The Encoding of Motion Elements in Croatian

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ABSTRACT

The thesis reports on the most common strategies native speakers of Croatian use for encoding Motion and Path in their descriptions of motion events. The first analysis entails the following elements: the speakers' lexicalization of Motion and Manner in two situation types, boundary-crossing and boundary-reaching/non-boundary crossing, respectively; the frequencies of the verb types used; and the extent to which they segment the Path across the abovementioned situation types. The second analysis examines the speakers' expressions of the two defining points of Path (Sources and Goals), which are examined in terms of the salience of elements presented in the video stimuli, as well as in terms of three different types of events – Support, Contact/Close proximity and Free movement of the Figure.

The materials used for this experimental study included 16 video stimuli (about 2-3 seconds long) designed for elicitation of motion event descriptions, accessed through the website of the Language and Cognition Department of the Max Planck Institute for Psycholinguistics. The participants included 60 students of different Croatian Universities. The materials were distributed to them via e-mail, and the data was collected online.

The results show that, when presented with a motion event that includes a self-propelled inanimate Figure whose movement is canonical, native speakers of Croatian tend to exhibit lexicalization patterns typical of the category of S-framed languages, which is attributed to the Croatian language. However, they also exhibit certain patterns that distance the language from that category, such as: they tend to omit Manner from their descriptions if they did not already express it within the verb; they partly attest to the boundary-crossing constraint regarding the expression of Manner; and tend to segment the Path less often in boundary-crossing situation types. Further,

overall results show that they generally attest to the goal-over-source principle, even though the salience of other elements, such as direction, seems to partly govern their choices in the encoding of Path, which in turn weakens the Goal bias they exhibited. Finally, they tend to express Path elements in ways typical for the strategies provided by the Croatian language, mainly prefixes and prepositional phrases.

Key words: motion encoding; path; manner; Croatian language; source; goal

1. Introduction

The relationship between language and thought has been the focus of much research and many debates over the course of at least a few centuries by now. The question of *whether*, *if*, and *to what extent* the two concepts are interrelated has produced various theories supported by empirical evidence from research in different fields of study. Stemming from philosophy, the discussion gained momentum through research in anthropological linguistics in the late 19th and throughout the 20th century, and situated itself as one of the central preoccupations of psycholinguistics and cognitive linguistics today. Consequently, two opposing views arose to build up the framework of the debate; the universalist view and the determinist/relativist view.

Universalists, such as Noam Chomsky, Eric Lenneberg, George Miller, Roger Brown, Morris Halle, and Alvin Liberman (as stated in Pinker, 1994), share the view of language as an innate mechanism, or an instinct, central to human abilities in more or less the same sense as web-spinning is to spiders (Pinker, 1994: 18). Hence, as Pinker (1994) puts it, thought and language are independent of each other, because humans think in the "language of thought" or "mentalese". On the other hand, determinism and relativity assumes the position that language influences and/or shapes its speakers' ways of thinking, and is supported by theories developed by the 20th century linguists and anthropologists, such as Wilhelm von Humboldt, Franz Boas, Edward Sapir, Benjamin Whorf (as stated in Slobin, 1996a), George Lakoff (1987) and Gumperz & Levinson (1996). Slobin (1996a) revised the Humboldt–Whorf position on linguistic relativity and determinism by arguing that our experiences of 'events' and 'situations' are "*filtered through language into verbalized events*" (Slobin, 1996a: 75). A 'verbalized event', he argues, is constructed in the very

process of speaking, or "*on-line*", and, as Von Humboldt and Whorf and Boas suggest, obligatory grammatical categories of a language play an important role in this construction (Slobin, 1996a: 75). Therefore, his view on grammar goes beyond mental imagery. He claims that it also reflects the specific needs of discourse: "*any utterance is multiply determined by what I have seen or experienced, my communicative purpose in telling you about it, and the distinctions that are embodied in my grammar*" (Slobin, 1996a: 75). By replacing the classic static terms of 'thought' and 'language' (which imply that 'thought' or 'worldview' are concepts existing only outside of language), with more dynamic words 'thinking' and 'speaking', Slobin linked conceptualization with grammaticized meanings specific to each language, stating that the role of those meanings is to serve as tools for expression for speakers of that language. Therefore, 'thinking for speaking' can be seen as "*picking those characteristics of objects and events that (a) fit some conceptualization of the event, and (b) are readily encodable in the language*" (Slobin, 1996a: 76). He supported this claim with crosslinguistic comparisons and translation, as well as with experiments involving young children acquiring their native language, which led him to conclude that humans learn how to 'think for speaking' from the onset of language acquisition.

Here we arrive at an area of study which is said to be one of the best for providing insight into the language–mind relationship; the study of conceptualization of space and spatial language, and their interrelatedness. A simple reason for that lies in the fact that all humans have to conceptualize space in some way, and all world languages have a mechanism for conveying spatial and temporal relations. As Lakusta & Landau (2005: 1) put it, "*our capacity to represent events that capture our spatial, temporal, and causal interactions in the world*" is one of the "*fundamental aspects of human cognition*". Further, Levinson (2003) states that the examination of the

language of space can provide a greater insight into the conceptual structure of spatial thinking and its possible cultural variability, as well as a deeper exploration of the correlation between semantics and conceptual structure. Apart from being one of the central notions explored in cognitive linguistics and psycholinguistics, the ongoing debate on whether there exists a direct link between conceptualization and linguistic encoding is pondered upon in various other areas of study, such as studies on bilingualism, translation, language acquisition, neuroscience, psychology, anthropology, etc. In order to broaden the discussion in the context of the results from the present research, this paper draws on some of those findings as well. In line with these ideas, Sections 2 and 3 of the present paper outline the most relevant notions and empirical evidence on two of the central concepts of spatial language: Motion and Path.

Using video stimuli as material for elicitation, the present research aims to examine the most common strategies native speakers of Croatian use for encoding Motion and Path. Departing from the existing assumptions on event encoding, mainly that languages are said to belong to different categories depending on the strategies they use for such encoding, and that certain elements of meaning are more prominent than others in language production, the present research draws on cognitive linguistics and pragmatics approaches in order to contribute to the existing data on various other world languages. The results are presented and discussed in Section 4, and a conclusion is given in Section 5.

2. Basic notions in event representations

2.1. Linguistic typologies

Even though his work has been largely discussed upon, and many revisions of his typology have been made up to this point, Talmy's (1985) views on how languages express and cope with motion serve as a starting point in every discussion on motion events, and this paper will be no exception. Basic semantic elements and terminology he introduced will be extensively used throughout discussions, which is why they will be presented at the beginning. The central notion of Talmy's work on the link between meaning and surface forms is lexicalization, which he defines as a process "*where a particular meaning component (or a set of meaning components related to each other) is found to be in regular association with a particular morpheme (making up the whole of its meaning)*" (Talmy, 1985: 59). One of the examples Talmy used for illustration was the comparison between '*break'* and *'make break'*. When put into context, the word *break* has a different usage, i.e. can function as both causative and non-causative: *'I broke the vase'* (the person caused the vase to break and this can be understood from the usage of *break,* so in this case the usage of the verb is causative) and *'I made the vase break'* (the meaning of the sentence is the same, but this time the cause can be inferred from the verb *make*, in which case *break* has a non-causative usage) (Talmy, 1985). To understand lexicalization patterns in expressions of motion events in different languages, we must first define the crucial semantic elements that are said to shape and frame the event itself. A basic motion event has four main components (Talmy, 1985: 61):

1. the Figure - "an object moving or located with respect to another object"

2. the Ground - "the reference object, or a reference-point stationary within a reference-frame, with respect to which the Figure's path or site is characterized"

3. Path - "the course followed or site occupied by the Figure object with respect to the Ground object"

4. Motion - motion and location serve as two internal components of motion.

In addition, Motion can entail 'Manner' or 'Cause'. Even though these elements are interdependent, and when expressed together constitute a complete motion event, they are differently realized when it comes to the abovementioned lexicalization patterns in different languages. A basic division of languages according to the lexicalization of their verb roots proposed by Talmy (1985) is the following: (1) Motion + Manner/Cause; (2) Motion + Path; and (3) Motion + Figure. Talmy assumed that a language exhibits a pattern of only one category, and that languages are distributed among categories based on their most characteristic expression of motion. In this context, 'characteristic' or 'typical' for a language means that: *"(i) It is colloquial in style, rather than literary, stilted, etc. (ii) It is frequent in occurence in speech, rather than only occasional. (iii) It is pervasive, rather than limited, that is, a wide range of semantic notions are expressed in this type*" (Talmy, 1985: 62). The first group comprises of Chinese and most Indo-European languages (Germanic, Slavic, Celtic, Finno-Ugric) with the exception of Romance languages. Their characteristic expression of motion includes verbs that entail Motion and Manner or Cause in their basic meaning (e.g. in English: *run*, *jump*, *walk*, *bounce*, etc.). The second group entails something different in its most characteristic verb form; Motion and Path (e.g. in Spanish: *subir*, 'move-up', *volver*, 'move-back', etc.) and expresses Manner or Cause independently, most commonly in gerunds or adverbials. Languages belonging to this group include: Romance, Korean, Japanese, Greek, Semitic, Turkic, and Basque (Slobin, 2006). The third group does not have that much representatives (Talmy mentiones only Atsugewi), but the notion of expressing Motion and Figure in

one verb can be illustrated through an example of the English non-agentive verb '(to) rain': *It rained in throught the window* (Talmy, 1985: 73). This kind of merging of two or more components into one verb is what Talmy calls 'conflation'. Conflation can occur with other combinations of elements too, for example Path, Ground, and Motion, like in certain agentive verbs in English. The most plausible answer to the question why conflation occurs in lexicalization patterns is the fact that it allows for a more concise and more practical way of expressing elements of motion events in verbs, since the language system for expressing Motion is organised in a way that "*relies less on large numbers of distinct elements and more on combinatorial devices that operate with a smaller set of elements"* (Talmy, 1985: 76).

If we take a step forward to examine other common elements that appear outside or inside of motion verbs, which also function in combinatorial patterns with the verbs and seem to be frequently associated with them, we come to a concept termed "satellite". It is of crucial importance for the typology, since it differentiates two major language type categories. As stated by Talmy (1991: 486), a satellite is defined as "*the grammatical category of any constituent other than a nominal complement that is in a sister relation to the verb root*", and it can be either a free word (e.g. English verb particles, Chinese verb complements) or a bound affix (e.g. Slavic and German prefixes). Based on the previously mentioned categories of conflations encoded in verb roots in different languages, Talmy (1991) proposed a new typology, that of satellite-framed and verb-framed languges, which mainly deals with how languages encode Path and Manner (and other supporting events, e.g. Cause). Languages from the first group (Germanic, Slavic, Celtic, Finno-Ugric, Chinese, Ojibwa, Warlpiri, etc.), the ones that express Motion and Manner or Cause (a supporting event) in the verb, are placed in the satellite-framed category. They usually

express Path through a satellite component. Languages from the second group (Romance, Korean, Japanese, Greek, Semitic, Turkic, Basque, Polynesian, most Bantu, most Mayan, etc.), usually incorporate Path into the verb and the supporting event, Manner or Cause, outside of the verb (e.g. in gerunds or adverbials). In order to better illustrate the difference between the S- and V-languages, Fortis (2010: 3) presented two of Talmy's (1985) examples in Greek, which he claims has a parallel system:

(1) *etreksa mesa (s-to spiti).*

I.ran in to-the house.ACC

'I ran in(-to the house).'

(2) bika (trekhondas) (s-to spiti).

I.entered running to-the house.

'I entered (the house) (running).'

A number of authors (Fortis, 2010; Beavers et al., 2010, as stated in Fortis, 2010; Filipović, 2007) discard Talmy's position on what satellites really encompass, and expand their function on to adpositions as well. Furthermore, it seems that some languages use both options from the dichotomy, which brings us to other faults in Talmy's typology that have been largely discussed upon from various perspectives. Fortis (2010: 34) shows the expansion of the dichotomy and lists the proposals for new lexicalization systems: V-framed system, S-framed system, Equipollent system, Split system, Parallel system, and Generic Framing system. Slobin (2006) studied Manner expressions in typologically distinct languages, as well as in languages belonging to the same typologies, and found both intra- and inter-typological differences. His observation that there exist language-specific constrains in expressing Manner (more specifically (Slobin, 2006: 1): language-specific morphosyntax, the

availability of ideophones, and the availability of motion-related lexical categories), led him to conclude that languages can be seen as belonging to a specific position on a cline defined by the salience of elements expressed, rather than to a specific typology. This also led him to advocate for a tripartite typology, where languages that are equipollently-framed express Path and Manner with equivalent grammatical forms, like it is the case with e.g. serial verb constructions, and constructions with coverbs and verbs (Slobin, 2006: 6). Further, a number of V-framed languages are seen as exhibiting patterns of S-framed languages, and vice versa, and they are referred to as belonging to the Split system (Talmy, 2000; Beavers et al., to appear; Croft et al., to appear; as stated in Fortis, 2010). Parallel systems, on the other hand, allow for a less restrictive combination of V-framed and S-framed patterns. Matsumoto (2003) proposed a renaming of the original typology, claiming that what is considered the defining notion for a typology is actually not the verb but the head of a clause. According to him, languages should therefore be divided into head-framed (V-framed) and nonhead-framed (S-framed). Apart from Fortis (2010) and Slobin (1997, 2006), numerous scholars they mention in their papers have contributed to the discussion on Talmy's typology by anaylsing various languages from different cultures: Beavers et al. (2010); Grinevald (2010); Croft et al. (2010); Zlatev & Yangklang (2004); Ameka & Essegbey (2006); Lambert-Bretière (2009); DeLancey (2007); Shaefer & Gaines (1997) and others, which is a strong indication that Talmy's original typology is not precise enough to explain the subtle differences and similarities in expressing motion. Apart from crosslinguistic research, some scholars claim the varieties within one language are also valuable to observe. Berthele (2004), as stated in Filipović (2007), discusses the importance of typological differences between languages and their dialects, indicating that even such close variations can

give us valuable information about the fine boundaries of typologies. Considered one of the biggest disadvantages is the fact that one typology cannot account for each language as a whole, but can rather be applied to how languages cope with individual complex events, since most of them use different strategies depending on event types (Croft et al., 2010). Similarily, Naigles et al. (1998: 547) point out that context has a very important influence on language production and use (even though its impact is not so easy to explain and understand) and can therefore influence the manifestation of typologies. Özçalışkan (2013) also confirms the context of an event as an important factor in language production, given that it allows speakers of typologically distinct languages to use different narrative strategies for conveying the same motion elements. For example, in situations in which speakers of S-languages might describe an action with a manner verb, the speakers of V-languages may express the same element implicitly, mainly by describing e.g. the setting of an event, the surroundings, the atmosphere, the subject's emotional states, or any other kind of elements which could aid the inference of Manner (Özçalışkan, 2013: 16-17). Other factors contributing to the expression of Manner, such as whether there is a boundary present on the Figure's Path, or which type of boundary is present, will be discussed later in the text. For now, we have to examine the position of Croatian language in terms of the differences among and within the typologies discussed in this section.

The placement of Croatian language within the original typology is somewhat controversial. As mentioned before, Slavic languages, among them Croatian, were originally placed in the Satellite-framed language category. Most analyses done up to this point have been dealing with Serbo-Croatian, and for the purposes of this paper we rely on them for comparison. The first analysis worth mentioning is that of Verkerk (2014), who conducted a parallel corpus analysis of 20 languages based on 3

literary works and their translations. Motion events present throughout the texts were sorted according to 9 event encoding constructions (e.g. *satellite-framed construction = manner verb + path satellite, verb-framed construction = path verb + manner expression, deictic verb - only construction*, etc.). Two basic groups appeared as the most prominent ones: 'satellite-framed' and 'verb-framed' languages. Interestingly, Serbo-Croatian was one of the 6 languages that seemed to be somewhere in between, not belonging to either of the groups (Verkerk, 2014: 317). The results indicate that Serbo-Croatian has a similar frequency of usage of both satellite-framed constructions and verb-framed constructions.

Other scholars seem to have found evidence in line with this notion, although their analyses do not exclude Serbo-Croatian from the category of S-languages. Filipović (2007, 2010) presents certain morphological constraints in lexicalization patterns of Serbo-Croatian that distance the language from the S-framed category. The constraints can be detected within the usage of verbs in different situation types. What Filipović (2007: 72) refers to as situation types are actually situations conveying certain *"spatio-temporal features of motion events"*, expressed differently in different languages. The main notions used in the categorization of situation types are *boundary* (related to the spatial frame) and *change* (related to the temporal frame). We can differentiate three situation types in the spatial frame: boundary-crossing, boundary-reaching, and non-boundary-crossing (Filipović, 2007: 37). Crossing a boundary implies crossing a physical boundary or a location, which can also be understood as a boundary. Whether or not a boundary had been e.g. crossed or reached can be inferred from the linguistic construals of speakers, i.e. from using adequate linguistic tools for interpretation. Therefore, no confusions or misunderstandings should be expected when dealing with e.g. a location as a

perceived boundary. *Change* is seen as *"the bearer of information focus"* (Filipović, 2007: 52), and is therefore central to every spatio-temporal expression. The temporal frame (revolved around the Figure and the Ground) can occur through three possibilities: no-change, moment-of-change, and change-occurred (Filipović, 2007: 38).

The limitations of the usage of manner verbs in certain situation types seem to be of the main concern in the two biggest constraints Filipović presents: combinatory potential and morphological blocking. In both cases, the prefixes play a crucial role, especially since they are generally very important for all Slavic languages. Therefore, to explain the two presented constraints, and to shed more light on the usage of manner verbs in Croatian, we must turn to the relation between the prefixes and prepositions Croatian speakers use to encode path. Filipović (2007, 2010) analysed the frequency of directional prefixes from dictionary and corpus data, which yielded a cline (or "*the number of verbs that combine with individual prefixes*") in their use (Filipović, 2007: 73): OD- ('from the speaker') /DO- ('to the speaker'); IZ- ('out of') /U- ('in', 'into'); PRO- ('through', 'past'); PRE- ('across', 'over'); NA- ('onto') /POD- ('under'). The prefixes are listed starting with the ones that have the highest frequency of use towards the lowest. This implies that most verbs from the data are prefxed with OD-/DO-. Filipović (2007: 73) also states that the cline is an "*implicational scale*", i.e. that "*if a verb can be prefixed by a prefix lower on the cline, it can also be prefixed by a prefix higher on the cline, whereas the reverse is not the case*". It seems that a similar cline happens with prepositions; verbs prefixed with OD-/DO- can combine with all existing prepositions, can be used on all occasions, and to express all kinds of directional motion events. On the other hand, verbs prefixed with prefixes placed lower on the cline can combine only with prepositions which are in line with

their prefixes. Filipović (2007, 2010) terms this characteristic as 'combinatory potential'.

To explain morphological blocking we have to briefly go back to the situation types previously introduced. Studies on the use of motion verbs in Serbo-Croatian led Filipović (2007: 74) to conclude native speakers of the language(s) usually use unprefixed manner verbs in *non-boundary-crossing/ no-change* situation types, prefixed manner verbs (with constraints) in the *boundary-crossing/ change-occurred* situation types, and directional verbs for expressing the *boundary-crossing/ moment-of-change* situation types. According to Filipović (2007, 2010), by contrasting the use of manner verbs in various situation types in English and Croatian, one can notice that both S-framed languages exhibit a similar pattern for situation types in which a boundary was crossed and change occurred or when there were no boundaries or changes present in a situation type. However, the patterns are different for situations which focus on the exact moment when the observer or speaker noticed a change occurring. The following examples in both languages given by Filipović (2007: 70) shed more light on the matter:

(1) a. He crawled into the shelter. (change-occurred)

b. He was crawling into the shelter (when I saw him). (moment-of-change)

c. He was crawling/crawled towards the shelter. (no-change)

(2) a. Upuzio je u sklonište. [Into-crawl-PST-PFV-3SG-M be-COP into shelter-ACC] 'He crawled into the shelter.'

b. Ulazio je u sklonište puzeći (kada sam ga ugledao). [Enter-PST-IPFV-3SG-M be-COP into shelter crawling (when be-COP him saw)] 'He was entering the shelter crawling when I saw him.'

c. Puzio je u skloništu. [Crawl-PST-IPFV-3SG-M be-COP in shelter-LOC] 'He was crawling/crawled in the shelter.'

