independent samples *t*-test for L1 Russian and L1 English participants; a one-way ANOVA for L1 Russian, L1 English and REB in Russian groups; one-way ANOVA for L1 Russian, L1 English and REB in English groups; and finally, a paired *t*-test for REB participants interviewed in both Russian and English.

4.3.2.2. Lexical richness

Lexical knowledge has been found to be an important prerequisite for academic achievement in bilinguals (Cummins, 1991; Verhallen & Schoonen, 1993); thus, another analysis conducted in the present study involved lexical richness of motion talk. The focus of the concept of lexical richness is not only on how big the active vocabulary is, but also on how it is organized and used in discourse. The analysis here helped to examine similarities and differences in the lexical diversity of motion vocabulary in the L1 Russian, L1 English and REB participants; it was intended to assess whether the lexical diversity of the motion repertoire in monolingual narratives is determined by language, and if so, whether the coexistence of two languages in one mind of bilinguals causes restructuring. In both languages the bilinguals may not use the same verbs L1 speakers do or incorporate vocabulary from L1 into the narratives in L2 and vice versa. This may result in simplification of vocabulary, substitution, or semantic extensions of certain verbs. The example of a semantic extension is the usage of the verb *hodit'* [walk] referring to the actions of driving, running, and swimming; it may happen under the influence of the English verb *go*, which may express the above mentioned activities.

An analysis of lexical richness (also called lexical diversity) examines how rich and colorful the vocabulary of a speaker is and involves the comparison of the number of different words (types) with the number of total words (tokens). In many analyses of lexical richness a type/token ratio (TTR) is used (e.g., Driagina, 2007), but Dewaele and Pavlenko (2003) pointed out that this formula does not compensate for the effect of the different narrative lengths. Other formulas trying to lessen the effect of narrative length on lexical diversity indices were developed, for example, Root TTR (T/N) by Guiraud

(1960), corrected TTR ($T/2N$) by Carroll (1964), Log TTR ($\log T/\log N$) by Herdan (1960), Dugast's Uber formula (1980, 1989), and D by McKee, Malvern, and Richards (2000). All these measures of lexical diversity try to reduce the impact of sample size on lexical diversity indices through various algebraic transformations of TTR.

In this study the decision was made to use Dugast's Uber formula. The data in this project consisted of narratives of various lengths and the traditional TTR approach would not compensate for the differences. The formula is an algebraic transformation of TTR that compensates for the length-dependence problem. Jarvis (2002) compared five different lexical diversity measures and found out that the D formula and the U formula produced the most similar and accurate rankings. According to Jarvis (2002), Dugast's Uber formula might be a better index of lexical diversity for relatively small samples with different narrative length while the D formula is more suitable for relatively long narratives. Since the data in this research contained small samples, U formula was chosen. The formula was used to measure lexical variation of motion verbs in four types of narratives. *Log* stands for logarithm, which is a quantity representing the power to which a fixed number (the base) must be raised to produce a given number. In this formula the squared logarithm of all the verbs produced by a participant is divided by the difference of the logarithm of all the words and logarithm of the word types produced by a participant. Logarithms are used for maximum-likelihood estimation to find a non-linear relationship between variables.

$$\text{Uber index} = U = \frac{(\log \text{tokens})^2}{\log \text{tokens} - \log \text{types}}$$

First, the total number of motion verbs (tokens) used by each participant was calculated. Then, the number of types of motion verbs used by each participant was calculated. The analysis can be illustrated by the same example of one of the obtained narratives produced by an L1 English speaker as in Section 4.3.2.1. The segment contains five motion verbs – *run away*, *run*, *fall*, *fall*, and *stick out*; thus, it has five tokens and four types since the same verb *fall* was used twice. After tabulating the total number of tokens and types of motion verbs in each narrative, the total number of tokens and types was calculated for each group of the participants and then the Uber formula was applied to the data. Also Uber index was calculated for each participant and the results of the Uber formula were applied to statistical analyses to determine whether there were statistically significant differences in the lexical variation of these four groups. Four statistical tests were used: an independent samples *t*-test for L1 Russian and L1 English participants; a one-way ANOVA for L1 Russian, L1 English and REB in Russian groups; one-way ANOVA for L1 Russian, L1 English and REB in English groups; and finally, a paired *t*-test for REB participants interviewed in both Russian and English.

4.3.2.3. Manner of motion

This analysis was carried out to investigate how L1 Russian speakers, L1 English speakers and RE bilinguals differ in encoding manner of motion. Several ANOVAs, independent samples *t*-test for L1 Russian and L1 English participants, and a paired *t*-test were used to determine if there were any statistically significant differences in the encoding of the manner of motion based on the language and participants' background (and if so, how the magnitude of the differences were and which groups were affected).

First, the verbs were divided into those that encode manner in the main verb, and those that do not. Given the different findings of previous research on manner encoding, Talmy's (1991) definition of manner (i.e., lexicalizing information about the way the figure moves along the path) was used in this study. As was discussed in Section 3.1, almost all Russian verbs encode manner (except for a very few exceptions, such as *pribyt'* (to arrive) or *otpravit'sya* (to set off)) while a number of high frequency English verbs, like *to go*, *to get*, *to come*, *to leave*, are not marked for manner. The classification of the verbs into manner/non-manner was done by the researcher together with another Russian-English bilingual researcher. The procedure the researchers agreed upon did not involve independent ratings and partial agreement. The procedure involved discussion and 100% consensus. When the two researchers were not able to reach consensus, they consulted with other Russian-English bilinguals and native speakers of Russian or English until the 100% agreement was reached. The verb was only classified as a manner verb if the two researchers agreed on this classification. If one party disagreed that the verb under discussion encoded manner of motion, this verb was classified as a non-manner verb.

The first task was to analyze how often the participants encode manner of motion in their speech. Since Russian and English differ in the amount of verbs that encode manner, the analysis included three phases. First, I examined whether L1 speakers of the Russian and English languages differ in how often they use the verbs that encode manner. Second, I examined whether the bilingual participants differ from L1 speakers in how frequently they mention manner in their motion talk. Finally, I examined whether the frequency of manner encoding in the bilinguals' Russian narratives differ from that in their English narratives. Thus, the overall number of manner verbs was counted for each

participant. Then, for the reasons explained in Section 4.3.2.1, independent samples *t*-test for L1 Russian and L1 English participants, two one-way ANOVAs, and one paired *t*-test were carried out to analyze the differences in the frequency of the usage of manner of motion verbs in the four corpora. L1 English, L1 Russian and REB using English participants' data were analyzed using one-way ANOVA; the same analysis was applied to the L1 English, L1 Russian and REB using Russian participants' data; and REB participants' data in both languages were analyzed by means of the paired *t*-test.

The next step was to analyze whether the four groups of narratives differed from each other not only in how often the speakers encode motion, but also in the variety of manner of motion verbs used. This analysis could shed light on whether Russian and English differ in how rich their manner of motion vocabularies are, on whether continuous use of the L2 changes the richness of the L1 manner vocabulary, and also whether maintenance of the L1 affects the richness of the L2 manner of motion vocabulary in any way. For this purpose, the number of types of manner verbs (see Section 4.3.2.2 for the explanation on what was considered to be a type) was counted for each participant, which was followed by three statistical tests: two one-way ANOVAs (using L1 English, L1 Russian and REB English data for the first test; L1 English, L1 Russian and REB Russian data for the second one) and a paired *t*-test for the English and Russian data collected from the REB participants.

4.3.2.4. Path of motion

The next analysis helped to investigate the similarities and differences in encoding of path by the L1 Russian, L1 English and REB participants. In order to do that, the first task was to detect the means to encode path of motion in the narratives.

Similarly to the identification of the manner of motion verbs, the identification of path elements in the collected narratives was also done by the researcher together with another Russian-English bilingual researcher manually.

As described earlier, English speakers mostly use satellites, i.e. verbal particles (*up* in *stand up*), as well as prepositions (*went to the forest*) and adverbs (*further* in *went further*) to encode path of motion. Though both verbal particles and spatial prepositions encode the information about path of motion, they are different in their function and usage. Particles form a single semantic unit with a verb, affect the meaning of the phrasal verb, and cannot be moved to the front of a sentence or the head of relative clause. However, prepositions are independent of their preceding verbs and do not change the verbs' meanings.

Similar to English, Russian speakers employ both bound satellites, i.e. prefixes (*vy-shel* [*went **out***]), and prepositions or prepositional phrases (*bezhit k obryvu* [*is running **to** the precipice*] and adverbs (*poshli dal'she* [*went **further***]) to encode path. Usually Russian path encoding combines a bound and an unbound element, especially in the past tense (*vy-pala iz okna* [*fell **out from** the window*]). In previous studies (e.g., Kita & Özyürek, 2003; Slobin, 1996; Brown & Gullberg, 2011), all lexical elements encoding information about the trajectory followed by the protagonist were coded as path; these elements included adpositional phrases indicating the specific direction with respect to a reference object, and deictic verbs indicating the direction with respect to the speaker. Since both English and Russian are S-framed languages, in this study certain lexical components (i.e., prefixes, prepositions, verbal particles, and adverbs) were counted as path elements.

When analyzing the encoding of path in the narratives, the repertoire for expressing path-related meanings in the speech of each group of the participants was analyzed. In this analysis, the nature and the number of types of path elements were compared. Following Driagina's (2007) study, path clauses (mono-componential and multi-componential) and path segments (constituents of path clauses) involved in the encoding of motion events in Russian and in English were calculated. Mono-componential clauses include only one path segment, while multi-componential clauses consist of two or more segments. Because a motion situation is defined in this study as containing change of location, path segments comprise only directional elements (i.e., *An owl came out of the tree*); since motion here does not include the fact of stasis, locative elements (i.e., *A young boy and his dog are sitting in his bedroom*) were not counted as path segments. All path elements used in the four corpora were divided into one-segmented, two-segmented and three-segmented elements. Then I calculated the percentage of each of the elements (i.e., one-segmented, two-segmented and three-segmented) from the total number of path segments used in each speaker group in Russian and in English.

To compare the frequency of path encoding in the data collected from the four groups of speakers, the following tests were used with the speaker group as an independent variable and the number of path segments as a dependent variable: independent samples *t*-test for L1 Russian and L1 English participants, two one-way ANOVAs (using L1 English, L1 Russian and REB English data for the first test, L1 English, L1 Russian and REB Russian data for the second) and a paired *t*-test for the English and Russian data collected from the REB participants.

4.3.2.5. Directionality

Directionality is a unique characteristic of Russian motion verbs, which distinctly opens up possibilities for simplification of the Russian system in contact with English. Directionality determines whether the action was performed in a single direction (i.e., *letet'* [fly in one direction]) and as a single action, or the action is performed not in a single direction or as a repeated one (i.e., *letat'* [fly back and forth or fly frequently]). The participants may have assigned directionality incorrectly preferring one pattern to another or, for example, use a multidirectional verb in a situation when L1 Russian speakers would opt for a unidirectional verb. Thus, an analysis was carried out to investigate whether REB's narratives undergo loss of distinctions in terms of directionality. Following Hasko's (2009) approach, the analysis employed the dichotomy of verbs as *unidirectional* and *multidirectional*. As discussed in Section 3.2, directionality is attributed to the temporal and aspectual features of motion verbs. A unidirectional verb occurs in one/certain direction at one given moment and multidirectional verbs are actions and processes that happen not in a single direction or occur as a habitual motion (for a more detailed description, see Section 3.2).

First, all motion verbs in the Russian narratives of two groups (L1 Russian and REB in English) were coded as either unidirectional or multidirectional. After that, the unidirectional and multidirectional verbs were divided into perfective and imperfective. Thus, the analysis concentrated on four groups: unidirectional imperfective (*bezhat'* [to run in a single direction]), unidirectional perfective (*pobezhat'* [to set off running]), multidirectional imperfective (*begat'* [to run back and forth or to run habitually]) and multidirectional perfective (*pobegat'* [to run back and forth for a while]).

As English does not have these characteristics, the analysis included only the narratives produced by L1 Russian speakers and REB participants using Russian. After calculating the raw number of all motion verbs in both groups of speakers and dividing them into the four categories described above, the percentage of usage of the four groups of verbs was calculated. Then two independent *t*-tests were used to test out whether Russian-English bilinguals differ significantly from L1 Russian speakers in their usage of motion verbs according to the feature of directionality, and whether any loss of the distinctions can be observed.

4.3.2.6. The effect of AOA

Age has been considered as a significant factor in the ways second language learners and users differ from native speakers and from each other, and a vast amount of research has been conducted concerning age effects on second language acquisition (e.g., Bialystok & Miller, 1999; Bylund, 2009; DeKeyser, 2000; Kersten *et al.*, 2010; Singleton, 2001). Therefore, the next analysis investigates whether the age of arrival of the L2 affects REB participants' performance in the two languages (i.e. in how REBs encode motion in their two languages).

It is necessary to distinguish between age of acquisition, which is the age when learning of a language (in this case, of the L2) occurs, age of arrival, which is the age when a person arrived to the country of a language in question (in this case, to the U.S.), and, finally, length of exposure, which is the time during which a person was exposed to a new language environment (in this case, English in the U.S.). The decision was made to examine the effects of the age of arrival on the maintenance and acquisition of motion talk by the bilinguals in their two languages for two reasons. First, it is easy to determine

the age at which the participants arrived to the country compared to when they started to acquire the L2, which could have happened in their native countries. Secondly, the present study also examines bilinguals' motion talk in their L1. The question of the maintenance of the motion talk in the L1 becomes relevant when the bilinguals are not exposed to the L1 environment, which happened after they arrived to the U.S.

Due to the low number of participants in the three groups of bilinguals (10 participants in each), the decision was made not to use 2x3 factorial ANOVA analyses with two factors (language and AOA). Instead, a series of Kruskal-Wallis tests were conducted comparing event segmentation, encoding manner of motion (frequency and variety), and encoding path of motion (the number of path segments) in English and in Russian between the three groups – early REB, childhood REB and late REB. The Kruskal-Wallis tests were used because being a non-parametric method, the Kruskal-Wallis test does not assume a normally-distributed population, unlike the corresponding one-way ANOVA. Prior to subjecting the data for statistical analysis, each set of data was ranked since ordinal data is a requirement for performing the Kruskal-Wallis test. Overall, 12 tests were performed – six analyzing the Russian data and six analyzing the English data. As several tests were conducted using the same data in sets of four, a Bonferroni correction was used to protect against committing a Type I error. In all tests the age (i.e., early, childhood, or late REBs) was used as an independent variable. The dependent variables were different in each test: the number of motion verbs when comparing event segmentation; the total number of words encoding manner when comparing the frequency of encoding manner; the number of types of verbs encoding

manner when comparing the variety of manner encoding; and the number of path segments when comparing encoding of path of motion.

I also decided to examine the richness of motion vocabulary in the three groups of REB participants, namely, early, childhood, and late bilinguals. In a similar fashion to the analysis described in Section 4.3.2.2, the number of all the motion verbs and types of motion verbs used by the participants was calculated for each of these groups in English as well as in Russian. Then the Uber formula was applied to the data to determine lexical richness of the each group as well as of each participant. This procedure was followed by a Kruskal-Wallis test with the AOA as independent variable and the index of lexical richness for each participant as a dependent variable.

4.3.3. Qualitative analysis

The final step in examining encoding of motion events in the speech of Russian-English bilinguals in their two languages was a qualitative analysis. In order to build upon the initial quantitative results, the decision was made to also include a qualitative analysis because it can provide further insights into the usage of motion verbs by bilingual speakers, especially in light of their learning histories and experiences. A qualitative analysis also allows analyzing the nature of lexical preferences of encoding manner of motion as well as the nature of differences and similarities.

The analysis was divided into two steps. The first included identification of lexical errors or deviations from standard Russian and English usage. While there may be a problem with what should be counted as a standard usage, in this particular study a corpus-based approach was used following Pavlenko's (2010) analysis. Lexical choices made by the bilingual participants in both languages were compared to the lexical choices

made by the L1 Russian and L1 English participants in the same context. The coding and identification of errors was performed by the dissertation author. Adopting Pavlenko's (2010) approach in the analysis of Russian narratives produced by bilingual participants, an item was considered a deviation/error if a morphosyntactic or pragmatic error was committed, and if no L1 Russian participants had made the same lexical choice. For example, one of the bilingual participants said "*olen' nachal bezhat*" (*the deer started to run*) violating the standard Russian "*olen' pobezhal*". None of the L1 Russian participants produced the same construction, so this violation was counted as a lexical error. The same approach was taken analyzing the English narratives by the bilingual participants. For example, one of the late bilinguals said *a dog ... is running out from the bees* going against the standard English *running away*. None of the L1 English speakers used the same construction, which is why this violation was counted as an error. During this qualitative analysis the errors were divided into several categories, i.e. aspectual distinctions, encoding of directionality, encoding of path (pre-/postfixation) and encoding of manner (semantic choice).

The second step of the qualitative analysis involved identification of cross-linguistic influence. Lexical and grammatical deviations in Russian were considered as evidence of L2 influence on the L1 if they patterned systematically with lexical and grammatical choices made by L1 English speakers, and differed from lexical and grammatical choices made by L1 Russian speakers. The coding was performed by the dissertation author. Using the previous example of the Russian utterance "*olen' nachal bezhat*", this incorrect construction used by the bilingual participant in Russian models the English construction "*the deer started to run*"; thus, it was counted as evidence of L2

influence on L1. Similarly, lexical and grammatical errors in English were treated as evidence of L1 influence on L2 if they patterned with lexical and grammatical choices made by L1 Russian speakers and differed from lexical and grammatical choices made by L1 English speakers. The incorrect construction *a dog ... is running **out** from the bees* used previously was counted as evidence of L1 influence on L2 since *out* is a translation of the prefix **u-** in Russian *ubezhat'* (*run away*).

Thus, the qualitative analysis provided further insights into the issues of what features of motion talk in both L1 and L2 are more or less resilient to cross-linguistic influence and to the AOA of the participants. It also helped to examine the use of directionality, aspectual, manner, and path distinctions in the bilinguals' speech.

CHAPTER 5

RESULTS

In this chapter, the results of the analyses are reported in the following order. First, I report the similarities and differences of (a) event segmentation, (b) lexical richness of motion vocabulary, (c) encoding of manner of motion (frequency and variety), (d) encoding of path of motion, and (e) encoding of directionality between L1 speakers of Russian and English. Then, I report the similarities and differences of (a) event segmentation, (b) lexical richness of motion vocabulary, (c) encoding of manner of motion (frequency and variety), (d) encoding of path of motion, and (e) encoding of directionality between L1 speakers and Russian-English bilinguals in their two languages. Third, I report the effects of AOA on the encoding of motion events by Russian-English bilinguals in their two languages. Finally, I report the results of the qualitative analysis.

5.1. Quantitative analysis

Table 5 presents an overview of the corpora in terms of overall size, mean narrative length, size of the motion lexicon, and proportion of the motion lexicon in the corpora. When determining the narrative length, all the words, including repetitions, false starts, and articles, were counted into the total number of words. The results of the word count showed that REBs differed from both Russian and English L1 speakers producing shorter narratives and fewer motion verbs in both Russian and English narratives. (See Table 9) The descriptive statistics reveal that the total number of words does not correspond to the number of motion verb tokens or proportion of motion verbs of the corpus. Even though L1 English speakers and REB participants speaking English

produced the longest narratives (L1 English *Mean* = 511.32, and L1 Russian *Mean* = 529.87 correspondingly), they also had the lowest number of motion verbs per narrative (L1 English *Mean* = 16.42, and L1 Russian *Mean* = 16.83 correspondingly). Surprisingly, REBs speaking Russian produced the highest proportion of motion verbs (4.8%) with the lowest total number of words (*Mean* = 375.4). As expected, the L1 Russian participants produced the highest total number of VoM (*Mean* = 23.19) and the second highest proportion of motion verbs in the corpus (4.7%) with second to the lowest total number of words (*Mean* = 491.58).

Table 9. Size of motion lexicon in the narrative corpora.

