The expression of Path in L2 Danish by German and Turkish learners

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Abstract

Do language learners think in their first language (L1) when using their second language (L2)? This study explores the nature of crosslinguistic influence by investigating how German and Turkish learners of Danish express motion, paying special attention to the semantics of Path. We examined three aspects: overall Path frequency, Path complexity, and the subcomponents of Path. The presence of L1 influence in each aspect reflects how the interplay between form and meaning is carried over as a whole to the L2. In particular, we show how the selection of a specific Path meaning for expression in the L2 has its root in the structural and semantic properties of the L1. This raises important questions regarding how form and meaning are organized in the learner's mind.

Keywords: L2 acquisition, motion events, crosslinguistic influence, thinking for speaking

Zusammenfassung

Denken Sprachlerner in ihrer Muttersprache, wenn sie eine Fremdsprache benutzten? Diese Studie untersucht die Beschaffenheit des Einflusses der Erst- auf die Fremdsprache. Es wird untersucht, wie deutsche und türkische Lerner des Dänischen Bewegungsereignisse in der Zweitsprache ausdrücken, unter besonderer Berücksichtigung der Pfadsemantik. Wir untersuchten die folgenden drei Aspekte: die Gesamthäufigkeit und die Komplexität der Pfadbeschreibungen und die Bedeutung, die ihnen zugeordnet wird. Die Präsenz eines Einflusses der Erstsprache in allen Aspekten macht deutlich, wie das Zusammenspiel zwischen Form und Bedeutung als Ganzes in die Fremdsprache transferiert wird. Insbesondere können wir zeigen, dass die Bedeutungszuweisung einer Pfadbeschreibung in der Zweitsprache ihre Wurzeln in der Struktur und in semantischen Präferenzen der Erstsprache hat. Dieses wirft die wichtige Frage auf, wie Form und Bedeutung in der sprachlichen Konzeptualisierung des Lerners organisiert sind.

Stichwörter: L2-Erwerb, Bewegungsereignisse, Einfluss der Erstsprache, Thinking for speaking

1. Introduction

The question of whether second-language speech is influenced by the learner's first language (L1) is at the heart of Second Language Acquisition (SLA) research. With the advent of cognitive linguistics, interest has expanded past structural influence towards investigations targeting conceptually motivated phenomena in the learner's second language (L2). This increased interest in language and bilingual cognition is reflected in the growing volume of published research on the topic (e.g., Han & Cadierno, 2010; Pavlenko, 2011; Cook & Basetti, 2011; Benazzo et al., 2012). Influenced by Talmy's motion event typology (1985, 2000) and Slobin's application of it in his "thinking for speaking" (TfS) hypothesis (1996), research has focused on the expression of motion in a second language. Many different aspects of motion events have been studied in various combinations, including the language type constellation between L1 and L2, the proficiency level of the learners, and the nature of the crosslinguistic influence. Furthermore, to investigate the concepts underlying linguistic expression, other modalities have been researched, e.g., the use of gestures and gaze patterns. To give but a few examples from the many relevant studies, the constellation L1 S-language and L2 V-language has been researched by Cadierno (2004), Navarro and Nicoladis (2005), and Hendriks and Hickmann (2011) among others. The constellation L1 V-language, L2 S-language has been examined e.g. by Carroll et al. (2012) and Reshöft (2011). Studies that looked at bilingual speakers' expression of motion events with typological different languages include Daller et al. (2011), Schroeder (2009), and Goschler (2009). Hohenstein et al. (2009) examined the nature of bidirectional transfer and the L2 acquisition of motion events. Gestures as a window into bilingual cognition have been reviewed by, e.g., Brown (2007), Brown and Gullberg (2010), and Stam (2010). Eye tracking is another method to study conceptual representation underlying learners' expressions of motion, which was used, e.g., in a study by Schmiedtova (2011). For a more detailed overview of studies on the L2 acquisition and expression of motion events, see Cadierno (2013). The main question underlying these studies is whether learners think in their L1 when using the L2. Different TfS patterns in the L1 and the L2 require a development of new ways of TfS (Cadierno, 2004). In other words, are learners able to rethink for speaking (Robinson & Ellis, 2008) and reconstruct meanings in an L2 context (Gullberg, 2009)?

Despite the vast volume of literature, there is still no consensus regarding whether or not L1 thinking patterns are reflected in L2 production. The present study follows this line of investigation, asking whether learners acquire L2-appropriate ways of TfS. We examine three aspects: overall Path frequency, Path complexity, and the meaning of the Path expressions. We pay special attention to the subcomponents of Path Vector, Conformation, and Deixis, as defined in Talmy (2000). Few studies have focused on the acquisition of the subcomponents of Path or, correspondingly, provided a more fine-

grained semantic analysis of Path. Two exceptions are Daller et al. (2011) and Carroll et al. (2012). Both find that L2 learners resemble L1 speakers on formal grounds but that the meaning underlying the forms differed from the language to be acquired. To that end, we investigate German and Turkish learners of Danish. This constellation allows us to look at possible inter- and intraypological crosslinguistic influences of the L1 on the L2. Particularly, we address the question of how L2 learners tackle the transition from simple to more complex Path expressions, and how the meaning of the L1 Path expression influences the choice of Path expression in the L2. To identify transfer effects and exclude other sources for divergence from the target language, such as acquisitional universals, we follow Jarvis's suggestions (2000) in our procedure. We establish intra-group homogeneity (similarities in the L2 production of learners with the same L1 background), inter-group heterogeneity (differences between the two learner groups in L2 production), and similarities between the learners' L1 and their L2 production. We find an influence of the L1 on the L2, and we discuss its nature in terms of the intricate interplay between structure and conceptualization.