Unlike the use of manner verbs in English, where they can be used with no restrictions in all situation types, the choice of verbs in Serbo-Croatian for different situation types is conditioned by the need for the perfective or imperfective form (Filipović, 2007: 110). Again, the prefix plays an important role since it can determine the direction and the perfective form. In most cases, unprefixed manner verbs are imperfective, while the prefixed are perfective. As mentioned, most constraints arise with the *moment-of-change* situation type. Here, the imperfective form is needed, but since imperfective manner verbs already express *no-change*, directional verbs must be used, because their imperfective forms have different characteristics than the imperfective of manner verbs (Filipović, 2007: 110). It is not possible to 'further imperfectivize a perfective manner verb', since that would mean changing the situation type from *boundary-crossing/ moment-of-change* to *non-boundary-crossing/ no-change* (Filipović, 2007: 74-75). This impossibility, or constraint, termed morphological blocking, represents another one of the reasons Serbo-Croatian cannot be classified as a clear example of an S-language, or an indication that it cannot assume the same position as other S-languages (e.g. English) on the cline proposed by Slobin (2004).

2.2. Manner and Path expressions in languages from different typologies

Even though scholars mostly agree on the fact that Talmy's dichotomy is too narrow and that a number of languages cannot be placed in one category, most of the research done on major world languages has been done in the context of those two categories, since there are more differences worth observing between them apart from the conflation patterns they use. When it comes to Manner of motion, surmounting evidence shows that S-language speakers express Manner more frequently and use a

wider range of diverse manner verbs than V-language speakers (Özçalışkan & Slobin, 2000; Slobin, 2004; Slobin 2006). Evidence from the analyses of Turkish and English narratives shows this is also valid for metaphorical motion events (Ozcaliskan, 2004). Evidence from an experiment Slobin (2006) conducted with Spanish and English speakers on mental imagery shows that speakers of typologically different languages might experience different inner conceptualizations of events. In his analysis of what a lot of scholars understood as "the spirit of a language", Slobin (2006) developed a set of factors that can be used to differentiate the degrees of Manner salience in various languages, which in turn influences the placement of a language within linguistic typology. According to him, there is no clear definition of Manner, but it is rather described as a notion covering different dimensions, like: "*motor pattern (e.g., hop, jump, skip), often combined with rate of motion (e.g., walk, run, sprint) or force dynamics (e.g., step, tread, tramp) or attitude (e.g., amble, saunter, stroll), and sometimes encoding instrument (e.g., sled, ski, skateboard), and so forth*" (Slobin, 2006: 3). The way languages deal with Manner can be 'measured' through the frequency of Manner use, the way it is used, and the variety of Manner vocabulary in a language. As was already mentioned, speakers of V-framed languages usually tend to conflate Path in motion verbs and express Manner outside of the verbs. One factor was found particularly prominent in constraining the expression of Manner for V-languages and that is change of state, or boundary-crossing (Slobin & Hoiting, as stated in Slobin, 2006). This restriction has a lot to do with the fact that V-languages have to express this change of state in a verb. The fact that a change of state in most cases cannot be expressed with a manner verb most likely stems from the fact that speakers of V-languages conceptualise it as something that entails duration, and as such, cannot go together with a shorter process (and crossing a boundary is

considered a process of short duration). In such cases, Manner can be freely expressed in a subordinate construction, but many speakers omit it nevertheless. The assumption is that by adding a Manner expression, unnecessary focus is put on Manner, and the addition makes language processing more complicated (Slobin, 2006: 9). Based on certain assumptions on the processing load, Slobin (2006) lists the following factors as facilitators of semantic domain encoding: expression by a finite rather than nonfinite verb form; expression by an uninflected coverbal element rather than an inflected coverbal form; and expression by a single morpheme rather than a phrase or clause. The first presupposition is based on the fact that S-framed languages "*do not require nonfinite verbs in order to include information and manner*", while V-framed options "*require access to lower-frequency nonfinite forms such as gerunds, participles and coverbs*" to convey the same meaning (Slobin, 2006: 10). The second option assumes that inflections require more effort on the part of the speaker, and many V-framed manner-path expressions use them, as opposed to equipollently-framed elements. Finally, complex expressions and descriptions are harder to access than single lexical items. Further, Slobin (2006) states morphosyntactic structure and lexical availability as additional factors, and notable differences between languages of the same type support that notion. His evidence is taken from an analysis of one of the frog story episodes[1], in which the focus is on the owl that comes out of a hole in a tree. Russian, Mandarin, Thai, and Tsou use significantly more manner verbs than German, English and Dutch, even though they all belong to the S-framed category. 'Come out' was used as a preferred option in Germanic languages. Since there is no

[1] So far, interesting information regarding Manner and Path in various languages have been extracted from the frog story narratives. This method of data collection was first developed by Berman and Slobin in 1994, and it is based on narratives elicited from the children's story *Frog, where are you?,* or more specifically, wordless pictures derived from the story. The original idea was to explore language development, but through the years the central notion of the frog story studies expanded on the analysis of motion expressions and narratives in children and adults (Slobin, 1996).

such option in Russian, i.e. 'come' and 'out' cannot be combined into one verb to express motion toward the viewer, a deictic prefix has to be used, as is the case in most Slavic languages. In either case, whether the Russian subjects focused on the path towards the viewer or the emergence of the owl from the hole, they opted for the simplest option, a single verb entailing more information (in this case 100% of the participants used manner verbs). The frog story studies yielded different results regarding the usage of manner verbs in Serbo-Croatian narratives. In her previous studies of Frog stories, Martinovic-Zic (1997), as stated in Jovanovic & Martinovic-Zic (2004), made several conclusions about the usage of motion verbs in Serbo-Croatian narratives compared to English narratives. Serbo-Croatian stories turned out to have "*a less varied choice of prefixes/satellites, primarily in younger narrators*" and "*fewer manner-of-motion verbs than the English narratives*" (Martinovic-Zic, 1997, as stated in Jovanovic & Martinovic-Zic, 2004: 214). In their further research, Jovanovic and Martinovic-Zic (2004) used the narratives to look for preferential verb usage in Serbo-Croatian and to compare it with English data, focusing on the ratio of verb types and tokens, where verb types referred to different verbs, and tokens referred to the numbers of occurrances of the same verb. They also discussed grammatical aspect in terms of its influence on expressing manner of motion in both languages. Their findings seem to be contrary to the aforementioned. Serbo-Croatian speakers used more manner verb tokens and a greater variety of verbs types than English. Manner verbs in both languages prevailed over other verb categories, i.e. they were used more frequently than directional and bare motion verbs, but English did exhibit a more frequent usage of bare motion verbs than Serbo-Croatian. Both languages seem to have a very similar way of use of directional verbs. In addition, aspect was shown to have a great influence on mediation of Manner, since it

contributes to the distribution of additional information through the prefix. However, it does not, as the authors primarily suggested, determine or impede the frequency of manner verbs usage.

When it comes to differences in path verbs lexicon, Özçalışkan (2004) states that Path vocabularies need not extensively differ in two typologically different languages. In analysing metaphorical motion in Turkish and English, she found that while English speakers used more and a greater variety of manner verbs, and Turkish speakers used more path verbs, the total number of Path verb types was not that different between categories. She states that this is due to the fact that they "*form a closed lexical category that does not provide many options for elaboration to speakers of either language type*" (Özçalışkan, 2004: 85). While Turkish speakers usually expressed Path in the verbs, English speakers had to use satellites, and this resulted in a higher percentage of path expressions outside of the verb. Path expressions in English included verb particles, path adverbials, and, the most common ones, prepositional phrases. In their expressions of Path outside the verb, Turkish speakers used directional nouns or noun phrases (Özçalışkan, 2004). While these examples show a part of the differences in only two languages, we can assume that these patterns can occur in other general comparisons including typical V-framed and S-framed languages. Verkek (2014), however, disagrees with that. She states that languages do not necessarily have a similar set and number of path verbs. According to her, certain languages have a varied set of reference points related to motion in a specific environment, like verbs reflecting movement along or across the river flow, or mountains (Levinson & Burenhult, 2009, as stated in Verkerk, 2014). Furthermore, some languages have a variety of path verbs whose subtle differences in meaning

cannot be compared to a smaller set of path verbs in English[2] (Verkerk, 2014: 322). Verkerk's (2014) reports on comparisons between various V-framed, S-framed and equipollently-framed languages give an overall conclusion that V-framed languages do have more path verbs in their lexicon. Furthermore, a phylogenetic analysis showed a correlation between languages of the same typological categories, i.e. it seems that languages of the same descent tend to behave similarly and have similar Path verb lexicons (Verkerk, 2014: 336-337).

2.3. The influence of situation types on Manner and Path encoding; the importance of boundaries

The differences between languages and their lexicalization patterns related to Path descriptions can be explored in greater detail if we take into account the type of event we are dealing with. As mentioned, the notion of boundary-crossing, and the idea that speakers of different languages encode Path in a different way when a physical boundary and a change of state have to be expressed, has been introduced and discussed through various research findings. One of the most convenient ways to illustrate this is through translation, especially since it is an important field of study for crosslinguistic comparisons. Slobin (1997) presents a short analysis of a chapter of *The Hobbit*, originally written in English, and translated to many world languages. The sentence analysed was the introductory sentence of Chapter 6:

(1) a. English original: *He still wandered on, out of the little high valley, over its edge, and down the slopes beyond...*

b. French translation: *Il continua d'avancer au hasard, sortit du haut vallon, en franchit le bord et descendit la pente au-delà...*

[2] Spanish and French are given as examples; French has six equivalences for one English verb ('*return*').

'He continued to *advance* haphazardly, *exited from* the high small valley, *crossed* the edge of it and *descended* the slope beyond...'
(Slobin, 2007:439).

The general pattern noticed was that speakers of S-languages (like English in the above example) have two equally valid possibilities in those cases, while speakers of V-languages (like French and Spanish for example) have only one possible way to express boundary-crossing, because of certain typological constraints in their language (Slobin, 1997; Aske 1989). One of these possibilities is to gather different satellites, like particles and prepositions, around one manner verb in Path description (like it is done in 1a), and the other is to use different directional verbs every time a change of state occurs (1b). The latter possibility almost always occurs in V-languages (Talmy, 1991; Slobin, 1997). An interesting finding from this analysis regarding Serbo-Croatian showed that the English original and its translation in Serbo-Croatian had the same number and variety of manner verbs (Slobin, 2006: 12), which implies that Serbo-Croatian translators predominantly used the technique of gathering several path components around one manner verb. However, the fact that such translations exist does not indicate that such patterns are colloquial in use among native speakers. For example, Filipović (1999, 2001, as stated in Filipović, 2007: 31) illustrated how speakers of Serbo-Croatian tend to omit or simplify information about manner in their translations of English texts, which she attributes to the morphological constraints already described in previous chapters.

In one of his discussions on the differences between S- and V-languages in Path segmentation in the events of boundary crossing, Slobin (1997) analyses 'the cliff episode' from the Frog Story studies, a sequence of a few pictures which shows a boy and a dog looking for their pet frog, and a deer pushing them in a stream. As

mentioned, S-languages are said to have two possibilities of expressing Path; one is to 'stack' several Path components onto one verb clause, and the other is to use various motion verbs to encode Path, i.e. to describe each boundary-crossing individually. According to Slobin (1997: 448), V-languages always opt for the latter option: "*Although speakers of both types of languages are able to relate the event at any degree of granularity, speakers of S-languages are more likely to break up the event into a larger number of components, based on 'narrative habits' of compacting several path components in a single clause. Speakers of V-languages, by contrast, have developed a narrative style that makes more sparing use of individual motion verbs to encode path components*". The results of his study confirmed this theory; the average number of expressed Path segments was higher for speakers of S-languages. Among S-framed languages, speakers of Germanic languages expressed more than 3 Path segments 86% of the time, while speakers of Slavic languages, among them Serbo-Croatian speakers, expressed them 76% of the time. In both cases, the percentage is significantly higher than the 30% detected in V-framed languages (Slobin, 1997: 449). In addition, it seems that the difference in percentages in Slavic and Germanic languages can be an indication of intra-typological differences in Path segmentation, another indicator that languages can be posited on a cline rather than be placed strictly into one typological category. Another interesting finding from this research shed some light on the possible reasons why speakers of S-languages generally exhibit a significantly higher percentage in Path segmentation. As mentioned before, an important factor to consider is the role of the setting and the context. Adult speakers of V-framed languages seem to describe static scenes surrounding motion events more often than speakers of S-framed languages, and in this way they provide more implications for the Figure's path (Slobin, 1997: 451). We

might then conclude that different language types have different ways of compensating for what they do not explicitly express when it comes to expressing complex Paths. Özçalışkan's (2004) results on conveying metaphorical motion in English and Turkish were in line with Slobin's findings. English speakers expressed Path segmentation at a significantly higher rate than Turkish speakers, while the latter used separate clauses to describe motion events. Further experiments involving speakers of English and Turkish (Özçalışkan, 2013) confirmed that boundary-crossing can be seen as a constraint in motion descriptions for speakers of V-languages, and that it could serve as test for the classification of languages in typologies. Another interesting factor Özçalışkan (2013) found was the importance of the very nature of the boundary, and the setting surrounding it. For example, in V-languages, boundaries that are more fluid, combined with a specific direction of the Path, might evoke more manner verbs in motion descriptions (Özçalışkan, 2013: 17). Further, the longer duration of motion can be seen as an additional constraint, as well as the type of Path included, since Paths involving crossing OVER a boundary allow for more Manner expressions than Paths involving going INTO or OUT OF a boundary (Özçalışkan, 2013: 17).

3. The encoding of Path

3.1. Asymmetries between the starting point and the endpoint

As we have discussed in previous chapters, a motion event can be seen as comprising of: a Figure; that undergoes Motion; on a certain Path; in relation to the Ground (or Reference object). In English, the Figure and the Reference object are usually represented by a noun phrase, the Motion by a verb, and the Path by a preposition (Lakusta & Landau, 2005), which places English in the category of S-languages. Croatian language is also listed as an S-language, which means it follows similar patterns. Since the following chapters deal mostly with the linguistic encoding of Path, an outline of factors that influence the process, described by Lakusta & Landau (2005), is presented in this paragraph. First, the speaker observes an event and has to form an accurate non-linguistic representation which will then be transferred into language. Based on her perspective, the speaker chooses a verb to encode motion. Her choice will determine the encoding of Path, given that some verbs contain Path in their basic meaning, and others (like Manner verbs) do not, which makes information about Path optional in the syntax. The encoding of Path depends not only on the speaker's choice of verb(s), but on her focus of attention too. Depending on her perspective, the speaker can choose to encode the starting point, the midpoint, the endpoint, or a complex combination of Paths. Comprehensive Path analyses identify three basic types of a complete Path expression: "FROM Paths, in which the Figure moves from a Reference object which is its Source (which in English require prepositions such as 'from', 'out', 'off', etc.), TO Paths, in which the Figure moves to a Reference object which is its Goal (which require prepositions such as 'to', 'into', 'onto', etc.), and VIA Paths, in which the Figure moves past a Reference object (which

require prepositions such as 'via', 'past', 'through', etc.)" (Jackendoff, 1983 as stated in Lakusta & Landau, 2005:3). A final factor to consider is the range of domains which the speaker's choices can apply to, since the use of Path terms extends beyond physical paths through space.

It is important to acknowledge that according to many theoreticians, the encoding of Path is seen as one of the fundamental parts of our conceptualization and reasoning. Johnson (1987) and Lakoff (1987), as stated in Johnson (2005: 18-19), introduced the concept of image schemas, which are basically "*the recurring patterns of our sensory-motor experience by means of which we can make sense of that experience and reason about it, and that can also be recruited to structure abstract concepts and to carry out inferences about abstract domains of thought*". Among them we can find the SOURCE-PATH-GOAL schema, which "*underlies our understanding of bodily motion along a path, where there is a starting point (Source), a continuous set of steps (Path), taken toward the destination (Goal)*". Of course, as one of the basic patterns, the SOURCE-PATH-GOAL schema (or the PATH schema) can be applied to various domains of abstract reasoning (from mathematics to political speeches), can serve as a basis for other image schemas, and is not strictly related to literal motion through space. Path is, therefore, directly related to the two defining points of motion – the Source and the Goal, which represent "*the starting and the ending point of a change respectively*", and should be "*to all intents and purposes on an equal footing*" (Ikegami, 1979: 141). However, there is a consensus among various linguists that in many ways the Source and the Goal are not equally posited at all. In fact, numerous languages demonstrate a clear inclination toward Goal-oriented constructs and interpretations. The 'goal-over-source principle', as this inclination was termed, has been examined in detail by many linguists in the last few

decades, one of the first being Yoshihiko Ikegami. He claims that "*the source and the goal do not constitute an equal and mutually contrasting pair of concepts*" and that "*language seems to manifest a peculiar dissymmetry in this respect*" (Ikegami, 1979: 141). In his elaboration on the goal-over-source principle, he presents two viewpoints which are to be taken into account: the psychological and the psycholinguistic.

From the psychological viewpoint, "*the source and the goal are not equally valued as constituting elements of a completed motion*" (Ikegami, 1979: 149). If language users perceive a motion event as a process with a beginning and an end (or result), the goal-oriented references appear to give more information about the event and therefore offer a sense of completeness. In other words, "*if we hear that something has started, we are still left with an expectation to be told that it has arrived at a certain point*" or that there is any kind of result or purpose to this start of movement, but "*if we hear that something has arrived at some place and ended its motion there, we feel quite satisfied with the description in spite of the fact that we are not told about the start of the motion*" (Ikegami, 1979: 148-149). Some researchers have termed this viewpoint as the *(psychological) salience hypothesis* (Stefanowitsch & Rohde, 2004). The notion of 'completeness' can be reflected in language through e.g. grammatical categories. Ikegami (1979: 147) touches upon clauses in terms of their orientation toward source or goal, and claims that "*a clause representing the source is less autonomous and more uncertain*". Take his example into account: *Because he is tired, he is in bed*. If we are presented with a reason (*because he is tired*) we expect a result or a consequence (*he is in bed*). In the same way, if we are presented with a question or a command, an answer or a response is expected. On the other hand, a clause or a sentence containing answers or responses can be complete without its reasons explicitly stated. Similarly, in line with their assumption that it is

necessary to conceptualize the complete Path in order to properly interpret a motion verb or event, Verspoor, Dirven, and Radden (1999: 88), as stated in Stefanowitsch and Rohde (2004: 250), give the following examples of Path encoding:

a. *I climbed from my room up the ladder onto the roof.* (all Path components present)

b. *I climbed onto the roof.* (Goal mentioned)

c. *I climbed up the ladder.* (trajectory mentioned)

d. *??I climbed from my room.* (Source mentioned)

As seen in the examples above, it is possible to express just the Goal or the trajectory, but it is semantically odd to express just the Source. The suggestion that a complete (or at least the most probable) conceptualization of a motion event can be inferred from the presence of Goal but not the Source (Ungerer & Schmidt, 1996, as stated in Stefanowitsch & Rohde, 2004: 252) has led to another hypothesis, the *complete-conceptualization hypothesis* (Stefanowitsch & Rohde, 2004: 252). If this assumption is correct, the Goal bias can be explained through its psychological (cognitive) motivation: "*the encoding of the relatively information-poor source raises the cognitive as well as the communicative costs; the cognitive cost because there is more inferencing to be done on the part of the hearer, and the communicative cost because the possibility that the hearer will make the right inferences is relatively low*" (Stefanowitsch & Rohde, 2004: 252). However logical this may seem, it is important to note that not every motion event is conceptualized as having a source, a trajectory, and a goal. Conceptualization is often influenced by context and the semantics of the specific motion verb used to encode the event (Stefanowitsch & Rohde, 2004: 264). Take the following examples into account (Stefanowitsch & Rohde, 2004: 264):

1. *He was strolling through the park.*

2. *He escaped from Alcatraz.*

In cases like these, we need not necessarily conceptualize all components of a 'complete motion event' (i.e. the starting point, the trajectory, and the ending point), nor do we need to infer them in order to fully understand the event or to find the sentences complete, and syntactically and semantically acceptable. According to this implication, a possible explanation for the goal-over-source principle can be found in a more general cognitive principle derived from Grice's maxim of quantity, which basically states that "*an utterance must contain enough linguistic clues to arrive at a complete conceptualization of the event encoded*" (Stefanowitsch & Rohde, 2004: 265). This does not discard the idea of a general (greater) human interest in Goals, but rather implies that there exists a general motion event schema extracted from linguistic and non-linguistic experience with a Goal bias inherited from some parts of these extractions.