	Narrative length/total number of words	Verbs of motion/tokens (proportion of the corpus)
L1 Russian (n= 31)	15,239 Mean = 491.58 SD = 173.9	729 (4.7%) Mean = 23.19 SD = 7.0
L1 English (n= 38)	19,430 Mean = 511.32 SD = 241.0	625 (3.2%) Mean = 16.42 SD = 6.3
REB Russian (n= 30)	11,264 Mean = 375.4 SD = 187.3	545 (4.8%) Mean = 18.17 SD = 8.0
REB English (n= 30)	15,896 Mean = 529.87 SD = 218.6	505 (3.1%) Mean = 16.83 SD = 7.9

Figure 1. VoM tokens (Means) by speaker group type

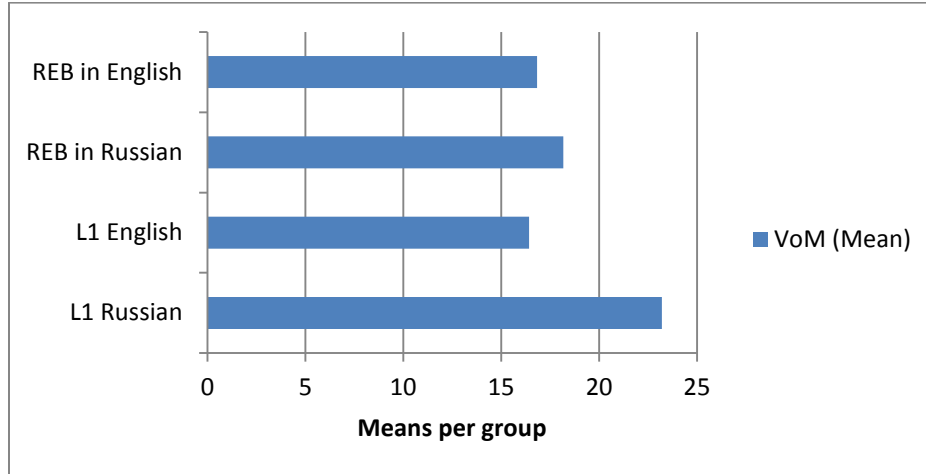
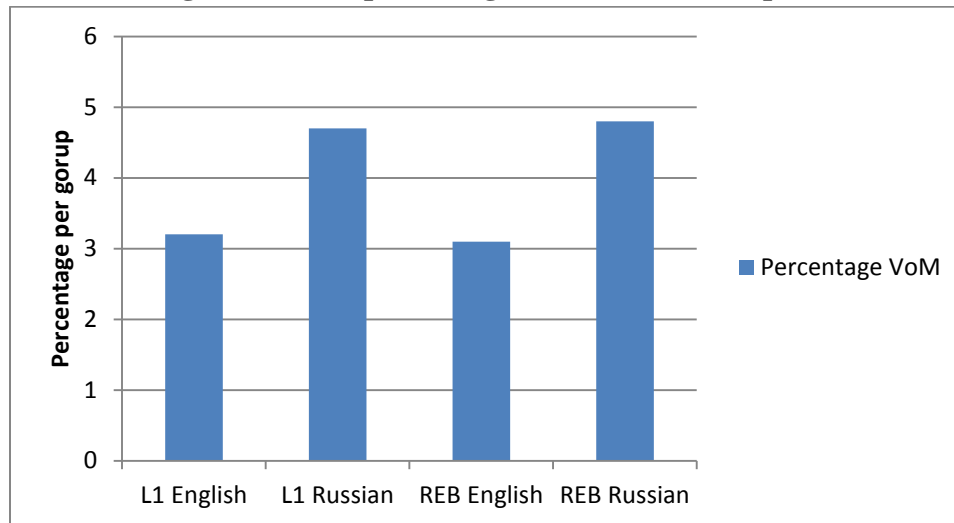


Figure 2. Total percentage of VoM in the corpora



Prior to running statistical analysis, the data were checked whether it was normally distributed to satisfy one of the assumptions for parametric tests. The data were tested for skewness and kurtosis. Skewness is a measure of the degree of asymmetry of a distribution. Normal distributions produce a skewness statistic of about zero. The acceptable values for skewness are between -1 and +1. Kurtosis is a measure of whether the data are peaked or flat relative to a normal distribution. The acceptable values for kurtosis are between -1 and +1. These values for skewness and kurtosis mean that the

data were distributed relatively symmetrically. Table 10 presents the results and demonstrates that the data used in the analysis were in fact distributed equally. Since multiple independent *t*-tests, one-way ANOVAs and paired *t*-tests were conducted, a Bonferroni correction was used to adjust alpha levels of .013 per test (.05/4) for the ANOVAs and .013 (.05/4) for the *t*-tests when the analyses were applied to the same set of data.

Table 10. Analysis of normal distribution of the data in the four corpora

	L1 English	L1 Russian	REB in Eng	REB in Rus
N of participants	38	31	30	30
VoM				
Mean	16.42	23.19	16.83	18.17
Std. Deviation	6.30	7.09	7.90	8.04
Skewness	.687	.287	.816	.481
Kurtosis	.440	.480	-.057	-.522
Percentage of VoM				
Mean	3.40	4.96	3.27	5.06
Std. Deviation	.88	1.45	1.09	1.47
Skewness	.53	.23	.82	.52
Kurtosis	.53	-.20	.62	.52
Manner VoM				
Mean	10.71	22.42	10.50	17.90
Std. Deviation	4.18	7.02	5.41	7.85
Skewness	.360	.433	.691	.508
Kurtosis	-.395	.846	-.031	-.432
Percentage of manner VoM				
Mean	65.85	96.67	62.27	98.82
Std. Deviation	13.30	4.47	16.08	2.49
Skewness	-.25	-1.57	-.01	-2.4
Kurtosis	-.61	2.40	.21	6.2
Manner VoM Type				
Mean	7.66	15.90	6.63	11.40
Std. Deviation	2.99	4.54	3.11	5.41
Skewness	.197	.608	.690	.596
Kurtosis	-.465	-.005	-.205	.767
Path Segments				
Mean	12.92	29.58	14.33	24.30
Std. Deviation	6.04	10.01	6.95	11.01
Skewness	.885	.492	.207	.657
Kurtosis	.230	.957	-.754	.024

To address the problem with the different length of the narratives within and across the groups while comparing distribution of VoMs in the narratives, the percentage of VoM was calculated for each participant, and then two one-way ANOVAs and a

paired-sample *t*-test were applied to the data. The results show that there was significant difference in the proportion of VoM to the narrative length between L1 Russian, L1 English and REB in English groups ($F(2, 96) = 21.30, p = .000$); between L1 Russian, L1 English and REB in Russian groups ($F(2, 96) = 18.78, p = .000$); and between REBs in Russian and REBs in English corpora ($t(29) = 8.25, p = .000$). The following *Tukey's* HSD post hoc analyses of the proportion of motion verbs used revealed L1 Russian speakers differed significantly from L1 English speakers; REBs in English differed significantly from L1 Russian speakers; REBs in Russian differed significantly from L1 English speakers (See Table 11); there were no other significant differences found.

Table 11. Table of Ordered Means for the percentage of VoM

	L1Eng	L1Rus	REB Eng	REB Rus
L1Eng	--	1.55*	.13	1.65*
L1Rus		--	1.69*	.09
REB Eng			--	--
REB Rus				--

* $p < .000$

5.1.1. Encoding of motion events by L1 speakers of Russian and English

5.1.1.2. Segmentation of motion events

To determine how participants segment motion events, the number of motion verbs used by each participant was calculated and then an independent samples *t*-test comparing the performance between L1 Russian and L1 English participants was used to evaluate whether the speakers segment the events differently. While performing the tests to determine if there were any statistically significant differences based on the speaker group, the total number of motion verbs was used as a dependent variable. The Levene's

test for the equality of variances shows no significant difference in the variances between groups $F = .25$, $p > .61$, which tells that the population variances are equal. The t -test revealed a significant difference in the number of motion verbs used by the two speaker groups: $t(67) = 4.20$, $p < .000$. L1 Russian speakers used significantly more motion verbs ($M = 23.19$, $SD = 7.09$) than L1 English speakers ($M = 16.42$, $SD = 6.30$).

According to Tabachnick and Fidell (2007), effect size represents the degree to which the independent variables and the dependent variables are related, that is to what extent the independent variable is a reason for the obtained differences in the dependent variable; an effect size of $r^2 = .01$ is small, an effect size of $r^2 = .09$ is medium, and an effect size of $r^2 = .25$ is large ((Larson-Hall, 2010, p.119). The obtained value for $r^2 = .20$ for L1 Russian and L1 English groups shows that the type of a speaker group (independent variable) accounts for approximately 20% of the variance in the total number of motion verbs used.

These results show that L1 Russian speakers use significantly more VoM than L1 English participants. Since the participants did not differ in the length of their narratives, the significantly higher number of motion verbs may suggest that L1 Russian speaking participants segment events in a more fine-grained manner than L1 English speakers. It seems that L1 English speakers do not verbalize small events, as Russian speakers do, thus, leaning towards a more holistic stance on motion events.

5.1.1.3. Lexical richness

The next analysis helped to answer the question about the richness and colorfulness of the speakers' vocabulary. After calculating the number of different words used (types) and the number of total words used (tokens) in L1 Russian and L1 English

corpora, the Uber formula was used to assess whether there were differences in the lexical diversity of motion vocabulary between L1 Russian and L1 English speakers (the reason for using the Uber-formula compared to other formulas was described in Section 4.3.2.2). The results of an independent *t*-test with the Uber index as a dependent variable and language as an independent variable demonstrated that L1 Russian and L1 English speakers differed in how diverse their motion vocabulary is ($t(66) = 2.41, p < .05$). This indicates that L1 Russian speakers' motion vocabulary ($M = 15.79$) is considerably richer than that of the L1 English participants' ($M = 11.74$).

The most frequent verbs that the participants used in their narratives varied between the groups. Both groups used the verb *to fall* most often, but other verbs were different. While L1 English speakers used the verb *to climb* 32 times, its Russian equivalents, *lezť*' and *lazit'*, were used only five and two times respectively. Similarly, the verb *to chase* was the second most frequently used verb by L1 English speakers (used 55 times), but the L1 Russian used its Russian equivalent *presledovat'* only 4 times. In the L1 Russian corpus the second most popular verb was *zalezť*', the English equivalent of which, *climb up*, was used only 6 times. The results suggest that even though Russian and English have more or less equivalent motion vocabulary, the speakers of these languages utilize different sets of verbs to describe the same situation; this difference, in its turn, points to cross-linguistic differences in the motion repertoire of L1 speakers. (See Table 12)

Table 12. Frequent motion verbs in the L1 corpora

Most common L1 Russian verbs	Number of times used	Most common L1 English verbs	Number of times used
<i>upast'</i> [fall]	67	to fall (<i>upast'</i>)	85
<i>zalezť</i> [climb up/into]	56	to chase (<i>presledovat'</i>)	55
<i>vylezti</i> [climb out]	39	to come out (<i>vyiti/vibrat'sya</i>)	50
<i>padat'</i> [fall]	33	to go (<i>idti</i>)	43
<i>poiti</i> [to start going]	31	to climb (<i>lezť</i>)	32

5.1.1.4. Encoding of manner

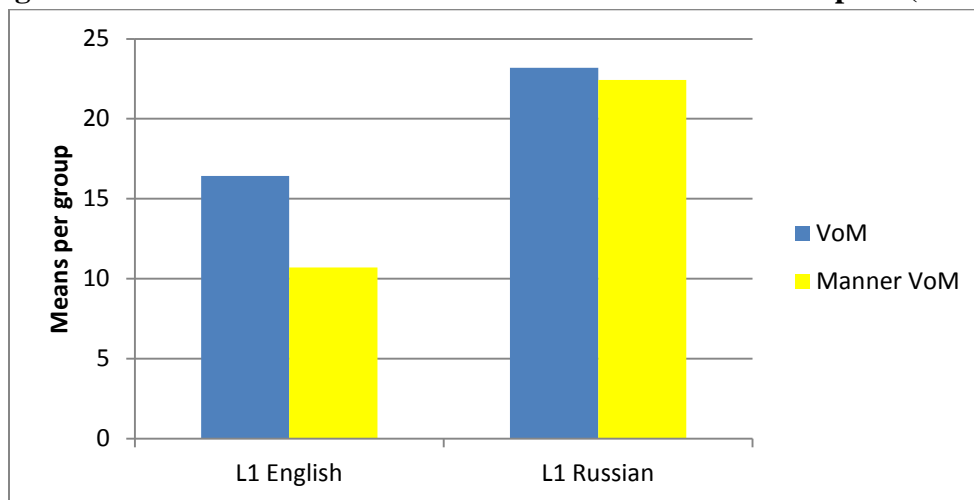
5.1.1.5.1. Frequency of manner encoding

In the next step, encoding of manner of motion in the L1 Russian and L1 English corpora was analyzed and compared. First, the verbs were identified as those that encode manner, and those that do not. The L1 Russian participants' narratives for the most part contained manner verbs (694 out of 719 verbs), while the L1 English participants' narratives had a relatively large number of non-manner verbs (217 out of 624 verbs). Table 13 and Figure 3 demonstrate the distribution of motion verbs and manner motion verbs in the L1 corpora.

Table 13. Distribution of manner and non-manner verbs in the L1 corpora (raw numbers)

	Manner verbs	Non-manner verbs
L1 English	407	217
L1 Russian	694	25

Figure 3. Distribution of VoM and Manner VoM in the L1 corpora (means)



To see whether there was a significant difference in the percentage of manner VoM in the total number of VoM, an independent samples *t*-test comparing the performance between L1 Russian and L1 English participants was performed. There was a significant effect for the speaker group, $t(67) = 12.32$, $p < .001$, with L1 Russian speakers using a higher percentage of manner VoM in relation to the total number of VoM than L1 English speakers.

To determine whether L1 Russian and L1 English speakers differ in how often they encode motion in their speech, a *t*-test was applied to the data with manner of motion verbs being the test variable and the speaker group being the grouping variable. The results of the *t*-test demonstrated that the L1 English participants used significantly fewer manner verbs ($M = 10.71$, $SD = 4.18$) compared to L1 Russian speakers ($M = 22.42$, $SD = 7.02$) ($t(67) = -11.70$, $p < .05$, $r^2 = .52$ two-tailed). Approximately 52% of the variance in the usage of manner verbs by the two groups of participants can be accounted for by language. Importantly, L1 English narratives were longer on average than the L2 ones.

Considering that English contains a number of high-frequency verbs that do not encode manner, the findings were not surprising. L1 Russian participants attended to manner in their narratives more often than L1 English participants because Russian obligatorily encodes manner with motion verbs.

5.1.1.4.2. Variety of manner of motion structures

Following the analysis of the frequency of manner encoding, the variety of manner of motion structures in the narratives was analyzed. After identifying all manner of motion verbs in the corpora, the total number of the types of manner of motion verbs was calculated (see Section 4.3.2.2 for identification of types of verbs as opposed to tokens). This analysis shows that Russian-speaking participants encoded manner to a greater extent the English-speaking participants with regard to the types of manner of motion verbs used. Overall, the L1 Russian-speaking narrators used 129 types of manner verbs (out of 136 types of motion verbs total) compared to only 62 types of manner verbs (out of 87 types of motion verbs total) in the L1 English narratives.

In order to learn whether the two groups of L1 speakers significantly differ from each other in how rich their manner of motion vocabulary is, another *t*-test was performed, this time with types of manner of motion verbs being the test variable and the speaker group still being the grouping variable. The results provide evidence that L1 English speakers use a significantly lower number of types of motion verbs ($M = 7.66$, $SD = 2.99$) compared to L1 Russian speaking participants ($M = 15.90$, $SD = 4.54$) demonstrating a narrower range of manner of motion verbs in their vocabulary ($t(67) = -9.03$, $p < .05$, $r^2 = .54$ two-tailed). The variety of motion structures greatly depends on the language with the 54 % of the difference being accounted for this factor.

The findings of this analysis demonstrate that the manner motion vocabulary of L1 Russian speakers is more versatile than that of L1 English speakers. The difference in the frequency and variety of manner encoding in Russian and English was significant and, thus, can affect the frequency and variety of manner encoding in the two languages of Russian-English bilinguals. The effect can be demonstrated by a lower number of tokens and types of manner of motion verbs in the participants' L1 Russian under the influence of L2 English. On the other hand, the bilinguals may use more manner of motion verbs in their L2 English compared to L1 English speakers following the Russian pattern of required encoding of manner.

5.1.1.5. Encoding of path

In order to analyze how L1 speakers of Russian and English encode path of motion, the different ways in which path is encoded in the two corpora were identified and counted. Table 14 displays path elements used in English and Russian narratives by L1 speakers, and how those elements were distributed across the corpora. Only three points of comparison – prepositions, adverbs, and verbs encoding path – were identified. L1 English speakers used more types of prepositions, while Russian speakers used more types of adverbs and verbs with path semantics. The frequency of other means of path encoding cannot be compared since they are employed only by one of the languages.

Table 14. Path encoding in the L1 corpora – number of types (number of times used)

	L1 English	L1 Russian
Verbal particle	10 (203)	
Preposition	16 (170)	14 (179)
Verbal Particle + Preposition	25 (53)	
Adverb	4 (7)	12 (46)
Prefix		10 (100)
Prefix + Preposition		25 (179)
Preposition + Prefix		14 (60)
Verbs with inherent semantics of path	3 (131)	7 (117)

As is seen from the data, Russian frequently utilizes the combination of two path elements – a satellite attached to the verb and a preposition, while in English the combination of a satellite and a preposition is also used, but not as often. Russian narrators also tended to build more sophisticated paths than English speakers in terms of the number of path segments per path clause. As evident from Figures 4a and 4b, Russian speaking narrators used 2-segmented path structures more than half of the time, while English-speaking narrators used 2-segmented paths in only 12-13% of the total number of path encodings. Also, a difference between 3-segmented path encoding in Russian and English was observed. In English path encoding did not include a satellite but other path elements – prepositions, adverbs or verbal particle (e.g. *go farther away from the house*). In Russian, however, 3-segmented path structure always involves one satellite element – a prefix – and 2 other path elements – either two prepositions or a preposition and an adverb (e.g., *zabralas' k nemu na golovu [on-climbed to him on head] or *ukhodit podal'she ot doma [away-go further from the house]).**

Figure 4a Distribution of Path elements in L1 Russian narratives

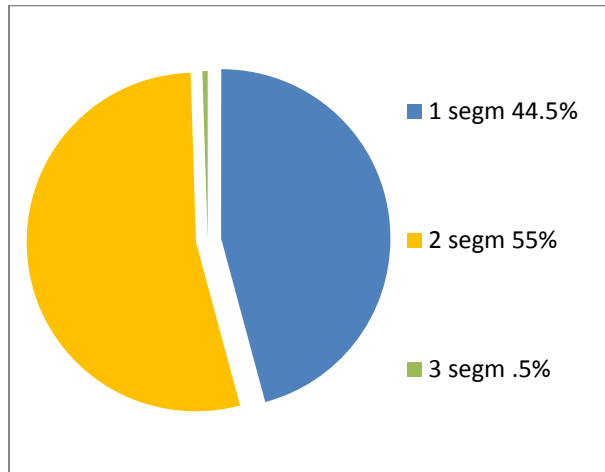
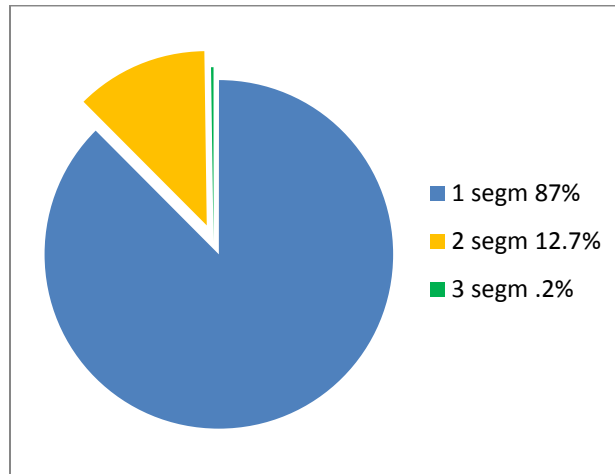


Figure 4b Distribution of Path elements in L1 English narratives



An independent samples *t*-test was used to analyze the differences of path encoding between the L1 speakers of Russian and English in one of the aspects of path encoding – the number of path segments (discrete units of speech that encode path of motion) used. This aspect was chosen because this is the area in which Russian and English path encoding differs the most (as described in Section 3.4). The results demonstrate that L1 Russian speakers use a significantly higher number of path segments ($M = 29.58, SD = 10.01$) than L1 English speakers ($M = 12.92, SD = 6.04$) and, thus, the L1 speakers of the two languages differ significantly from each other in how often they encode path ($t(67) = -8.53, p < .05, r^2 = .52$ two-tailed).

Thus, the results of the analysis suggest that Russian-speaking participants employ significantly more path clauses overall. In particular, they employ more 2-segmented path clauses and more path segments than English speaking participants, who, in turn, use significantly more 1-segmented path clauses.

5.1.2. Encoding of motion events by Russian-English bilinguals

5.1.2.1. Segmentation of motion events

To analyze cross-linguistic differences in event segmentation in both languages of Russian-English bilinguals, two one-way analyses of variance (L1 English-L1 Russian-REB in English, and L1 English-L1 Russian-REB in Russian) and one paired *t*-test (REB in English-REB in Russian) were used to evaluate whether the groups performed differently. First, the homogeneity of variance assumption for both ANOVAs was assessed using the Levene Statistic (LS). The result was not statistically significant, indicating that the homogeneity of variance assumption has not been violated ($F = .89$, $p = .34$ and $F = 1.43$, $p = .24$).