We first introduce Talmy's motion verb typology and Slobin's application of it in his thinking for speaking (TfS) hypothesis. We then review SLA literature that has investigated L2 acquisition from the theoretical perspective of Talmy's typological framework and Slobin's TfS hypothesis. We consider how the semantic component of Path, subject to the current analysis, is expressed in Danish, German, and Turkish before stating our research questions. A description of the experiment and the coding we apply precedes the presentation of the results. Finally, we discuss our findings in the light of the literature reviewed.

2. Talmy's motion event typology and Slobin's thinking for speaking hypothesis

In recent years, many studies focusing on L2 acquisition have related in one way or another to two very prominent theories in cognitive linguistics, namely Talmy's (1985, 2000) motion event typology and Slobin's thinking for Speaking hypothesis (TfS).

In Talmy's motion event typology, the basic assumption is that motion can be considered a universal conceptual domain that is lexicalized across languages (Talmy, 1991, 2000). Various combinations of lexical items and grammatical morphemes can encode events. Elements of the basic motion event are the Figure, which is the object that is moving (or located) with respect to another object, and the other object, the Ground. The Path is "the course followed or site occupied by the Figure object with respect to the Ground object" (Talmy, 1985). Path consists of three parts, a) the vector, including basic types of arrival, traversal and departure, e.g. *to*, or *along*, b)

the conformation, including the main geometric schema of a Path, e.g. *into* or *out off*, and c) deixis, defining motion as either toward or not toward the speaker (Talmy 2000: 53-57). Talmy (1985, 2000) suggests that languages code Motion according to two main lexicalization patterns. Verb-framed languages (V-languages) typically code motion and Path in the main verb and Manner of motion in a separate constituent (an adverbial, converb, or gerund). In contrast, satellite-framed languages (S-languages) tend to encode Path outside the main verb as in satellites and conflate motion and Manner in the main verb. Examples for the two patterns are given in (1) and (2):

(1) German (S-language)	(2) Turkish (V-language)
Die Affe-n geh-en um den Baum herum.	*Maymun-lar ağac-ın etraf-ın-da dön-üyor.*
ART:DEF monkey-pl walk-3plPres around	monkey- pl tree-POSS side-POSS-loc turn-
ART:DEF:ACC tree around.	PRE:PROG
'The monkeys walk around the tree.'	'Monkeys circle a tree.'

In Talmy's original definition, satellites were directional verb particles that had to be distinguished from prepositions on syntactical and formal grounds (1985: 102). However, Talmy also mentions that both satellites and prepositions can semantically describe Path (1985: 105), e.g., *past* is referred to as a satellite-preposition. In current research, prepositions and particles are commonly included in the analysis of Path (e.g., Daller et al., 2011; Berthele, 2006; Treffers-Daller, 2012), since (e.g., in German) prepositions are frequently the only lexical items conveying directional meaning. In this study, too, prepositions are considered possible loci for Path expression.

Slobin (1996), building on Talmy's typology, finds that "each one [language] is a subjective orientation to the world of human experience, and this orientation affects the ways in which we think while we are speaking" (p. 91). For Slobin, the different lexicalization patterns in a language lead speakers to attend to different dimensions of experience, a process that Gullberg (2011) calls "the activity of information selection of linguistic conceptualization for speech" (p. 166). Slobin observes that speakers of V-languages tend to describe the scene setting, whereas speakers of S-languages tend to add more detailed Path descriptions to motion verbs. In S-languages, several satellites can be connected to a single verb (Path concatenation). As a result, several Ground elements can be expressed in one clause associated to one verb, as in English *fall down into the river*. V-languages tend to express the scene setting and use several verbs together with several Path devices in a narrative. Slobin (1997) gives the following example for Turkish: "[...] *Cocuğu aşağıya atıyor, köpek de düşüyor aşağıya. Uçurumun dibinde bir göl varmiş. Göle düşüyorlar* [...]'He throws the boy down, and the dog falls down, too. At the bottom of the cliff, there was a lake. (They) fell into the lake'" (p. 451). However, there are intratypological differences regarding the degree of detailed path description (path salience cline) (Ibarretxe-Antuñano, 2009).