To explore the psycholinguistic viewpoint, we must examine the crosslinguistic comparisons and linguistic research which indicate that there are a number of examples supporting the goal-over-source principle in major (also, typologically distinct) languages. Ikegami's (1979) first line of linguistic evidence stems from the comparison of English and Japanese expressions of giving and taking. In Japanese expressions, the source marker is often replaced with the goal marker, where in English this is not possible. For example, the Japanese idiomatic equivalent of the English expression *'to get X from Y'* is *'to get X to Y'*. The goal marker '*to*' is used in almost all expressions of giving and taking in Japanese, as it can easily replace the source marker, while the opposite (replacing the goal marker with the source marker) is not possible. Ikegami also mentions expressions in English in which the use of the goal marker is gradually increasing at the expense of the source marker: *different from/to*, *immune from/to*, *in distinction from/to*, etc. His second line of

evidence is related to the markedness of Goal and Source. Throughout the historical development of language, a tendency for the goal and location markers to get neutralized developed (e.g. the location and goal adverbs *here* and *there*), while the source remained marked in most contexts (e.g. *from here* and *from there*). He further illustrates the differences in markedness through the following examples: 1) *run behind the wall* and 2) *run from behind the wall* (Ikegami, 1979:143). The first expression can refer either to the goal or the location, but the goal can remain unmarked. On the other hand, the second example shows that the source must remain marked if one does not want the meaning of the sentence to change. Examples from Japanese show that in cases where the marker (either the goal or the source marker) is removed from the sentence and "*the status of the head noun in the resulting relative clause becomes ambiguous*", the only possible interpretation is a Goal-oriented one (unless there are special contextual constraints) (Ikegami, 1979:144). The third group of evidence consists of verbs and expressions that allow for a Goal-oriented interpretation even if there is an existing Source-oriented basic interpretation, while the opposite is not possible. For example, Source-oriented verbs *leave* and *start* which inherently entail the notion of 'going from X' can also be interpreted as 'going toward non-X'. On the other hand, the twofold interpretation is not possible for Goal-oriented verbs such as *arrive* or *reach*. Thus, Goal-oriented interpretations can be seen as favored and as having broader possibilities for application. Ikegami (1979: 145) also states that there is an ongoing tendency in Modern English to "*decidedly prefer the goal-oriented expression*". This is seen through examples such as: 1) *John asked of Mary if she would come*; and 2) *John asked Mary if she would come*, where the second example, in which the person is presented 'as a goal', is clearly the preferable one in Modern English. Some researchers have proposed that the asymmetry of Goals

and Sources originates from the fact that Goals are generally more telic than Sources, i.e. they offer a greater sense of completeness. Nam (2004:26) states that the syntactic behavior of Sources and Goals "*suggests in general that Goal PPs have more integrity with the verb than Source PPs do*", which is discussed in terms of preposition incorporation, pseudo-passives, movement, and locative alternation. In addition, Verkuyl (1993), Krifka (1995), Cinque (1999), Travis (2000), and Tenny (2000), as cited in Nam (2004), claim that there are at least two aspectual domains in syntax, and that an internal argument determines the aspectual character of the verb phrase. According to Nam (2004) there is a clear contrast between Goal and Source in terms of their contribution to aspectual shifts; while Source PPs do not change the aspectual character of the inner event, Goal PPs can be treated as internal arguments which participate in aspectual composition (Nam, 2004:18). Some supporters of the non-linguistic nature of the Goal bias (i.e. conceptual asymmetry) claim that there is no aspectual asymmetry between Goals and Sources, but rather that their different positions in syntax and semantics stem from other asymmetries in language. For example, in her analysis of prepositions and postpositions in English and Dutch, Gehrke (2007:95-96) states that the apparent asymmetry could be induced by the presence of more elaborate strategies for deriving Goals, as well as certain morphological constraints (e.g. *in* and *on* can incorporate into the Goal P *to* — *into*/*onto*, but not into *from* — **infrom*/**onfrom*).

In order to gain a better perspective on the apparent asymmetry between Sources and Goals, we must examine the empirical evidence provided by different fields of study (e.g. first and second language acquisition) and further crosslinguistic research.

3.2. Evidence for the 'goal-over-source' principle

Empirical research on this topic mostly comports with the goal-over-source principle. One group of evidence comes from studies on pre-linguistic representations of events, and language acquisition. Studies have shown that children start to encode Paths early in their acquisition, at one- and two-word stages (Lakusta & Landau, 2005; Choi & Bowerman, 1991). More specifically, they encode both FROM and TO Paths as early as 14 – 21 months of age (Choi & Bowerman, 1991). One of the central questions researchers have been trying to answer in this field is whether or not there is a direct link between the acquisition of spatial words and non-linguistic conceptualizations of space among infants. Consequently, two major theories emerged. The first one states that children learn spatial terms by mapping them to concepts of space formed independently of language (universality claim), while the second assumes the position that spatial concepts alone are not enough for learning spatial terms, and that language-specific strategies for conveying space and motion play a crucial role in learning those terms (language specificity claim).

Researchers such as Choi & Bowerman (1991), Choi et. al (1999), Choi (2006; 2011), Slobin et. al (2011), support the claim that a child's acquisition of linguistic event representations is greatly influenced by the specific language the child is exposed to. In their study on the acquisition of motion expressions among children learning English and Korean Choi & Bowerman (1991) found that the children show sensitivity to language-specific patterns as early as 17-20 months. More specifically, they found that children learning English start using their earliest spatial terms in various contexts very quickly (Path particles like *up*, *down*, *in*), regardless of whether they talk about spontaneous or caused changes of location, or posture changes, while children learning Korean strictly separate words for spontaneous and caused motion,

and use different words for vertical and posture changes. Furthermore, children learning English learn how to isolate a few frequent kinds of Path very quickly, while in Korean Path is often conflated with motion and specific properties of Figure or Ground, so the children take longer to realize that Path can be expressed separately and have its own marking (Choi & Bowerman, 1991: 117). In their experiments, Choi (2006) and Choi & Hattrup (2012) found that language-specific semantics play an important role in categorization of containment and tight/loose features among adult monolingual speakers of English and Korean. They also found that sensitivity to different types of containment (tight-fit vs. loose-fit, i.e. *kkita* in Korean or tight-*IN* in English vs. *nehta* in Korean or loose-*IN* in English) can be detected among 29- and 36-month-olds, as well as among 18-23-month-olds for some aspects of that categorization (Choi et. al, 1999). Further, longitudinal studies of two Korean-speaking children examined by Choi (2011) reveal striking differences between languages of the same typology (Korean and French, both V-framed languages). Her analyses show that language-specific properties have a great influence on how two-year-old children express Motion events, and how their influence grows as the children grow older. In line with Hickman et al. (2009), as stated in Choi (2011: 180), she states that language-specific grammar "*interacts with development of general cognitive capacity*" and that "*while children acquire the core structural properties of the target language from early on, they need to develop further cognitive capacities to fully master them, including the use of peripheral devices*". Slobin et al. (2011) found similar evidence on language-specific patterns. They investigated how children acquiring different languages (four S-framed languages: English, German, Russian and Finnish, and four V-framed languages: Spanish, Hindi, Turkish and Tzeltal) encode "putting" events at the stage of early multi-word utterances. Apart from

finding clear differences in encoding patterns between typologically distinct languages, they found that children use strategies typical for their language, which often differ intratypologically. In addition to intratypological differences, they found that the following factors contribute to acquiring strategies for encoding placement events (Slobin et al., 2011: 148): perceptual salience of grammatical morphemes that encode spatial relations (particles, verbal affixes, case markers and adpositions), and semantic richness of verbs (i.e. the number of elements they conflate). Further, in looking beyond Talmy's (1985) typology, they explore language-specific semantic organization in the domain of placement events, more specifically, the marking of goal phrases, and verb categories. According to their data, children who learn languages with more complex (and more abstract) ways of encoding events will take more time to acquire all of them. For example, Spanish uses one preposition (*en* - 'in/on') for four dimensions; containment, support, static (location at) and dynamic (movement toward), while Finnish marks each dimension separately with different cases, which makes it a lot easier for Spanish children to express them. The level of specificity of the verb is also a factor to consider, since it is obviously easier to learn a simple verb like 'put' than it is the very specific 'attach by inserting tightly between two pinching surfaces' (Slobin et al., 2011: 152). Hence they conclude that "*there may be an interaction between the ease of learning semantic categories and where the language puts its information*" Slobin et al. (2011: 155). Another interesting finding they elaborate on in their paper is related to intratypological differences in the explicit encoding of the Goal. The languages compared in this small case study are English and German. The study involves a six-month research on two girls at an early stage of language learning, and their parents. The results show a strong correlation between the usage of motion descriptions of parents and their children. In fact, this correlation

is stronger for the children with respect to their parents than with respect to other children their age. What they found was that while both languages have similar patterns for encoding Goals, German possesses more variations in the elaboration of deixis in combinations with expressions of relative location (Slobin et al., 2011: 160), and English expresses Goal explicitly more often. These patterns were clearly present among children from a very early age.

Evidence from certain biases among prelinguistic infants and young language learners suggests that language learning stems from and gets support from non-linguistic representations of the world (Stefanowitsch & Rohde, 2004; Lakusta & Landau, 2005; Lakusta et al., 2007; Lakusta et al., 2012; Georgakopoulos & Sioupi, 2015). Furthermore, many theories put forward the proposition that some components in event representation are more prominent than others, and are therefore essential in language learning because they "*guide the mappings between conceptual structure and syntax*" (Fisher, 1996; Grimshaw, 1981; Pinker, 1989 – as stated in Lakusta et al., 2007: 180). According to some researchers and theoreticians, the assumption can also be applied to the representation of Sources and Goals. The Source-Goal asymmetry is reported to appear across various groups of children and adults: in pre-linguistic infants (Lakusta et al., 2007); in speech production of brain-damaged patients (Ihara & Fujita, 2000 on Japanese, as stated in Papafragou, 2010); in speech production of children with Williams syndrome (Lakusta & Landau, 2005); in spontaneous gestures of children who are congenitally deaf and have not been exposed to language (Zheng & Goldin-Meadow, 2002, as stated in Papafragou, 2010); and in various other experiments including children and adults (Lakusta & Landau, 2005; Luo & Baillargeon, 2005; Papafragou, 2010). In line with these ideas, a theoretical assumption that "*there are homologies between infants' cognitive systems and the*

system of language that they must learn" emerged (Lakusta et al., 2007:180). The assumption is based on evidence of children and infants assuming that objects are mapped to nouns (Bloom, 1999; Grimshaw, 1981; Waxman & Booth, 2001, as stated in Lakusta et al., 2007:180), properties to adjectives (Waxman & Markow, 1998, as stated in Lakusta et al., 2007:180), agents to subjects (Fisher, Hall, Rakowitz, & Gleitman, 1994; Grimshaw, 1981, as stated in Lakusta et al., 2007:180), and 10-month-olds differentiating between conceptual entities that are relevant for an action and those that are not (Gordon, 2003 as stated in Lakusta et al., 2007:180). Lakusta et al. (2007) tested the possibility of a Goal bias in infants not yet able to produce full linguistic structures for motion events. Their experiments tested the attention and looking time of 12-month-olds in situations where either only the source or the goal were present, and situations where both the source and the goal were present. The experiments showed that 12-month-olds tend to encode ordinary Goals in motion events including only Goal objects, but tend to encode Sources in motion events including only Source objects only after the source object had been made particularly salient (e.g. bigger, more unusual). Furthermore, in situations in which infants were presented with motion events that included both Source and Goal objects (and the source object presented was the modified, 'more salient' one), they exhibited a Goal bias, i.e. they exhibited a tendency to look longer at a change in the goal than a change in the source. In line with their results, the authors discuss the origin of a possible non-linguistic Goal bias, presenting two possible and probably related explanations. The first one states that the non-linguistic nature of the Goal bias may be a reflection of the forward-looking nature of human cognition. This claim is supported by evidence from research on visual and motoric representations of space, which shows that people have a tendency to anticipate what comes next (Freyd, 1983;

Intraub, 2002; Rosenbaum, Cohen, Meulenbroek, & Vaughan, 2006, as stated in Lakusta et al., 2007:193). The second possibility revolves around intentional reasoning, stating that "*perhaps only endpoints that are goals in intentional, goal-directed actions are preferred over starting points*" (Lakusta et al., 2007:193). Since the Figure from their experiments was animate, the authors point out the possibility that infants interpreted the Figure's movement toward an endpoint (regardless of whether the endpoint contained a goal object) as intentional. Related to intentional actions is the notion of agency, which is presumed to have a great influence in the infants' ability to reason about motion events. For example, research on goal attribution in 5-month-olds shows that they tend to attribute goals not only to human agents, but to any entity with appropriate features of an agent (e.g. a self-propelled box), as long as they are given unambiguous information on the object's motion (Luo & Baillargeon, 2005). Lakusta et al. (2012) further explored the significance of agency by conducting an experiment about the encoding of sources and goals in causal events (in which the source object became also an agent) and noncausal events (in which the Figure was moving from the source object to the goal object by itself). They found that there is a difference between the coding of sources in these two types of events, i.e. that the source is more often included in the descriptions of causal events than in noncausal events. Nevertheless, the goal was included in the descriptions more often than source in both types of events, which therefore accounts for the goal-over-source principle. Lakusta & Landau (2005) tested whether the Goal Path bias occurs for Change of Possession events, Change of State events, Attachment/Detachment events, and Manner of Motion events in which the Source and the Goal are simultaneously displayed, across three groups of English-speaking subjects: children with Williams syndrome (who were expected to show a weakness

in encoding Path), normally developing children, and adults. Their results are based on three experiments, all of which have shown a clear tendency of the participants to regularly and accurately describe Goal Paths, as opposed to Source Paths, which were often omitted or inaccurately described. For example, in cases (like Manner of Motion verbs) where both source and goal PPs were optional, the subjects used goal PPs significantly more often than source PPs. The Goal bias patterns occurred among all three groups of subjects, even though it was weaker among adults. In reference to the results, the authors made a parallel between the Goal bias and formal theories of word meaning, stating that Goals and Goal Paths in most cases convey more important and central elements of a word's meaning, and should therefore be placed higher in thematic hierarchies (Lakusta & Landau, 2005: 29).

Georgakopoulos & Sioupi (2015) investigated Change of Possession events in Greek and German. Their corpus-based study included three text types (news, literature, and academic texts), based on which the expression or omission of optional elements (PPs) with the verbs *buy* and *sell* were examined. The results confirmed the preference for Goals in Change of Possession events, since the optional PPs were found to be significantly more times expressed with the Goal-oriented verb (*sell*). Considering the fact that this finding is valid for both languages, and taking into account other research that confirms the preference for Goals in various languages, the authors claim that the Goal bias can be examined as an argument in favour of the Universality claim. However, their findings also show a difference in preference for Goals between the two typologically different languages in question. German, an S-framed language, seems to have a higher degree of preference for expressing Goals than Greek, a V-framed language (i.e. the PPs are more often explicitly expressed in German than in Greek). The degree of robustness of the Goal bias therefore seems to

support the Language Specificity claim, as it can be presumed that it is more common among S-framed languages. In their corpus analyses of verbs *go*, *climb*, *flee*, *fall*, *escape*, *cruise*, *stroll*, *move*, *fly*, *roll*, and *slide*, and prepositions appearing with those verbs, Stefanowitsch & Rohde (2004) also found a prevalence of Goal-oriented literal and non-literal motion expressions, but stated that the goal-over-source principle was confirmed as a tendency rather than an absolute rule.

Papafragou (2010) attested to the Goal bias in children and adults with respect to their memory of motion events, encoding of Source/Goal relations, and comprehension of novel spatial vocabulary. The Goal bias was confirmed for every stated aspect: adults and young children tend to remember objects and relations better when they appear with Goals than with Sources; they tend to refer more to Goals than Sources in event encoding and give more detailed descriptions of Goals than Sources; and they tend to discriminate more detailed lexical distinctions in the domain of endpoints when it comes to the interpretation of novel verbs. However, her results also indicate that there exists an asymmetry between linguistic and non-linguistic representations. For example, one of her experiments shows that adults are prone to extending the same novel verbs across scenes that are visually different. She therefore concludes that while the presence of the Goal bias may stem from cognitive and attentional biases, linguistic manifestations of the bias are subject to "*language-internal principles (such as the more abstract principles governing naming) and may not align perfectly with the non-linguistic effects of the bias*" (Papafragou, 2010: 16).

3.4. The lexicalization of Sources and Goals in Croatian

When it comes to encoding Sources and Goals in Croatian, a particularly important role is carried out by prefixes and prepositions. More specifically, verbs prefixed with *od-* or *do-*, and prepositions *od* and *do*, which are basically the most

common indicators of Sources and Goals in Croatian. Moreover, they are, in similar forms, present in all Slavic languages, which makes them particularly interesting and important to observe. Therefore, a thorough analysis of these elements is necessary in the context of the present research.

Brala-Vukanović and Memišević (2012a) made an interesting observation about the treatment of *od* and *do* in literature, which can be applied to all major Slavic languages. It seems that even though they represent a complementary prepositional pair, *do* tends to be analyzed much more frequently than *od*. Here a parallel can be made with English where, according to some researchers, 'to' seems to appear more frequently than 'from' (Tyler and Evans, 2004, as stated in Brala-Vukanović and Memišević, 2012a:44). The authors note that this prevalence of the treatment of *do* might be connected to the general "*experiential, perceptual, attentional, and related cognitive primacy*" of Goals (Brala-Vukanović and Memišević, 2012a:50), i.e. to the goal-over-source principle discussed in previous chapters. Another one of their conclusions was that the preposition *do* (i.e. 'motion toward') "*has a number of very distinct and clear interpretative (and also informative) or rather analytical 'advantages' over od*" (i.e. 'motion from') (Brala-Vukanović and Memišević, 2012a: 50). According to them, *do* is found to be "*more autonomous in meaning construction than od*": an example of that would be the contrast of usage of adlative vs. ablative relations, where the adlative relation (expressed by *do*) is in many cases the only possible one – e.g. *parkiran je do bolnice* / 'he is parked next to the hospital' vs. *parkiran je od bolnice* / 'he is parked (away) from the hospital' (Brala-Vukanović and Memišević, 2012a: 65).