The analyses of variance revealed a significant difference in the number of motion verbs for both ANOVA tests: $F(2,96) = 9.28$, $p < .05$ for L1English-L1 Russian-REB in English and $F(2,96) = 8.08$, $p < .05$ for L1 English-L1 Russian-REB in Russian. The values for *eta*-squared being $\eta^2 = .16$ for L1Eng-L1 Rus-REB in English groups and $\eta^2 = .14$ for L1Eng-L1 Rus-REB in Russian groups demonstrates that the type of speaker group accounts for approximately 16% and 14% of the variance in the number of motion verbs used.

The significant difference observed in the omnibus-F test requires a *post hoc* analysis to help determine where the significant differences occur. The results of the

Tukey's HSD post hoc analyses indicate that Russian-English bilinguals speaking English differed significantly from L1 Russian speakers, but not from L1 English speakers. While speaking Russian, Russian-English bilinguals also differed significantly in the number of motion verbs used from L1 Russian participants, but not from L1 English speaking participants. (See Table 15)

Table 15. Table of Ordered Means for the number of VoM

	L1Eng	L1Rus	REB Eng	REB Rus
L1Eng	--	6.77*	.412	1.74
L1Rus		--	6.36*	5.02*
REB Eng			--	--
REB Rus				--

* $p < .05$

The results of the analysis of the data from Russian English bilinguals speaking Russian suggest that Russian-English bilinguals segment events more in an English-like manner. They attend to motion events in a more holistic manner with fewer details than L1 Russian speakers. The bilinguals do not break down a single event into as many component parts as L1 Russian speakers do. This tendency points to the L2 influence on the bilinguals' L1.

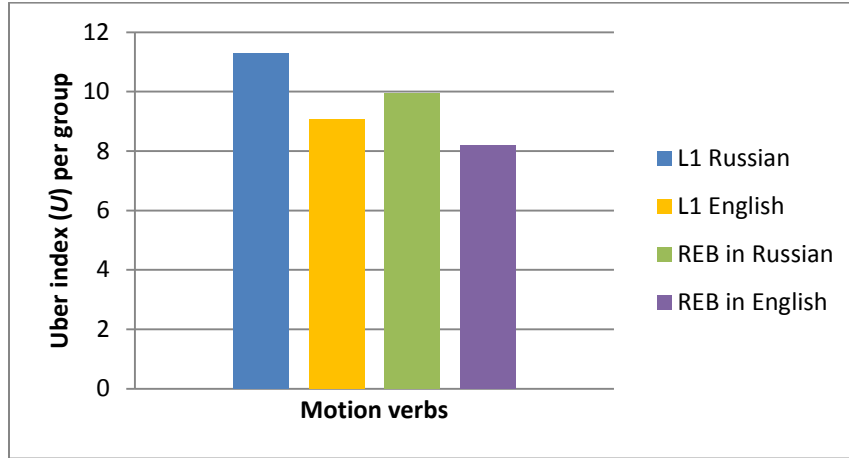
The results of the analysis of the data from Russian English bilinguals speaking English suggest that Russian-English bilinguals do not differ from English speakers in how they segment events. The bilinguals demonstrated the English pattern of event segmentation, indicated by the fact that they used significantly fewer motion verbs than L1 Russian speakers but did not differ from L1 English speakers. These findings may point to the lack of an L1 influence on the L2 and to the complete acquisition of English patterns.

A second step in the statistical analysis of event segmentation in the speech of Russian English bilingual participants was to analyze their narratives in the two languages. Since Russian and English narratives were collected from the same participants, a paired *t*-test was employed to see whether the participants differed in how they segment motion events in Russian and English. There was no significant difference in the number of motion verbs used for Russian narratives ($M = 18.17$, $SD = 8.04$) and English ones ($M = 16.83$, $SD = 7.90$): $t(29) = .86$, $p = .39$. Thus, unlike L1 English and L1 Russian speakers, who differed significantly in how they segment motion events, REB participants segmented motion events in a similar way in English and Russian. These results demonstrate that event segmentation patterns of Russian-English bilinguals in Russian and in English may have converged. Also, the results of the paired *t*-test corroborated the results of the two ANOVAs discussed earlier and support the hypothesis of the influence of the L2 on the L1 in the bilingual population.

5.1.2.2. Lexical richness of motion vocabulary

The analysis of the richness and colorfulness of the bilingual speakers' Russian and English vocabulary was performed with the application of the Uber formula to the data. REB participants had the narrowest range of motion vocabulary when they were speaking English ($U = 8.19$). The Russian narratives and L1 English participants' narratives showed a similar range of motion vocabulary, with REB's vocabulary similar to the L1 English participants' ($U = 9.93$ and 9.05 respectively). L1 Russian speakers' motion vocabulary is considerably richer than any of the other groups ($U = 11.28$). (See Figure 5)

Figure 5. Lexical richness of motion vocabulary in the four corpora



The following one-way ANOVA tests were carried out: a one-way ANOVA applied to L1 Russian, L1 English and REB in Russian data, and a one-way ANOVA applied to L1 Russian, L1 English and REB in English data. The Levine statistic for the homogeneity of variances demonstrated that the assumption of equality of variance among the groups was not violated. The results of the first ANOVA (i.e., L1 Russian, L1 English and REB in Russian) showed statistically significant results ($F = 7.48, p = .001$) and the post-hoc analysis demonstrated that L1 Russian speakers have a statistically significant higher index of lexical richness than REB participants when speaking Russian. However, L1 English speakers did not differ from the bilingual speakers (See Table 16).

Table 16. Table of Ordered Means for the Uber index

	L1Eng	L1Rus	REB Eng	REB Rus
L1Eng	--	4.04*	3.51	2.68
L1Rus		--	-7.56*	-6.73*
REB Eng			--	--
REB Rus				--

* $p < .05$

The results of the second ANOVA (i.e., L1 Russian, L1 English and REB in English) also showed statistically significant results ($F = 11.03, p = .000$) and the post-hoc analysis demonstrated that L1 Russian speakers have a statistically significant higher index of lexical richness than REB participants when speaking English. However, L1 English speakers did not differ from the bilingual participants. (See Table 16).

The next step was to find out whether there is statistically significant difference in the richness of Russian-English bilinguals' English and Russian motion vocabulary. The results of the paired samples *t*-tests did not reveal any statistically significant differences ($t(29) = .62, p > .05$).

The results demonstrate that Russian speaking participants' (both L1 speakers and bilinguals) range of motion vocabulary was higher than that of English speaking participants (both L1 speakers and bilinguals). These findings suggest that the bilingual speakers when speaking Russian use the range of the vocabulary available to them in Russian, but a relatively smaller Uber index may indicate the influence of their L1 English, which has a narrower range of motion vocabulary. When speaking English, the bilingual speakers also use the range of the vocabulary available to them in English; however, the smaller Uber index may indicate the effect of a low range of motion vocabulary in late bilinguals, whose overall lexical diversity may be lower than that of early and childhood bilinguals.

A closer look at the verbs favored by each group revealed that REBs in Russian were fairly similar to L1 Russian speakers in their choice of the most common verbs. When speaking English, the bilinguals were similar to L1 English speakers in the usage of the most common verbs. However, across the languages the most common VoMs were

not exactly the same. The most used verb – *to fall* – was the same in all four corpora, but the second most frequent verb used in the English corpora – *to chase* – was not common in Russian narratives. In Russian one of the most frequently used verbs was the verb *poiti* [go on foot], but its English equivalent *to walk* was not very common. (See Table 17)

Table 17. Frequent motion verbs in the corpora

	Number of verbs in the L1 Russian corpora	Number of verbs in the REB Russian corpora		Number of verbs in the L1 English corpora	Number of verbs in the REB English corpora
<i>upast'</i> [fall]	67	74	to fall	85	48
<i>zalez't'</i> [climb up/ into]	56	35	to chase	55	35
<i>vylez'ti</i> [climb out/get out]	39	18	to come out	50	34
<i>padat'</i> [fall]	33	24	to go	43	39
<i>poiti</i> [go on foot]	31	29	to climb	32	26

Sixty-five verb types used by the L1 Russian speakers were not used by REBs when they were speaking Russian (almost 1/3 of all the verb types used), which may indicate the simplification of the bilinguals' L1 vocabulary. Forty-two verb types used by L1 English speakers were not used by REBs, which may suggest that not the whole range of L2 motion vocabulary was acquired by the bilinguals.

Thus, the results of the lexical diversity analysis suggest that Russian-English bilinguals display some loss of lexical diversity in their motion lexicon in their L1. As discussed earlier, because Russian makes distinctions that are not encoded in English, this loss of lexical diversity may be evidence of the influence of the L2 on L1.

5.1.2.3.Manner of motion

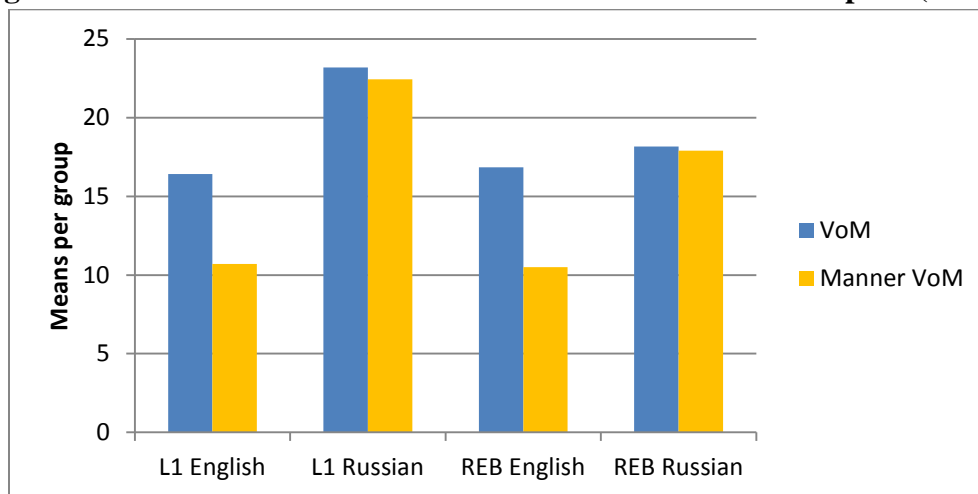
5.1.2.3.1. Frequency of manner encoding

The next step involved analyses of encoding of manner of motion by Russian-English bilinguals in the two languages, and a comparison of their performance with L1 speakers of the respective languages. Table 18 and Figure 6 demonstrate the distribution of motion verbs and manner motion verbs in the four corpora. Russian-English bilingual participants when speaking Russian behaved similar to L1 Russian speakers in that they rarely used non-manner verbs, reflecting the distinctive characteristic of Russian motion verbs to be manner-encoding. However, when the bilingual participants were speaking English, they encoded motion at a similar rate to the L1 English speakers. L1 Russian participants and Russian-English bilinguals speaking Russian encoded manner almost in all motion verbs used in the narratives (96% and 98% respectively), while L1 English participants did it only in 65% of all motion verbs and Russian-English bilinguals speaking English did so even less frequently – 62%.

Table 18. Distribution of manner and non-manner verbs in the corpora (raw numbers)

	Manner verbs	Non-manner verbs
L1 English	407	217
L1 Russian	694	25
REB English	315	190
REB Russian	537	8

Figure 6. Distribution of VoM and Manner VoM in the four corpora (means)



For the statistical analysis, two one-way ANOVAs were first performed to analyze the frequency of manner encoding with the total number of manner verbs as a dependent variable. The first ANOVA included the total number of manner of motion verbs from L1 English, L1 Russian and REB English narratives; the second ANOVA included the total number of manner of motion verbs from L1 English, L1 Russian and REB Russian narratives. Two ANOVAs were used because the bilinguals' narratives in Russian and English were produced by the same people, which made impossible to carry out one ANOVA with the four data sets (i.e., L1 Russian, L1 English, REBs in Russian, and REBs in English). The results of the Levine's homogeneity of variance test demonstrate that the data were distributed equally.

The dependent variable in these set of tests was manner of motion verbs and the independent variable was the speaker group. The results of the analyses indicated a significant difference in the number of motion verbs encoding manner for both tests: $F(2,96) = 47.76, p < .05$ for L1English-L1 Russian-REB in English and $F(2,96) = 29.61, p < .05$ for L1 English-L1 Russian-REB in Russian. The values for *eta*-square being $\eta^2 = .49$ for L1Eng-L1 Rus-REB in English groups and $\eta^2 = .38$ for L1Eng-L1 Rus-REB in

Russian groups present large effect sizes and show that the type of a speaker group accounts for approximately 49% and 38% of the variance in the number of motion verbs encoding manner used.

A post hoc analysis using *Tukey's* HSD comparison indicated that there were significant differences in encoding manner of motion between all the groups except for one pair - REB participants when they were speaking English did not differ significantly from the L1 English speakers in the frequency of encoding of manner of motion in their narratives (See Table 19). To be more specific, REB participants speaking Russian encode manner significantly less often than the L1 Russian speakers, but more often than the L1 English participants. These results suggest that encoding of manner in Russian-English bilinguals' Russian narratives was influenced by the English pattern since they do not attend to manner as often as L1 Russian speakers. However, they did not apply entirely English patterns in the Russian narratives since the bilinguals still differed significantly from the L1 English speaker group. While speaking English, Russian-English bilingual participants encode manner significantly less often than L1 Russian speaking participants, but, as mentioned earlier, similar to L1 English speakers. These results suggest that the bilingual participants preserve the English pattern of how often manner is encoded in speech and also point to the lack of the influence of their L1 Russian.

Table 19. Table of Ordered Means for the number of manner VoM

	L1Eng	L1Rus	REB Eng	REB Rus
L1Eng	--	11.70*	-.21	7.18*
L1Rus		--	-11.91*	-4.51*
REB Eng			--	--
REB Rus				--

* $p < .05$

To find out whether REBs' English and Russian frequency of encoding manner differ, a paired *t*-test was carried out. The results of the test show that there was a significant difference between Russian and English number of manner verbs ($M = 17.90$, $SD = 7.85$ for Russian and $M = 10.50$, $SD = 5.41$ for English): $t(29) = 5.77$, $p = .000$. Accordingly, REB participants significantly differ in how often they encode manner of motion in their Russian and English narratives. Thus, even though the results of ANOVA demonstrated the reduced frequency of manner encoding by Russian-English bilinguals in Russian, the results of the paired *t*-test provide evidence that the bilingual participants still preserve the patterns characteristic to their two languages.

5.1.2.3.2. Variety of manner of motion structures

As the next step in the examination of manner encoding in the speech of Russian-English bilinguals, the variety of manner of motion structures in the narratives was analyzed. This analysis shows that the bilingual participants speaking Russian used various types of manner of motion verbs at a higher rate than when they were speaking English or than L1 English speakers. Ninety-three out of the total 95 types of motion verbs used by the Russian-English bilinguals in Russian encoded manner of motion while in the bilinguals' English narratives only 40 out of 66 types of verbs encoded manner.

In order to learn whether the bilingual participants significantly differ from L1 speakers of Russian and English as well as from each other in how rich their manner of motion vocabulary is, a second set of factorial ANOVAs was performed, this time using the number of manner verb types as a dependent variable. The first ANOVA included the number of types of manner of motion verbs from L1 English, L1 Russian and Russian-English bilinguals' English narratives; the second ANOVA included the number of types of manner motion verbs from L1 English, L1 Russian and Russian-English bilinguals' Russian narratives. The results of the Levine's homogeneity of variance test reveal that the data were distributed equally (however, it is necessary to mention that the significance level was close to .05).

The results of these one-way ANOVAs demonstrate a statistically significant difference in the range of manner of motion vocabulary between the groups: $F(2,96) = 63.32, p < .05$ for L1 English-L1 Russian-REB in English and $F(2,96) = 30.91, p < .05$ for L1 English-L1 Russian-REB in Russian. The relationship between the speaker group and the number of types of motion verbs encoding manner, assessed by η^2 ($\eta^2 = .56$ for L1 Eng-L1 Rus-REB speaking English groups and $\eta^2 = .39$ for L1 Eng-L1 Rus-REB speaking Russian groups) was very strong, with the speaker group factor (independent variable) accounting for 56% and 39% of the variance in the number of types of manner of motion verbs used.

A follow-up test was conducted to evaluate pairwise differences among the means. Post hoc comparisons using *Tukey's* HSD test revealed that there was a significant difference in the means between all groups except for Russian-English bilinguals using English and L1 English speaking participants (no significant differences

were found between these two groups) (See Table 20). The biggest difference was observed between Russian-English bilinguals speaking English and L1 Russian participants, with Russian-English bilingual speakers using considerably fewer types of manner motion verbs. These results indicate that the manner of motion vocabulary of Russian-English bilinguals seemed to have little effect on the L1 Russian since they behaved very similar to L1 English speakers, i.e. used a similar range of manner of motion verbs as L1 English participants but a much narrower range than L1 Russian speakers.

Another finding is that Russian-English bilinguals using Russian used a greater variety of manner of motion verbs than L1 English speakers, but a lesser variety than L1 Russian speakers. These results suggest that the bilinguals' L1 Russian, rich in manner of motion verbs, was affected by their L2 English and thus, the manner of motion vocabulary was simplified. Yet, the fact the bilinguals used a significantly higher number of types of manner VoM in Russian compared to L1 English speakers, indicates that REBs did not converge with the latter.

Table 20. Table of Ordered Means for the number of manner VoM types

	L1Eng	L1Rus	REB Eng	REB Rus
L1Eng	--	8.24*	-1.02	3.74*
L1Rus		--	-9.27*	-4.50*
REB Eng			--	--
REB Rus				--

* $p < .05$

These statistical analyses were followed by a paired *t*-test for Russian and English narratives produced by REBs to see whether they behaved differently in their two languages or their performances converged. The participants' range of manner of motion

verbs in Russian and English was compared. The results offered evidence that their manner of motion vocabulary differed significantly in Russian and English with more types of manner of motion verbs used in Russian ($M = 11.40$, $SD = 5.41$) than in English ($M = 6.63$, $SD = 3.11$): $t(29) = 4.56$, $p = .000$. This finding, combined with the results of the two ANOVAs, suggests that the bilinguals' L1 Russian encoding of manner of motion is changing, but their L2 English encoding of manner of motion is most likely intact.

5.1.2.3.3. Path of motion

To examine how REB encode path of motion, several characteristics of path encoding were analyzed. As discussed earlier, since Russian utilizes elements that are not used in English (satellites attached to the verb), L2 influence on the L1 may be displayed as lower frequency or incorrect usage of those elements. Table 21 demonstrates the means of path encoding – frequency as well as variety – in English and Russian and their distribution across the four corpora. Figures 7a and 7b display the distribution of path elements in REBs' Russian and English narratives.

Table 21. Path encoding in the four corpora – number of types (number of cases)

	L1 English	L1 Russian	REB English	REB Russian
Verbal Part	10 (203)		13 (156)	
Prep	16 (170)	14 (179)	19 (152)	14 (94)
Verbal Part+Prep	25 (53)		14 (42)	
Adverb	4 (7)	12 (46)	5 (8)	14 (20)
Prefix		10 (100)		10 (93)
Prefix+Prep		25 (179)		27 (186)
Prep+Prefix		14 (60)		14 (39)
Verbs with inherent semantics of path	3 (131)	7 (117)	4 (97)	6 (109)

Figure 7a Distribution of Path elements in REB Russian narratives

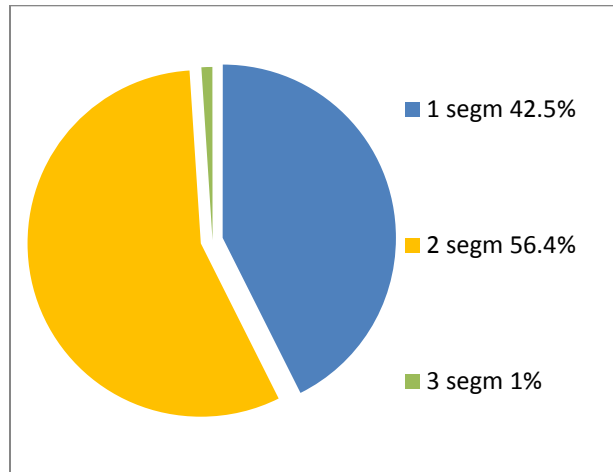
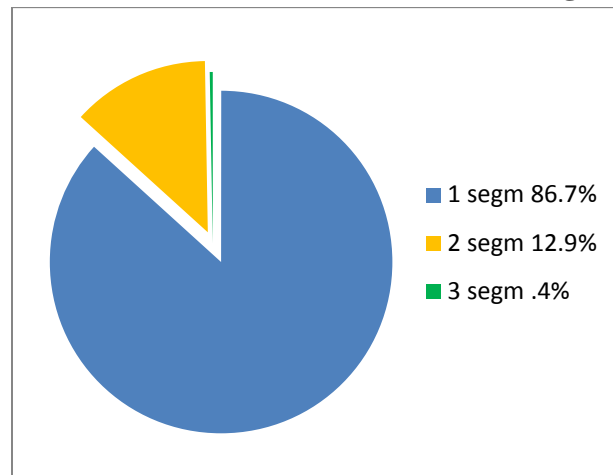


Figure 7b Distribution of Path elements in REB English narratives



In the next step in analyzing path encoding in the narratives, two analyses of variance (comparing L1 English with L1 Russian and REB in English; and comparing L1 English with L1 Russian and REB in Russian) and one paired *t*-test (REB in English-REB in Russian) were performed. The results of the statistical tests described in Section 5.1.1.5 revealed that Russian and English differ significantly in how many path segments the language employ. The analyses described in this section aimed to analyze if the number of path segments used in the bilinguals' Russian narratives was affected by their L2 English, and vice versa, whether the number of path segments in the bilinguals' L2 English was affected by their L1 Russian.