3. Typology and TfS in L2 acquisition

Talmy's typology addresses differences in how conceptual elements are mapped onto linguistic forms. Adult learners of a second language not only have to learn the morpho-syntactic patterns of their L2, they also have to understand how to relate meaning to these forms. Thus, in the case of the acquisition of an L2 exhibiting lexicalization patterns that differ from the learner's L1, the learner not only has to locate these differences in the morpho-syntactical structure, s/he also must understand which meaning the structure typically expresses. Thus, the task for an L2 learner is to learn a different way of thinking for speaking (Cadierno, 2004; Cadierno & Lund, 2004) or learn to rethink for speaking (Robinson & Ellis, 2008).

Similarly, the conceptual transfer hypothesis (Jarvis & Pavlenko, 2008) describes how form-meaning mappings learned in the L1 might affect L2 acquisition, stating that "a person's patterns of language use in one language can reflect the concepts and patterns of conceptualization that a person has acquired as a speaker of another language" (p: 115). The many interesting studies that have looked at an influence of the L1 on the L2 in this framework mainly examined lexical categories in a great variety of domains, such as objects or emotions (Jarvis & Pavlenko, 2008). A detailed account on similarities and differences between rethinking for speaking and conceptual transfer can be found in Jarvis (2011), Odlin (2005), and Treffers-Daller (2012). Differences notwithstanding, in both approaches, the encoding of "outer world" experience is subject to language-specific constraints. These constraints result from the size of the lexicon and from the availability of certain grammatical categories. In a similar vein, von Stutterheim and Nüse (2003) argue that "differences in the organization of information in texts are rooted in structural contrasts between languages" (p. 851). In the framework of Levelt's model of speech processing (1989), this means that processes in the conceptualizer at least are partly language specific. Thus, language specificity already starts when speakers select what to talk about and how. Studies applying Talmy's typology, Slobin's Thinking-for-Speaking, and the conceptual transfer hypothesis as a basis to account for phenomena in L2 acquisition have shown varying outcomes as to whether or not the patterns of information selection, as acquired in the L1, play a role in the acquisition of motion events in an L2. As mentioned in Cadierno and Ruiz (2006), other factors, e.g. the level of proficiency, might crosscut the influence of typological membership. Furthermore, as described in great detail in Jarvis and Pavlenko (2008), transfer rooted in the selection of information is only one possible type of transfer. Other types include morpho-syntactic transfers or phonological transfers.

Vulchanova et al. (2012b) and Goschler (2009) did not find crosslinguistic influence of the L1 on the L2 in the context of motion events that could be based on

typological differences. Other studies, however, argue for a crosslinguistic influence rooted in linguistic conceptualization: Daller et al. (2011) and Schroeder (2009) for German-Turkish bilinguals, Reshöft (2011) for Romance learners of English, Carroll et al. (2012) for French learners of English and German, Hijazo-Gascon (2011) for German, Italian and French learners of Spanish, and Cadierno (2010) for Russian, German and Spanish learners of Danish.

There is thus a divide between studies that find an influence of the L1 on the L2 that is conceptual in nature, and those that do not. The studies that do not find an influence include the constellation L1 V-language – L2 S-language and learners (Vulchanova et al. 2012) vs early bilingual speakers (Goschler 2009). This constellation is found as well in those studies that do find an influence (e.g. Schroeder 2009 for bilinguals and Cadierno 2010 for L1 V-language – L2 S-language). A focus on the L2 expression of semantic components might help to cross this divide.

4. Path of motion in Danish, Turkish, and German

Before presenting the method and findings, we will briefly discuss the structure of the languages used in this study.

4.1 Turkish

Linguistic means to express Path of motion in Turkish are verbs, local nominals, local adpositions (prepositions or postpositions), and case marking. Most typically, Path is expressed in the root of the main verb, e.g., *inmek* 'move down' and *dönmek* 'turn', making Turkish a V-language. Case marking can be used to distinguish between static location, -DE (3), and directional interpretation relative to the goal, –E (5), or source, -DEn (4) (Kornfilt, 1987, Becker, 1994; Moser-Weithmann, 2001). According to Becker (1994), the "relatum," or the Ground, can often be implicit.

(3) *kitap raf -ta* book shelf-LOC 'the book is on the shelf'	(4) *ev-den cık-tık* house-SOURCE leave-PAST 'we left from the house'	(5) *kitap raf-tan yer-e düş -tü* book shelf-SOURCE floor-GOAL fall-PAST '(the) book fell from the shelf to the floor'

Furthermore, to express the relation of the moving Figure and the Ground more specifically, locative adverbials can be used, such as *iceri* 'into', *disari* 'out', *yukari* 'up', *asagi* 'down', *ileri* 'forward', and *geri* 'backward'. These forms can also take nominal inflections. It is thus possible to express several Path segments in a complex fashion (6):

(6) *geyik (...)çocu-ğu baş:ın-**dan asağı** at-ıyor*
deer (...) boy-ACC its :head -**ABL downwards** throw-pres.PROG.3
'(The) deer throws the boy **down from** his head'. (Aksu-Koç, 1994: 354)

The expression of several Path elements is atypical for a V-language, but it has been shown to occur in other V-languages, too, e.g., in Basque (Ibarretxe-Antuñano, 2004, 2009) and Italian (Hijazo-Gascón & Ibarretxe-Antuñano, forthcoming). Akşu-Koç observed that in the narration of the frog story, speakers of Turkish showed a tendency to express a static Ground, as marked by –DE. The availability of locative inflections might predispose Turkish speakers to mention source and goal explicitly. Slobin (2004) speculates that this use of productive verbal morphology seems to compensate for lack of lexical richness.