As mentioned, prepositions *od* ('from') and *do* ('up to') are found to be among the most commonly used ones, and represent a "preposition pair", which is a non-existent

term in English (Brala-Vukanović and Memišević 2012a, 2012b, 2014; Filipović, 2007, 2010). "Preposition pair" is a term used to mark two prepositions with opposite meanings very often used together, whose usage becomes truly meaningful once put into pairs (e.g., *to — from*, *into — out of*, *on — off*) (Brala-Vukanović and Memišević, 2012a: 44). *Od* and *do,* as well as prepositions from other common preposition pairs, typically appear before nouns or noun phrases (e.g. *od* + N_1 + *do* + N_2). Kovačević and Matas Ivanković (2007: 248-253) explored the semantic features of the *od* - *do* pair, whose meanings were classified into 6 groups:

1. Spatial meaning:

a) indicating the length extending between the starting and the ending point (e.g. *od Lučice do Jablanca* / 'from Lučica up to Jablanac');

b) indicating a wider area covered between N_1 and N_2 (e.g. *od obala Ponta Euxina do obale jadranskoga i jonskoga mora* / 'from the shores of the Black Sea up to the shores of the Adriatic and the Ionian Sea');

c) by repeating the same noun after both prepositions (*od* + N_1 + *do* + N_1), distributive sense (*od kuće do kuće* / 'from one house to another house');

2. Temporal meaning: indicating a time span of events and processes (e.g. *od 10 do 16 sati* / 'from 10 a.m. until 4 p.m.');

3. Measures: indicating a quantitative span among the same units (e.g. *od 3 000 do 10 000 stanovnika* / 'between 3 000 and 10 000 inhabitants');

4. Span: indicating a quantitative span among related units with different characteristics (e.g. *od jednostavnih do složenijih skladbi* / 'from simple to complex musical compositions')

5. Idiomatic expressions (e.g. *od glave do pete* / 'from head to toe')

6. Other variants; a dash between figures indicates the *od* - *do* relation between them.

Before turning to explore the prefixes *od-* and *do-*, a short outline of the most significant properties of prefixes in Croatian is presented. In Slavic languages, verbal prefixes have two main functions (Brala-Vukanović and Memišević, 2012b:73); they modify the meaning (semantic function), and change the aspect of the verb, i.e. they turn imperfective verbs into perfective (syntactic function). In Croatian, the situation is somewhat different – if the verb's stem contains an imperfective marker (i.e. suffixes *-iva*, *-ava*, *-ova*), the addition of a prefix will not change its aspect. Furthermore, the imperfective aspect of an already prefixed imperfective verb cannot be changed by the addition of another prefix, especially since the addition of a second prefix is restricted to a limited number of verbs (Brala-Vukanović and Memišević, 2012b:73). Another important issue to address is the existence of empty or purely perfectivizing prefixes, or natural perfectives. A prefix is classified as empty or creating natural perfectives when it produces only a perfective form of a verb, and when it does not add a semantic component to a verb (Brala-Vukanović and Memišević, 2012b:74). As we will see in the following analyses of *od-* and *do-* in Croatian, neither of the prefixes fits into these categories.

As mentioned, *od-* and *do-* are the highest ranking prefixes on a cline of prefixed Manner verbs (Filipović, 2007, 2010), which means they can combine with all existing prepositions. Hence, they can also form any possible combination with the prepositions *od* and *do* (Brala-Vukanović and Memišević 2012a, 2012b, 2014; Filipović, 2007, 2010). Further, Brala-Vukanović and Memišević (2012a) note that *od-* and *do-* convey implicit information about Sources and Goals. For example, an *od*-prefixed verb can be followed by both *od-* and *do*-headed PP, and in both cases the prefix attached to the verb carries the meaning of an implicit Source: lopta se **ot**kotrljala **od** djeteta/**do** djeteta – 'the ball rolled away from the child' [the ball from-

rolled from childGEN]/ 'the ball rolled up to the child' [the ball from-rolled to childGEN]. The same thing happens with *do*-prefixed verbs, except their prefix contains an implicit Goal: lopta se **do**kotrljala **od** djeteta/**do** djeteta – 'the balled rolled over to the point of the end of motion from the place where the child is posited' [the ball up-to-rolled from childGEN] / 'the ball rolled over to the place where the child is posited' [the ball up-to-rolled to childGEN].

Among the scholars who have dealt with prefixal semantics in Croatian, Brala-Vukanović and Memišević (2012a,b, 2014) gave the most thorough analyses of the related specificities, so a review of their insights will serve as a basis for the information we need for the present research. Their cognitively-based approach in dealing with prefixes resulted in developed networks of core meanings and submeanings of *od-* and *do-* prefixed verbs in standard Croatian.

The prefix *od-* appears in similar forms (*od-*, *ad-*, *ot-*, *vid-*, *wot-*) in various Slavic languages. One interesting peculiarity is that the number of its variations is a bit higher than that of other prefixes (including *do-*) and the variations differ in functions, grammatical meanings, and combinatorial properties with verbal bases (Brala and Memišević, 2014: 92). The form of *od-* in Croatian depends on the first sound of the base verb. Therefore, it can appear in the form of four different allomorphs (Babić, 2002, as stated in Brala Memišević, 2014:93): *od-* (added to the verbs that begin with voiced consonants or vowels and those beginning with *s*, *š*, *c*, *č*, and *ć*), *oda-* (added to the verbs that begin with a consonant cluster), *ot-* (added to the verbs that begin with voiceless consonants), *o-* (added to the verbs that begin with *d* or *t*).

As for the semantic structure of *od-*, it is important to note that *od-* is never an empty prefix and it never creates natural perfectives, since it always modifies the meaning of the verb and can appear with verbs in imperfective forms (Brala and Memišević,

2014: 92). Following other researchers, mainly Janda's (1986) analysis of Russian prefixes, Brala-Vukanović and Memišević (2014) conducted a thorough, cognitively-based analysis of the semantic components and syntactic requirements of all Croatian *od-* prefixed verbs. Their analysis revolves around the core meaning of the prefix *od-* in terms of its spatial sense, which is 'away', or 'distancing'. However, they also present other senses realized by *od-* prefixed verbs, which are not directly related to the spatial sense, but can be viewed through the 'action completion' sense ('leaving X, completing X, severing X – where X can be an action, state or period of time). In those cases, the verbs include not only the notion of 'moving away from the Source', but also indicate the beginning of a new, opposite event, state or time. Other information about physical Sources, and/or Paths is then encoded by the prepositions following the prefixed motion verb (Brala and Memišević, 2014: 110).

The analysis encompasses seven major groups of verbs and related subgroups that distinguish different senses the verbs in the categories can express. It is summed up in the following outline (Brala and Memišević 2014, 96-108):

1) AWAY verbs (express the meaning of 'move away' literally and metaphorically); a) *motion* (motion + manner; generic motion; motion + cause); b) *distancing*; c) *temporal*;

2) AWAY/CLOSURE group (contains verbs that can express the 'away' and 'closure' sense)

3) RETRIBUTION verbs (express the meaning of 'response to another action'); a) *repayment*; b) *communication*;

4) RETRIBUTION (COMMUNICATION)/CLOSURE group (contains verbs that can express the 'retribution (communication)' and 'closure' sense)

5) CLOSURE verbs (express the meaning of 'completion of action or a period of time and moving on'); a) *pure closure*; b) *emotion*; c) *thinking*; d) *change of state*; e) *temporal closure*;

6) CLOSURE/SEVER group (contains verbs that can express the 'closure' and 'sever' sense)

7) SEVER verbs (express the meaning of 'Trajector is cut off and removed from the Landmark'[3]).

Šarić and Tchizmarova (2013) also analysed verbs prefixed with *od-*/*ot-* in Bosnian/Croatian/Serbian and Bulgarian from a cognitive linguistics perspective, with a special focus on non-spatial domains deriving from spatial meaning. Their data was comprised of dictionary entries. The general overview of meanings of *od-*/*ot-* prefixed verbs outlined in their work led them to classify the verbs into three major groups (Šarić and Tchizmarova, 2013:9): the first group encompasses verbs expressing motion in space away from a source (typically indicating self-caused motion), the second group consists of verbs indicating spontaneous and caused separation, and the third group includes verbs that indicate a special case of completion, one in which the initial point of a process or its duration is emphasized in abstract motion, i.e. one in which spatial meaning is transformed into an action that is a response to a preceding action.

Šarić and Tchizmarova (2013) state that the central meaning of *od-*/*ot-* can be characterized as a *from* schema, i.e. a schema involving a Trajector moving away from a Landmark.

Motion away (prototypical): *otići*/'go (away)'; *odjedriti*/sail away

[3] As Brala-Vukanović and Memišević (2014:93) define them: a Trajector refers to the object whose motion or location is being specified, and a Landmark to the object with respect to which motion or location are being defined. In the present research they are mostly referred to as the Figure and the Ground (or reference) object(s), respectively.

Completion, initial point: *odglumiti*/act out; *odbrojiti*/count off

Duration: *odležati*/spend a long time; *odslužiti*/do service

Abstract motion away: *odskakati* (impf.)/stand out, be different from; *odzvoniti*/come to an end, die

Separation: *odmaknuti se*/move away; *odvesti*/take away

Abstract separation: *odgoditi*/postpone; *oduzeti*/'take away'

Cancellation of a previous state: *odljutiti se*/'calm down'; *odmrsiti*/'unravel'

Action in response: *odazvati se*/respond to; *odgovoriti*/reply.

Having dealt with the most prominent features of the prefix *od*-, we now turn to its counterpart; the prefix *do*-. Its functions are the same as of the prefix *od*-, meaning it does not always create perfectives, and it always adds a semantic component to the verb. Therefore, *do*- cannot be classified as an empty prefix or as creating natural perfectives (Brala-Vukanović and Memišević, 2012b:74). As mentioned, there is a greater number of investigations of *do*- than of *od*- in Slavic languages. Among the more relevant ones for Croatian are the analyses of *do*- in Russian and Polish by Janda (1986) and Dabrowska (1996), as stated in Brala-Vukanović and Memišević, 2012b. Their research yielded some general conclusions about the central meaning of *do*-; apart from it having a 'goal' and 'action completion' sense, it is also used to indicate 'addition', where the final point of the verbal action is not important. The situation is similar in Croatian; the core semantic element of *do*- is 'reach', but the different senses integral to *do*- prefixed verbs overlap in some cases and form a network of submeanings (Brala-Vukanović and Memišević, 2012b:87). As with *od*-, the authors propose a network of *do*- prefixed verbs and categories of submeanings realized by the prefix.

Senses realized by *do*- prefixed verbs are as follows:

1) REACH verbs — express the meaning of 'reach an end point'; a) *motion* (motion + manner; generic motion; motion + cause; metaphorical motion); b) *come to an end*; c) *come into possession*; d) *communication*; e) *impression*; f) *thinking*; g) *non-terminative temporal*;

2) ADD verbs — express the meaning of 'add to the already existing quantity'; in this category the end-point is never objectively quantifiable; the verbs take a direct object and do not allow a *do* headed spatial PP;

3) REACH/ADD group — comprises of verbs that can express either the 'reach' or the 'add' sense; if the end-point (boundary) is objectively quantified, the verbs are interpreted in the 'Reach' sense, which is expressed by *do-* prefixed verbs selecting a direct object i.e. the noun in the Accusative; if the end-point (boundary) is not defined, the verbs are interpreted in the 'Add' sense, which is related to the indirect object i.e. the noun in the Genitive.

Evidence for a Goal bias in Croatian mostly comes from analyses by Brala-Vukanović and Memišević. In their examination of the relation between event frames and sentence constructions containing prefixed verbs + PPs, and prefixed verbs + dative NPs, with a special focus on the *od-do* pair, Brala-Vukanović and Memišević (2012a) found clear implications for the goal-over-source bias. Their research involved 30 native speakers of Croatian, whose task was to mark the position of the speaker (in the region of the Trajector; or in the region of the Landmark; or anywhere) in the event frame for six sentences (where each sentence expressed a motion situation with a certain source/goal pattern). For the most part, the participants chose to place the speaker in the proximity with the Goal, regardless of whether the Goal was explicit or implicit. The only sentence which yielded an inclination toward the Source was the one in which the Source was both implicit (the prefix of the verb) and

explicit (preposition). In addition, their results showed the perceived difference between two possible ways of expressing Goal; the first one being the 'prefixed verb + PP with a genitive noun' construction and the second one the 'prefixed verb + dative NP' construction. It appears that native speakers of Croatian perceive the first construction (e.g. Marko je dotrčao do majke/Ana je otrčala do bake) as the goal point being reached (i.e. the focus is on the physical elements of Path), and the second construction (e.g. Marko je dotrčao majci/Ana je otrčala baki) in terms of a sense of "*(...) completion, resultative sense of the verbal action—or, rather, affectedness of the dative referent by the sentence event*" (Brala-Vukanović and Memišević, 2012a: 55). Another important part of their analysis, which also contributes to the evidence in favor of the goal-over-source bias, revolves around different readings of the abovementioned 'verb + dative NP' construction. The authors note that "*with some verbs and in certain contexts some bare datives have a dual reading*" (Brala-Vukanović and Memišević, 2012a: 58), and by that they refer to two possible opposite readings, which, for spatial verbs, basically indicate 'motion toward' and 'motion (away) from'. For example:

(6) *Marko* bježi Petru.
Marko run-away-PRS-IPFV-SG Petar-DAT.SG.M
(Brala-Vukanović and Memišević, 2012a: 58)

The sentence has two possible readings: a) 'Marko is running toward Petar', or b) 'Marko is running away from Petar', who is chasing him (Brala-Vukanović and Memišević, 2012a: 59). This is not to say that the dual reading applies only to spatial verbs, or that it should be examined only through directionality. An important domain the authors point out is "affectedness" by the licensed NP.

(12) *Vratila sam knjige sestri/*

return-PST-PFV-SG-F be-COP books sister-DAT-SG-F/ *knjižnici/ *sobi*.

library-DAT-SG-F/ *room-DAT- SG-F

(Brala-Vukanović and Memišević, 2012a: 63, after Janda, 1993: 56)

In this case, 'library' is licensed for this construction, even though it is an inanimate noun, because of the fact that it can be "affected" by the act of returning books, while 'room' cannot.

Finally, the authors note that "*the "affectedness" of the dative referent by the verbal action (...) has been viewed all too often in the target/recipient/approaching/reach/goal/etc. sense; that is, in terms of a "positive" scalar value (applied to a physical or metaphorical spatial directional context), and rarely (practically only in the benefit/harm opposition) allowing for the "opposite end"; that is, the source/distancing/severing/etc. negative (or detrimental) sense*" (Brala-Vukanović and Memišević, 2012a: 62). The fact that they were the first up to that point to describe the ablative sense of the prepositionless dative in Croatian seems to further support the goal-over-source bias.

4. The present research

4.1. Participants

The sample consisted of 60 university students and graduates; 30 female and 30 male subjects, all native speakers of Croatian. The graduates formed 38,3% of the sample, but since they had completed their education within a year prior to their participation in this study, the level of their education was not considered an important factor for analysis. 30 subjects, or 50% of all subjects, belonged to a group of language students, while the other 50% of the sample comprised of students from other fields of study. Language study programmes present in the first group include: Croatian language and literature (36,7%), English language and literature (83,3%) and German language and literature (16,7%)[4]. A full list of faculties and study programmes included in the research and the number of participants according to their education is presented in Table 1. 88,3% of participants were students of the University of Rijeka, while the remaining 11,7% studied at universities in other cities (Zagreb, Pula, and Zadar). The average age of the participants was 25,01.

Table 1. List of Faculties and study programmes included in the research.

Faculties and study programmes	**Number of participants**
Faculty of Humanities and Social Sciences in Rijeka (Croatian language and literature/English language and literature)	8
Faculty of Humanities and Social Sciences in Rijeka (Croatian language and literature/Philosophy)	2
Faculty of Humanities and Social Sciences in Rijeka (Croatian language and literature/History of Art)	1
Faculty of Humanities and Social Sciences in Rijeka (English language and literature/History)	5
Faculty of Humanities and Social Sciences in Rijeka (English language and literature/Philosophy)	3
Faculty of Humanities and Social Sciences in Rijeka (English language and literature/German language and literature)	3

[4] Due to the fact that all language study programmes included are double major programmes, the percentages were calculated for each language individually.

Faculty of Humanities and Social Sciences in Rijeka (English language and literature/Pedagogy)	4
Faculty of Humanities and Social Sciences in Rijeka (English language and literature/Computer Science)	2
Faculty of Humanities and Social Sciences in Rijeka (German language and literature/Pedagogy)	1
Faculty of Humanities and Social Sciences in Rijeka (German language and literature/History)	1
Faculty of Humanities and Social Sciences in Rijeka (Pedagogy/History)	1
Faculty of Humanities and Social Sciences in Rijeka (Histoy/History of Art)	2
Faculty of Humanities and Social Sciences in Rijeka (Pedagogy)	3
Faculty of Humanities and Social Sciences in Rijeka (History/Philosophy)	1
Faculty of Humanities and Social Sciences in Rijeka (Cultural Studies)	1
University of Rijeka (Computer Science)	2
Faculty of Medicine (Sanitary Engineering)	1
Integrated undergraduate/graduate university Study of Law Rijeka	2
Faculty of Economics and Business in Zagreb	3
Faculty of tourism and hospitality management Opatija	2
Undergraduate specialist study of preschool education in Pula	1
Undergraduate university study programme of Marine Sciences in Pula	1
Faculty of Economics Rijeka	3
Faculty of Humanities and Social Sciences in Zadar (Pedagogy and Sociology)	1
Graduate university study of Electrical Engingeering in Rijeka	1
Undergraduate University Study of Electrical Engineering in Rijeka	1
Undergraduate University Study of Mechanical Engineering in Rijeka	2
Faculty of Electrical Engineering and Computing Zagreb	1
Faculty of Maritime studies in Rijeka	1

4.2. Research method and procedure

Participants were shown 16 3D animations, designed by members of the Language and Cognition Department of the Max Planck Institute for Psycholinguistics and other scholars. The animations and the accompanying materials, or 'the Field Manuals', were downloaded from their website, which contains a great number of freely accessible materials designed for various elicitation tasks. To my knowledge, these materials have not been used for research on Croatian language

so far. In fact, available research done on Croatian was so far conducted mostly using corpus analyses, and data elicitation based on pictures or sentences (Brala-Vukanović and Memišević 2012a, 2012b, 2014; Filipović, 2007, 2010, Kovačević and Matas Ivanković, 2007). This type of video stimuli could make a valuable contribution to the existing data since motion does not have to be inferred like in picture tasks, and it is directly related to the colloquial usage of language, which is a limitation in corpus analyses. Furthermore, Naigles et al. (1998: 540) report that the usage of video events in their research minimised ambiguity, and that single event context produced different results than the narrative one (like in the Frog Story studies). This is not to say this method is without limitations. Since it is done on a small-scale with inanimate objects, the events shown are very specific and require simple, narrow descriptions. These factors might impede the participants' spontaneity. However, since I was not interested in elaborate narratives, the stimuli were shown to be highly adequate for this research. The animations from this particular Field Manual, 'Motion Verb Stimulus, version 2', were about three seconds long and portrayed a ball (the Figure/Trajector) rolling in different directions (towards or away from the viewer, or horizontally), and positioning itself differently with respect to other objects (Ground objects/Landmarks) present in the scenes (e.g., rolling onto or off a plate). The Figure and its Manner of motion were the only constant elements throughout the animations, with Manner being canonical, i.e. a type of motion typical for a ball. Ground elements remained static, with the exception of one video, which includes a moving Ground object (a plate moving towards the ball). The number of Ground objects varied, as well as the Path of motion and the perspective. The order of the animations was randomized. The original animations were renamed, since they contained short

descriptions of events in English which would have interfered with the subjects' impressions of the events.

Data was collected online. The animations and an accompanying document containing a list of videos were sent to participants via e-mail. The participants had to provide basic personal information; their age, sex, and name of their higher education institution. The e-mail also contained instructions for the procedure; the participants were asked to describe what they saw in the animations, preferably using verbs. They were encouraged to replay the videos if they found anything ambiguous. They were asked to write down their descriptions of the events in one or two sentences in Croatian next to the corresponding name of the video on the list included in the document. The whole procedure lasted about 10-15 minutes. To test if there is a significant difference between spoken and written production in this context, about a third of the participants were monitored while describing the events. They were asked first to say what their impression of the event was, and then to write down exactly what they said. No differences were found between the spoken and the written production.