The result of Levine's test for equality of variances demonstrated that the homogeneity of variance assumption has not been violated. (See Table 22)

Table 22. Levene's Test for Equality of Variances for path segments

	LS	df1	df2	Sig
VOM (L1 Eng-L1 Rus-REB in English)	.2.72	2	96	.08
VOM (L1 Eng-L1 Rus-REB in Russian)	4.03	2	96	.21

When conducting the two ANOVAs, the speaker group was used as an independent variable and the number of path segments was used as a dependent variable. The results of both ANOVAs revealed a significant difference in the number of path segments for both tests: $F(2,96) = 45.87, p < .05$ for L1 English-L1 Russian-REB in English and $F(2,96) = 30.78, p < .05$ for L1 English-L1 Russian-REB in Russian. The value for *eta*-square $\eta^2 = .48$ for L1 Eng-L1 Rus-REB in English groups shows that the type of a speaker group (independent variable) accounts for approximately 48% of the variance in the number of path segments used; the obtained value for *eta*-square $\eta^2 = .39$ for L1 Eng-L1 Rus-REB in Russian groups shows that the type of a speaker group (independent variable) accounts for approximately 39% of the variance in the number of path segments used. Thus, the differences in the number of path segments used in the narratives can be explained by belonging to an L1 Russian, L1 English or an REB speaker group.

The significant difference observed in the omnibus-F test requires *post hoc* analysis to help determine where the significant differences occur (See Table 23). The results showed that Russian-English bilinguals encode motion in English with a significantly lower number of path segments than L1 Russian speakers, but do not differ

from L1 English speakers in the number of path segments employed. These results, combined with the results of the t-test on path encoding in L1 Russian and L1 English narratives, suggest that the bilingual participants acquired the patterns of path encoding in English, and that their L1 Russian does not seem to influence their L2 English.

When Russian-English bilinguals were speaking Russian, they encoded a significantly higher number of path segments than L1 English speakers, but not than L1 Russian participants. Considering that L1 Russian participants also employed a significantly higher number of path segments than L1 English speakers, the results of the *post hoc* analysis indicate that the bilingual participants seem to maintain Russian patterns of path encoding in their L1, and that the effect of their L1 English was not detected.

Table 23. Table of Ordered Means for the number of path segments

	L1Eng	L1Rus	REB Eng	REB Rus
L1Eng	--	16.66*	1.41	11.37*
L1Rus		--	-15.24*	-5.28
REB Eng			--	--
REB Rus				--

* $p < .05$

Finally, the number of path segments employed to encode path by REB participants in their Russian and English narratives was analyzed. The results of the paired *t*-test demonstrate that there was significant difference in the number of path segments used for Russian narratives ($M = 24.30, SD = 11.01$) and English ones ($M = 14.33, SD = 6.95$): $t(29) = 5.47, p = .000$. REB speakers mentioned significantly more path segments in their Russian narratives compared to their English narratives. These results collaborate the results of the two ANOVAs discussed earlier that Russian-English

bilinguals do not converge the two patterns of encoding path of motion of their two languages.

To give a more complete picture of the differences in motion encoding between the L1 and REB participants, the final step of the analysis was to describe in detail the patterns of path encoding in the four corpora. English narratives produced by L1 English and REB in English participants contained the following elements of path encoding:

- 1) Verbal particles (elements that form a single semantic unit with the verb) – even though L1 participants used more verbal particles, REB had a wider range of types than the L1 English speakers; the most common particle for both groups was “out” (133 cases for L1 English and 93 for REB); however, REB participants used 4 particles that were not mentioned by L1 English speakers.
- 2) Prepositions – the same happened with the use of prepositions to encode path in English narratives. L1 English participants used more prepositions overall but a narrower range of them; however, the two groups differed in what prepositions they favored with only one overlapping proposition “on” (24 cases for L1 English and 21 case for REB); again REB used a number of prepositions that were not mentioned in the L1 English corpus.
- 3) Verbal particle + preposition – L1 English participants used this means of path encoding at a higher rate than REB speakers did, and also they had a much wider range of different combinations. Interestingly, six combinations of a particle and a preposition used by REB participants were not employed by L1 English speakers, which may be the case of incorrect usage of a particle or a preposition (such instances will be discussed in more detail in Section 6.2).

- 4) Adverbs – the two groups were very close in their usage of adverbs without any particular preferences;
- 5) Verbs with inherent semantics of path – both groups favored the verb “fall” (124 and 92 cases for L1 English and REB respectively).

In both groups, path elements usually followed the verbs with a few exceptions of stylistic inversion. Both groups used 1-segmented path encoding the vast majority (86-87%) of the time (See Figures 7a,b). However, the two groups differed in the diversity of path elements used in their narratives.

The analysis of Russian narratives presents a different picture. L1 Russian and REB participants were very much alike in the overall number of clauses and segments of path encoding as well as in the assortment of structures used. Russian narratives produced by L1 Russian speakers and Russian-English bilinguals in Russian contained the following elements of path encoding:

- 1) Prepositions – both groups used 14 different types and both groups favored the same three prepositions *v* (in), *za* (after), *na* (on); L1 Russian speakers used 3 prepositions not found in Russian-English bilinguals’ Russian narratives and also 3 prepositions not used by L1 Russian speakers were found in Russian-English bilinguals’ narratives.
- 2) Adverbs – even though both groups used the same number (12) of types of adjectives, L1 Russian speakers used them considerably more often with the most common adjective *ottuda* (from there); Russian-English bilingual participants used two adverbs *ottuda* (there) and *kuda-to* (to somewhere) most often; six adverbs used by L1 Russian participants were not used by Russian-English bilinguals, and five

- adverbs that were used by Russian-English bilinguals were not employed by L1 Russian speakers.
- 3) Prefix – again, both groups used the same variety of prefixes, i.e. 10 types favoring the same two prefixes *u-* (out, away), *vy-* (out, away); L1 Russian speakers used 3 prefixes not found in Russian-English bilinguals' Russian narratives and 2 prefixes that were not used by L1 Russian speakers were used by late Russian-English bilingual participants.
 - 4) Prefix + preposition – the most utilized combination for both groups was the combination of a prefix first and a preposition following the verbs. There were 25 types in L1 Russian narratives and 25 types in Russian-English bilinguals' narratives. Both groups were consistent in their favored patterns, i.e. *vy- iz* (out from), *za- na* (up on). Less utilized but still common was the combination of a preposition first followed by a verb with prefix with both groups using the same number of types of such a combination with the most common *iz vy-* (from out).
 - 5) Verbs with inherent semantics of path – using a similar variety of such verbs (7 by L1 Russian speakers and 6 by Russian-English bilinguals) both groups favored the verb *upast'* (to fall).

Based on the characteristics of the patterns of the motion descriptions in Russian and English, Russian motion talk appears to be more complex and more varied structurally in terms of its patterns. Russian narratives were richer in adverbs than English narratives in terms of overall numbers as well as types of adverbs. The most common way to encode path in Russian was a combination of two path elements (i.e., a satellite and a preposition); English speakers also combined two path elements in one

clause, but with less frequency. Russian-speaking participants also employed more types of verbs with inherited path semantics.

To sum up, the results of analyses on encoding motion in the four corpora demonstrate that the four corpora differ in how the participants encode path of motion in their narratives. However, the results reveal that the difference seems to be only language dependent. When speaking Russian, Russian-English bilinguals do not differ from L1 Russian speakers in encoding of path of motion but differ from L1 English speakers. Similarly, when speaking English, Russian-English bilinguals do not differ from L1 English speakers in encoding of path of motion but differ from L1 Russian speakers. These findings signify that there are cross-linguistic differences in the ways Russian and English speakers encode path, but they do not point to cross-linguistic influence. The results of the analyses of path encoding differed from the results of the analyses of manner encoding. Manner encoding in REBs' L1 Russian appeared to be influenced by their L2 English.

5.1.3. Directionality

As directionality is a unique characteristic of the Russian language, it was analyzed only in the Russian narratives produced by L1 Russian speakers and REB when speaking Russian. First, all motion verbs used by the participants were divided into four groups - unidirectional imperfective, unidirectional perfective, multidirectional imperfective and multidirectional perfective.

Table 24 and Figures 8a and 8b present the distribution of these four categories of motion verbs across the corpora. Overall, REB participants did not differ significantly from the L1 Russian speakers in encoding directionality. However, they did favor

unidirectional verbs somewhat more than L1 Russian participants (66.5% and 59.9% respectively), especially unidirectional perfective verbs. This is the only category of motion verbs that REBs used with more frequency than L1 Russian participants.

Table 24. Directionality in the Russian corpora (number of VoM /types of VoM)

	Unidirectional		Multidirectional	
	Imperfective	Perfective	Imperfective	Perfective
L1 Russian	80/9	436/68	211/59	2/1
REB in Russian	44/7	362/56	137/31	1/1

Figure 8a. Distribution of VoM according to directionality in L1 Russian narratives

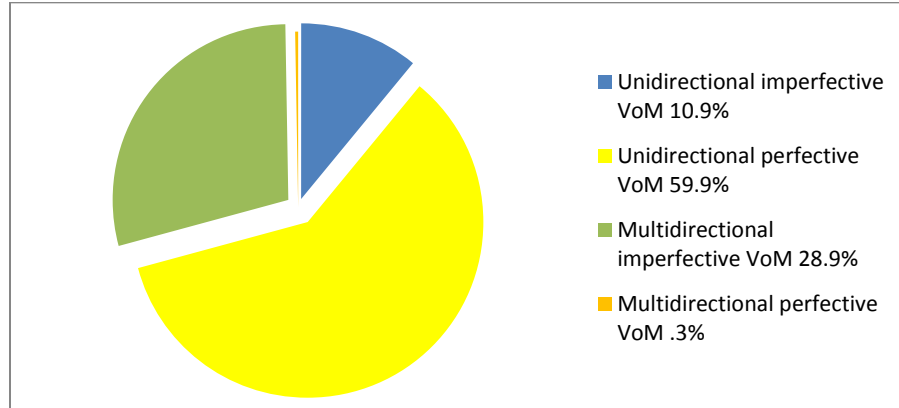
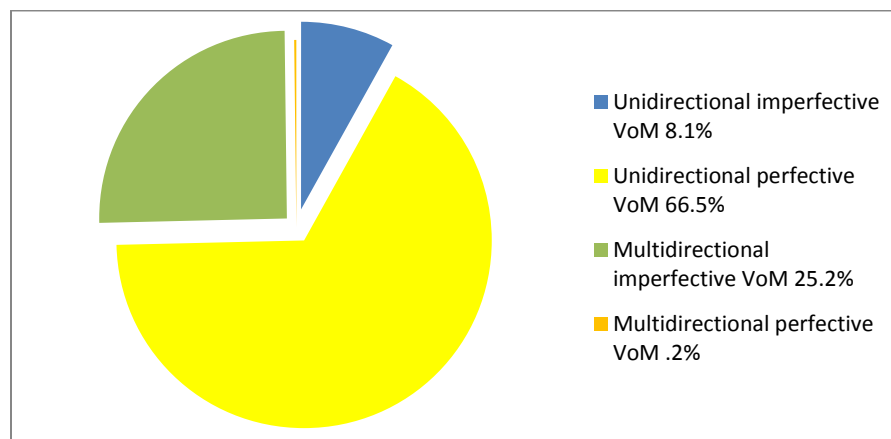


Figure 8b. Distribution of VoM according to directionality in REB Russian narratives



When carrying out statistical analysis, i.e. independent samples *t*-test, the decision was made to set aside the distinction between perfective and imperfective since the focus

of attention in this particular analysis was the feature of directionality only. The results of the *t*-tests on the number of unidirectional and multidirectional verbs demonstrate that even though there was some difference in the number and distribution of the verbs according to the directionality feature between Russian-English bilinguals and L1 Russian speakers, the differences were not statistically significant. There was no difference between the groups in the use of unidirectional verbs ($M = 16.58$ for L1 Russian speakers and $M = 13.67$ for REB participants): $t(59) = 1.51, p = .92$, two-tailed, as well as multidirectional verbs ($M = 6.71$ for L1 Russian speakers and $M = 4.50$ for REB participants): $t(59) = 1.82, p = .60$, two-tailed. The results suggest that the feature of directionality is well-maintained in the speech of Russian-English bilinguals.

Finally, the number of types of VoM used in the four categories described earlier was examined. The participants differed in the number of types of VoM – REB used fewer VoM types in three categories – unidirectional imperfective, unidirectional perfective, and multidirectional imperfective. Out of 88 types of unidirectional imperfective verbs used by all the speakers, the L1 Russian speakers used more types (67), than Russian-English bilinguals (57). A relatively small number of unidirectional perfective verbs were used (9), and L1 Russian speakers used all verbs, while Russian-English bilinguals used 7 types in their narratives. The biggest difference was demonstrated in the number of multidirectional imperfective verbs types – out of 68 types used in the narratives of all Russian speaking participants, L1 Russian speakers used almost the whole range, 58 verbs, while Russian-English bilinguals used less than half, only 31 verbs. The category of multidirectional perfective verbs is rare in Russian and

only one verb type (the same verb for L1 Russian and REB participants) was used by both groups of speakers.

However, it should be taken into consideration that these results do not account for the errors made by the REB participants in assigning directionality to the verbs. Those errors include incorrect assignment of directionality after some period of active usage of L2 English, the language that does not have this feature. The bilingual participants sometimes opted for multidirectional (imperfective) verbs in contexts where unidirectional (perfective) ones were required. In most cases when REBs misused multidirectional verbs, the error combined an error in aspect assignment in constructions of an auxiliary verb or a verb denoting the beginning of an action with the motion verb, for example *oni budut letat' za sobakoi* [they will fly after the dog] instead of *oni poletyat za sobakoi* [they will fly after the dog]. A more detailed exploration of such errors was performed during qualitative analysis.

5.1.4. The effect of AOA

Previous studies have shown that the age at which the participants start learning and using the L2 influences their proficiency in both languages (the first and the second) as well as the degree of cross-linguistic influence (e.g., Bialystok & Miller, 1999; Matsuoka & Smith, 2008; Silverberg & Samuel, 2004; Singleton, 2001). To examine whether the age of acquisition of the L1 influences encoding of motion events in the L1 and L2, a number of Kruskal-Wallis tests were conducted. The tests compared event segmentation, the encoding of manner of motion, and path of motion in English and in Russian between the three groups – early Russian-English bilinguals, childhood Russian-English bilinguals, and late Russian-English bilinguals. Then, the effects of AOA on the

lexical diversity of the motion vocabulary of the bilingual participants were analyzed with the help of the Uber formula. Additionally, the relationship between the independent variable, which was AOA, and the dependent variables, which were the number of VoM, the number of manner VoM, and the number of path segments in both languages, were analyzed through the use of scatterplots.

Kruskal-Wallis tests were chosen because of the low number of participants in each group, which was 10 participants only; therefore, the one-way analysis of variance could not be used. Moreover, the Kruskal–Wallis test is a non-parametric method of data analysis; thus, it does not make assumptions about normal distribution of the data as parametric tests do.

The results of the Kruskal–Wallis tests are summarized in Tables 25 and 26. There was no statistically significant difference between the speaker groups in their use of Russian VoM, manner VoM, type of manner VoM or path segments. However, there was a statistically significant difference between the different speaker groups in their use of the types of English manner VoM ($X^2 = 8.02, P = 0.018$) with a mean rank of 21.40 for early bilinguals, 14.22 for childhood bilinguals and 10.45 for late bilinguals. The pairwise comparisons revealed that early bilinguals used significantly more types of English manner VoM than late bilinguals ($X^2 = 7.58, P = 0.006$); there was no difference in the number of types of English manner VoM between early and childhood bilinguals or between childhood and late bilinguals.

Table 25. AOA effects in encoding of motion events in English

	VoM English	Manner VoM English	Type of Manner VoM English	Path Segments English	Lexical richness
Chi-Square	1.572	5.209	8.022*	.902	10.62*
Df	2	2	2	2	1
Asymp. Sig.	.456	.074	.018	.637	.005

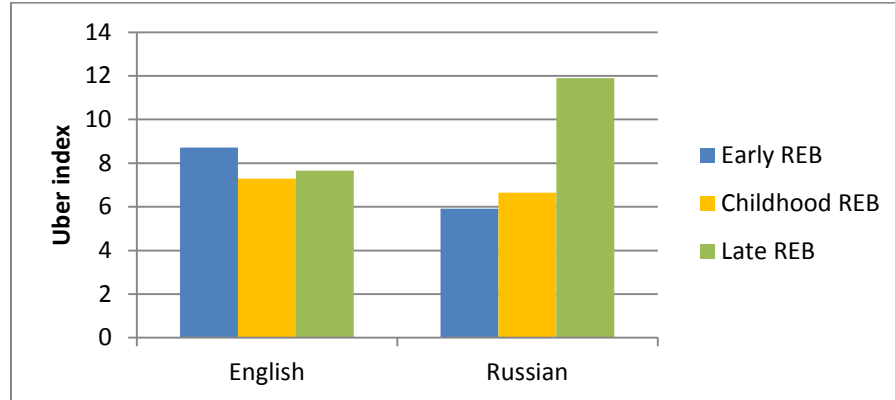
Table 26. AOA effects in encoding of motion events in Russian

	VoM Russian	Manner VoM Russian	Type of Manner VoM Russian	Path Segments Russian	Lexical richness
Chi-Square	.184	.090	.493	.752	2.17
Df	2	2	2	2	2
Asymp. Sig.	.912	.956	.781	.687	.338

The Kruskal-Wallis test applied to the bilinguals' L1 data revealed no statistically significant differences between the groups in the lexical richness of their Russian motion vocabulary, which suggests that the age at which the bilinguals learned their L2 does not affect their L1 motion vocabulary in terms of its diversity. In contrast, the Kruskal-Wallis test applied to the bilinguals' L2 data revealed statistically significant difference in how rich the bilinguals' English vocabulary was ($X^2 = 10.62$, $P = 0.005$) with a mean rank of 22.90 for early bilinguals, 11.55 for childhood bilinguals and 12.05 for late bilinguals. The following pairwise comparisons demonstrated significant difference between early and childhood bilinguals ($Z = -2.87$, $p = 0.004$), and early and late bilinguals ($X^2 = -2.72$, $p = 0.007$).

Also, the overall richness of motion vocabulary in REBs' Russian and English narratives was analyzed to see whether it depends on the age the participants started to use the L2. The Uber formula was applied to the data from six corpora. The results show that AOA affects the variety of motion vocabulary in both ways; the participants' Russian motion vocabulary is affected more strongly than their English motion vocabulary (See Figure 9). The highest index of lexical diversity in Russian was reached by late REBs and in English by early REBs.

Figure 9. Lexical richness of motion vocabulary in REBs' Russian and English narratives



A closer look at the verbs favored by each group shows that the three groups differed in what verbs they used more often in both languages; the choice of verbs did not coincide across the languages either. The most frequent English verb for early REB speakers was *to fall* (19 instances used by all 10 participants), for childhood REB speakers it was the verb *to come out* (21 instances used by 7 participants), and for late REB speakers it was the verb *to go* (18 instances used by 8 participants). However, in Russian the three groups unanimously used the verb *upast'* (to fall) more often than any other verb (31 instances used by all 10 early REBs, 21 instances used by 9 childhood REBs and 22 instances used by 9 late REBs). (See Table 27)

Table 27. Frequent motion verbs in the corpora

	Early REBs	Childhood REBs	Late REBs
<i>Upast'</i> (fall)	31	21	22
<i>Zalez't'</i> (climb up/get into)	11	10	14
<i>vylez'ti</i> (climb out/get out)	3	3	12
<i>Padat'</i> (fall)	14	4	6
<i>poiti</i> (go/walk)	11	9	9
<i>Vylezat'</i> (to be climbing out)	12	1	
fall	17	19	12
climb	13	12	11
come out	9	21	4
go	13	8	18
escape	2	12	15
chase	4	17	4

The scatter plots for the number of English VoM vs. AOA, the number of English manner VoM vs. AOA and the number of English types of VoM vs. AOA demonstrate a negative, though weak, association (Figures 10-12). The older the bilinguals were when they started to use their L2 English, the fewer English motion verbs they used. The same is true for the number of motion verbs encoding manner. The younger the bilinguals participants were when they acquired their L1 English, the fewer verbs encoded manner in their narratives. A sharp decrease in the number of manner VoM happens around the age of 17. The bilinguals who started to use English after that age employed a much lower number of manner motion verbs compared to the bilinguals who started to use English before that age. In a similar fashion, the variety of English manner of motion verbs went down as the Russian-English bilinguals' AOA increased with a sharp decrease after the age of 20.