4.2 German

Linguistic means for the expression of Path of motion in German are prepositions, separable and inseparable verb particles, case marking, adverbs, and some few Path verbs. Typically, Path is marked outside the verb, in the Ground prepositional phrase (PP) (7). German also allows for a more complex motion construction, with a PP as well as an adverb (8) (Berthele, 2006). Thus, German belongs to the S-languages.

(7) *Der Frosch hüpft in das Glas.* ART:DEF frog jump-PRES into ART:DEF glass 'The frog jumps into the glass'.	(8) *Der Frosch hüpft ins Glas rein.* ART:DEF frog jump-pres1sg into-ART:DEF glass into 'The frog jumps into the glass into'.

4.3 Danish

Linguistic means to express Path in Danish are prepositions, adverbs, and, to some degree, nominal constructions. The typical expression of Path in Danish is achieved by a combination of a particle and a preposition, rendering a complex path description:

(9) *Hun kravler op på stolen.*
She crawl-pres up onto chair-ART:DEF.
'She crawls up onto the chair'.

As Sinha et al. (1994) point out, "Distributionally, Danish [...] encourages a higher degree of specification or semantic profiling of the semantic relations that are encoded" (p. 265). This idea is also expressed in Sinha and Kuteva (1995) in that distributed spatial semantics "permit[s] the Danish speaker to profile path, goal, and

configuration to a greater extent than [...] the English speaker" (p. 261). According to Hovmark (2009), it is necessary to relate the space the moving Figure is moving in to: a) the starting point of the Figure as well as b) to an estimated endpoint or continuation of the movement. Harder et al. (1996) have pointed out that transitional adverbs cannot be omitted when they occur in a certain context. They argue that speakers of Danish have to specify the "subjectively conceived spatial location" and a "specific directionality within the subjectively conceived space." The analysis of our data confirms this. Since Danish marks Path outside the main verb, it belongs to the S-languages (Cadierno, 2010).

5. The study

Previous studies investigating the L2 expression of motion events have mainly focused on whether or not L1 preferences for a mapping between form and meaning had an influence on the L2. Few studies have addressed how the L1 patterns for the selection of more-specific meanings (such as the selection of subcomponents of Path) influence the expression of a motion event in an L2. In the process of verbalizing a motion event, speakers have to "plan" if a trajectory is to be expressed, whether this trajectory is simple or complex, and which meanings of Path are to be expressed. Hence, we ask how learners in their L2 tackle these steps and whether or not the L1 has an influence on these selection processes. In Danish, Path is expressed frequently and in a complex fashion, by the use of two lexicalized Path devices. In German, Path is expressed frequently, but in a simple fashion, by the use of one lexicalized Path device. Finally, in Turkish Path is expressed less frequently and in a simple fashion. Thus, the constellation between L1 German, L1 Turkish, and L2 Danish allows us to test how L2 learners tackle the transition from a simple to a complex system for form and meaning alike. We addressed the following research questions:

RQ 1: Do the participant groups (i.e., the Danish native speakers (NS), the German NS, the Turkish NS, the German learners of Danish, and the Turkish learners of Danish) differ with respect to the overall frequency of expression of Path? What is the proportion of Path in all the descriptions?

RQ 2: How complex are the descriptions of Path used across the five groups? How many different Path devices are expressed?

RQ 3: What meanings/subcomponents of Path are expressed?

RQ 4: How can we account for differences between Danish native speakers and the learner groups' production of Danish as an L2?

6. Method

6.1 Participants

A total of 99 informants participated in the study, including native speakers of Danish (n 21), German (n 25), and Turkish (n 25); German learners of Danish (n 14); and Turkish learners of Danish (n 14). The participants were asked to fill out a linguistic background questionnaire, based on The Language Background Questionnaire (Gullberg & Indefrey, 2003). They generally reported a good to very good knowledge of English.

Participants belonging to the L2 informant groups used Danish at their work place and interacted with Danes on a daily basis. Most Turkish participants (n=11) and most German participants (=n13) took a placement test based on DIALANG (Alderson, 2006). A nonparametric Wilcoxon test suggests that the means of the two populations are comparable. Table 1 summarizes the biographic information for the learners. One German learner and three Turkish learners did not complete the placement test. They were included in the sample based on their self-assessment, researcher assessment by means of an oral interview, and high reported use of the target language.