4.3. The encoding of motion and Manner

4.3.1. Aims, research questions and predictions

The first analysis aims to examine the most common strategies native speakers of Croatian use to encode motion and Manner across different situation types: boundary-crossing and boundary reaching/non-boundary crossing. Further, another aim is to examine whether the change in situation types affects the use of these strategies in any way, including whether it affects the segmenting of Path elements. Based on the aims, the following research questions are posed:

1. What types of verbs will the subjects use most often? How will they encode motion and Manner in their descriptions? How will their descriptions align with the placement of Croatian in the S-framed category of languages?
2. Will the subjects attest to the boundary-crossing constraint? How will the shift in situation types affect their encoding of motion and Manner?
3. How will the subjects segment elements of Path in boundary-crossing and boundary reaching/non-boundary crossing situation types?

My predictions are based on the strategies of motion, Manner and Path encoding attributed to languages belonging to different typologies. I assume the subjects will encode Manner in verbs more often than any other elements, and Path in prefixes or prepositional phrases. Since the materials used do not include any situation types which could possibly constraint the encoding of these elements which are not typical for the typology of S-framed languages, I assume no significant differences will be observed across boundary-crossing and boundary reaching/non-boundary crossing situation types.

4.3.2. Results

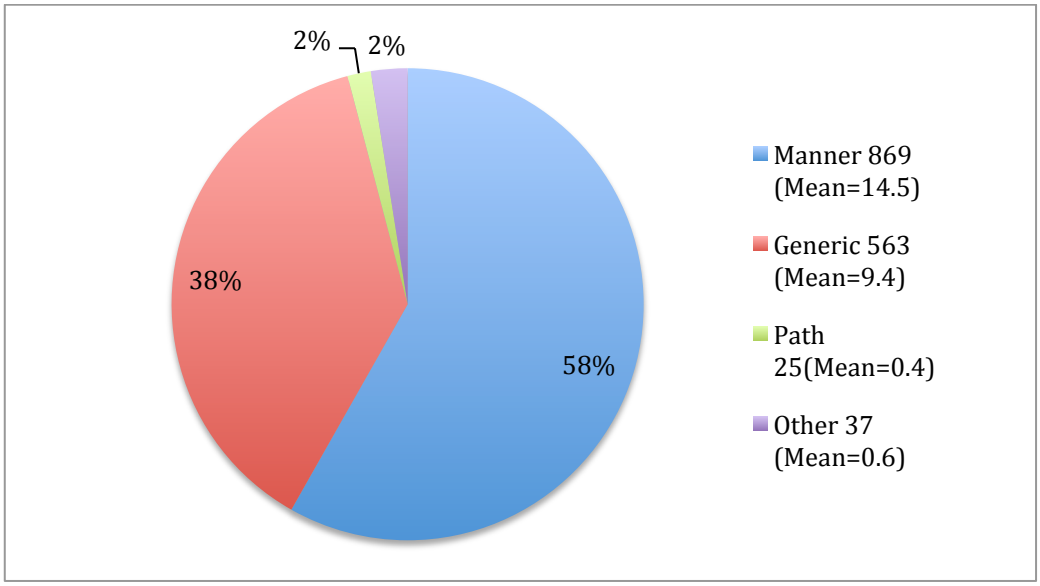
The use of motion verbs in boundary-reaching/non-boundary crossing and boundary crossing situation types

For the purpose of this analysis the videos were divided into two groups. The first group comprised of videos of events related to boundary-reaching or non-boundary crossing situations, while the latter included events showing boundary crossing situations. In total, 1494 verbs and verb phrases were analysed, with 714 belonging to the first situation type (non-boundary crossing) and 780 to boundary crossing situations. The numbers refer to verb tokens counted in the answers, which means that

each unit stands for one verb occurrence, regardless of whether that verb was already mentioned or not. Motion verbs used in both groups were singled out and sorted according to the type they belonged to. In this way, 4 categories of verbs were formed: manner verbs, generic verbs, path verbs and other. The category 'Other' consists of complex verbs phrases (e.g. 'the ball continues to move'). Since these verbs and phrases do not contribute to the focus of this part of the analysis, the category is further explored in later analyses in the paper. Also, for the most part, the present analysis is focused on manner and generic verbs, since the other two categories comprise only a small portion of the overall verbs used.

If we consider the distribution of verbs by categories (Chart 1), we can see that manner and generic verbs are far from being equally distributed. In fact, Pearson's chi-squared test confirmed that there is a high statistically significant difference between the frequencies of use of these two verb categories ($p<0.01$). More specifically, manner verbs were used considerably more often than generic verbs. As far as the groups of subjects are concerned, no considerable differences were found between language students and other students. However, language students did show a slight preference toward using manner verbs. The difference is worth mentioning because the calculated probability is near the threshold of high statistical significance ($p=0.06$).

Chart 1. Distribution of overall results according to verb categories.



Boundary-reaching and non-boundary crossing

As mentioned, the total amount of units in this group was 714. The results showed the following distribution of verbs: 461 (64,6%) manner verbs (mean of 7.7 per participant), 226 (31,6%) generic verbs (3.7 mean), 14 (2%) path verbs (0.2 mean), and 13 (1,8%) other verbs and expressions (0.2 mean). The most commonly used groups of manner verbs include: *kotrlja se* (189), *zaustavlja se/staje* (121), and *otkotrljala se* (60). The most commonly used generic verbs include: *kreće se* (131) and *ide* (37). Pearson's chi-squared test was used to examine the difference in the frequency of use of two highly represented groups of verbs, manner and generic. The difference turned out to be highly statistically significant ($p<0.01$), so we can say that manner verbs were significantly more represented than generic verbs. No major differences in the frequencies of verb use were found among the two groups of students according to their education group. Language students tended to use manner verbs 7% more than students from other study programmes. Non-language students used generic verbs 5% more often than language students. Pearson's chi-squared test

and a two-sample t-test were used to determine whether the frequencies of use of manner and generic verbs in both groups show any important differences. Results show that there are no statistically significant differences between the language students' use of manner and generic verbs and non-language students' usage of those verb categories ($p>0.05$). Furthermore, only slight differences in percentages were found among female and male participants. Female subjects tended to use manner verbs 5,8% more than male subjects, while the latter used 6,2% more generic verbs. However, no statistically significant differences were found when comparing these two groups.

Boundary crossing

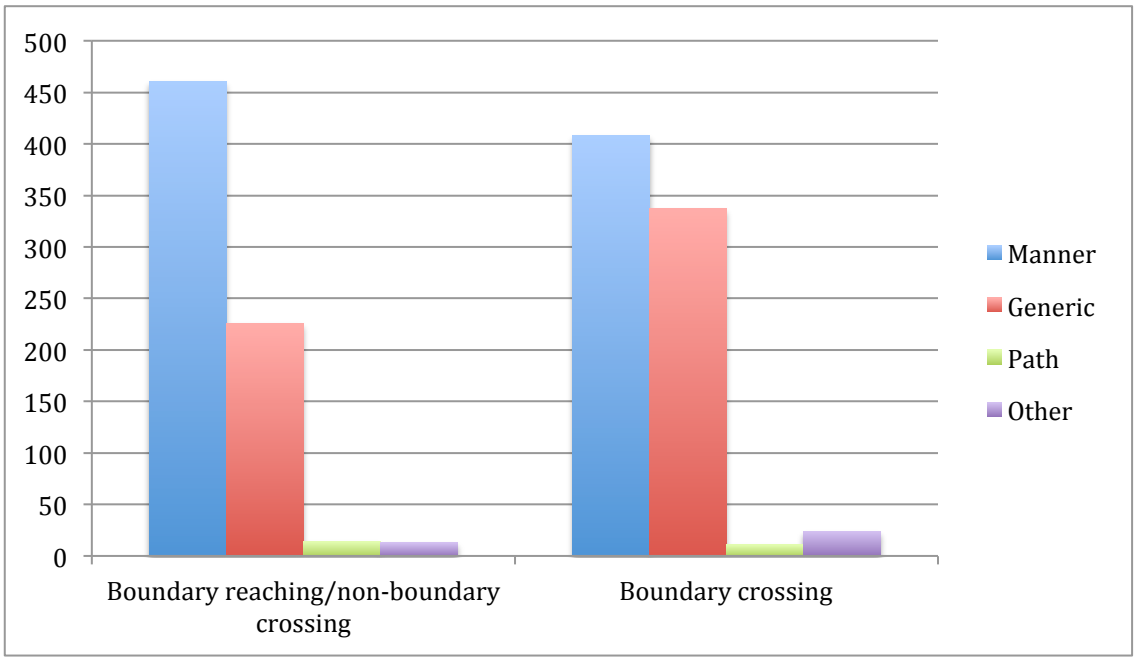
The total amount of units, 780, was distributed in the following way: 408 (52,3%) manner verbs (mean=6.8), 337 (43,2%) generic verbs (mean=5.6), 11 (1,4%) path verbs (mean=0.2), and 24 (3,1%) other verbs and expressions (mean=0.4). Almost the same manner verbs as in the first situation type were used most often: *kotrlja se* (105), *zaustavlja se/stala je* (96), *penje se* (57), and *otkotrljala se* (41). The most commonly used generic verbs were the following: *kreće se* (137), and *prolazi* (91). Again, Pearson's chi-squared test showed a highly significant difference in usage of manner and generic verbs ($p<0.01$), with manner verbs being notably more represented. Regarding differences between groups of participants, even smaller ones were found in this category. Language students used manner verbs 2,1% more, and generic verbs 1,6% more than non-language students. Again, no statistically significant differences were found. However, this represents a shift in comparison with the first category of situation types, since in this case language students used more of both manner and generic verbs, while in boundary-reaching and non-boundary crossing situation types non-language students were the ones who exhibited dominance in generic verb use.

The differences between female and male subjects in this category were negligible and not statistically significant.

Comparison of the two situation types

When comparing the two groups of situation types with the overall scores of participants included, one can immediately notice the differences in the frequency of use of manner and generic verbs (see Chart 2). What should be noted first is that manner verbs were dominant in both situation types, which comes as no surprise since manner verbs comprise 58,2% of all verbs used. The subjects used 12,3% more manner verbs in boundary-reaching and non-boundary crossing situations than in boundary crossing situations. However, no statistically significant difference was found between the use of manner verbs in these situation types. On the other hand, Pearson's chi squared test showed that the difference in the use of generic verbs in the two situation types is extremely statistically significant ($p<0.01$). This means the subjects used generic verbs significantly more often in boundary crossing situations than in boundary-reaching and non-boundary crossing situations, and this was most probably not by chance. It becomes even more obvious if we take a look at the discrepancy between manner and generic verbs in both situation types (see Chart 2), since it is much greater in non-boundary crossing situations (33%) than in boundary crossing situations (9,1%).

Chart 2. The frequency of verb use in non-boundary crossing and boundary crossing situations.



Path segmentation in different situation types

To describe the Paths in which no boundary was present, the subjects mostly opted for expressing motion or Manner in the verb and Path in a prepositional phrase (example from video 1: *kugla se kotrlja prema kutiji* 'the ball is rolling toward the box'). Another strategy used was expressing motion or Manner in the verb, Path in a PP, and the result, or the goal of movement, in a separate verb (example from video 1: *kugla se kreće prema kutiji, gdje se zaustavlja* 'the ball is moving toward the box, where it stops'). This resulted in the average number of verbs used in non-boundary crossing situations being 1.3. In cases in which the events depicted the crossing of a boundary, the subjects had three possible options to express all elements of Path (examples are taken from video 6): one was to segment the Path by expressing it in PPs gathered around one motion verb (e.g. *kugla se kotrlja od kutije, pokraj valjka, prema kameri* 'the ball is rolling from the box, by the cylinder, toward the camera'); another was to express the Figure's Path in PPs around one verb, and a separate clause to indicate the

passing of a boundary (e.g. *kugla se kreće od kocke prema gledatelju i pritom prolazi pokraj valjka* 'the ball *is moving* from the brick toward the viewer thereby *passing* by a cylinder'); and the third one was to express each part of the Path in a separate clause (e.g. *kugla se kreće od kocke, prolazi kraj valjka na sredini prostora i zaustavlja se na drugom kraju* 'the ball is moving from the brick, passes by a cylinder in the middle of the area and stops at the other end'). The most often used strategy was the second one, followed by the third one. The average number of verbs used in descriptions was 1.9. At first glance the difference in the average number seems small, but a paired t-test showed it is statistically significant ($t(6)= 2.97$, $p=0.025$). Here we have to take into account that not all events portrayed this kind of boundary crossing, that in some events certain parts of the Path were more salient than others, and that the subjects' answers varied depending on the part of the Path they chose to focus on (for example, if the subjects chose to encode only the Goal, they used one verb to describe the whole event which cannot account for a complete description but it was nevertheless included in the analysis so that the test can offer more reliable results). As predicted, more complex events resulted in a higher number of average verbs used (e.g. video 14 which included the Ground object and the Figure moving toward each other and the Figure ascending the Ground object had an average number of 2.3 verbs, while video 5 which included the Figure moving across the surface with no objects present in the scene had an average of 1.1 verbs used per description). In sum, the subjects used more verbs per description in boundary-crossing situation types, which means the Path segmentation was significantly lower in those types of events than in the events where no boundaries were present or the Figure reached a boundary but did not cross it.

4.3.3. Discussion

Overall results go in favor of the placement of Croatian language in the S-framed language group. When presented with events showing a self-propelled inanimate Figure exhibiting canonical movement, speakers of Croatian tend to express its Manner of motion in verbs, and its Path in other elements. They use manner verbs significantly more often than generic verbs. This pattern is present both in situations in which no boundaries were present in the Figure's Path or the Figure reached a boundary, and in situations in which the Figure crossed a boundary on its Path. The results are in line with some of the research on Croatian, or more specifically, on Serbo-Croatian, regarding translation (Slobin, 2006), and analyses of spontaneous narratives (Jovanovic & Martinovic-Zic, 2004). So far, the research on Croatian has been done mostly involving animate Figures (such as the animals in the Frog story studies), so a factor to consider in the present research is the very nature of the Figure and its movement. As mentioned, the Figure and its movement were constant throughout the video stimuli. The Figure was a ball, and its Manner of movement was always canonical. This allowed for various choices of verbs, ranging from the ones usually used for humans (*putuje, susreću se, sastali su se*, etc.) to the ones encoding general directionless motion, which could be applied in a wider range of contexts (*kreće se, ide, giba se, prolazi*, etc.). What is interesting is that there was only one option possible for encoding canonical motion, and that is *kotrljati se* 'to roll', which can of course enter into various possible combinations with prefixes. Even though the choice of verbs for canonical motion was limited to one option, and generic verbs (albeit their semantics could never account for the canonical motion of a ball) allowed for a wider application of choices, the use of 'to roll' was the most

widespread option in results for each video separately, and across the two different situation types. However, these results were easy to anticipate. The fact that overall more manner verbs were used aligns with the fact that the verb most often used was *kotrljati se* 'to roll', which is a manner verb canonical for the motion of the Figure. Therefore, even though the present research can shed some light on the most common patterns of expressing Manner used by native speakers of Croatian for motion events involving an inanimate Figure, it can only partly account for the general placement of Croatian in the category of S-languages. To elaborate on the debate in greater detail, more experiments involving spontaneous motion descriptions elicited from video stimuli should be done in Croatian.

Before continuing the discussion on the most common patterns of expressing Manner and Path detected in the present research, a brief summary of the possible options is presented. Stosic (2013: 62-63) outlines the following possibilities:

1. "*if Path is encoded in the verb, and depending on more general language-specific lexical, syntactic, and morphological devices, Manner may be expressed by*": adverbs, prepositional phrases, gerunds, subordinate clauses, ideophones (onomatopeic adverb formations), or verbs (e.g. serial verb constructions or compound verbs);

2. "*if manner is encoded in the verb, and depending on more general language-specific lexical, syntactic, and morphological markers, path can be expressed by*": adpositions (prepositions, postpositions, particles, etc.), affixes, applicatives, semantic cases, *until*-markers, or verbs (e.g. serial verb constructions or compound verbs).

Since Croatian has a very small set of path verbs, it comes as no surprise that the only path verb observed in the present research was *vratiti se* 'to return'. In all of these cases, the subjects omitted Manner in their descriptions, since they obviously perceived it as redundant, seeing that for them the Path was the most salient element

in those particular events. However, if we extend the option of expressing the Path and/or Manner outside the verb to other possible combinations, we can detect another widely present pattern of expressing motion elements among the subjects in this research: expressing the fact of motion in the verb in combination with expressing Path and/or Manner in other elements. However, the results show that if the subjects chose a generic verb to encode motion, they expressed the Path outside the verb, and this usually resulted in omitting information about Manner. Basically, if we replace the encoding of Path in the verbs with the encoding of bare motion in the verbs in Stosic's aforementioned outline, we can see that native speakers of Croatian are not so prone to expressing Manner in elements outside the verb. Therefore, these results might present another implication that Croatian does not fit neatly into the category of S-languages, a notion discussed in a similar vein by e.g. Filipović (2007; 2010).

To further explore the most common ways of expressing Manner in the context of this research, the present analysis will also give a brief overview of the most common ways of expressing Manner based on Stosic's (2011, as stated in Stosic, 2013: 64) "multilevel approach", which includes expressing Manner by the following means: syntactic, lexical, morphological, grammatical and suprasegmental. For the most part, when they chose to express Manner, the subjects did so by using the lexicon. Manner was encoded either in the verb (e.g. *kotrlja se, klizi, sudara se, pogađa*, etc.) or in combination with simple adverbs (e.g. *brzo se otkotrljala, sporije se kotrlja*, etc.). The variety of manner verbs used was about 50% greater than the variety of generic verbs used. This does not imply that the lexicon has a greater set of manner verbs, but rather might imply that manner verbs allow for a 'more narrow' or a more specific description of motion, while generic verbs, given their semantic values are more broad, might be applied to a wider range of motion encoding. Another

example of encoding Manner detected in the present research includes what Stosic (2013) terms 'syntactic Manner'. This implies the encoding of Manner in participles (e.g. *kotrljajući se popela*), or in different case constructions (e.g. *paralelnim kretanjem se zaustavila*).

An important factor to consider in the discussion on the encoding of motion elements in speech production is the existence or lack of boundaries on the Figure's Path. As the results show, the difference in the use of verb types in two situation types is statistically significant; the subjects chose to use generic verbs more frequently in situations in which the Figure had to cross a boundary than in situations in which the Figure reached a boundary or no boundaries were present in the motion event. Therefore, the results show that the presence or lack of boundaries is an important factor that influences the speakers' choice of verbs, as well as their choice when it comes to encoding Manner (as was already presented earlier, in most cases the subjects omitted Manner when they used generic verbs in their descriptions). Situations in which a boundary has to be crossed have shown to be crucial for the distinction between S-framed and V-framed languages (Slobin, 2006; Özçalışkan, 2013, but can also account for the differences between languages belonging to the same typology (Slobin, 1997; Filipović, 2007; Croft et al., 2010). What is important to note is that we cannot talk about lexical or morphological or any similar types of constraints in the context of the present research that might have influenced the frequency of use of different types of verbs, since the events themselves did not pose any restrictions for event descriptions of that kind (as would happen if the events would have dealt with, for example, *moment of change* situations, a factor which Filipović (2007) claims to be important). Instead, we can discuss the use of verbs in terms of the native speakers' preferred options, and try to answer the question why the

subjects chose to use more generic verbs in boundary-crossing situations. To elaborate on this question, we must take into account the comparison of Path segmentation across the two situation types, because, as Slobin (2006: 463) puts it: "*If a language uses verbs to lexicalize transitional motion, it apparently also adheres to the boundary-crossing constraint. As a consequence, many components of an extended trajectory must be encoded in separate verbs*".