Figure 10. Number of English VoM vs. AOA

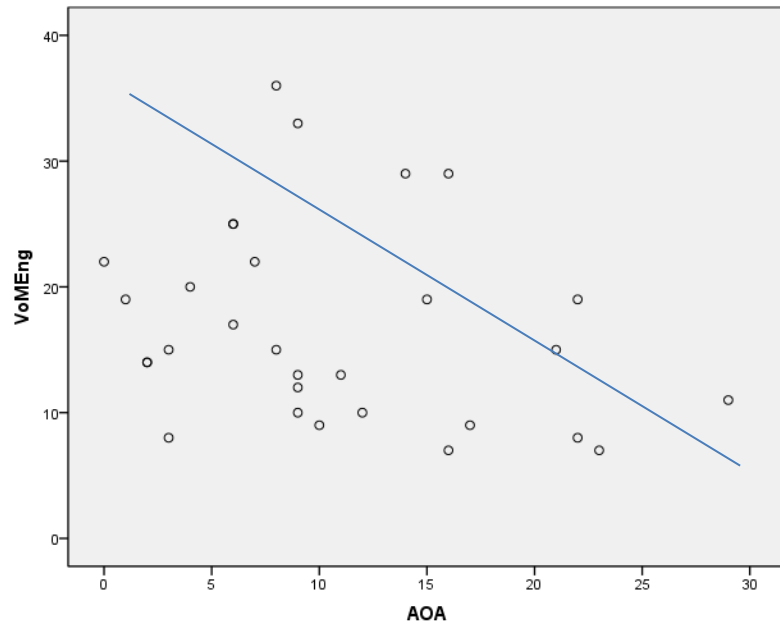


Figure 11. Number of English manner VoM vs. AOA

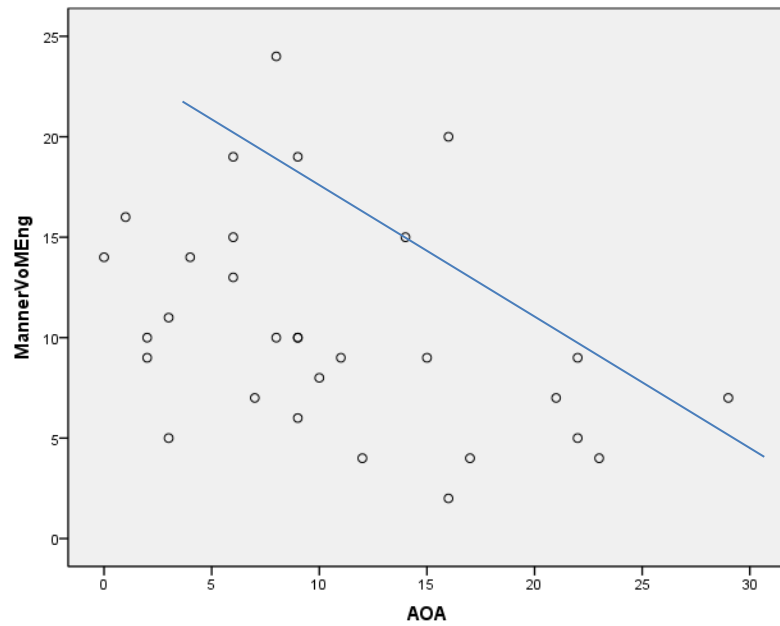
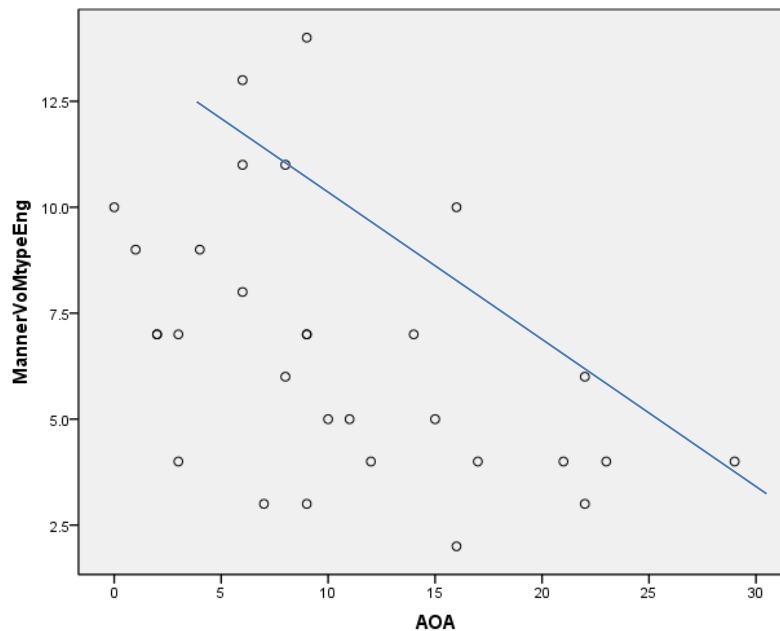
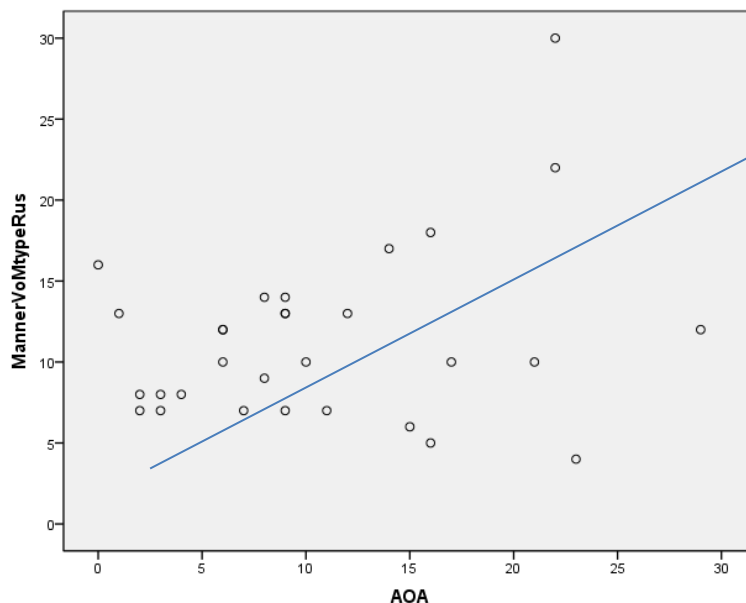


Figure 12. Number of English types of manner VoM vs. AOA



One association was demonstrated in a scatterplot in the Russian portion of the data, namely, between the AOA and the number of types of manner VoM (Figure 13). The bilinguals who started to use English later used more types of Russian motion verbs encoding manner. Since the vast majority of Russian motion verbs encode manner, it is possible to expect the same tendency in the number of types of Russian motion verbs used by the bilinguals. The older Russian-English bilinguals are when they started to use their L2 English, the more types of motion verbs they used in their L1 Russian.

Figure 13. Number of Russian types of manner VoM vs. AOA



In the case of encoding of motion events in the L1, the older Russian-English bilinguals were when they learned English, the more types of Russian manner VoM they used. However, there were no significant associations between the AOA and other aspects of encoding of motion verbs in Russian, i.e. the number of VoM, the number of manner VoM, or the number of path segments. These results suggest that even though AOA does affect the expression of motion events in the L1 of bilingual speakers, this influence is limited.

To summarize the findings, the analyses of the effect of AOA on the encoding of motion events in L1 and L2 showed that L1 patterns of lexicalization of motion are somewhat related to the AOA of L2 acquisition. No statistically significant differences were found between early, childhood and late bilinguals in any of the aspects of motion encoding under investigation in the Russian data. However, when speaking English, early bilinguals used significantly more types of English manner verbs than late bilinguals; there were no other significant differences in the number of VoM, number of manner

VoM or path segments used. The results suggest that lexicalization of motion in the L1 is more resistant to the effects of the AOA than lexicalization of motion events in the L2.

5.2. Qualitative analysis

To analyze lexical preferences in encoding motion events, and to identify deviations from common motion verb usage in the two bilingual corpora as well as the nature of differences and similarities, a qualitative analysis was performed. The procedures for identification of deviations from standard Russian and English usage as well as of cross-linguistic influence are outlined in Section 5.3.3. The uses of total 1,050 motion verb tokens (505 in English and 545 in Russian) were analyzed in the narratives produced by REB participants. Overall, eighty-seven instances of deviations in the narratives by 26 participants (6 males, 20 females) were identified. Sixty-nine of them were instances of motion encoding produced by Russian-English bilinguals in Russian narratives – 36 deviations were produced by 10 early RE bilinguals, 22 by 9 childhood bilinguals and 11 by 5 late bilinguals. 18 deviations were instances of motion encoding produced by Russian-English bilinguals in English narratives – all deviations in English were produced by 4 late bilinguals; no deviations were made by early or childhood bilinguals. It appears that early and childhood bilinguals completely acquired English patterns of motion encoding in all domains; however, late bilinguals have more difficulties in learning those patterns, which points to the effect of AOA.

Subsequently, errors made in the Russian-English bilinguals' Russian narratives were divided into four categories: 19 errors were made in aspectual distinctions, 13 in encoding of directionality, 25 in encoding of path, and 24 in encoding of manner. Then, several subgroups of errors were identified within each category to provide a more

comprehensive picture of the nature of the deviations in the bilingual corpus (See Tables 28 and 29 for more details). As directionality is closely connected with aspect, semantic choice (manner encoding) and pre-/post-fixation (key elements in encoding of path), deviations in the domain of directionality are discussed together with the other three categories in the analysis of REB narratives in Russian.

The errors made in the Russian-English bilinguals' English narratives were divided into two categories: 6 errors were made in encoding manner of motion, and 12 errors were made in encoding path. Two subgroups of errors were identified within each of the two categories. As mentioned above, all the erroneous instances in the L2 corpus were made by 4 participants only, who are all late bilinguals.

Table 28. Deviations in encoding of motion events in REB corpus in Russian narratives

		Early REB (# of cases)	Childhood REB (# of cases)	Late REB (# of cases)
Aspect	Loss of aspectual distinction	2	2	1
	auxiliary+imperfective (instead of perfective)	3	1	
	verbal constructions with “nachat” (to start, to begin)	6	2	2
Manner	influence of English verb “to go”	7	4	1
	overextended use of the verb “prygnut” [to jump]	3		
	incorrect manner encoding	4	5	
Path	incorrect prefix assignment	7	2	2
	incorrect preposition	3	6	5
Directionality		8	4	1

Table 29. Deviations in encoding of motion events in REB corpus in English narratives

		Early REB	Childhood REB	Late REB
Manner	overextended use of the verb “to go”	0	0	5
	incorrect manner verb	0	0	1
Path	incorrect preposition	0	0	8
	incorrect verbal particle	0	0	4

The second step involved examination of cross-linguistic influence in encoding of motion events in the Russian-English bilinguals’ narratives. As discussed in Section 4.3.3, instances of a morphosyntactic or pragmatic error counted as evidence of L2 influence if none of the L1 Russian speakers made the same choice, and if they were similar to the forms produced by L1 English speakers. Instances of a morphosyntactic or pragmatic error counted as evidence of L1 influence if none of the L1 English speakers made the same choice and if they patterned with choices made by L1 Russian speakers. Out of the 87 total deviations made by Russian-English bilinguals (69 deviations in Russian and 18 deviations in English), 25 instances can be counted as evidence of cross-linguistic influence, with 22 of them being indications of L2 English influence on L1 Russian (made by 17 participants), and 3 instances of L1 Russian influence on L2 English (made by one participant). Table 30 demonstrates the distribution of these instances in the corpus. Most participants who demonstrated L2 influence on L1 in encoding aspect, manner and path are grouped among those who arrived earliest (between the ages 0 and 6 years) and among those who have been longest in the country (between 15 and 28 years).

Table 30. Distribution of instances of L2 influence on L1 (numbers in parentheses refer to the number of participants who produced erroneous instances).

AOA	0-6 years	7-13 years	14-32 years
Total	16 (10)	6 (5)	3 (2)
Aspect	7	2	2
Manner	7	4	1
Path	2		

As mentioned above, the majority of instances of cross-linguistic influence in motion encoding are the effect of the L2 (English) on L1 Russian. These instances were made predominantly in two categories:

1. Aspect - verbal constructions with “начать” (to start, to begin) and imperfective verbs. The use of verbal constructions with an auxiliary “to start” is absolutely acceptable in English and is regularly used in the L1 English corpus. In Russian, in contrast, the beginning of an action is usually marked with a prefix “по-“. The use of other verbs in place of the prefix represents a clear case of L2 influence on L1 lexicalization patterns.

2. Manner – the simplification process that takes place under the influence of the generic English verb “to go”. In English the verbs “to go” does not encode manner and can be commonly used to express movement by foot, by car, by plane, etc. In Russian, on the other hand, the corresponding verb *hodit'* encodes manner and expresses movement by foot only. Thus, the use of this verb referring to movements other than by foot is another case of L2 influence on L1.

Other erroneous instances indicating L2 influence on L1 were made in encoding aspect (1 instance) and path (2 instances). Three erroneous instances of deviation from L2 English usage that can be evident of L1 influence on L2 were made in encoding path by one participant, who arrived in the U.S. at the age of 29 and her LOE was only 3 years.

The qualitative analysis demonstrated that the bilingual participants produced more erroneous instances of motion encoding in Russian than in English. The deviations in Russian included errors in aspectual distinctions, encoding of directionality, manner, and path; encoding of manner and path demonstrated the most number of errors. The deviations in English included errors in encoding of manner and path. While all three groups of bilinguals produced erroneous instances in Russian, in English the deviations were recorded only in the narratives of late bilinguals. Cross-linguistic influence was revealed in both Russian and English narratives with more instances in Russian than in English. The demonstrated influence of L2 on L1 was in the encoding of manner and path as well as aspectual distinctions; only one late bilingual demonstrated L1 influence on the encoding of motion in the L2, and it was in the encoding of path.

CHAPTER 6

DISCUSSION

This study aimed to examine whether motion talk in both languages of Russian-English bilinguals differs from patterns displayed by L1 Russian and L1 English speakers, whether L1 and L2 of the bilingual speakers influence each other, and whether the AOA of the L2 affects the motion lexicalization patterns of bilingual speakers.

This chapter is a review and interpretation of the findings presented in Chapter 5 as related to the research questions. First, the performance of L1 Russian and L1 English speakers will be compared. Then, Russian-English bilinguals' performance in their L2 English will be discussed followed by the discussion of their performance in their L1 Russian. After that, their performance in two languages will be compared and possible areas of bidirectional transfer will be outlined. Finally, the effects of AOA on the bilinguals' performance in both of their languages will be discussed.

6.1. Encoding of motion events by L1 English and L1 Russian speakers

The analyses of encoding motion events revealed differences between L1 English and L1 Russian speakers in several aspects. The *t*-test analyses show that L1 Russian speakers encode significantly more events than L1 English speakers, L1 Russian speakers encode manner significantly different from L1 English speakers, and L1 Russian speakers employ significantly more path segments than L1 English speakers to encode path in their narratives. The analysis of lexical diversity of motion vocabulary also demonstrated differences in the performance of L1 speakers.

The findings indicate that there is a difference in how L1 Russian speakers and L1 English speakers segment motion events. Event segmentation is the process when

complex dynamic situations have to be divided into events or processes. L1 Russian speakers were found to segment motion in a more fine-grained way than L1 English speakers, using a higher number of motion verbs. L1 Russian speakers tend to describe the events more as ongoing while L1 English speakers usually refer to events more as completed. As discussed in Chapter 3, the segmentation of motion events is closely connected with the aspectual system of the language. Following the adopted framework of event construal, the possible explanation of the results is due to the differences in the aspectual system of the two languages. Even though English is also an aspectual language, in Russian every verb must be assigned a particular aspect. The Russian aspectual system comprises two aspectual forms (i.e., imperfective and secondary imperfective) to denote ongoingness, and one (perfective) to denote completion. English system has only one aspectual form, progressive, which allows speakers to anchor the events in the domain of discourse (i.e., state the time of statement or the time interval of the action), as in “a woman is driving” or “the boy is running”. The use of simple verb forms not marked for aspect in English prompts speakers to add adjuncts, as in “the boy runs to the forest.” As Carroll, v. Stutterheim and Nüse (2004) state, the need to produce such anchorings in clarifying the status of the event with respect to the time of assertion may guide speakers to take a more holistic view of the event. In other words, instead of breaking an event into smaller actions speakers provide a temporal or spatial point of reference. It appears that this major difference in the aspectual systems of Russian and English caused the difference in how the speakers segment the events in their narratives.

With regard to the differences in the richness of motion vocabulary found between L1 Russian and L1 English speakers, the results of the ANOVA analysis showed

that Russian motion vocabulary is more diverse than English. Russian makes distinctions that are not encoded in English, and thus several Russian verbs correspond to a singular verb in English. An example of such a lack of correspondence are the two Russian verbs *bezhat'* and *begat'*, both of which can be translated into English as *run*. The two Russian verbs differ on the aspect of directionality – *bezhat'* indicates running in one direction at a certain moment, while *begat'* may denote running back and forth, running in multiple directions, or it may represent a repeated action. These subtle differences between the two Russian verbs are not reflected in one English verb *run* and will require an adjunct specifying the meaning of the Russian verb *begat'*.

The analysis of encoding of manner of motion concentrated on two aspects: 1) frequency of encoding of manner, which was done by calculating and analyzing the total number of VoM encoding manner in each corpora; and 2) variety of encoding of manner, which was done by calculating and analyzing the number of types of VoM encoding manner in each corpora. The hypothesis in the beginning of the study was that L1 English speakers will encode manner less frequently than L1 Russian speakers because manner encoding is not obligatory in English. The results of an independent *t*-test supported the hypothesis. The number and the types of manner verbs used by L1 English speakers were significantly lower than those of the L1 Russian speaking participants. English narratives contained a high number of verbs that do not encode manner, such as *come out*, *go*, *escape*, *get*, while their Russian narratives had only one non-manner VoM *ostanovit'sya* (stop). The results were not surprising since, as explained in Chapter 3, English has a number of high frequency motion verbs that do not encode manner (e.g., *to go*, *to get*, *to*

come), while Russian is poor in such verbs, and even those that do not encode manner are not of high frequency.

These results are consistent with prior research (Hasko, 2010), which demonstrated that Russian and English lexical repertoires of encoding manner are different, and that Russian is more salient than English in expressing manner. In those two studies, the L1 Russian participants encoded manner in almost 100% of the cases, while L1 English speakers quite often opted to use a non-manner verb in the same situations. The participants of the present study behaved in a similar way. Thus, even though Talmy (1991, 2000) puts Russian and English into the same typological group, the findings display significant difference in how the two languages encode manner.

The requirement to encode manner of motion in Russian is reflected in the results of the study. Ninety-seven percent of all motion verbs in L1 Russian narratives were manner verbs. The results of the study also support previous findings (Hasko, 2010) about the optionality of encoding of manner in English – only 65.2% of all motion verbs in L1 English narratives were manner verbs. These results only partially corroborate the framework of Talmy's (1991, 2000) typology used in this study. In agreement with the typology, both languages have linguistic means to encode manner in the main verb; however, speakers of English tend to use the verbs not marked for manner of motion, thus being different from speakers of Russian, whose lexical choice of motion verbs not marked for manner is very limited.

Analysis of encoding of path of motion in the L1 Russian and English narratives, and the results obtained from the independent samples *t*-test also demonstrated significant differences between the languages. As described in Chapter 3, even though Russian and

English are both S-framed languages that encode path outside the verb, they differ in their lexicalization pattern of expressing path information, and the results of this study reflected this. L1 Russian speakers encoded path more frequently than L1 English participants, utilizing more path clauses and more path segments. They also used a greater variety of path elements than L1 English speakers. Since Russian usually incorporates a combination of two path elements, the higher number of path elements in L1 Russian discourse compared to L1 English discourse was not surprising.

The speakers of both languages used a very low number of verbs encoding path in their roots (characteristic of a V-framed languages) in both corpora. The usage of such verbs can be considered a deviation from the typological predisposition, and the results demonstrate that the participants behaved according to the characteristics of S-framed languages. Hasko (2009) also found that her Russian and English monolingual participants followed this feature specific to S-framed languages.