Table 1. *Biographical information summary.*

	German learners			Turkish learners		
	Mean	Range	SD	Mean	Range	SD
Prof test %	83.07	58.7–94.7	10.43	75	58.7–92	10
Age	33	22–55		34.7	26–58	
Length of residency	5.7	1–19	5	11.5	1.5–33	9.5

6.2 Stimuli

The stimuli in this study were 37 video clips, each 3- to 4-seconds long, showing a great variety of motion events performed by humans, primates, and a range of different animals (Vulchanova et al., 2012a). Originally designed to map out the Manner verb inventory across different languages, the videos also lend themselves to the examination of the expression of Path because a) the descriptions of the informants included more than just Manner information and b) the descriptions of German and Danish NSs included a high degree of Path description, as opposed to a lower number in Turkish L1 descriptions. This fact provides a good testing ground to see how Turkish learners of Danish handle the expression of Path in Danish as an L2. The

video clips were embedded in a Web page with instructions in the native language of the L1 informants and in Danish for the learner groups. Participants viewed each clip as often as they liked and typed their answers into a response box. The L1 informants answered in their native language; the learners answered in Danish. The response box was preceded by the appropriate translation of "please, describe what you see".

6.3 Coding across the five groups

The focus of this study is on the expression of Path. As described by Sinha and Kuteva (1995), Path information can be distributed across different word classes. Accordingly, we base our Path count on all lexical form classes that can express Path. In detail, they include adverbs, prepositions, and a few verbs in Danish; verbs, adverbs, and prepositions in German; and verbs, adverbs, and morphological inflection in Turkish. Taking Danish as a point of departure, we derived five complexity categories (Table 2): simple *(s)* if the Path description contained only one Path device, complex redundant *(cr)* if the Path description contained two Path devices describing the same meaning, and complex complementary *(cc)* if the Path description included two Path devices with different meanings. If the Path description contained three or more Path devices, it belonged to the multi-complex category *(ccc)*. The category "other" *(o)* contains Path descriptions that are very infrequent and not part of the dominant coding strategies of the languages, e.g., *den ganzen Weg hüpfen* 'jump all the way'. Examples as to how we applied the complexity categories for the five languages are described in the coding section below.

Table 2. Complexity categories across languages; Path devices in bold.

Category	Number of Path devices	Examples
simple *(s)*	1	der koala klettert **auf** den Baum ART koala climb-PRES up ART.DEF.ACC tree 'the koala climbs **up** the tree'
other collapsed (nominal devices etc.)	1–3	Der Frosch ist **den ganzen Weg** gehüpft. ART frog is ART.DEF.ACC whole way jumped ' The frog jumped **the whole way**'
complex redundant *(cr)*	2	koalaen kravler **op ad** træet koala-ART crawl-PRES up along tree-ART 'The coala crawls **up along** the tree'
complex complentary *(cc)*	2	der Koala klettert **auf** den Baum **rauf** ART koala climb-PRES up ART.DEF.ACC tree up 'The koala climbs **up** the tree **up'**
more than 3 Path devices (ccc)	3	koalen kravler **ned ad fra** toppen koala-ART crawl-PRES down along from top-ART 'The koala crawls **down along from** the top'

6.3.1 Coding Danish: We have considered two Path devices in the most frequently appearing construction Vmanner+particle+P: *løbe ind i skoven* 'run into into the forest', the particle and the preposition. We furthermore made a distinction whether particle and preposition referred to the same "direction" (complex redundant, *cr*) or different ones, as in *ud i havet* 'out into the sea' (complex complementary, *cc*). In the case of constructions with only a preposition (typically either *gennem* 'through' or *over* 'across/through'), we counted one Path device, (simple, *s*). In this, we follow Berthele (2006), who applied a similar distinction for a Swiss-German variant.

6.3.2 Coding German: Most of the German speakers' descriptions followed a simple pattern *(s)*: *das Krokodil geht ins Wasser* 'The crocodile walks into the water'. For these instances, we counted the preposition as one Path element. Some instances showed a construction like *auf den Baum rauf* 'up the tree up'. Following Berthele (2006), we assume that there is no semantic spatial distinction between *auf den Baum* 'up the tree' and *auf den Baum rauf* 'up the tree up' and counted the preposition and the adverb as referring to the same "direction", complex redundant (*cr*).

6.3.3 Coding Turkish: As a V-language, Turkish can express the Path in verbs. Additionally, there are three case suffixes that can be interpreted locally (-dE) or directionally (-E goal and –dEn source) (Kornfilt,1987; Becker, 1994). We counted each of these element as one Path device. In order to specify space in more detail, directional nominal adverbials can be used, e.g. *iceri*: insideness (see section 4). These can be combined with the directional case suffixes. Similar to this class is *doğru:* straightness. Thus, example (6) contains two Path devices: *baş:ın-dan asağı at-ıyor* 'from his head down'. As outlined in Aksu-Koç (1994), Path verbs can be used in combination with directional locative inflections and directional adverbs, thus making it possible "to present several Path segments in a compact fashion," as summed up by Slobin (2004). This is represented in coding categories as "*cc*", complex complementary, and "*cr*", complex redundant.

7. Results

We first focused on the overall expression of Path and examined how many scene descriptions included one or more Path devices, independent of the locus of Path expression. Second, we looked at how structurally complex the descriptions were with respect to Path. Third, we looked at which meanings the Path devices encoded. For all aspects, we first report on the NSs' descriptions, followed by the descriptions of the two learner groups and the across-group comparisons.