The results have shown that Path segmentation was notably higher in the events where a boundary was reached or there were no boundaries on the Figure's Path, whereas in boundary-crossing events the subjects mostly opted for a separate verb to indicate the crossing of a boundary. A factor to consider is that the particular videos used in this research may not be the best tool to account for the differences in expressing segments of the Path, since they mostly show very simple events and Paths. To gather more reliable information on the most commonly used strategies the native speakers of Croatian use to describe Paths, we would have to use different videos depicting events of longer duration and in which the Figure passes two to three, or more boundaries. However, despite the fact that a minimum number of boundaries was present in the events, the results have shown a statistically significant tendency of the speakers to express elements of Path in separate clauses when the Figure was shown crossing a boundary ($p<0.05$). Since there are no available results on Croatian similar to the ones in the present study, we can compare the present results with Slobin's (2006) analyses of translations, and his analyses of the frog story narratives (1997). As already mentioned, in his analysis of Serbo-Croatian translations of the chapters of *The Hobbit*, which was originally written in English, Slobin (2006) states that the two texts were extremely similar in the number of manner verbs and Path segmentation. This implies that Serbo-Croatian has a very

similar set of strategies for encoding Path to that of English, whether it be in boundary-crossing or in non-boundary crossing situations. Since English is considered to hold a high position on the cline of S-framed languages, this can also indicate the position for Croatian. However, this does not mean that Croatian speakers prefer to use the same strategies, which is implied by Filipović (2007) in her report on Croatian speakers' translations of English texts. The results from the present research indicate that there are differences in Path encoding among speakers of Croatian that rely on the type of situation for which the Path has to be described, and that Path segmentation seems to be more frequent in spontaneous speech production for situations in which the Figure encounters no boundaries on its Path, or in situations in which the Figure reaches a boundary but does not cross it. It seems then that Croatian speakers do tend to put emphasis on the crossing of a boundary by using a separate clause, rather than by segmenting the Path with PPs. Analyses of the frog story narratives indicate the opposite, even though the results are not fully comparable since the frog story analyses focused only on boundary-crossing situation types and on the comparison of different languages. Slobin's (1997) results show that in spontaneous event descriptions, Serbo-Croatian speakers did use a high percentage of Path segmentation in boundary-crossing situations, albeit significantly lower than speakers of other S-languages. Again, these contradictory results are a strong indication that Croatian does not exhibit all the features of a typical S-language, and that more studies should be done on spontaneous speech production to shed more light on the typical patterns used by the speakers of Croatian.

Finally, some conclusions can be drawn from the possible interrelatedness of the higher number of generic verbs and the higher number of separate verbs used in boundary-crossing situation types. Even though manner verbs prevail even in the

boundary-crossing situations, the generic verb *kretati se* 'to move' was found to have the most tokens, or the highest number of occurrences in those situation types. The other generic verb with a high number of tokens was *prolaziti* 'to pass', which is a verb used exclusively for indicating the crossing of a boundary (in the context of the present research). This implies that most of the time the separate verb the subjects used to encode the crossing of a boundary was a generic verb. Of course, this might be closely related to the nature of the Figure's Path, since the verb was not used in descriptions for every video. However, it may be related to the fact that the subjects obviously perceived more complex events as requiring more focus on the Path, and therefore perceived certain situations as requiring the use of verbs of a broader, generic meaning. It may also be the case that some generic verbs are more colloquial in use, and easier to apply in certain situations. In any case, we can say that such a high number of occurrences of the same phrase *prolazi pored* 'is passing by' in the same events, among a high number of people, was not caused by chance.

4.4. The encoding of Path

4.4.1. Results

16 videos were analysed. Table 2. shows the distribution of results according to path descriptions in the videos. Since two units (i.e. two path descriptions), one from the first video and one from the second, had to be excluded from the analysis, the total amount of units categorized was 958. Table 3. shows the distribution of percentages across the categories.

Table 2. Path descriptions in numbers of occurrences for every video.

Video number:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	**Total**
All components present (Source, midpoint, Goal - valid only for video 6 and 11)						32					34						**66**
Source/Goal	13	8	36	34	21		50	40	16	58	2	30	44	8	43	37	**440**
Source-oriented path		8	16	14	1								11		10		**60**
Goal-oriented path	46	27	8	7	28	1	10		44	1	1	30	3	52	3	21	**282**
Path only		16		5	10	1		20		1						1	**54**
Source/midpoint						20											**20**
Midpoint/Goal						5					23						**28**
Midpoint only						1											**1**
Source/duration													2		4	1	**7**
Total number of answers:	**59**	**59**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**958**

Table 3. Path descriptions in total percentages.

	Total in percentages
All components present (Source, midpoint, Goal - valid only for video 6 and 11)	**6,9%**
Source/Goal	**46%**
Source-oriented path	**6,3%**
Goal-oriented path	**29,4%**
Path only	**5,5%**
Source/midpoint	**2%**
Midpoint/Goal	**3%**
Midpoint only	**0,1%**
Source/duration	**0,8%**
Total	**100%**

The criteria for placing the subjects' descriptions in the abovementioned categories were based on the overall patterns present is this research and were therefore established in the following way:

1. *All components stated* (valid only for videos 6 and 11): a) the subjects used a prefixed or an unprefixed manner verb or a generic verb along with prespotitional phrases indicating the Source, the midpoint and the Goal (*kotrlja se od–pored–prema*

/ 'rolls from–toward–to'); b) the subjects used a Source-prefixed or an unprefixed manner verb or a generic verb along with Source and Goal prepositions, and a separate verb to indicate passing along the midpoint (*kotrlja se od–do, prolazi pored* / 'rolls from–up to, passes by'); c) the subjects used separate motion verbs for each segment of the path (*kreće od – prolazi pored – dolazi do* / 'moves from – passes by – comes up to');

2. *Both Source and Goal explicitly stated*: a) the subjects used a motion verb prefixed by a prefix indicating an implicit Source along with a preposition indicating the Goal of motion (e.g. *otkotrljala se do* / '*from*-rolled up to'; *otkotrljala se prema* / '*from*-rolled toward'); b) the subjects used a motion verb prefixed by a prefix indicating an implicit Goal along with a Source preposition (e.g. *dokotrljala se od* / *up-to*-rolled from'); c) the subjects used a prefixed manner verb, an unprefixed manner verb or a generic verb along with two prepositions, one indicating Source and one indicating Goal (e.g. *kotrlja se od – prema* / 'rolls from – toward'; *kreće se od – do* / 'moves from – up to'); d) the subjects used a motion verb prefixed by a prefix indicating an implicit Source and a Goal-oriented verb (e.g. *zakotrlja se i udara* / 'starts rolling and hits'); e) the subjects used an unprefixed manner verb or an unprefixed generic verb along with a Source preposition, and a Goal-oriented verb[5] (e.g. *kotrlja se od – zabija se u* / 'rolls from – crashes into'); f) the subjects used combinations of possibilities listed above (e.g. implicit Source in the prefix + Source and Goal PPs: *otkotrljala se od – do* / 'from-rolled from – up to');

[5] A factor to consider here is that some verbs are Goal- or Source-oriented with respect to their semantic values. The terms Goal-oriented/Source-oriented verb are therefore used to code these types of verbs. A Source-oriented verb in the context of the present research indicates a verb used by the participants to convey the Source of movement of the Figure (e.g. *odbila se od; udaljava se od*). A 'Goal-oriented' verb in the context of the present research indicates a verb used by the participants to convey the Goal of movement of the Figure, i.e. the final part or the result of the motion event (e.g. *udara* / 'hits'; *sudara se [s]* / 'collides [with]'; *zabija se [u]* / 'crashes [into]'; *zaustavlja se kod* / 'stops beside [x]' etc.). The semantics of the verbs used, as well as the way the participants used them served as criteria for this kind of categorization.

3. *Source-oriented descriptions*: a) the subjects used a motion verb prefixed by a prefix with an implicit Source along with a Source-oriented preposition (e.g. *otkotrljala se od* / '*from*-rolled from'; *skotrljala se s* / '*off*-rolled off of'); b) the subjects used an unprefixed manner verb or a path verb or a generic verb or a Source-oriented verb along with a Source-oriented preposition (*kotrlja se od* / 'rolls from'; *udaljava se od* / 'distances itself from'; *pao je s* / 'it fell off of');

4. *Goal-oriented descriptions*: a) the subjects used a motion verb (a *do*-prefixed manner verb, an unprefixed manner verb, a generic verb, or a path verb) along with a Goal preposition (e.g. *dokotrljala se do* / '*up-to*-rolled up to'; *kreće se prema* / 'moves toward'; *klizi ka* / 'slides toward'; *došla je do* / 'came up to'; etc.); b) the subjects used a Goal-oriented verb, at times with an accompanying preposition (e.g. *udara* / 'hits'; *sudara se [s]* / 'collides [with]'); c) the subjects used a motion verb (a path verb, an unprefixed manner verb; or a generic verb), a Goal preposition, and another Goal-oriented verb, at times with an accompanying preposition (a combination of criteria 1 and 2); d) the subjects used a combination of the possibilities listed above along with more complex descriptions (e.g. *[kugla] se kreće prema (...) i zaustavlja se udarom u [kocku]* / '[the ball] is moving toward (...) and stops by hitting [the cube]');

5. *Pure path descriptions*: a) the subjects used only a Path verb to describe the event (e.g. *vraća se* / 'returns') b) the subjects used unprefixed manner verbs or generic verbs followed by NPs or PPs (e.g. *kotrlja se ravno* / '[the ball] is rolling in a straight line'; *kreće se po stolu* / 'moves on the table');

6. *Only the Source and the midpoint stated*: a) the subjects used a motion verb prefixed by a Source-indicating prefix, or an unprefixed manner verb, or a generic verb, along with a Source preposition and another PP indicating the passage beside the midpoint (e.g. *otkotrljala se od – pokraj* / '*from*-rolled from – by'); b) the subjects

used a motion verb prefixed by a Source-indicating prefix, or an unprefixed manner verb, or a generic verb, at times with a possible Source preposition, and another verb indicating the passage beside the midpoint (*udaljava se od – prolazi kraj* / 'distances itself from – passes by; *odbila se od – prošla je pored* / 'beat back from – passed by');

7. *Only the Goal and the midpoint stated*: a) the subjects used a motion verb along with Goal-oriented prepositions and prepositions indicating the passing beside a midpoint (*kotrlja se prema – pored* / 'rolls toward – by'); b) the subjects used a motion verb along with Goal-oriented prepositions and a verb with an adequate PP indicating the passing beside a midpoint (*kotrlja se prema, prolazivši pored* / 'rolls toward, by passing by');

8. *Only the midpoint stated*: the subjects used a verb with an accompanying PP to indicate the passing of the Figure by a midpoint object (*prolazi pored* / 'passes by')

9. *Source and duration stated*: the subjects used a manner or a generic Source-oriented verb along with a Source preposition and another verb indicating the continuation of the path (*spušta se s, nastavlja se kotrljati* / 'descends from, continues to roll).

This is not to say the results for every video contain all of the patterns mentioned. To avoid unnecessary repetition, only the most interesting and most common examples were listed in the detailed analyses of the videos presented later in the text.

Three categories arose as the most significant and salient ones, and are therefore presented for analysis. These include: complete path descriptions, Goal-oriented, and Source-oriented path descriptions. For the most part, the subjects opted for a complete description of the Figure's path (52,9% of the results). In the table, these results are presented within the first two categories, named "All components

present" and "Source/Goal". A 'complete description' implies that the subjects expressed the Figure's starting point, its direction, and the endpoint of its movement. However, in the context of two videos, number 6 and number 11, a 'complete description' required a midpoint object included in the description. The two "Source/Goal" descriptions in Video 11 were excluded from this general analysis, since they do not represent a complete path description in the context of the video. The next category with the largest number of units is "Goal-oriented paths", and it accounts for 29,4% of the descriptions. Finally, "Source-oriented" descriptions make up 6,3% of the results. While at first glance we might think the results are clearly in favor of the goal-over-source bias, at this point it is important to clarify any possible ambiguities by elaborating on the nature of the events presented in the videos. As mentioned, the relation between the Figure and the Ground objects varied in every video. On that point, the videos can be classified as follows:

Table 4. Categorization of videos according to the salience of Path elements.

The salience of Path elements	Video number				
Both Source and Goal explicit	6	7	10	11	
Source explicit	3	4	13	15	
Goal explicit	1	9	12	(14)	16
No reference objects	2	5	8		

Video 14 was not so easy to categorize since it is the only video that includes a moving Ground object. In it, the Figure and the Ground object start their movement on opposite sides of the surface, and finish in the middle when the Figure ascends the Ground object. It was therefore first placed into the 'both Source and Goal explicit' category. However, the results clarified the ambiguous placement of the video, and confirmed that the participants perceived the event as having the Goal emphasized. For an ideal distribution of results, the 'Source explicit' and 'Goal explicit' categories should contain an equal number of videos, which is why a redistribution of results had

to be made. Keeping that in mind, and by acknowledging the fact that most other videos are "paired", i.e. they show very similar events, with a change of direction and perspective, therefore changing the spatial relations, I decided to exclude video 14 from this part of the analysis. By doing that, I got a more fair distribution of results, and ultimately, the following percentages for the three most prominent categories: 'complete path descriptions' – 55,3%, 'Goal-oriented paths' – 26%, and 'Source-oriented paths' – 6,7%. The redistribution of results in percentages is seen in Table 5.

Table 5. Path descriptions in percentages excluding the results from video 14.

	Total in percentages
All components present (Source, midpoint, Goal - valid only for video 6 and 11)	**7,3%**
Source/Goal	**48%**
Source-oriented path	**6,7%**
Goal-oriented path	**26%**
Path only	**6%**
Source/midpoint	**2,2%**
Midpoint/Goal	**3%**
Midpoint only	**0,1%**
Source/duration	**0,7%**
Total	**100%**

By pitting the Goal-oriented category against the Source-oriented, we can see that even without the ambiguous results from video 14 the overall results support the goal-over-source bias. A matched-pairs comparison confirmed the difference in expressing Sources and Goals is statistically significant ($t(15)=2.35$, $p=0.034$). Other factors also contribute to this conclusion. For example, the results (presented in Table 2.) show that the subjects opted for a Source-oriented path description mostly (with the exception of 2 videos) when the Source object was made explicit (videos number 3, 4, 13, and 15). Still, the Source-oriented descriptions did not constitute the biggest group of results. In fact, for every video that has an explicit Source, the participants mostly opted for a complete path description. Moreover, a number of participants opted for a

Goal-oriented path description even for the 'Source-explicit' videos, while the same did not happen with descriptions of videos where the Goal is explicit (i.e. they do not have any Source-oriented descriptions). On the other hand, a closer examination of Goal-explicit videos shows that Goal-oriented descriptions constitute the largest group of results in two out of four of them (videos 1 and 9), encompass half of the results in one of them (number 12), and form the second largest group in the last one (number 16). In addition, they form the largest group of results in two out of three videos that have no reference objects. Because these videos can be considered as the most neutral ones with respect to the starting point and the endpoint, it is important to mention here that the participants chose to focus on the Goal even in situations in which the Figure exhibited a kind of "free movement", unbounded by any explicit Source or Goal objects. Another interesting observation concerns the overall use of verbs in the descriptions. About 27% of all manner verbs used, or 16% of all verbs used were verbs indicating the cessation of motion, or 'stopping' verbs (zaustavila se, stala je), which is interesting when compared to the fact that the opposite descriptions, those that state the explicit start of motion or a movement (e.g. 'počinje se kretati prema' 'starts to move towards'), were significantly less present in the descriptions (only a few percent in complex expressions like the abovementioned one). This is not to say that the subjects did not express the starting points of motion at all, but explicit statements, which could be considered the opposites of the 'stopping' verbs, were visibly absent from the descriptions. Finally, a possible indication that the subjects were more prone to focusing on the Goal than the Source is the fact that some of them changed the most common word order while expressing both Source and Goal. Most subjects used the following order to express path: first the starting point, then the direction and midpoints if present, and finally, the Goal. However, a number of

subjects used the Goal PPs first: e.g. *kotrlja se do kutije od valjka* / '[the ball] is rolling up to the box from the cylinder'. The fact that a number of subjects chose to use this kind of order might mean that the Goal was the first thing they noticed, i.e. the most salient component of the motion event, and only then did they continue to elaborate on the path description.

One part of the analysis deals with the difference in expressing Sources and Goals across three different event types: Support events (in which the ball moved onto or off of a Goal object); Contact/close proximity events (including TO, FROM and VIA paths); and Free movement events (in which the ball exhibited unbounded movement and no reference objects were present in the scene). Mean values for these groups for Goal encoding include: Support events (M=21.8), Contact/close proximity events (M=14.75), Free movement events (M=18.33). Although the results from the group of Support events have the highest mean, and the largest total number of Goals expressed, a one-way ANOVA showed the differences in expressing Goal across these situation types are not statistically significant (F= 0.2132, p=0.8). Another one-way ANOVA conducted to test for the difference in the expression of Source indicated there are no statistically significant differences in expressing Sources either (F=0.034, p=0.97), with the Mean values for each group the following: Support events (M=4.2), Contact/close proximity events (M=3.75), Free movement events (M=3).

The final research question deals with particular strategies used by native Croatian speakers in encoding elements of Path in motion events of this type. A more detailed presentation of results is provided for each video separately, since they all have elements that vary and need to be highlighted. As mentioned, most of the videos show "opposite" events, which allows for minimum alternations with respect to the

complexity of the Figure's path, but also a complete change of relations of the Figure and the reference objects. The analysis was based on the subjects' descriptions of paths.

Video 1. The first video shows a ball, the Figure, rolling away from a point in front of the viewer and approaching a box, the Ground object, in a straight line. Here, the Goal object is in the spotlight, but the starting point is clearly distinguishable. One person did not use a verb in his description, which is why his answer was excluded from the analysis and the total number of units analysed was 59. Instead, he used a noun, indicating that a crash had happen between two objects. The subjects' answers can be divided into two groups, based on what they expressed in their descriptions: Goal-oriented paths, and Source/Goal path descriptions (the Source and Goal are explicitly stated). Not surprisingly, Goal-oriented paths comprise 78% of all answers, while the latter comprise 22%. The most common patters of expressing Goal iclude: 1. Verb + Goal PP (kotrlja se *do* kocke); and 2. using a Goal-oriented verb to indicate the final portion of the event (e.g. pogađa rub kocke). Most of the participants who had chosen to express only the Goal used either one of the possibilities, or their combination (e.g. kreće se prema i udara). 26 out of 46 participants whose descriptions were put into the Goal-oriented category had chosen to use a Goal preposition and/or a verb indicating that the Figure came in contact with the Ground object (verbs used: *udarila je / 'it hit'; sudarila se s / 'it collided with'; kocka zaustavlja kuglu / 'the brick stopped the ball'; dotakla je / 'it touched'; zabila se u / 'it crashed into'; pogađa /* 'it strikes'; *lupila je / 'it banged [into]'*). The rest of the answers express Goal in PPs (e.g. *klizi ka* / 'slides toward'; *kotrlja se prema* / 'rolls toward'; *kreće se do* / 'moves up to'; *došla je do* / 'came up to', etc.). The most common patterns of expressing Source include: 1. Source implicit in a prefixed manner verb (e.g. *za*kotrlja se; *ot*kotrljala se); and 2. Source

expressed in a PP (e.g. kotrlja se *od* [gledaoca] / 'rolls away from [the viewer]'). Participants who had chosen to express both the Source and the Goal used combinations of the patterns listed above. The most common combinations include: 1. Source implicit in a prefixed manner verb + Goal PP (*otkotrljala se do* / '*from*-rolled up to'); and 2. unprefixed manner or generic verb + both Source and Goal explicit in the PPs (*kreće se od – prema* / 'moves from – toward'). Other examples include: 1. Source implicit in a prefixed manner verb + Goal-oriented verb (*zakotrlja se i udara* / 'starts rolling and hits') and 2. Source explicit in a PP + a Goal-oriented verb (*kotrlja se od – zaustavlja se kod* / 'rolls from – stops by [x]').