Most of the path segments in L1 English present a characteristic S-language pattern of a verb directly followed by a satellite or a preposition, except for a few cases with stylistic inversion as in (4):

(4) a. ***Out*** comes an owl ...

b. ***From*** the hole in the ground ***jumps*** a hamster and bites the boy's nose.

On the other hand, L1 Russian participants displayed a wider variety of path encoding patterns. Not only did they use prepositions both before (5a) and after (5b) the main verb, they also employed satellite prefixes attached to the verb (6), and in half of the instances of path encoding they combined both types of path elements (7):

(5) а. ... она [лягушка] **остановилась перед** обрывом.

[it (the frog) **stopped before** the precipice]

б. ... и собачка **около** камня **ползает**

[and the dog **near** the rock is **crawling**]

(6) Мальчик **выпрыгнул**, взял собаку, он недоволен, что она видно **выпала**

[The boy jumped out [**out-jumped**], took the dog, he is upset that is might have fallen out [**out-fallen**]]

(7) ... **из** кустов **вышел** олень и потом ... этот мальчик **залез на** него ...

[**from** behind the bushes walked out [**out-walked**] a deer and then ... this boy climbed [**up-climbed**] **on** him]

The results corroborated Hasko's (2009) findings in comparison of Russian and English path of motion encoding. Both studies revealed a more frequent encoding of path in Russian with a more extended repertoire of path elements. In Hasko's (2009) study Russian speakers used twice as many path elements as the English speakers. Her Russian participants also utilized a higher number of morphosyntactic choices available in the language with regard to the expression of path.

Another finding supporting the claim that Russian and English are different in path encoding is that L1 English speakers used fewer 2-segmented path clauses, and considerably more 1-segmented path clauses than the L1 Russian participants. These results can be explained by the fact that in Russian a perfective verb almost always requires a prefix, and 59% of the L1 Russian motion vocabulary consists of perfective verbs. That is why the L1 Russian participants usually combined two path elements, a prefix and a preposition, into one path clause. Thus, based on the patterns distinguishing

path descriptions in the L1 Russian corpora and the L1 English corpora, Russian motion talk appears to display a higher structural variety in terms of the path clause configurations it allows to build. However, following the framework of Talmy's (1991, 2000) typology, both languages still encode path of motion with the help of linguistic means characteristic of S-framed languages.

In summary, the results of the analyses demonstrate that the two typologically similar languages differ significantly on all the variables of motion encoding examined in this study. L1 Russian speakers used a higher number of motion verbs than L1 English speakers, and the lexical diversity of the L1 Russian speakers was higher than that of the L1 English speaking participants. Furthermore, the L1 Russian speaking participants encoded manner and path of motion more often than L1 English speakers. Thus, English does not appear to be a prototypical S-language according to the typology. Talmy (1991, 2000) did not account for the differences in the aspect, manner, and path encoding between the languages as well as the absence of the Russian category of directionality in English.

6.2. Encoding of motion events by Russian-English bilinguals in English and L1 English speakers

The analyses of encoding motion events by Russian-English bilinguals speaking English and L1 English speakers did not reveal significant differences in the performance of these two groups of participants. The results of the ANOVA analyses of the number of motion events used by the participants show that when speaking L2 English bilinguals did not differ in how they segment motion events from L1 English speakers; neither did the bilinguals differ in how they encode manner or path of motion. The results of the

analysis of lexical diversity in the bilinguals' and L1 English speakers' narratives revealed no significant difference between the two groups of participants.

Russian-English bilingual participants did not differ in how they segment the events when they were speaking English from L1 English speakers. They used a comparable number of motion verbs in their narratives, which were also of a comparable size; thus, no L1 influence on the L2 was displayed. This similarity indicates Russian-English bilinguals have acquired the L2 segmentation pattern – they did not differ from L1 English speakers in their L2 English. If there were more influence from Russian, the bilingual participants might have segmented the events into smaller fragments attending to more detail. This pattern would have been demonstrated by a higher number of motion verbs used by REBs when speaking English compared to L1 English speakers. However, the bilinguals did not display this behavior, which indicated lack of L1 influence on their L2 patterns of event segmentation.

The Russian-English bilinguals displayed similar lexical diversity in L2 English compared to L1 English speakers. Even though the REBs' Russian motion lexicon is richer than L1 English speakers' vocabulary, it did not have an effect on the Russian-English bilinguals' L2 English motion lexical richness. However, the bilinguals' richness of motion vocabulary in English was the lowest among the four groups, which may point to the proficiency effect. The low Uber index that reflects the lexical diversity Russian-English bilinguals' narratives can be explained by the fact that several late bilinguals had a low self-reported proficiency in English and thus, their English proficiency and overall vocabulary knowledge was relatively low.

The bilinguals' L1 appeared to have no effect on how they encoded manner in their L2 English. Both frequency and diversity of manner VoM used in the L2 English corpus were comparable to the ones in the L1 English corpus. The number of manner of motion verbs and the number of types of manner of motion verbs in the L1 English narratives and in the English narratives of Russian-English bilinguals were not significantly different. These results contradict Hohenstein *et al*'s (2006) and Brown and Gullberg's (2008) findings, whose participants mentioned manner less frequently in motion event descriptions in L2 discourse compared to L1 discourse (albeit the compared languages in those two studies were from two different typological groups). It appears that the bilingual participants of this study did not experience difficulties in encoding manner and looked fairly targetlike in terms of their lexical repertoire for manner expression. Most likely it happened because the bilinguals were acquiring a language with a less dense system of manner expression. They also conform to the English pattern of optionality of manner encoding – the bilingual participants used 62.3% of manner verbs in their English narratives compared to 65.2% of manner verbs in the L1 English narratives.

Both the frequency and the variety of manner encoding in the bilinguals' English narratives matched the patterns of manner encoding by L1 English participants. However, moving from a more complex system to a system with a less salient domain of manner of motion makes it easier to follow the patterns of the latter. The fact that Russian-English bilinguals' English narratives did not reveal any L1 Russian effect on encoding of manner may be indicative of the transfer to nowhere (Kellerman, 1995). Since the domain of manner is more salient in Russian than in English, it is expected that bilinguals

will not transfer their L1 patterns of manner expression to their L2; even if they do, they will not be detected.

The bilinguals still made several errors in manner assignment in English – they overused a generic verb *go* in situations where a manner verb or a different non-manner verb would be required.

(8) ... a small animal went out from this hole ...

(an appropriate lexical choice here is came out/crawled out)

Since only late bilinguals committed such an error, these findings can be explained by the AOA of the participants. The older the participants were when they started learning English, the less proficient they are in the language and, consequently, they appear to display narrower motion vocabulary, in particular, manner of motion vocabulary.

The results of the ANOVA analysis on the number of path elements used by the Russian-English bilinguals and the L1 English and Russian speakers demonstrate that the bilingual participants were very close to the L1 English participants in the frequency of path encoding in their L2 English narratives, and differed significantly from L1 Russian speakers. Following the cross-linguistic differences described in Section 6.1, the Russian-English bilinguals produced overall fewer path elements than the L1 Russian speakers did, but used comparable proportions of 1-segmented and 2-segmented path elements as the L1 English participants.

The qualitative analysis showed that the bilinguals' L2 English narratives contained very few errors in path encoding and all the errors were made by late bilinguals who have been in the U.S. the least amount of time. Early and late bilinguals were 100% correct in the assignment of directional prepositions and verbal particles. The largest

proportion of the errors made by the late REBs was in preposition assignment, most likely due to their lack of grammatical knowledge:

(9) a. ... they walked up on the tree

(an appropriate lexical choice here is *to*)

b. ... the boy ... fell in the ground

(an appropriate lexical choice here is *on*)

The absence of errors in path encoding in the English narratives of early and childhood bilinguals suggest that this area of motion talk is acquired fairly easily and completely. Those several instances that did occur were made by the bilinguals who were in the U.S. for the least amount of time, and did not have the large amount of exposure as other participants did.

The results of the present study reflect the typological similarities of the languages in the encoding of path, suggesting that the differences described earlier did not prevent the bilinguals from complete acquisition of L2 patterns. Studies with the speakers whose L2 belonged to a different typological group from their L1 demonstrate a different tendency (Brown & Gullberg, 2011; Daller *et al.*, 2011). The participants of those studies differed significantly in the means they employed and the frequency of path encoding in their L2. However, in Daller *et al.*'s (2011) study, language dominant factor was observed. Conceptualization of motion in the bilingual speakers' was influenced by the dominant linguistic environment in both languages of the participants, Turkish and German. Turkish-German bilinguals residing in Germany performed more similarly to L1 German speakers in their L2 German (still producing erroneous instances), than the bilinguals residing in Turkey. When speaking German, the bilinguals chose manner verbs

less often in appropriate situations than the bilinguals in Germany or monolingual Germans. When speaking Turkish, the bilinguals who returned to Turkey most often chose concepts and patterns that resemble those used by L1 Turkish speakers; however, those bilinguals who resided in Germany opted for German patterns even when they were speaking Turkish. For example, they frequently used a satellite to express path even though this is redundant in Turkish.

The only instances of L1 Russian influence on L2 English was recorded in the narrative of the same late bilingual participant who has resided in the U.S. for only 3 years, which is the shortest time reported. The errors involved directional preposition assignment:

(10) ... a dog who is running out from the bees ...

(an appropriate lexical choice here is *away*)

In Russian this VoM with the preposition (running out) would be *ubezhat'*, where *u-* is a prefix denoting leaving a place, getting out of somewhere. In English the verbal particle *out* usually serves this purpose. Most likely, the participant simply “translated” the Russian prefix into English, thus displaying the cross-linguistic influence.

To sum up, the findings suggest that Russian-English bilinguals completely acquired language specific patterns of event segmentation and encoding of manner, as well as path of motion in their L2 English. There is no evidence pointing to cross-linguistic influence of their L1 Russian in the domain of manner of motion or path of motion.

6.3. Encoding of motion events by Russian-English bilinguals in Russian and L1 Russian speakers

The analyses of encoding motion events by the Russian-English bilinguals speaking Russian and L1 Russian speakers revealed significant difference in the performance of these two groups of participants on several variables. The results of ANOVA analyses of the event segmentation show that bilinguals speaking L1 Russian encode fewer motion events than L1 Russian speakers. The results of the analysis of lexical diversity in the bilinguals' and L1 Russian speakers' narratives demonstrated differences between the two groups of participants, suggesting an L2 influence on the L1. Another set of ANOVAs revealed significant differences in the encoding of manner of motion between the two groups of participants, but no differences in the encoding of path. The results of an independent sample *t*-test showed no significant differences in encoding of directionality between the Russian-English bilinguals and L1 Russian speaking participants.

Russian-English bilingual participants when speaking Russian segmented events into significantly fewer number of actions than L1 Russian participants, but they performed similarly to L1 English participants. These results are in line with the findings of previous studies (Bylund & Jarvis, 2011; Flecken, 2011; Schmiedtová et. al., 2011), in which the bilingual participants performed differently from L1 speakers of their L1 language, but similar to the L1 speakers of the bilinguals' L2 language. The likely explanation of the present finding is the influence of the bilinguals' L2 English (i.e., the aspectual system of the language) on their L1 aspectual system. Russian, unlike English, has three aspectual forms, and the results suggest that when speaking Russian the

bilinguals start to lose the distinctions between those forms and start to follow the English pattern to segment events in a less fine-grained way.

The loss of aspectual distinctions was demonstrated by the fact that bilingual participants at times used imperfective verbs in situations that required perfective ones when referring to singular completed actions. The use of perfective or imperfective form signifies what perspective speakers take on the situation. The focus on the ongoingness of the event is accomplished by the use of the imperfective form, while focusing on the holistic perspective is accomplished by the use of the perfective aspect. Since English lacks the perfective form, and a progressive aspect is somewhat similar to the Russian imperfective aspect, the choice of imperfective by Russian-English bilinguals may point to the L2 influence on L1. The example below demonstrates this phenomenon. In this discussion, deviations from appropriate lexical choices in the participants' narratives are underlined. Each example is followed by a word-by-word translation in square brackets and then by appropriate lexical choices in parentheses based on the data from the L1 Russian corpus.

(11) мальчик старается в ...бежать от совы ...

[a boy is trying in ... to be running away from the owl ...]

(an appropriate lexical choice here is *ubezhat'* [*to run away*, perfective])

Another type of substitution of perfective aspect for imperfective by Russian-English bilinguals when speaking L1 Russian is the verbal construction with the auxiliary *nachat'* (to start, to begin) or *budet* (will). While these are perfectly acceptable constructions in English, in Russian the beginning of an action is usually marked by the prefix *po-* as in *pobezhat'* (*to start running*). The use of an auxiliary verb with the

imperfective VoM instead of a perfective VoM marked by a prefix is a clear example of L2 influence on L1.

(12) a. ... пчёлы к нему начинают ... летать

[bees to him start ... flying]

(an appropriate lexical choice here is *poleteli* [*started flying*, perfective])

b. ... олень начал скакать

[a deer started galloping]

(an appropriate lexical choice here is *poskakal* [*started galloping*, perfective])

Similar constructions were found in previous research on encoding aspect by heritage Russian speakers (Gor *et al.*, 2010; Polinsky, 2008a) and late AOA Russian-English bilinguals (Pavlenko, 2010), who also used the constructions of auxiliary + imperfective verb instead of a prefixed perfective verb, and imperfective verbs instead of perfective ones.

(13) ... пчелы начали мчаться за собакой ...

[the bees started running after the dog]

(an appropriate lexical choice here is *pomchalis'* [*started running*, PERF])

[Pavlenko, 2010]

The results of this data analysis suggest that under the influence of the constant use of the L2, bilinguals are becoming less accurate in aspectual distinctions in their native language and L2 English was found to affect segmentation patterns in bilingual speakers. These results are in line with previous findings of the loss of aspectual distinctions, which were reported in the speech of late-Russian-English bilinguals

(Pavlenko, 2010) and heritage Russian speakers (Gor et al., 2010; Polinsky, 2008a; Zemskaja, 2002). However, since the participants of this study still use both perfective and imperfective verbs and in many cases they choose the appropriate aspect, we may conclude that the system is still in place but is undergoing simplification.

When speaking Russian, Russian-English bilinguals demonstrated a narrower range of motion vocabulary compared to L1 Russian speakers. This finding indicated simplification of L1 motion vocabulary in Russian-English bilinguals. They probably start losing those slight distinctions that set the two languages apart, such as the difference between the verbs *letat'* and *letet'* – both verbs are translated into English as *fly*; the former is a multidirectional verb and the latter is a unidirectional one, a distinction that the English language does not make. This finding was not surprising considering that overall, the Russian-English bilinguals encoded fewer motion events (i.e., used fewer motion verbs in their narratives) in Russian than L1 Russian speakers. Most of the verbs that were not frequently used or not used at all by REBs were verbs with prefixes and perfective verbs. It seems that the complicated Russian system of affixation to encode path starts going through the simplification process and the speakers do not employ this system to its full potential. Moreover, since perfective aspect is formed by means of prefixes, not using verbs with prefixes affects the aspectual system of the bilinguals and causes its simplification.

The following hypothesis was put forth with regard to encoding of manner in bilinguals' Russian narratives: Russian-English bilinguals will encode manner of motion in L1 Russian less frequently than L1 Russian speakers, with fewer types of manner of

motion verbs due to the influence of the bilinguals' L2 English, in which expression of manner is less salient. These predictions of manner of motion encoding were supported.

The results of the one-way ANOVAs demonstrated that Russian-English bilinguals did not perform in an entirely targetlike way, since both frequency and variety of manner encoding in Russian-English bilinguals' Russian narratives were significantly lower than in the L1 Russian narratives. It was established that L1 English speakers use a smaller number of manner VoM than L1 Russian speakers. It appears that encoding of manner in Russian-English bilinguals undergoes changes under the influence of their L2 English. This is in line with the results of previous research with bilingual speakers (Brown & Gullberg, 2008; Daller *et al.*, 2011). The bilingual participants in those studies – Japanese-English in Brown and Gullberg's (2008) study and Turkish-German in Daller *et al.*'s (2011) study encoded manner significantly less often in motion event descriptions than did monolingual speakers of the bilinguals' L1 language.

However, Brown and Gullberg (2008) reported no erroneous instances in their bilingual participants' L1 narratives, which was different in the present study. The qualitative analysis performed here provided a deeper understanding of the types of errors bilinguals make in their L1, and the types of transfer the L1 system experiences after being in active contact with the L2 for many years. The first and the most frequent example of L2 influence and, as a result, L1 system simplification, is the use of *idti/khodit'* [to walk] to refer to climbing, flying and jumping. A possible reason for this substitution is the influence of the generic English verb *go*. The obligatory Russian distinction between different types of movements was lost due to the possibility of using

a non-manner verb *go* for all these instances in English. The following are the two examples showing this phenomenon:

(14) a. ... маленькое животное выходит из дырку ...

[a small animal is walking out from in the hole]

(an appropriate lexical choice here is *vylezaet* [climbing/crawling out])

b. ... сова идёт за мальчика ...

[an owl is walking after the boy]

(an appropriate lexical choice here is *letit* [flying])

Similar substitutions were found in the speech of Russian-English bilinguals in other studies (Gor *et al.*, 2010; Pavlenko, 2010). In those studies even highly proficient heritage Russian speakers and late bilinguals produced erroneous instances that reflect the beginning of the simplification process that takes place under the influence of generic verbs in English. The participants did not make the distinction between *idti/khodit'* [to walk] and *ekhat'/ezdit'* [to drive/ride], and other movements by means of transportation. They also failed to distinguish other types of movement, for example the ones denoting getting out of some place (e.g., *vylezat'* [to climb out] and *vyhodit'* [to walk out]).

In addition to *idti/khodit'* [to walk], the speakers assigned manner incorrectly in other motion events, mainly the verbs *vyprygnut'/vyprygivat'* (jump out) and *vylezti/vylezat'* (crawl out):

(15) a. ... сова из дырки вылезла ...

[an owl from the hole climbed out]

(an appropriate lexical choice here is *vyletela* [flew out])

b. ... собака выползла в окно ...

[a dog crawled out from the window]

(an appropriate lexical choice here is *vyprygnula* [jumped out])

Most likely the manner was assigned incorrectly because the bilinguals start to lose the distinction between different manner verbs due the presence of highly frequency non-manner verbs in English. Overall, the results of the study demonstrate differences in the encoding of manner of motion between Russian-English bilinguals speaking Russian and L1 Russian speakers. The decrease in the frequency of manner encoding in the bilinguals' Russian narratives coincides with the decrease of the overall usage of motion verbs, and points to cross-linguistic influence of their L2 English.

The ANOVA analyses of the expression of path in the speech of Russian-English bilinguals and L1 Russian speakers revealed no significant differences in the frequency of path encoding between the two groups. The L1 Russian patterns of encoding path were preserved in the REBs' Russian narratives, which differs from Brown and Gullberg's (2011) results in the study of path encoding in Japanese learners of English. Their participants, who were learning and using English in Japan as well as in the U.S., showed a unique distribution of verbs and adverbials within the clause, which did not pattern with the L1 Japanese speaker's use of the same elements. Similar findings were reported by Hohenstein *et al.* (2006) and Daller *et al.* (2011); the participants of those two studies also demonstrated L2 English and L2 German influence on the encoding of path in their participants' L1 Spanish and L1 Turkish. The bilingual participants in the present study used all types of path elements in the same proportions as the L1 Russian speakers did; they also did not differ from each other in the number of combinations of various path

elements (e.g., prefix+preposition). The differences between the results of this study and Brown and Gullberg's (2011), Hohenstein *et al.*'s (2006), and Daller *et al.*'s (2011) studies can be assigned to the characteristics of the languages. Japanese, Spanish and Turkish belong to a different typological group compared to English and German, and have pronounced differences in path encoding; thus, the effect of one language on another is more transparent. On the other hand, Russian and English belong to the same typological group and thus possess more similarities; cross-linguistic effects, if any, would be more difficult to observe in such languages.

Interestingly, L1 Russian participants used more free standing prepositions than bound prefixes, while bilingual participants used a fairly equal number of prepositions and prefixes in their Russian narratives. The discrepancy can be explained by the fact that the bilinguals used slightly more perfective verbs than L1 Russian speakers did, and, as mentioned above, perfective verbs require a directional prefix more often than imperfective ones. Overall, it appears that markers of path are well-preserved in the bilingual corpus, which goes in line with Pavlenko's (2010) findings of path encoding in late Russian-English bilinguals. She reports several instances of incorrect prefix assignment in encoding path of motion that suggested some loss of prefix meanings in the bilingual corpus. Those instances were not frequent and targeted only a few prefixes with a variety of not very transparent meanings, which is also similar to the results of the present study.