7.1 Overall frequency of Path

Our first analysis focuses on whether or not one or more Path devices have been expressed across the five groups. Table 3 gives an overview of the results:

Table 3. Overall Path frequency, i.e., Path mentions in relation to all descriptions.

	Danish NS (n=21)	German NS (n=25)	Turkish NS (n=25)	German L1/ Danish L2 (n=14)	Turkish L1/ Danish L2 (n=14)
Path %	52.77	64.22	30.6	49.81	21.43
# Scene descriptions	777	925	925	518	518
# Path mention absolute	410	594	283	258	111

Regarding the NSs, the highest proportion of Path mentions can be observed for the German NSs, mentioning Path in 64.22% of all their descriptions, followed by the Danish NSs with 52.77%, and the Turkish NSs with 30.6%. In cases when Path is not expressed, descriptions across all groups include motion verbs and either static or no ground descriptions or descriptions that did not contain motion. With respect to the learner groups, German learners of Danish expressed Path in 49.81% of their scene descriptions. The Turkish learner group displayed the lowest proportion of Path mentions with 21.43%. Chi-square tests and comparisons across groups showed significant differences regarding the overall expression of path, except for the comparison between Danish NS and German learners (Appendix A).

The low values for overall Path expression for Turkish NSs and Turkish learners of Danish can be accounted for in terms of a preference for the description of a static Ground, as encoded by *–DE* in L1 Turkish and the frequent use of *på* 'on' in the descriptions of the Turkish learners. Note that Turkish NSs frequently use Manner verbs in their descriptions, probably because of the nature of the videos. The high number of Manner verb tokens can be considered as an artifact of the stimuli.

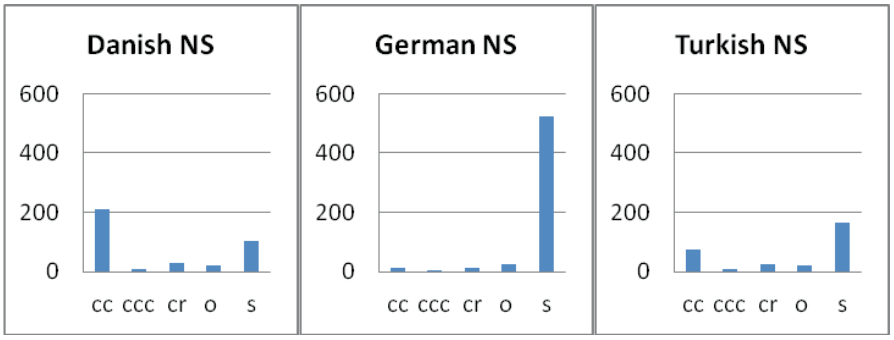
Overall, we can summarize that Danish NSs, German NSs, and German learners of Danish express Path very frequently, i.e., they display a high frequency of Path expression. Conversely, Turkish NS and Turkish learners of Danish do not express Path very frequently, and thus display a low frequency of Path expression.

7.2 Degree of Path complexity across groups

In this section, we first provide a description of the behavior of speakers in each group regarding how structurally complex their descriptions are by using the coding categories outlined in section 3. In order to show the distribution of complexity categories within each group, absolute numbers are presented in Figure 1 for the NS groups and Figure 2 for the learner groups.

7.2.1 Native speakers: Danish NSs preferred to express Path in a complex construction with two complementary Path devices, noted as *cc* (Figure 1). Typically, the *cc* construction consisted of Vmanner+adverb+PP. The second-most-frequent type of Path expression used by Danish NSs was the simple Path category *s*, represented as Vmanner+PP. In most cases, the simple pattern was realized by the use of *gennem* 'through'. To illustrate the use of *cc* and *s,* the five most-frequent Path devices used by Danish NSs were *hen over cc,* 'horizontal transition across', 64 mentions; *gennem s,* 'through/across', 38 mentions; *rundt om cr* 'around around', 28 mentions; and *ned ad cc* 'down via', 22 mentions. German NSs clearly preferred the expression of Path in a single element (Figure 1). The structure reflecting this preference was Vmanner+PP, as in (7). There were very few occurrences of more complex constructions. Turkish NSs most frequently expressed one Path element (Figure 1). Typically, this element was represented in the use of a Path verb plus a stationary Ground description: +N-DE+Vpath, as in (2). The second-most frequent construction used was complex, containing two complementary Path devices, Vpath+(y)E or –DEn.

Figure 1: Path complexity in NS groups, absolute numbers



Note:cc-two complementary path devices, ccc-three path devices, cr-two redundant path devices, o-nominal path devices, etc., s-single path device).