Video 2. Video 2 depicts the Figure rolling away from a point in front of the viewer in a straight line. There are no explicit reference objects present in the scene, although we could say the starting point is slightly more emphasized. One description was excluded from the analysis, so the final number of results analyzed is 59. The description had to be excluded because it was not clear which part of the Path the participant wanted to emphasize; he used a generic verb along with an NP indicating direction and duration, however the fact that he used a perfective verb might indicate he wanted to emphasize the start of motion (*[kugla] je krenula [ravnom putanjom]* / '[the ball] started moving [in a straight line]'). Four groups of results can be distinguished in case of this video: Goal-oriented paths, which make up 46% of the overall results, pure path descriptions, which comprise 27% of the results, Source-oriented paths, and Source/Goal paths, both of which make up 13,5%. Again, for their descriptions of Goal-oriented paths the subjects mostly used a motion verb (an unprefixed manner verb; or a generic verb) along with a Goal preposition (e.g. *kotrlja se prema* / 'rolls toward'; *ide do* / 'goes up to'), at times combining the verb with another Goal-oriented verb with an accompanying PP (e.g. *kotrlja se i zaustavlja [kod*

kutije] / 'rolls and stops [by the box]'). Other examples include more complex path descriptions (e.g. *[lopta] se zaustavila prije nego što je izašla iz polja* / '[the ball] stopped moving before exiting the surface'), or simple statements about the result (e.g. *zaustavlja se [sama od sebe]* / '[the ball] stops moving [out of the blue]'). The category "pure path descriptions" comprises of descriptions of motion and duration without any indication of Sources or Goals of movement; the descriptions in this category include unprefixed manner verbs or generic verbs followed by NPs (e.g. *kotrlja se ravno* / '[the ball] is rolling in a straight line'; *kreće se po stolu* / 'moves on the table'). For this video, most participants who focused on Source-oriented descriptions used an unprefixed manner verb or a generic verb along with a Source preposition (*kotrlja se od* / 'rolls away from'; *udaljava se od* / 'gets further away from'). The participants who chose to express both Source and Goal used combinations with the abovementioned possibilities, the most common pattern being: Source implicit (if the participant used a prefixed manner verb – *otkotrljala se* / '*from*-rolled'); Source explicit in the PP (if the participant used an unprefixed manner verb or a generic verb – *kotrlja se od* / 'rolls [away] from'); or Source both implicit and explicit (if the participant used a prefixed manner verb along with a Source PP – *otkotrljala se od* / '*from*-rolled [away] from') + a Goal PP (e.g. *kotrlja se od – prema* / 'rolls from – toward'; *otkotrljala se do* / "*from*-rolled up to').

Video 3. The video depicts a Figure moving from the Source object towards the viewer in a straight line and stopping somewhere in the middle of the field. The Source object is explicit. The subjects' answers are grouped in the following way: Source/Goal paths make up 60% of the answers, Source-oriented paths 26,7%, and Goal-oriented paths 13,3%. The subjects who chose to express both Source and Goal mostly used the previously mentioned combinations, along with some other

interesting ways of expressing both reference points. For example, one participant decided to use a Goal-oriented verb ([nam] *prilazi* / 'is approaching [us]') along with a participle to indicate manner of motion and Goal, and a participle combined with a Source PP to indicate Source: *prilazi kotrljajući se, počevši od kvadrata* / 'approached us while rolling, starting from the square'. Another participant decided to express Goal in a Goal-oriented verb, and Source in a Source PP (*od* PP): *staje na pola puta od kocke* / 'stops in the middle of its path from the cube'. A number of participants who chose to express only Source in their path descriptions did so mostly by combining *od*-prefixed verbs and the Source preposition *od*. However, some of them used more complex descriptions in which they highlighted the start of movement: *počinje se kretati od* / 'starts moving from', or *kretala se udaljavajući se od* / 'moved by distancing itself from'. Despite depicting an explicit Source object, the video yielded a portion of Goal-oriented descriptions. These mostly included a combination of unprefixed manner verbs and Goal prepositional phrases (*do* 'up to' or *prema* 'toward'), but some participants also used a path verb combined with a Goal PP (e.g. *vraća se do* / 'returns up to'), or a path verb and another Goal-oriented verb (*vraća se i staje* / 'returns and stops').

Video 4. Video 4 is very similar to Video 3, except the Figure comes closer to the viewer, and its path ends closer to the implicit endpoint. Again, the Source object is the only explicit element. Apart from the abovementioned categories, another category was observed, the one in which only the path component is present. The results are distributed in the following way: Source and Goal paths comprise 56,7% of the results, Source-oriented paths 23,3%, Goal-oriented paths 11,7%, and pure path descriptions 8,3%. Descriptions of both Source and Goal for this video include, apart from repeating, previously described patterns, more detailed descriptions of the

endpoint (*dolazi bliže* / 'comes closer'; *prilazi bliže [kameri]* / 'further approaches [the camera]; *stigla je do* / 'arrived up to'; *prišla [nam] je* / 'approached [us]'; *prelazi [više od pola puta]* / 'traverses [more than a half of the way]). This was to be expected since the trajectory is very similar to the one in video 3, so the participants had to find a way of differentiating them. As a result, some participants decided to express only the path of the Figure (e.g. *[kugla] prelazi duži put* / '[the ball] traverses a longer path'; *[lopta] se vraća* / '[the ball] returns').

Video 5. The motion event depicted in this video is the same as in Video 2, except for the direction of the Figure. This time, the Figure is directed towards the viewer, which means that the emphasis is put slightly more on the Goal, or the endpoint of motion. Again, the same categories as in Video 2 are present: 46,7% of the answers belong to the Goal-oriented paths category, 35% of the descriptions include both Source and Goal references, 16,6% of the answers belong to the pure path descriptions, and finally, one participant (1,7% of the results) opted for a Source-oriented path description. For the most part, the participants marked the Goal within the PP, but some of them chose to use a *do*-prefixed verb, indicating an implicit Goal in the prefix (e.g. *dokotrljala se [natrag]* / '*up-to*-rolled [back]'), and some of them combined the verb with a *do* PP (e.g. *dokotrljala se do* / '*up-to*-rolled up to'). As for the descriptions containing both Source and Goal, the reference points are mostly expressed in PPs. However, we can find combinations of both *od*- and *do*-prefixed verbs along with the prepositions *do* and *od* in the following patterns: *dokotrljala se od* sG (doV + sPP), *otkotrljala se do* sG (odV + gPP)[6].

Video 6. The path of the Figure in this video includes an explicit Source, or a Ground object that indicates the starting point of motion, a midpoint, or another Ground object

[6] The patterns are taken from Brala-Vukanović and Memišević, 2012a: 50-51.

the Figure passes by on its way towards the Goal, which is the viewer. The results are distributed in various different categories in the following way: full path descriptions, including Source, midpoint and Goal (53,3%), Source and midpoint components expressed in the path (33,3%), Goal and midpoint expressed (8,3%), Goal-oriented path (1,7%), midpoint-oriented path (1,7%), and pure path description (1,7%). For the most part, the participants chose to describe the full path by expressing both the Source and the Goal in PPs, and midpoint in another, separate clause, V + PP (e.g. *kreće se od – prema* / 'moves from – toward'; *prolazi pokraj* / 'passes by'). Other valuable examples of the strategies the participants used include: 1. expressing every path element in PPs gathered around a prefixed manner verb, an unprefixed manner verb, or a generic verb (*kugla se kotrlja od kvadra, pokraj valjka, prema promatraču* / 'the ball is rolling from the cube, by the cylinder, toward the viewer'); 2. expressing Source and Goal in PPs, and midpoint in another, more complex phrase (*kugla se kotrlja od kocke prema gledatelju, a na pola putanje s lijeve strane joj se nalazi stožac* / 'the ball is rolling from the cube toward the viewer, and half way there a cone is posited on her left side'); and 3. expressing every element of the path in a different clause (*kugla od kocke kreće prema promatraču, zaobilazi valjak, te zastane pred promatračem* / 'the ball moves from the cube toward the viewer, goes around the cylinder, and stops in front of the viewer'). As mentioned, in this video more emphasis is put on the Source and the midpoint, so it does not come as a surprise that one third of the participants decided to express the two elements in question. For the most part they used strategies to indicate Source (*od*-prefixed verbs, and the preposition *od*) in combination with a separate clause indicating the passing beside a midpoint (*prolazi pored [x]* / 'passes by [x]'), but some of them chose to express both elements in PPs (*otkotrljala se od – pokraj* / '*from*-rolled from – by'). Surprisingly

though, a number of participants chose to focus on the midpoint and the endpoint of the Figure's path, without mentioning the explicit Source object (*kotrlja se prema [gledaocu], prolazi tik uz [valjak], te nastavlja prema [gledaocu]* / '[the ball] rolls toward [the viewer], passes close to [the cylinder], and continues toward [the viewer]; *prošla je pored i prišla [kameri]* / '[the ball] passed by and approached [the camera]).

Video 7. The video shows the Figure moving from one Ground object (a box) to the other (a cylinder). The Source and Goal are both explicitly presented. Nevertheless, none of the subjects chose to express a Source-oriented path, but 16,7% described a Goal-oriented path. Their descriptions vary from the most simple ones (e.g. *ide do [valjka]* / 'goes up to [the cylinder]'*; prišla je [valjku]* / 'approached [the cylinder]'; *kotrlja se prema [stupu]* / 'rolls toward [the pole]'), to the more descriptive ones (*zaustavila se dolaskom do [valjka]* / 'stopped by coming close to [the cylinder]'; *kotrlja se prema [gledatelju], gotovo dotičući [valjak]* / 'rolls toward [the viewer], almost touches [the cylinder]). The rest of the answers, 83,3%, are descriptions involving both Source and Goal explicitly stated. Most of the participants used *od-* prefixed verbs and PPs to indicate Source, and PPs or Goal-oriented verbs to indicate the Goal. Some examples include more detailed descriptions of the path: *Golf loptica putuje od iza prema naprijed. Krece od drvene konstrukcije te prolazi pored cilindra na sredini ali ga dodiruje, te staje kod cilindra. /* 'The golf ball travels from the back toward the front. It starts from the wooden construction and passes by a cylinder in the middle without touching it, then stops by the cylinder.'

Video 8. The video depicts a Figure rolling across an empty field from the left side to the right side of the screen with respect to the viewer. The specific change in direction caused most participants to focus on the path and direction only (80% of the participants). Their answers mostly include unprefixed manner verbs or generic verbs

combined with prepositions indicating direction (e.g. *kotrlja se s lijeve na desnu stranu* / 'rolls from the left to the right side'), although some chose to reference the path with respect to the viewer's position differently (e.g. *ide horizontalno* / 'goes across a horizontal line'; *kotrlja se vodoravno* / 'rolls horizontally'; *kretala se paralelno s kamerom* / 'it moved in parallel with the camera'). 20% chose to formulate their description in terms of imaginative reference points (*kraj* / 'part'; *rub* / 'edge'), using *od*-prefixed verbs and Source and Goal PPs (*od*, *do*, *prema*), so their answers were categorized as Source and Goal descriptions. The following examples illustrate how they differ from descriptions of Path and direction: *lopta se otkotrljala od jednog do drugog ruba* / 'the ball rolled from one corner to the other'; *kotrlja se od lijeve prema desnoj strani* / 'rolls from the left toward the right side'.

Video 9. This video is very similar to Video 1 (the ball is rolling from a place right in front of the viewer toward a box in a straight line), except the Figure stops in the middle of the field and does not reach the Ground object. The video is the opposite of Video 3. Again, the Goal object is explicit, but this time, the endpoint is not exactly in close proximity to the Goal object. Nevertheless, the results were again divided into the same two groups as in Video 1, with the Goal-oriented paths comprising 73,3% of the overall results, and Source/Goal path descriptions 26,7%. The participants used combinations of previously described strategies, and there are no notable examples worth mentioning.

Video 10. In this video, the Figure moves from one Ground object to the other (from the cylinder to the box), and it can be considered the opposite of Video 7. This time the majority of the answers were directed towards expressing both Source and Goal equally (96,6%), while the Goal-oriented paths comprise only 1,7%, as well as pure path descriptions (1,7%). Again, their descriptions are mostly simple, with the

majority choosing to express the path in combinations of prepositions *od – do*, or *od – prema*. A number of participants chose to express the Goal with a separate verb (e.g. *udara [kutiju]* / 'hits [the box]'; *sudarila se s [kockom]* / 'collided with [the cube]; *zaustavila se kod [kocke]* / 'stopped by [the cube]').

Video 11. Video 11 shows an event opposite to the one in Video 6. In this video, the starting point and the endpoint are reversed, so the ball rolls from a point in front of the viewer, past a midpoint, and stops in front of the box. Descriptions that include all elements of the path (Source, midpoint, and Goal) comprise the largest part of the results (56,7%), and are followed by descriptions in which only the midpoint and the Goal were expressed (38,3%). The rest of the answers can be placed in two other categories: Source/Goal-oriented path (3,3%), and Goal-oriented path (1,7%). Most participants chose to indicate the Source and the Goal using prepositional pairs *od – do* ('from' – 'up to'), or *od – prema* ('from' – 'toward'), and the midpoint in a separate clause (e.g. *prolazi pored* / 'passes by'). Others used path segmentation (e.g. *kotrlja se od – prema – do* / 'rolls away from – toward – up to') or a separate clause for each reference point of the Figure's path (*krene se kotrljati od gledatelja, prođe pokraj valjka i zaustavi se kod kocke* / 'starts rolling away from the viewer, passes by the cylinder and stops by the cube'). Most of the participants who opted to express only the midpoint and the Goal did so by stating the Goal of movement first (in a PP), additionally stating the Figure had passed a midpoint object (e.g. *kotrlja se prema – prolazi uz/kraj/pored* / 'rolls toward – passes by, beside, along'). Other examples include path segmentation (e.g. *prolazi pokraj – do* / 'passes beside – up to'; *prokotrljala se uz – prema* / 'rolled by – toward').

Video 12. The video depicts the Figure moving from the right side of the field to the left side from the viewer's perspective, and ascending a Ground object (a wooden

plate). Again, the change in the direction of the Figure prompted the participants to highlight the position of the viewer. In fact, about 30% of the participants chose to include direction in their descriptions. However, since direction was an additional component of their descriptions, the results can be divided exactly in half according to 2 categories: 50% of the answers describe a Goal-oriented path, and 50% express both the Source and the Goal. To express Goal, the participants mostly used Goal PPs, although a few participants also used *do*-prefixed verbs along with prepositions *do* and *na*. Since this video involves a Figure ascending a Ground object, the preposition *na*, which translates to 'on' in this context, is used to indicate the Goal of movement and not direction like in video 8 (*penje se na* / 'climbs onto', as opposed to *kotrlja se s lijeve na desnu stranu* / 'is rolling from left to right'). Roughly 85% of the participants used *na* in their coding of the Goal. Most common examples include: *popela se na [pladanj]* / 'climbed onto [the plate]'; *zaustavila se na [drvenom tanjuru]* / 'stopped by ascending [the wooden plate]; *podiže se na [kružnu plohu]* / 'ascends the [round surface]; *dokotrljala se na [pladanj]* / '*up-to*-rolled onto [the plate]. Others used the preposition *do* which requires a more detailed description of the Ground object in order to get an accurate description of the event: *dolazi do [centra kruga]* / 'comes to [the centre of the circle]; *kreće se do [sredine kruga]* / 'moves up to [the centre of the circle]; *kotrlja se do povišenja na čiju sredinu prelazi* / 'rolls up to the elevated object and crosses on its centre'. As we can see, the participants chose to highlight the centre of the plate in order to properly describe the crossing of a boundary. However, these descriptions lack the information on the position of the plate (i.e. the fact that the plate was not in line with the ground, and that the ball had to ascend it). Here we can notice that the preposition *na* offers the most simple solution to conveying information about the Goal of the event. To express Source, the participants mostly used Source PPs, as

well as *od*- and *za*-prefixed verbs. The most simple descriptions of both the Source and the Goal include a combination of Source-prefixed verbs and Goal PPs: *zakotrlja se na; otkotrljala se na*.

Video 13. This video includes an event opposite to the one described above, which means the Source is explicit as opposed to the explicit Goal in the previous video. The Figure descends the Ground object, and ends up in the right part of the field. Most of the participants (73,4%) opted for a description of both Source and Goal, and included direction as a component of their description. Descriptions of Source-oriented paths comprise the second category, which includes 18,3%. The rest of the answers are divided into Goal-oriented paths (5%) and Source and duration descriptions (3,3%). Similar to the use of *na* for describing the Goal of the event, its counterpart, the preposition *s* (*sa*) / 'off', is widely used to indicate Source (68% of the descriptions include *s/sa*). Descriptions of both Source and Goal include prepositional pairs *s(a) – na* (e.g. *sišla je sa pladnja na površinu* / 'descended from the plate onto the surface'), and *od – do* (e.g. *otkotrljala se od sredine kruga do ruba stola* / '*from*-rolled from the centre of the circle up to the edge of the table'), as well as other possible combinations: *s – prema* (e.g. *kotrlja se s drvenog podija prema desnoj strani polja* / 'rolls off of the wooden plate toward the right side of the field') and *od – prema* (e.g. *kreće se od kruga prema suprotnom kraju površine* / 'moves from the circle toward the opposite end of the surface').

Video 14. This video is different than the others because it includes a moving Ground object. The Figure and the Ground start moving each from their own side of the field and end up in the middle, where the Figure ascends the Ground object (the wooden plate). Their starting points do not contain any distinctive markers, but are visible and clear enough. Still, most of the subjects (86,7%) focused on the final part of the event

and therefore described Goal-oriented paths. The rest of the results (13,3%) belong to the category in which both Source and Goal are expressed. Most of the Goal-oriented descriptions include movement of the two objects toward each other (e.g. *kretali su se jedno prema drugome* / 'they moved toward each other'; *približavali su se jedno drugome* / 'they were approaching each other'), as well as the final result of the movement (e.g. *sastali su se u sredini* / 'they met in the middle'; *kugla je završila na pladnju* / 'the ball ended up on the plate'; *kugla se popne na pladanj* / 'the ball climed onto the plate*; kugla se zaustavila na tanjuru* / 'the ball stopped when coming onto the plate'). The descriptions that were listed in the category where both Source and Goal were expressed included emphasis on the starting points of each object individually, their direction and the final portion of the event. Some are more elaborate than others (like the following example: *Kugla kreće s desna na lijevo, dok okrugla ploča kreće s lijeva na desno. Kreću se jedna prema drugoj, te dolaze u doticaj pri čemu se kugla penje na ploču i zaustavlja se na njenoj sredini.* / 'The ball starts moving from right to left, while the round plate starts from the left to the right. They move toward each other, then come into contact while the ball climbes onto the plate and stops in the middle of it.), but they all include the same path elements.

Video 15. Video 15 depicts the same motion event as video 13, except the Figure is now directed toward the viewer (the ball rolls off the plate and approaches the viewer). Again, the focus is on the Source object, since it is the only explicit reference point. The results are distributed in the following way: 71% of participants expressed both Source and Goal points in their descriptions, 17% opted for a Source-oriented path description, 7% expressed only Source and duration of movement, and 5% gave a Goal-oriented description. Again, the same strategies were used to convey both Sources and Goals (mostly combinations of PPs; *od – do*, *s – prema*, *od – prema*, and

s(a) – na). In addition, some participants chose to encode Source in the prefix and Goal in PPs (e.g. *otkotrljala se s; skotrljala se s/prema*). The descriptions from the category 'Source and duration' mostly include explicit coding of the Source and a separate clause that indicates the continuation of the Figure's path (e.g. *spušta se s [tanjura]* / 'gets off of [the plate]'; *nastavlja se kotrljati [po površini]* / 'continues to roll [across the surface]).

Video 16. Video 16 shows the same motion event as video 12, except the Figure and the Ground object are placed in line with the viewer's perspective (the ball rolls from a point in front of the viewer onto a plate in a straight line). As in video 12, the focus is on the Goal, since the Ground object the Figure ascends is the only explicit reference point. Here, most descriptions belong to the group of both Source and Goal equally stated (61,6%). 35% of the participants opted for a Goal-oriented description of the path. One participant (1,7%) chose to express only path, and one (1,7%) expressed Source and duration. The same, already described strategies for encoding all elements of path are present in this group of results, and there are no notable examples to be mentioned.