The qualitative analysis of L1 path encoding supports Pavlenko's (2010) findings and the quantitative analysis of this study that Russian-English bilinguals are quite resistant to the cross-linguistic influence on encoding path. Close examination of the

bilinguals' narratives showed that only early bilinguals misused a directional prefix, and even they did not make those errors very often.

(16) ... мальчик залез с дерева ...

[the boy climbed up from the tree]

(an appropriate lexical choice here is *slez* [climbed down])

However, the bilingual participants still were not always on target with prefix and preposition assignment for path encoding. There were many instances demonstrating that REBs start losing prefix and preposition meaning, sometimes assigning them incorrectly:

(17) a. ... собака упала из дома ...

[the dog fell down from the house]

(an appropriate lexical choice here is *vypala* [fell out])

b. ... мальчик залез в дерево

[the boy up-climbed in the tree]

(an appropriate lexical choice here is *na* [on])

c. ... они уходят с воды

[they walk away from the water]

(an appropriate lexical choice here is *vyhodyat iz* [walk out of])

No direct correspondence with English was found when analyzing the reasons for the misuse of those affixes. The differences between prefixes and prepositions such as *upala* and *vypala* (fell down and fell out), *zabezhal* and *vbezhal* (ran into and ran in), *ukhodyat s* and *vykodyat iz* (go away from and go out from) are not very pronounced and thus, may be hard to maintain. Moreover, Russian prefixes, prepositions, and especially combinations of prefixes with prepositions do not have close correlations with English

particles or prepositions. For example, the Russian preposition “с” can be translated into English as *from, off, with, by, for, and since*; the English preposition *from*, in its turn, can be translated into Russian as five different prepositions. This lack of correspondence could be a possible reason why Russian affixes are more difficult to maintain.

It is plausible to suggest that typological differences play an important role in maintaining L1 patterns of the encoding of path of motion. When the two languages of bilinguals belong to different typological groups, encoding of path of motion in the speakers’ L1 undergoes changes. These findings were reported in Brown and Gullberg’s (2011) study, Daller et al.’s (2011) study, and Hohenstein et al.’s (2006) research. Their participants either adopted L2 patterns of encoding path of motion, or created their own means to express path of motion. On the other hand, the differences observed in the encoding of path in typologically similar languages are not strong enough to cause restructuring of the linguistic system in the domain of path encoding, or any significant deviations from monolingual patterns. The participants in Pavlenko’s (2010) study demonstrated the same resistance to L2 influence on L1 patterns of encoding of path of motion.

The next analysis concerned a unique feature in the Russian language not reflected in the framework used in this study. Talmy’s (1991, 2000) dichotomy of S-framed and V-framed languages is based on the linguistic means employed to encode manner and path of motion only. Along with the differences between Russian and English described in Chapter 3 and Section 6.1, the two typologically similar languages also differ in the ability to encode directionality – the English linguistic system does not have this feature. Thus, the hypothesis of the present study was that the absence of such a

characteristic in the L2 of bilinguals would affect their encoding of directionality in their L1 Russian to a significant degree. However, the hypothesis was not supported.

The analysis of similarities and differences in encoding directionality by the Russian-English bilinguals and L1 Russian did not provide evidence that continuous exposure and usage of L2 English forced bilinguals to lose the distinction in terms of directionality in the Russian system. The two groups of participants used a comparable number of unidirectional as well as multidirectional verbs in their discourse; the distribution of these types of verbs in the corpora was also similar (although, several mistakes were revealed in the assignment of directionality by the bilinguals).

Even though previous studies demonstrated that multi-/unidirectional VoMs are problematic for heritage speakers (Gor *et al.*, 2010; Polinsky, 2008b), the results of the current study show that the loss of distinctions made in terms of directionality is quite minor. For the most part, the bilingual participants assigned directionality correctly with only a slight overuse of unidirectional verbs (compared to L1 Russian speakers). This finding is in line with Zemskaya's (2004) and Polinsky's (1996), studies but does not correspond with the results of Gor *et al.*'s (2010) and Pavlenko's (2010) studies, whose participants favored multidirectional VoM. The bilinguals in Pavlenko's (2010) study preferred to use multidirectional imperfective verbs in the contexts that required unidirectional perfective verbs. A possible interpretation for this discrepancy is probably due to a loss of distinctions between uni- and multidirectional verbs, rather than a preference for a particular verb type by the bilinguals. In addition, no statistical analysis involving the feature of directionality was used in Pavlenko's (2010) or Bermel and

Kagan's (2000) studies, and the differences were reported only on the level of particular instances of incorrect assignment of directionality.

However, in spite of the fact that the total number of multidirectional verbs being used was more for the bilinguals than for L1 Russian speakers, the number of types of this group of verbs was smaller in the bilinguals' narratives. Similarly, REBs used fewer types of unidirectional verbs than L1 Russian participants did. This was not a surprising outcome since it has already been found that REBs' overall motion vocabulary is smaller than that of the L1 Russian group's. Yet again these results provide additional evidence of simplification among the Russian-English bilinguals.

As mentioned above, the bilingual speakers differed from the L1 Russian speakers in that they often used multidirectional imperfective verbs instead of unidirectional perfective verbs required by the context of the story.

(18) ... мальчик упал на оленя и олень с ним куда-то бегал ...

[the boy fell on a deer and the deer with him somewhere was running back and forth]

(an appropriate lexical choice here is *pobezhal* [started to run])

Similar errors, specifically, the use of multidirectional verbs *letat'* [to fly back and forth] or *begat'* [to run back and forth] instead of unidirectional verbs *letet'* [to walk in a particular direction] or *bezhat'* [to run in a particular direction], were found in the combination of a verb *nachat'* [to start], *pytat'sya/starat'sya* [to try] or *budet* [will] with a motion verb.

(19) а. ... собака тоже с оленем начал бегать ...

[the dog also after the deer started running]

(an appropriate lexical choice here is *pobezhal* [started to run])

б. ... они будут летать за собакой ...

[they will *fly* after the dog]

(an appropriate lexical choice here is *poletyat* [will start to fly])

This erroneous use of directionality and aspect represents a clear case of L2 influence on L1 lexicalization patterns. In Russian the beginning of an action in the past or future is indicated by a unidirectional perfective verb marked with a prefix *no-*. In English, on the other hand, the beginning of an action is most commonly specified by the verb *to start* plus an infinitive or gerund, a combination found in REBs' Russian narratives. Similar errors were reported in previous studies with heritage language speakers (Polinsky, 2008a; Zemskaia, 2002) as well as with late bilinguals (Pavlenko, 2010).

More than half of all the errors in directionality committed by the bilingual participants were made by early bilinguals (8 out of 13), childhood bilinguals made three errors, while only one late bilingual made only one error of substituting a unidirectional perfective verb for a multidirectional imperfective one. It appears that the earlier the bilinguals were exposed to an active use of their L2 English, the easier it was for them to begin losing distinctions in directionality, as well as aspectual distinctions, at least in production.

In summary, Russian-English bilingual participants differed from L1 Russian speakers in several aspects of motion encoding. The bilinguals segment events in a more fine-grained way than L1 Russian speakers. The bilinguals also encoded manner of

motion less often than L1 Russian speakers. However, they did not differ significantly from the L1 Russian speakers in the encoding of path of motion or directionality, suggesting that these two features are maintained relatively well in the bilingual discourse.

6.4. Encoding of motion events by Russian-English bilinguals in L1 Russian and in L2 English

The analyses of encoding motion events by Russian-English bilinguals revealed differences between their performance in English and in Russian in most of the aspects under examination. The results of the paired *t*-test show that bilinguals do not differ in the way they segment motion events in their two languages, but they do differ in manner and path encoding in their two languages.

Although Russian-English bilinguals were speaking two different languages which pattern significantly differently in event segmentation in monolingual discourse, the results of the *t*-test comparing the bilinguals' event segmentation in their L1 and L2 showed that there were no significant differences in how many motion events they encoded. It seems likely that the bilinguals start using similar patterns of motion event segmentation similar to the L1 English pattern (the facts that Russian-English bilinguals did not differ from L1 English speakers when using English but differed from L1 Russian participants when speaking Russian supports this conclusion). It seems that constant use of the L2 in the L2 environment influenced the less used L1.

Different results were obtained in the analysis of encoding of manner in the Russian-English bilinguals' narratives in their two languages. The *t*-tests analyzing frequency and variety of manner encoding in the bilinguals' L1 Russian and L2 English

narratives resulted in an interesting outcome. The speakers used a significantly higher number and a significantly wider range of manner verbs in Russian than in English. The results contradict the Brown and Gullberg (2008) study, who also investigated manner encoding in the two languages of their Japanese-English bilinguals. The performance of their participants was indistinguishable, even though their languages belonged to different typological groups and was in the context of cross-linguistic in the monolingual baseline. Brown and Gullberg (2008) suggest convergence between L1 and L2 linguistic systems in the domain of encoding manner.

Thus, contrary to Brown and Gullberg's (2008) findings, the results of this study with Russian-English bilinguals suggest that REBs attempt to preserve the L1 pattern for manner encoding. However, it is also necessary to consider the significant difference found in the L1 Russian speakers' performance and Russian-English bilinguals' Russian discourse. It appears that since the system is undergoing simplification in overall conceptualization of motion events, expression of manner also experiences changes but to a lesser degree.

In the domain of path of motion, the results of the independent samples *t*-tests demonstrated significant differences in how Russian-English bilinguals encode path in the two languages. The bilingual participants used a significantly higher number of path segments when they were speaking Russian than when they were speaking English. These results combined with the absence of cross-linguistic influence on path encoding reported in Sections 6.2 and 6.3 suggest that Russian-English bilinguals preserve language-specific patterns of encoding of path in their two languages. These findings again differ from Brown & Gullberg's (2011) results of the comparison of path encoding

by Japanese-English bilinguals in their two languages. Their encoding of path in Japanese and in English was very similar and did not reveal any differences; however, they differed from L1 speakers of both languages, producing significantly more goal expressions per clause than either group of monolingual speakers. Brown and Gullberg's (2011) results suggest that their participants not only converged in the way they encoded path of motion, but also that Japanese-English bilinguals created a unique pattern different from Japanese or English. The participants of the present study, on the other hand, preserved the patterns of Russian and English encoding of path, as demonstrated by the results.

In summary, Russian-English bilinguals encoded motion differently in their two languages in most motion domains. The only aspect in which their performance in Russian and English did not reveal any significant differences and suggested convergence of the two language patterns was event segmentation. The bilinguals performed differently in the encoding of manner and path of motion in their L1 Russian and L2 English.

6.5. The effect of AOA on the encoding of motion events by Russian-English bilinguals in L1 Russian and in L2 English

One of the aims of the study was to investigate the effects of the AOA on the bilingual participants' performance in their two languages. Previous research has demonstrated the presence of the effect of AOA on the acquisition of the L2 in the domain of motion events encoding (e.g., Hohenstein *et.al.*, 2006; Kersten *et al.*, 2011; Montrul, 2002), as well as on the maintenance of the L1 (e.g., Bylund, 2009). However, the results of the current study only partially supported these previous claims.

The results of the Kruskal–Wallis test demonstrated no statistically significant differences in any aspect of motion encoding between any groups in the L2 English of the bilingual participants, except for the number of types of manner VoM used by early and late bilinguals. These results are consistent with the analysis of the richness of the overall motion vocabulary. Early bilinguals were superior to the other two groups in their motion vocabulary diversity. It seems that late bilinguals still did not acquire the whole range of the motion vocabulary in English, especially the verbs that encode manner. These results somewhat coincide with previous findings of Hohenstein et al. (2006), who found that learning L2 post-puberty affected L2 lexical choice.

Similar to the results of the effect of AOA on Russian-English bilinguals' discourse in English, there were no statistically significant differences in the effect of AOA on any domain of motion talk in the bilinguals' L1 Russian. It seems that the domain of motion is quite resilient to L2 influence and once it is acquired, it remains stable. The only difference found during the analyses was in the diversity of the L1 motion lexicon. Early bilinguals' motion vocabulary was significantly less diverse than the motion vocabulary of childhood and late bilinguals. It appears that L1 motion lexicon did experience changes, and decreased under the influence of constant use of L2 since early bilinguals reported using English significantly more often than Russian in their everyday life. The results of the current study are similar to Hohenstein *et al.*'s (2006) results in that little difference was found in encoding motion between the pre- and post-puberty bilinguals in that study. However, Hohenstein *et al.* did not report correlations between AOA and encoding of manner and path. The current study included this analysis expanding the investigation of the AOA effects.

However, Bylund (2009) obtained different results on the effect of AOA on the L1 in motion talk. In his study of endpoint encoding and temporal perspective-taking strategies, the participants who were older than 12 when they acquired their L2 Swedish converged with the monolingual speakers of their L1 Spanish on both aspects, while the participants who were younger than 12 at the time of L2 acquisition demonstrated deviations from the performance of the control group, which was L1 Spanish speakers. The differences between the results of the two studies may be explained by two factors. First, the domain of investigation was different – Bylund (2009) examined endpoint encoding, while the present research studied event segmentation as well as encoding of manner and path in bilinguals' discourse. Secondly, the properties of the language also affected the outcome. Using the same framework of event conceptualization, Bylund (2009) investigated Swedish, which lacks the category of aspect, whereas Spanish is an aspectual language. In the present study, while the two languages (Russian and English) differ in encoding of aspect, they are both aspectual languages.

Despite the fact that the Kruskal–Wallis tests did not provide much evidence of the influence of AOA on the bilinguals' encoding of motion in both languages, the scatterplots provided more information on the relationship between AOA and different aspects of motion encoding discussed previously. Even though there were no statistically significant results found, the scatterplots suggest the possibility for a negative correlation between the age the participants came to the U.S. and the number of motion verbs, and manner of motion verbs VoM in English, in addition to the statistically significant results found in the number of types of English manner of motion verbs. This finding means that the younger the participants were at the time of the onset of L2 acquisition, the better

they acquired the English lexicalization patterns of motion encoding, in particular, encoding of manner. The absence of the statistically significant results may be explained by a small number of the participants in each group.

No statistically significant correlations between the AOA and motion encoding in the bilinguals' Russian narratives were found, but scatterplots demonstrated a possibility for a negative association between the AOA and the number of types of manner VoM. This finding indicates that the participants who arrived to the U.S. early in their lives did not use a wide range of manner of motion verbs. The absence of any other correlations was surprising since Russian has an elaborate system of motion encoding, especially of manner and path, and the longer the bilinguals are not actively exposed to the language, the more likely the speakers would lose the distinctions between the intricate minute aspects. However, the participants of this study seemed to be resistant to the effects of the age of acquisition of the L2.

A possible explanation of the only limited effect of AOA on the L1 and L2 of the participants may be the participants themselves. First, each bilingual group consisted only of ten participants. Second, out of 30 participants, only 10 started to actively use English in the English environment after the age 13, which is the time after which the literature suggests that the acquisition of the L2 becomes more difficult. Moreover, out of the 10 late bilinguals, two arrived to the U.S. when they were 14 and 15, the age that is very close to the age of childhood bilinguals. Finally, there was very a high amount of variation in the frequency and contexts of the use of Russian. Some early bilinguals took trips to Russian-speaking countries, watched TV, and spoke Russian with their relatives, while several late bilinguals had not travelled to any Russian-speaking country after their

arrival to the U.S., and the use of Russian for some of them was limited to phone conversations with family, or occasional interactions at work.

To sum up, very limited overall AOA effects were found in the bilinguals' performance in either Russian or English. The biggest effect was found in the bilinguals' Russian diversity of the motion vocabulary followed by the number of types of English manner VoM. Other differences did not reveal any significant effects of AOA on the bilinguals' motion talk.

6.7. Overall discussion

The aim of the present study was to test the role of L2 in the maintenance of the L1 patterns in the domain of motion, the role of the L1 in the acquisition of motion events encoding in the L2, and the effect of AOA on both the maintenance of the L1 acquisition of the L2. The second aim of the study was to review the validity of Talmy's (1991, 2000) typological framework used in the research of motion events encoding.

The first research question concerned similarities and differences in encoding of motion events (event segmentation, lexical diversity, manner and path of motion, and directionality) by native speakers of Russian and English. The results of the study demonstrated significant differences between the two languages in all the investigated domains. The cross-linguistic differences found in the L1 Russian and L1 English discourse support previous criticisms of Talmy's (1991, 2000) typology of motion events (Croft, *et. al.*, 2010; Hasko, 2010; Ibarretxe-Antuñano, in press; Pedersen, 2009) and demonstrate nuances of the linguistic systems of the languages and of the motion event encoding that were not taken into consideration. The typology is mostly based on an analysis of the grammatical system of the language, without examining actual discourse

and how semantic domains are expressed in speech. Some languages have certain characteristics that are not represented in other languages (e.g., directionality in Russian), which should be considered in the description of motion events encoding within the typology. It is important to note that the differences found in event segmentation in Russian and English do not reflect the typological profile of these languages, but rather the differences in the aspectual system pointed out by von Steutterheim and Nüse (2003) and Bylund (2011). However, the findings of the study are in line with several other studies that pointed out inconsistencies with the framework of event conceptualization (Flecken, 2011; Schmieđtová & Sahonenko, 2008). Even though both groups of L1 participants spoke aspectual languages, the differences in the marking of aspect caused differences in event segmentation. The results provide evidence that concepts marked by different grammatical means play an important in structuring information for expression. The speakers of Russian, whose language includes an intricate system of aspect and its marking, appeared to pay attention to more details of a motion event. In contrast to Russian participants, the speakers of English, whose language has a less complicated system of aspect, appeared to consider a more holistic picture of an event, omitting the details the Russian speakers attended to.

The second research question concerned similarities and differences in encoding motion events by Russian-English bilinguals in their two languages in the context of cross-linguistic differences. In contrast to previous research (e.g., Hendricks et al., 2008; Inagaki, 2002; Matsunaga, 2006) demonstrating the L1's effect on L2 acquisition, the present findings did not reveal cross-linguistic influence on the participants' L2 English. The bilinguals appeared to completely acquire all the investigated motion domains.

However, several motion domains demonstrated cross-linguistic influence of the bilinguals' L2 on their L1 (i.e., event segmentation, encoding of manner and directionality, and lexical diversity of motion vocabulary). These results support a body of research showing the effect of the L2 on the L1 in functional bilinguals (e.g., Bylund & Jarvis, 2011; Brown & Gullberg, 2008; Cook, 2003).

In contrast, encoding of path in the L1 was the area that was strongly maintained by the bilinguals. This finding can be explained by the structural differences in the encoding of path. While Russian and English are similar in the ways they encode manner (i.e. in the main verb, and differ only in the frequency of its encoding), the languages employ different elements when encoding path. As mentioned before, Russian employs prefixes encoding path, while these do not exist in English. Moreover, Russian usually combines a bound satellite and an unbound element in one path clause, which is infrequent in English. Thus, the languages display deeper fundamental differences in the ways path of motion is encoded compared to the manner of motion. It appears that it is much harder to make structural changes to the system than simply use fewer components.

A possible explanation of the different outcomes compared to previous studies (e.g., Brown & Gullberg, 2011) is the methodology used. In this study, a picture book was used, while in other studies (Brown & Gullberg, 2011; Bylund, 2008; Stutterheim & Nüse (2003) the reserachers used cartoons or silent films. The movements in cartoons and films could have elicited more frequent and fine-grained descriptions of motion compared to static pictures in a book.

The reason why path is retained but manner decrease in variety in Russian narratives of Russian-English bilinguals could be the characteristics of the elements

involved in encoding of manner and path in Russian and English. Path is marked by prefixes and prepositions, which are a closed class of parts of speech; in contrast, manner is encoded in verbs, which belong to an open class of parts of speech, and thus a possibility of expanding the vocabulary (as well as creation of words by participants) exists. Also, a certain path can be expressed by a certain preposition, prefix, or a combination of the two. A different prefix, preposition or a combination of the two will result in a different meaning and incorrect encoding of path. Thus, even though the path encoding system in Russian is complicated, the bilinguals have to retain it in order to be able to express the meaning they need. In contrast, when Russian speakers encode manner, they have a variety of verbs to choose from to talk about one action. The verbs can express minute details regarding the motion manner, which can be overlooked by bilinguals, who do not use their L1 Russian with the same regularity as L1 Russian speakers. Moreover, the verbs that attend to small details of the manner of motion are used with less frequency and, as research has demonstrated, low-frequency words remain in the bilinguals' vocabulary shorter than low-frequency ones (Ammerlaan, 1996; Isurin, 2007; Schmid, 2004). It appears that the bilinguals tend to use the verbs that express the relatively basic information about manner, thus reducing the variety of motion verbs encoding manner.

The fact that bilingual speakers segmented motion events differently from monolingual speakers of their L1 Russian, but also differently from monolingual speakers of their L2 English, suggests that the domain of event segmentation was an area that provided evidence of bidirectional transfer in the bilingual speakers. The results demonstrated that the bilinguals' L1 does not simply go through the process of attrition,

which is the inability to produce or recognize particular lexical items or categorical distinctions. Instead, their L1 is adding new patterns taken from the bilinguals' L2 demonstrated by borrowing, restructuring, or shift.