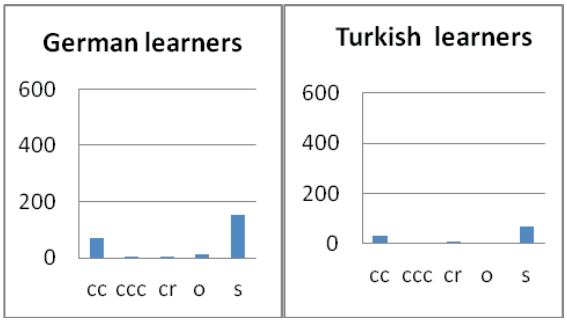
7.2.2. Learner groups: Figure 2 shows the preferred degree of Path complexity for the learner groups. The German learners preferred a simple construction *(s)* in their L2 Danish descriptions, encoded by a Vmanner+PP construction. The single path

device is realized in the preposition. The forms most frequently filling the P slot were *gennem* 'through' and *over* 'across'. The use of *gennem* 'through' in the German learners' production is not the same as in the Danish NSs' production, since the two groups used it in the description of different scenes. Furthermore, the use of *over* 'across' (29 times) without an additional Path device, as frequently applied by the German learners (10), is absent in the Danish baseline data. The Turkish learners preferred a simple expression of Path, V+PP, as in (11). The second-most-frequent construction used by the Turkish learners of Danish was a complex construction consisting of an adverb and a preposition providing complex complementary Path information (*cc*).

(10) *en kamelion klættrer rolig over græne* a chameleon climb-PRES quiet along/across twig 'a chameleon climbs slowly along a twig'	(11) *en abe kravler ned et træ* a monkey crawl-PRES down ART:INDEF tree 'a monkey crawls down a tree'

Figure 2 shows Path complexity across learner groups in absolute numbers.

Figure 2. Path complexity in learner groups, absolute numbers



Note: cc-two complementary path devices, ccc-three path devices, cr-two redundant path devices, o-nominal path devices etc., s-single path device.

To sum up, our results regarding degree of Path complexity, indicated that German NSs, German learners of Danish, Turkish NSs, and Turkish learners of Danish tend to encode Path in a single device (*s*), i.e., they show a low Path complexity. Conversely, Danish NSs prefer a complex expression of Path, using two Path devices, i.e., they display a high complexity of Path expression. Typically, the two Path devices have different meanings.

7.3 The meaning of Path devices

In this section, we examine the meaning of the Path devices employed for the descriptions of two selected scenes. In the "koala scene," a koala is climbing up a tree; in the "crocodile scene," a crocodile is walking on a beach towards the sea. The

two example scenes (Figure 3) were selected because they display different vectors and different options with respect to a possible goal/endpoint encoding. They thus give us the possibility to compare all these aspects in the descriptions of the five groups. Appendix B includes screenshots of all 37 scenes. Unfortunately, due to space restrictions, only two scenes can be analyzed here. They nevertheless are representative of overall tendencies. First, the Danish baseline description is presented, followed by the baseline data for German and Turkish, and lastly the learner data.

Figure 3. Screenshot of koala and crocodile scenes.

Danish NSs used a complex construction with a particle and a preposition, providing complementary information to describe both scenes, illustrating the high degree of Path specificity in Danish, as represented by examples (12–13):

(13) *En koala bjørn der kravler op ad et træ.* ART:DEF coala bear PRON:REL crawl-PRES up along ART:INDEF tree 'A koala bear that crawls up along a tree'.	(14) *En aligator går ud i vand-et.* ART:INDEF aligator walk-PRES out into water-DEF 'An alligator walks out in the water'.

In (12), a movement on an upward axis is expressed, *op* 'up', together with a Path scheme assigning a via, *ad* 'along' (11 occurrences) or *i* 'into' (10 occurrences). In (13), a movement away from a container, *ud* 'out', into another container, *i* 'into' (7 occurrences) or towards a goal *mod/til* 'towards' (5 occurrences) as in *ud mod/til vandet* 'out towards the water' are expressed.

The German NSs preferred simple constructions for the same scenes; representative examples are (14) and (15):

(14) *Ein Koala kletter-t ein-en Baum hinauf/hoch.* ART:INDEF coala climb-PRES ART:INDEF-ACC tree up 'A koala climbs up a tree'.	(15) Ein Krokodil läuft in-s Meer. ART:INDEF crocodile walk/run into-ART:DEF:ACC sea 'A crocodile walks/runs into the sea'.

In (14), Path is expressed by means of an adverbial accusative and an adverb indicating an upwards vector, *hinauf/hoch* 'up' (18 occurrences). In (15), the conformation component *in* 'into' is expressed in a PP (10 occurrences). Alternative descriptions included *zu* 'to' (7 occurrences).

The Turkish NSs preferred a complex expression of Path for the two examples scenes, as shown in examples (16) and (17). This is the second most frequent complexity pattern.

(16) *Koala ağac-a tırman-ıyor.* koala tree-GOAL climb.up-PRES.PROG 'The koala is climbing up the tree'.	(17) *Timsah suy-a doğru yürüyor.* aligator water-GOAL straight walk-PRES.PROG 'The alligator is walking straight to the water'.

In (16), complexity resulted from a specification of a goal, *-a*, and an upwards vector expressed in the verb, *tırman-* 'climb up' (25 occurrences). For the crocodile scene, most of the Turkish speakers described a goal, *-a*, and a vector, *doğru* 'straight' as in (17) (24 occurrences).

The German learners' data showed a relatively high variability. Nevertheless, the preferred pattern was a simple Path expression *(s)* for both scenes.