4.4.2. Discussion

The present analyses have dealt with the expression of Path and its defining points (direction, starting points, landmarks, endpoints) among native speakers of Croatian, with a special focus on the asymmetry between Sources and Goals previously described in literature. The stimuli were mostly "paired"; they portrayed opposite events, where the only thing that changed was the direction, i.e. the spatial relation between the Figure and the landmarks. In this way, the same objects were shown in different roles (both as Sources and Goals), which allowed for an even representation of the defining points and minimised the possible ambiguities in the

objects' salience. In addition, research materials included videos showing unbounded movement of the Figure without any landmarks present in the events, which allowed for a portrayal of events free of any salient elements and therefore open to any possible interpretations. The results were analyzed across three event types (Contact/Close proximity events, Support events, Free movement events). Types of Path included in the stimuli were the following: TO, FROM, FROM/TO, FROM/VIA, VIA/TO, ONTO, and OFF OF Paths.

The first research question concerned the possibility of a Goal bias across events in which different Path elements were made more salient (Source, Goal, both, etc.). Overall results confirm the goal-over-source principle, in that they show a general tendency of participants towards expressing Goals more frequently than Sources. The primacy of Goals in linguistic production has already been confirmed in numerous experiments including speech production (Lakusta & Landau, 2005; Lakusta et al., 2007; Lakusta et al., 2012; Papafragou, 2010; Luo & Baillargeon, 2005). The results confirm that it is more likely for the same landmark within opposite motion events to be expressed as a Goal than as a Source, a pattern also confirmed by Papafragou (2010). This link between landmark objects and spatial relations partly stems from the fact that many spatial relations rely on the properties of landmark objects to represent a motion Path, which makes their interrelatedness even stronger, e.g. Support events presuppose that the landmark object can function as a support object (Papafragou, 2010). In addition, this pattern could also indicate that the direction of the Path itself influences the salience of reference objects present in the event. Further, the present research explored the expression of Sources and Goals within motion events with no explicit landmarks. The Goal bias was confirmed for events of this type. However, another factor appeared as important for encoding

Sources and Goals for events of this type, which caused big differences within the category — the direction of the Figure with respect to the viewer. The Goal bias was confirmed for events showing the movement of the Figure AWAY FROM the viewer and UP TO the viewer. However, the Goal bias was not detected for events showing horizontal movement (movement FROM THE LEFT TO THE RIGHT SIDE of the screen). Compare: 1. *otkotrljala se prema rubu plohe* / '*from*-rolled toward the end of the surface' (for 'AWAY FROM the viewer and UP TO the viewer' movement), as opposed to 2. *otkotrljala se s lijeve na desnu stranu* / '*from*-rolled from the left to the right side' (for horizontal movement). The first example could technically be applied to horizontal motion as well – the ball is rolling towards the opposite side of the field in both events. However, apparently the participants found it redundant to emphasize the 'AWAY FROM the viewer and UP TO the viewer' direction (instead expressing it within prefixes and PPs), as opposed to horizontal direction (where they emphasized it by changing the semantics of the PPs). In their descriptions of the unbounded horizontal movement of the Figure, all participants have chosen to focus on direction explicitly, which resulted in them stating both the Source and the Goal through prepositional pairs, *s – na* and *od – do*. One possible explanation for this tendency could be that this particular video came first after a series of videos depicting AWAY FROM – UP TO Paths so the participants found the change in direction more salient than they would have found it had the videos showing horizontal motion been shown first. To investigate whether the order of the video stimuli might have influenced the encoding of direction, more experiments including more stimuli showing horizontal movement and a different order of the presentation should be conducted. However, there is some firm evidence that the order of the stimuli was not a factor that influenced the expression of direction. For example, other videos portraying horizontal movement

also evoked more explicit expressions of direction than the videos showing the Figure moving on the 'AWAY FROM – UP TO' line. They also portrayed different events including reference objects which probably had an influence on the salience of elements that needed to be described. Accordingly, the number of explicit descriptions of direction was the lowest for the most complex event involving horizontal movement (one that involved movement of both the Figure and the Ground object and their contact in the middle of the field). Therefore, both direction in its relation to the viewer and the type of event portrayed, as well as the complexity of the Path(s), can be seen as crucial factors that influence the participants' choice to encode direction. On the other hand, as mentioned, the Goal bias was confirmed for the events that showed movement AWAY FROM the viewer and UP TO the viewer. In fact, for these videos, Goal-oriented Paths constitute the largest group of results, which shows a clear inclination of the participants to state the aim or Goal of movement in cases when there are no reference objects. This brings us to the question of how the results from the present research contribute to the debate about the origin and nature of the Goal bias.

At first glance, we could say that the results are in favor of the non-linguistic nature of the Goal bias. The fact that adult language speakers exhibit a statistically significant Goal bias when presented with stimuli in which all elements are presented equally, in which the Figure is inanimate (albeit self-propelled), the same object is used both as a Goal and as a Source, and there are enough variations for the bias to be tested can be considered one portion of evidence. Further, Goal-oriented descriptions were to a certain extent present across all event types and categories. More specifically, they were dominant in event types in which the Goal object was explicit, as well as events portraying unbounded movement of the Figure, and they formed the second largest

group of results falling into other categories (e.g. where both Source and Goal were explicit and the Figure moved from one to the other). On the other hand, Source-oriented descriptions were found only in the event types in which the Source object was explicit, and in a lower percentage in events with no reference objects, where they never formed the largest group of results. This preference for Goal-oriented descriptions over Source-oriented ones across different types of events with emphasis on different elements could be explained by the people's general greater interest in Goals, either perceptual or experiential, which is in line with the psychological view of the goal-over-source principle (Ikegami, 1979; Stefanowitsch & Rohde, 2004). The fact that people are generally more interested in results or aims of unbounded movement might be reflected in language, in their tendency to encode only the complete or more clear or more prominent information about the Figure's Path. However, there are patterns which do not align with this notion. First of all, we have to recall that overall results show a clear prevalence of expressions in which both Source and Goal were stated. For the most part, these descriptions form the largest group of results in descriptions for each video individually (and 55,3% of overall results). This might be due to the fact that the research is small scale and the events are really simple and specific, but it can also mean the participants generally perceived them as equally salient and important to express. Second, the fact that the Goal bias was detected among unbounded 'AWAY FROM – UP TO' movement but not horizontal movement is also an indication that there are other factors which influence the salience of Path elements. In this case, the Goal was not the most salient one because the participants chose to elaborate on the direction of the Figure, which required both Sources and Goals to be expressed. Here, different language constructs might be taken into account as a factor. For example, *otkotrljala se do ruba* 'from-

rolled up to the edge' is perceived by the participants as a complete description of a FROM/TO Path realized in a straight line from the point of view of the speaker/observer (the ball rolled to the opposite side). The implicit Source in the prefix *od-* in this case indicates the starting point is somewhere close to the position of the speaker/viewer. However, if the participants were to say *otkotrljala se do desnog ruba* / 'from-rolled to the right edge', it would mean that the ball started moving from a place where the speaker/observer is placed, and then rolled up to the right side of the field. Instead, by using prepositional pairs *s – na* (e.g. *kotrlja se s lijeve na desnu stranu* / 'rolls from the left to the right side') and *od – do* (e.g. kotrlja se od lijevog do desnog ruba plohe / 'rolls from the left to the right border of the surface'), the participants were able to describe the position of the Figure, as well as its spatial relation with the observer, more accurately. In addition, had they chosen to express only the Goal, they would not have been able to express the Path accurately. On the other hand, in the first case, the language construction assumes the orientation point is the viewer, which is why no necessary elaboration is needed and Path can be expressed in regular strategies for its encoding.

Both observations can make us rethink the perceptual nature of the Goal bias. Is it possible that the participants who have chosen not to encode Source when it was explicitly present in the scene simply did not notice it? The results show that in those situations the participants mostly opted for an expression of both the Source and the Goal, which might be connected to the fact that they decided this would be a more complete Path expression. This might be in line with the fact that expressing Goal in situations of unbounded movement of the Figure, or in situations where the Goal is explicit, can function as a complete and accurate description of the whole Path (or at least the most important part of the Path). The theory that Goals are more telic and

therefore offer a more satisfying description of the Path is supported by many researchers who claim language structures influence the presence of the Goal bias (Ikegami, 1979; Stefanowitsch & Rohde, 2004; Nam, 2004; Gehrke, 2007). Further, Goals can generally be more telic, but there are situations (like the above described situation of horizontal movement) in which Goal-oriented Paths do not offer a fulfilling, complete description.

Given that the present research does not deal with memory tasks, which are crucial to explore the non-linguistic nature of the Goal bias, as well as its relation to the linguistic encoding of Goals (which have shown not to be so directly related in experiments by Lakusta & Landau, 2012; and Papafragou, 2010), we can only assume that some of the results discussed above show a general cognitive bias towards endpoints and results (although there are solid arguments in favour of this view). However, the results also indicate that the Goal bias in language production might be a reflection of language properties. These two notions are put together in the intermediate hypothesis, explained by Lakusta and Landau, which suggests that "*the path asymmetries observed in language stem both from the properties of non-linguistic event representations and constraints internal to language*" (Lakusta & Landau, 2012: 518). The basic notion of the hypothesis is the existence of prominence hierarchies in language, and more specifically, the prominence of Goals both at the conceptual/semantic level (Ikegami, 1979; Lakusta et al., 2007; Nam, 2004), as well as at the pragmatic/discourse level (Riemsdijk, 2007; Wexler, 2007; as stated in Lakusta & Landau, 2012). The results of the present research indicate that not only do Goals appear to be more prominent than Sources for events like the ones presented in the stimuli (which can be inferred by the overall Goal bias detected across different event types, different Path types, and in different spatial relations of the Figure and

Ground objects), but other elements in different contexts seem to be more prominent than Goals (which can be inferred by the general tendency of participants to express both Sources and Goals in their descriptions, and by the absence of Goal-oriented descriptions for events that show unbounded horizontal movement, as well as the fact that their increase is parallel to the introduction of reference objects in the events with the same direction). Also, the latter is an argument in favour of both linguistic and non-linguistic nature of spatial relations. Further evidence for this hypothesis in the context of the present research might be tested by changing the order of the videos in the stimuli, and by introducing an inanimate Figure which is not self-propelled, since most research on the nature of the Goal bias confirms that causality and agency are important factors which align with (and partly trigger) the Goal primacy, both in non-linguistic and linguistic contexts (Lakusta et al., 2007; Lakusta et al., 2013; Lakusta & Landau, 2012; Luo & Baillargeon, 2005; Papafragou, 2010).

The next question posed for analysis refers to the difference in expressing Sources and Goals across the three different event types: Support events (in which the Figure moved ONTO or OFF OF a Goal object); Contact/close proximity events (in which the Figure moved AWAY FROM, VIA, or UP TO certain reference objects, sometimes coming close to them and sometimes coming in contact with them); and Free movement events (in which the ball exhibited unbounded movement and no reference objects were present in the scene). Results showed the differences in expressing both Source and Goal across these situation types are not statistically significant. Similar results are reported by Papafragou (2010). Her research included events which portrayed different types of spatial relations: Containment, Support, Contact and Cover. She reports that children and adults tend to remember spatial relations better if they belong to the Containment group than any other event types.

Further, no significant differences were found between the other groups. Even though the present analysis and Papafragou's experiment deal with different observations (linguistic encoding of spatial relations and memory of spatial relations), and the materials used for this research do not include events of Containment, some parallels between the two can be drawn. First, both groups of results indicate that there is no difference in language encoding of Support and Contact events, and that people tend to memorize these types of events in a similar way. Second, research on language acquisition shows that both types of events are learned around the same time, that is, later than some other types of events, like Containment (Johnston & Slobin, 1978), and that even prelinguistic infants show earlier sensitivity to Containment than e.g. Support events (Casasola & Cohen, 2002; Casasola, Cohen & Chiarello, 2003, as stated in Papafragou, 2010). Based on this information, we can assume that the types of events listed in this research are acquired roughly around the same age, later than other event types, and that these factors might have an influence on why there is no difference in their linguistic encoding (for example, the relationship between the Figure and the surface Ground might be processed in a similar vein). Finally, based on the data from this research, it is possible to infer that the Goal bias appears as a constant across the event types discussed (Support, Contact/Close proximity), as well as that the spatial relations listed do not influence the encoding of Sources.

Detailed analyses of results for each video have given us insight into the most dominant patterns Croatian speakers use in the encoding of the defining elements of Path, as well as the spatial relations between the Figure and the reference objects. The most common way the participants expressed Path was in prepositional phrases. The participants mainly conflated motion and/or manner in the verb, and expressed Path in a PP, which is a pattern typical for S-languages, a category to which Croatian already

belongs (Talmy, 1985, 1991; Slobin 1997, 1996a, 1996b; Filipović, 2007, 2010; Vidaković, 2012). The most commonly used preposition pair included the *od – do* pair, which is also confirmed in previous research as being the most widely applicable and the most commonly used preposition pair, especially for encoding Sources and Goals (Filipović, 2007, 2010; Brala-Vukanović and Memišević, 2012a, 2012b, 2014; Kovačević and Matas Ivanković, 2007). Quantitative analyses confirm the participants used more Goal prepositions (the most common ones *od* and *prema*) than Source prepositions. The participants also used more (and a wider variety of) Goal-oriented verbs (e.g. *udarila je* / 'hit'; *dodirnula je* / 'touched'; *zabila se* / 'crashed into' *zaustavila se [kod]* / 'stopped [beside]' etc.) than Source-oriented verbs (e.g. *udaljava se* / 'distances from'; *odbila se* / 'beat back'; *odmiče se* / 'gets away from', etc.). The pair *s(a) – na* was used more often in events portraying ascending and descending, which is in line with its semantic value. Further, the Goal preposition *na* was used about 20% more often than its Source-oriented counterpart *s(a)*. The encoding of midpoint was usually realized through a separate verb + PP construct (e.g. *prolazi pokraj*), which significantly decreased Path segmentation in boundary-crossing situations, a pattern discussed in the previous section of the paper. The second dominant pattern the participants used revolved around the use of prefixes, which allow for implicit Sources and Goals, as well as direction, to be conflated within the verb, adding a semantic component to the verb (Brala-Vukanović and Memišević, 2012a, 2012b, 2014). What is really interesting is that among prefixes, a strong bias toward Source-oriented prefixes was discovered. Prefixed manner verbs comprise around 14% of all manner verbs present in the research. A total of 94% of those prefixes were Source prefixes (the most common one being *od-*, followed by *za-*, *s-*, and *pro-*). Goal prefixes constitute only 6% of all prefixes used, and are represented

by only one prefix, *do*-. The asymetry between the Goal and the Source among prepositions and prefixes seems almost complementary; Croatian speakers tend to express the Source more often in the prefix, and Goal more often in PPs. We could say that this alignment allows speakers of Croatian to easily express both defining points of motion, but the fact that they still expressed the Goal more often (i.e. used more generic and unprefixed manner verbs with Goal PPs to express Path) goes in favor of the general Goal bias in language production. Now, we could say that in Croatian (as well as in other Slavic languages), prefixes offer a mechanism of expressing Sources and Goals without "greater effort", i.e. they allow for additional information about the direction of the Figure's Path to be conflated with information about motion within a verb. It seems that they make use of this advantage on the pragmatic level to encode more Sources. However, the results also show that they do not make use of this strategy more than they encode Goals, whether it be in the PPs, or in Goal-oriented verbs, which is on one hand, a factor contributing to the cognitive/attentional nature of the Goal bias. On the other hand, the fact that generic verbs do not allow for such implementation of implicit Path elements might be an indication that language-specific morphological limitations impede the expression of implicit Sources and Goals, which in turn might result in the weaker position of Sources in language production. Another widely used strategy observed in this research is what Sinha and Kuteva (1995), as stated in Slobin (2011: 139), term "distributed semantics" (a conflation strategy that allows for information about motion, or any meaning component, to be expressed in more than one morpheme). More specifically, in the case of the present research, it is represented by the following pattern: implicit Source or Goal in the prefix + explicit Source or Goal in the prepositional phrase. Again, this strategy was used more often to encode Source

(e.g. *otkotrljala se od*; *skotrljala se s*) which was often followed by a Goal PP (e.g. *otkotrljala se od – do*), which then represented a complete Path description.

5. Conclusion

The study aimed at providing greater insight into the habitual strategies used by native Croatian language speakers for encoding motion events. To our knowledge, the stimuli used in this study have not yet been used for experiments focused on the Croatian language, which is why the results, hopefully, offer valuable information on some common aspects of motion encoding in Croatian. The stimuli included a number of varying elements: the direction of the Figure; the relation of the Figure and the viewer; the number of reference points present in the events and their relation to the Figure; different Path types (FROM, TO, VIA and their combinations, as well as unbounded Paths); different situation types (boundary-crossing, and non-boundary crossing); different event types (Support, Contact/Close proximity and Free movement of the Figure); and the same objects used as both Sources and Goals in different scenes. This allowed for reliable observations of a variety of patterns, all of which contributed to the discussion on the relationship between language and its users, and language and conceptualization.

The first analysis has shown that native speakers of Croatian exhibit patterns typical of S-framed languages: they most often use the lexical elements to encode Manner, in verbs and adverbs; they most often encode Manner in the verb and Path in PPs; and they use manner verbs significantly more often than other types of verbs in expressing canonical motion of an inanimate Figure. However, they partly attest to the boundary-crossing constraint, which is subsequently reflected in their tendency to omit Manner in those situations, and also seem to prefer some patterns in segmenting the Path which are not typical of S-languages. These results distance the Croatian language from this category, therefore supporting the view that the existing typologies cannot account for the variety of preferred strategies used by the native speakers, and

that language should be approached as being at certain positions (different positions for different encodings) on a cline of salience, rather than having a fixed position in a category.

The second analysis dealt with the encoding of the defining elements of Path (direction, starting points, landmarks, endpoints). Surmounting evidence from the literature that support a general primacy of Goals in language encoding, as well as conceptualization, served as a basis for this analysis, so a specific focus was put on the analysis of encoding of Sources and Goals. The overall comparisons of Source-oriented and Goal-oriented descriptions confirm a general Goal bias, since Goal-oriented descriptions formed the largest group of results in two out of four event types, and formed the second largest group of results in the third one. Contrary to that, Source-oriented descriptions formed a substantial group of results only in one of the event types. This might lead us to conclude that there exists a general preference toward expressing Goals, whether it be a cognitive, perceptual or experiential one. However, some of the findings partly cast doubt on the origins of such a preference. The fact that the highest percentage of overall results included complete Path descriptions (i.e. the ones containing both Sources and Goals, as well as other reference points present in the scene) is one of them. Another, stronger argument, is the fact that the Goal bias was weaker for the events showing horizontal movement. This might be an indication that other aspects of a motion event are perceived as even more salient, either because of certain conceptual constraints regarding context, or certain constraints in language. Further, the results indicate that the most common ways in which native speakers of Croatian encode Sources and Goals are through prefixes and prepositional phrases. An interesting finding regarding the relation between the two components and their comparison with Sources and Goals suggests

that Sources are preferred over Goals when it comes to prefixes, and Goals over Sources when it comes to prepositions. However, despite the fact that the Croatian language offers its speakers this economical strategy of expressing both defining points of the Path, the overall results still comport with the Goal bias.

Further research on these topics could build on the same stimuli and procedures, not only to give more insight into the Croatian language, but other languages as well. However, there are some limitations to the study which should be taken into account and modified in order to possibly conduct a similar research on the same or another language. The fact that the stimuli depict very short and simple events, that the Paths are not long and complex and a maximum of one boundary is present at a time, all could be modified to elicit more elaborate descriptions and therefore more data for analysis of e.g. motion encoding in boundary-crossing situations of Path segmentation. Further, the fact that the Figure always exhibited canonical movement is a reliable factor for some analyses, but in a way it might have guided the choice of manner verbs, since a manner verb encodes the canonical movement in the present materials. Also, introducing other types of events, such as Containment, could be a valuable variation for this type of study. Finally, tools and procedures (e.g. memory tasks) for testing conceptualization could be introduced since the present material alone is not sufficient to account for the possibility of a non-linguistic nature of the bias.

6. References

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