The third research question examined the effects of AOA on Russian-English bilingual participants' performance in the two languages. The results of this study do not coincide with previous research that demonstrated that bilinguals' motion talk in both languages depends on the age when they arrived in the country of their L2 (Bylund, 2009; Hohenstein *et al.*, 2006; Kersten *et al.*, 2011). The findings demonstrate that the three groups of participants that differ in their AOA of L2 did not differ in the L1 maintenance or L2 acquisition of any of the aspects of motion talk, except for the number of types of manner VoM in English between early and late bilinguals. Late bilinguals' restricted number of types of manner verbs can be explained by the lower proficiency level reported by Russian-English bilinguals. Even though the patterns of manner encoding in the L2 were easy to acquire due to the similarities between the languages, the manner of motion vocabulary still presents difficulties for late bilinguals.

Possible explanations of the absence of AOA effect are the typological properties of the languages investigated and language dominance. It appears that if the two languages share similar linguistic means to encode motion, bilinguals are capable of acquiring patterns of motion expression in the L2 to a very high degree, even at a later period in their lives. On the other hand, constant exposure and use of the L2 can affect maintenance of the L1 motion talk and create possibilities for L2 to L1 transfer.

Another explanation of the inability to find significant AOA effects is the sample size, which was not big enough to find any significant effects. Also, the participants were

self-selected, which means that the participants felt comfortable enough and confident enough in their two languages to talk to the interviewers. However, it is necessary to acknowledge that there are a number of Russian-English bilinguals whose levels of both Russian and English can be different from those who participated in the study. Inclusion of the data from such participants into the study could have changed the outcome.

CHAPTER 7

CONCLUSION

In this chapter the summary of the findings of the encoding of motion events in the two languages by Russian-English bilinguals is presented followed by the discussion of the significance of the study. Then the limitations of this study are addressed. Finally, directions for future research are considered.

7.1. Summary of findings

This study investigated how Russian-English bilinguals encode motion events in their two languages; in particular, whether they differ from the L1 speakers of their respective languages, whether any cross-linguistic influence of the two languages can be observed, and whether the age of acquisition affects motion talk in the bilinguals' L1 and L2. An additional concern of the study was how similar Russian and English, both S-framed languages, are in the lexicalization patterns of motion talk. The key findings of this study are:

1. Russian and English differed in the lexical and grammatical means they employ to communicate each of the components of a motion event. Events were segmented in a more fine-grained way in Russian than in English with manner attended to more often and path encoding utilizing more elements in Russian. Lexical diversity of Russian motion vocabulary was higher than that of English motion vocabulary.
2. Russian-English bilingual participants in Russian differed from L1 Russian speakers in the frequency of segmentation of motion events, in the lexical diversity of motion vocabulary, and in the frequency and variety of encoding manner: they used fewer motion verbs, had a lower index of lexical diversity of motion vocabulary, encoded

- manner less often and with a fewer types of manner of motion verbs. On the other hand, Russian-English bilingual participants did not differ from L1 Russian speakers in how they encoded path and directionality. The bilingual participants did not differ from L1 English speakers in any aspect of motion talk.
3. Cross-linguistic influence was observed but it was only in one direction: the bilinguals' L2 English influenced their L1 Russian in event conceptualization, lexical diversity of motion vocabulary and encoding of manner. No L1 Russian effect on the bilinguals' L2 English was found.
 4. AOA was not found to be a significant factor in how the bilinguals maintained motion talk in their L1; however, the low number of participants and their self-selectivity may have distorted the picture. AOA effects were found in the acquisition of motion talk in the bilinguals' L2, specifically, the variety of manner VoM in the L2 was affected by the AOA.

It was discussed above that Russian and English differ in how often manner is encoded in the verbs – the marking of manner in verbs is obligatory in Russian, while in English it is optional. It was also described that encoding of path is not the same in the two languages – while Russian uses both bound and unbound elements (most frequently a combination of the two), English employs unbound elements only. The results of this study support both statements. Interestingly, the findings provide evidence that encoding of manner in Russian did undergo changes under the influence of L2 English; however, the results demonstrate no change in how REBs encode path in Russian. Another surprising finding was that no effect of L1 Russian on L2 English was found in either encoding of manner (frequency or variety) or encoding of path. It seems that

lexicalization of motion is more resilient to cross-linguistic influence than other domains and the results of this study provide evidence for this argument.

7.2. Significance

Although many comparisons of motion event encoding in two languages have been reported in the field of SLA and bilingualism (e.g., Brown and Gullberg, 2008; Hendricks et al., 2008; Hohenstein et al., 2006; Inagaki, 2002; Navarro and Nicoladis, 2005), the present study makes a valuable contribution to the field for several reasons. The speakers of typologically similar languages were involved in the design in order to study their ways of encoding motion in both languages and to examine cross-linguistic differences between the languages. Second, previous studies examined motion talk in L2 learners (Cadierno and Ruiz, 2006; Hasko, 2009) or L1 maintenance of bilingual speakers (Pavlenko, 2010), but none investigated cross-linguistic influence and AOA effects in encoding motion in such languages. The in-depth qualitative analysis of the majority of motion talk areas provided insights that are useful for future investigation of cross-linguistic influence in motion events encoding. Additionally, lexical diversity of motion talk in bilingual speakers was examined for the first time. Finally, very few studies previous to this one examined motion talk of the same bilinguals in their two languages; the results of this study do not support previous findings, offering new directions for future investigations. The variation in the findings could be attributed to various linguistic and non-linguistic factors, such as the length of exposure to the L1, the frequency of the L1 use, the contexts in which the L1 is used, the language environment, the educational level of the participants, the age of the participants, as well as the number of the speakers participating in the study. Addressing these factors can produce more

unified results and reveal a more comprehensive picture of the bilinguals' maintenance of the L1 and acquisition of their L2.

One of the findings of this study is that Russian and English, though belonging to the same typological group, are significantly different in grammatical and lexical patterns of motion encoding. This study reports empirical data related to the differences of the use of motion structured in English and Russian and previous concerns about placing languages with considerable differences in the lexicalization patterns for expressing motion into the same typological group were supported. Both have means to encode manner in the verb and path outside the verb through satellites. However, the English corpus contained high frequency verbs not encoding manner, which was not found in the Russian corpus; thus, manner of motion in Russian was encoded more frequently. Encoding of path of motion was found to be more varied in Russian in terms of elements and combinations of satellites and path elements. Also, the differences in encoding of aspect in the two languages resulted in a more fine-grained segmentation of motion events compared to English. Within both frameworks, typology of motion events and event conceptualization, Russian and English were considered to be similar to each other and placed in the same groups. The findings of this study contribute to previous research that positions the two languages further apart, which may advocate for reviewing the requirements and parameters of the typology of motion events.

Another contribution of this study concerns adding a new dimension to the motion talk analysis (i.e., richness of motion vocabulary). To my knowledge, this is the first study that examines the diversity of motion verbs used the bilinguals' discourse in their two languages as well as by the native speakers of those languages. These results provide

more support for Hasko's (2009) initial findings and demonstrate that Russian is by far richer in motion vocabulary than English. The findings suggest that the bilinguals do not utilize the whole range of motion verbs they have at their disposal in Russian. The bilinguals' L2 English does not offer such variety, and the less diverse motion vocabulary in their Russian may be explained by the influence of the L2. The demonstrated differences suggested the need for further investigation of the topic.

This study provides interesting results on the extent of how age affects different conceptual domains. Findings from previous SLA and bilingualism research show that the acquisition of event conceptualization patterns, such as encoding of endpoints or manner and path encoding, depend on AOA (Bylund, 2009; Carroll and von Stutterheim, 2003; Hohenstein 2006). The results of this study demonstrate the selectivity of the effects AOA has on maintaining the L1 and acquiring the L2 in the domain of motion encoding. Since very little effect of AOA on the acquisition of L2 motion patterns and no effect of AOA on the lexicalization of motion events in the L1 were discovered, it seems that certain linguistic patterns that present a lesser degree of conceptual complexity are less conditioned by AOA.

Finally, the analyses of the L1 and bilingual corpora provide important insights which can inform the fields of heritage language teaching and materials development. With the help of the findings of this study it is possible to point out the areas in the bilinguals' L1 that are harder to maintain, i.e. the ones that undergo simplification or begin experiencing attrition. For example, a wider selection of VoM needs to be addressed by the teaching materials in heritage language classrooms especially in the area of manner encoding. Support for this statement comes from the results of the comparative

corpus analysis: in the bilinguals' L1 narratives the frequency and the variety of manner VoM was considerably lower than in the L1 Russian corpus; additionally, the choice of context appropriate manner of motion was a problem in early and childhood bilinguals' Russian narratives. Adding a variety of motion elements presented in the heritage language classroom should improve maintenance of the L1 features in bilinguals. The comparative analysis based on native speakers' and L1 bilinguals' motion talk can serve as a valuable resource for identifying the discrepancies in the most frequently used VoM and other elements of encoding of motion to determine which areas of motion talk to pay more attention to.

7.3. Limitations

The first limitation of this study is that it did not address the frequency of the use of Russian by the bilingual participants and in what context they spoke their L1 (e.g., work, school, friends, or Russian-speaking countries). Some of the early bilinguals not only constantly spoke Russian with their friends and families, but also took several trips to Russian-speaking countries. On the other hand, some late bilinguals did not go to any Russian-speaking countries even once over a period of many years and used Russian only occasionally. The more frequently the participants use Russian, the closer they perform to L1 speakers in encoding of motion compared to those bilinguals who are not exposed to Russian. It is possible that the use of Russian could be a variable that has a stronger effect than other variables, for example AOA, on the bilinguals' motion talk.

Second, the number of bilingual participants and their age distribution was not sufficient for a more thorough analysis of the cross-linguistic influence on their motion talk in both languages. Moreover, the sample size was not big enough to find any

significant effects with regard to the participants' AOA. First of all, the AOA distribution in these groups was not equal. 20 out of 30 participants started to actively learn and use English before the critical period (i.e., 13years old), after which acquisition of the L2 is more difficult. This can explain the overall absence of the L1 influence on the L2. Moreover, there were only 10 participants in each of the three groups (early, childhood and late bilinguals); thus it was not possible to run parametric statistical tests. A larger number of participants would have been desirable for conducting the AOA analysis. Finally, in the late bilingual group half of the participants started to use English at the age very close to the critical period since they attended school in the U.S.; most likely acquisition of English by these participants was more similar to the childhood bilinguals. Even though the number of speakers participating in the study was small, the decision was made to proceed with the analysis – the statistical tests available allowed to perform analysis with the smaller number of participants. Finally, uneven distribution of males and females in all three groups could have distorted the picture; thus, possible gender effects should be taken into consideration regarding the results. However, the results obtained are initial, and the conclusions are speculative; the findings should be treated with caution and should not be generalized to the whole population of REBs.

The third limitation of this study is that the data were gathered from picture book descriptions rather than from naturally occurring data collected from authentic interactions in real world settings. This was done because the study required data that contained a sufficient number of motion verbs; although naturally occurring interactions would have been ideal, it would not ensure the participants' usage of motion verbs. Therefore, data from narratives were gathered with no restrictions, such as time

limitations or amount of sentences per picture, given to the participants. However, the nature of the scenes and actions on the pictures forced all the participants, L1 speakers and REBs, to use a certain range of motion vocabulary. Moreover, because the book depicted actions that the bilinguals did not know a word for in Russian or in English, some bilingual participants chose not to talk about those particular scenes and actions but omit them, avoiding usage of a number of motion verbs. Thus, the results might not reflect the complete picture of the bilinguals' motion talk in either language.

The fourth limitation is the amount of time between the first interview, in Russian, and the second one, in English, for the bilingual participants. Though there was a minimum of three weeks between the interviews, some participants met with the researcher several months after the first interview. The shorter time between the interviews could have resulted in the priming effect for the English narratives. The second experience of the stimulus, i.e. narration of the picture book, could have been processed more quickly by the brain and made the participants resort to the words they used while telling the story in Russian. The participants could have remembered their descriptions in Russian and try to translate what they have said before. A very long time between the interviews could have produced negative effect on the comparison of the bilinguals' concurrent state of Russian and English. Although data distortion caused by the reasons describe above likely did not occur to any great degree, it is still a possibility that must be acknowledged.

7.4. Suggestions for future research

Several suggestions for further research can be made based on the results of this study. First, the amount and the contexts of the use of each language by bilinguals were

not analyzed in this study. The participants of the present study varied in terms of how often, when and where they used Russian (not so much English) even within their group (i.e., early, childhood or late bilinguals). According to Daller et al. (2011) and Montrul (2002), the intense exposure to the sociolinguistically dominant language and not only an early AOA may be a critical condition for L2 acquisition and L1 maintenance. Would bilinguals who use Russian almost every day differ from the bilinguals with the same AOA and with the same L2 learning history but who use Russian on rare occasions? A rating scale (e.g., from 1 to 5) could be created for the participants to assess how much they use each of the languages on a daily/weekly/monthly basis. Would REBs who maintain their L1 in an academic setting (e.g., by taking “Heritage Russian” courses) differ from those who do not have any schooling experience in their L1? Would bilinguals who use media in their L1 differ from those who do not read or watch TV in Russian? Further research should be conducted to find out whether there is correlation between these variables and motion event encoding.

Second, to obtain more generalizable results, future studies should employ a larger number of participants with an even gender distribution, and involve a control group as well as participants who need to be properly measured on their proficiency level using at least one test, for example the Oxford Quick Placement Test (QPT; Oxford University Press, 2001), especially when the groups are differentiated by proficiency level in the language. To be able to perform a set of parametric tests and to investigate the differences in motion encoding of people with various AOA, at least 30 participants in each group need to be interviewed with a more even distribution of the AOA within each

group. In addition, the effect of the length of bilinguals' exposure to the L2 should be examined.

Third, this study dealt with elicited narratives based on picture descriptions only. Research designs combining different types of data elicitation and modes of communication may prove fruitful. For example, recording of conversations among the bilinguals or bilinguals with the speakers of their L1 and L2 languages, verb recognition tasks or various writing assignments could be also employed to get a more detailed representation of how bilinguals talk about motion in their two languages in various modes. Structured exercises would allow accessing the bilinguals' not active knowledge. Also, as stated in Hohenstein et al. (2006), written responses can produce more detailed narratives with a richer vocabulary, in particular a higher number and greater diversity of motion verbs. Thus, future studies may include various types of oral and written data from both monolingual and bilingual participants.

Finally, longitudinal approaches are needed in order to illuminate the patterns that bilinguals maintain and acquire when talking about motion and to inform the effects of speaking both languages on the bilinguals' motion talk in both languages. The differences observed in the bilinguals in this study might possibly be the result of cultural differences (the participants were from different Russian-speaking countries), family language traditions or individual differences. Since longitudinal studies track the same people over a long period of time, such time-invariant unobserved differences can be reduced. Moreover, cross-sectional studies, as the present study is, provide information about the knowledge and use of a language at a certain point in time. Any development, progress,

changes, gains, or losses can be meaningfully observed only within a longitudinal perspective.

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APPENDICES

APPENDIX A

Language background questionnaire

1. Name _____
2. Gender ___ M ___ F
3. Age _____
4. Country of origin _____
5. Student status _____
6. Major _____
7. If you speak more than one language, please answer the following questions with regard to your second language:
 - (1) How old were you when you started studying your second language?
English _____
Russian _____
Other _____
 - (2) Where and for how long have you been studying these languages?
English _____
Russian _____
Other _____
 - (3) Have you lived in a country where these languages are spoken? Where and for how long?
English _____
Russian _____
Other _____
 - (4) With whom and in what contexts (home, university, etc.) do you usually use these languages?
English _____
Russian _____
Other _____
 - (5) If you are a Russian-English bilingual, when did you arrive in the US? How old were you at the time?

8. Language skill (for bilingual participants):
On a scale from 0 (not at all) to 7 (native or native-like), evaluate your skills below:
 - (1) English: Listening ___ Speaking ___ Reading ___ Writing ___
 - (2) Russian: Listening ___ Speaking ___ Reading ___ Writing ___
 - (3) What other languages besides English and/or Russian do you know? _____

Additional languages (if applicable):

 - (4) _____ Listening ___ Speaking ___ Reading ___ Writing ___
 - (5) _____ Listening ___ Speaking ___ Reading ___ Writing ___

APPENDIX B

MOTION VERBS USED IN THE L1 RUSSIAN CORPUS

бежать	добраться	плавать	сбежать
бегать	догнать	плыть	свалиться
броситься	дойти	плюхаться	сдвинуться
вернуться	доходить	плюхнуться	сесть
взгромоздиться	ехать	побежать	скатываться
взобраться	забираться	повалить	следовать
виться	забраться	погнаться	слезать
влезть	залазить	подбежать	слезть
возвращаться	залезать	подбегать	слетать
вставать	залезть	подбираться	сопровождать
встать	запрыгивать	подкрадываться	спадать
выбежать	запрыгнуть	подкрасться	споткнуться
выбираться	затормозить	подлезть	спрыгивать
выбраться	идти	подойти	спрыгнуть
выйти	лазить	подползти	спуститься
вылазить	лезть	подпрыгивать	съезжать
вылезать	летать	подскользнуться	съехать
вылезти	лететь	подходить	убегать
вылетать	лечь	пойти	убежать/унести ноги
вылететь	набрести	полезть	уворачиваться
выпадать	направиться	полететь	удаляться
выпадывать	обогнать	понестись	удирать
выпасть	останавливаться	поскакать	уйти
выплывать	остановиться	преследовать(ся)	улететь
выползать	отодвинуться	прибегать	упасть
выползти	отойти	прибежать	усесться
выпрыгивать	отправиться	приблизиться	уходить
выпрыгнуть	отпринуть	придти	ходить
выскакивать	падать	приземлиться	
выскочить	перейти	приземляться	
высовываться	перекидываться	приходить	
высыпать	перекинуться	прихрамывать	
выходить	перелазить	пробегать	
гнаться	перелезть	пролетать	
гоняться	перелезть	проноситься	
добежать	перепрыгивать	прыгать	

APPENDIX C

MOTION VERBS USED IN THE L1 ENGLISH CORPUS

backtrack	get up	stick out
charge	go	step up
chase	go off	stop
climb	go out	swarm
climb away	go over	swarm out
climb out	head	swim
climb up	hop	swim back
come	hop out	swim over
come around	hop up	swim up
come back	jump	swirl
come out	jump out	swoop
come up	jump over	take off
crawl out	jump up	tip-toe
crawl over	knock	tumble
creep out	land	venture
creep up	leave	walk
drop	limp	walk away
duck	move	walk over
enter	move out	whimper
escape	outrun	
fall	pop out	
fall down	pop up	
fall off	reach	
fall out	run	
fall over	run away	
fly	run off	
fly away	run over	
fly off	sit up	
fly out	sneak	
follow	sneak away	
get	sneak off	
get away	sneak out	
get down	sneak over	
get out	sneak up	

APPENDIX D
MOTION VERBS USED IN THE REB CORPUS IN RUSSIAN

бежать	заползать	придти
бегать	запрыгнуть	прилететь
взлететь	идти	прискочить
встать	лазить	приходить
входить	лезть	пробежать
выбраться	летать	проходить
выйти	лететь	прыгать
выкрадываться	остановиться	прыгнуть
вылазить	отойти	разлететься
вылезать	отчалить	сброситься
вылезти	падать	сбежать
вылетать	перелезть	свалиться
вылететь	плавать	сесть
выпасть	плыть	скакать
выползти	побежать	следовать
выпрыгивать	погнаться	слезть
выпрыгнуть	подбежать	слетать
выскакивать	подлезть	сопровождать
выскочить	подобраться	спрыгнуть
высунуться	подойти	спускаться
выходить	подплыть	спуститься
гнаться	подскочить	убегать
гулять	пойти	убежать/унести ноги
добежать	полезть	удирать
догонять	полететь	уйти
догнать	ползать	улететь
доходить	помчаться	упасть
забежать	понестись	уходить
забираться	поплыть	
забраться	поползти	
зайти	поскакать	
закарабкаться	поспешить	
залезать	преследовать(ся)	
залезть	прибежать	

APPENDIX E

MOTION VERBS USED IN THE REB CORPUS IN ENGLISH

chase	fly away	move
climb	fly out	move on
climb out	follow	pop out
climb up	get	resurface
come	get away	run
come after	get out	run away
come along	get up	run down
come back	go	run off
come out	go after	run out
come up	go away	rush
crawl out	go back	slip off
crouch	go out	sneak away
depart	go over	sneak out
drown	go up	stand up
escape	head	stop
fall	jump	swim
fall down	jump out	take off
fall off	jump up	walk
fall out	land	walk away
fall over	leave	walk back
float	limp	walk out
fly	line up	walk up