(18) *En koala klatrer op en træ.* ART:INDEF koala climb-s up ART:INDEF tree 'A koala climbs up a tree'.	(19) *Krokodilen går i vandet.* crocodile-art:def walk-pres in water-art:def 'The crocodile goes in the water'.

Seven descriptions included a vector *op* 'up' (18) as the only Path device. In typical descriptions of the crocodile scene (19), the German learners expressed a conformation, *i* 'into' alone (4 occurrences), or a more complex pattern, *krokodillen går ind i vandet* (4 occurences) 'The crocodile goes into in the water'. Both kinds do not appear in the Danish baseline data. Another striking difference is that German learners only used *hen* "horizontal:translocation" in 9 cases, whereas in the Danish baseline data *hen* is used 85 times. In these cases, German learners used a simple *over* 'over' or *gennem* 'through'.

The data for the Turkish learners of Danish showed a relatively high variability, too. The preferred pattern was a simple Path expression *(s)* for both scenes.

(20) *En lille bjørn kravle-r op på træ* ART:INDEF little bear crawl-PRES up on tree 'A little bear crawls up on tree'.	(21) *En varan gå-r imod hav-et.* ART:INDEF varan walk-PRES towards sea-ART:DEF 'A varan goes towards the sea'.

For the koala scene, most descriptions of the Turkish learners included the upwards vector *op* 'up', (4 occurrences) often in combination with *på* 'on' as in (20) (4 occurrences). For the crocodile scene, two Path devices were prominent in the Turkish learners' descriptions: *til/mod* 'towards', expressing a goal (6 occurrences) (21), and *ind/i* (4 occurrences) 'in', expressing a conformation. Other descriptions by the Turkish learners included *på* 'on' with a static meaning: *går på træ* 'walks on tree' or *går på stranden* 'walks on the beach'. Table 4 gives a summary of the preferred Path semantics expressed by the five groups.

Table 4. The meaning expressed in the Path devices.

Group	koala scene	crocodile scene
German NS	*rauf/hoch* (vector up)	*rein* (conformation into)
German Learners	*op* (vector up)	*i* (conformation into)
Danish NS	*op ad* (vector up + medium/ via)	*ud i* (conformation out of + conformation into)
Turkish learners	*op på* (vector up + location)	*til/mod* (goal)
Turkish NS	*-a tirman-* (goal+vector up)	*-a doğru* (goal + vector horizontally)

7.4 Across-groups comparison for the three aspects

The relevant across-group comparisons can be derived from the suggestions made by Jarvis (2000) regarding methodological rigor. We compare the learners' descriptions to the Danish baseline data to see if they differ for the relevant aspects. In order to establish if possible differences are due to crosslinguistic influence, we compare the L1 and L2 production of the learners to see if there are similarities. Similarities between L1 and L2 descriptions can be interpreted as one indicator of crosslinguistic influence. Additionally, we compare the two learner groups to each other to see if we can establish inter-group heterogeneity (differences between the two learner groups in L2 production). Inter-group heterogeneity is another indicator of crosslinguistic influence. We have already established intra-group homogeneity (similarities in the L2 production of learners with the same L1 background). Table 5 summarizes the results for overall Path expression and Path complexity.

Table 5: Summary of results for overall Path expression and Path complexity.

	L1 German	German learners L2 Danish	L1 Danish	Turkish learners in L2 Danish	L1 Turkish
Freq. of Path expression	high	high	high	low	low
Path complexity	low (s)	low (s)	high (cc, cr, ccc)	low (s)	low (s)

Comparisons between both learner groups and the Danish baseline data revealed the following results. Regarding the frequency of Path expression, a comparison between the German learners' production data and the Danish baseline data shows that both groups exhibit a high frequency of Path expression. Regarding the degree of Path complexity, a difference can be observed in that the descriptions of the German learners show a low Path complexity, contrasting with a high Path complexity in the Danish baseline. A comparison between the Turkish learners' production data and Danish baseline data revealed differences in both aspects. Regarding Path frequency, Turkish learners display a low overall frequency of Path expression in contrast to a high frequency of Path expression in the Danish baseline data. Regarding Path complexity, Turkish learners preferred a low degree of complexity, whereas Danish NSs preferred a high degree of complexity. Comparisons between L1 and L2 data revealed the following results: The comparison between German learners and German NS data shows similarities, both regarding the Path frequency and Path complexity. Likewise, a comparison between Turkish learners and Turkish NSs revealed similarities in that both groups show a low frequency of Path expression as well as a low degree of Path complexity. However, complex Path descriptions are the second-most frequent pattern in both groups. Finally, a comparison between German learners and Turkish learners showed that German learners describe Path more frequently. Both groups prefer simple Path encoding.

Regarding the semantic content of the Path expression, we shall apply the same comparisons across groups. Table 4 summarizes results for the meaning expressed in the Path devices to facilitate these comparisons. Both learner groups diverged from the Danish baseline regarding the complex meaning of the Path expressions. Compared to the descriptions of the Danish NSs, the descriptions provided by the German learners were syntactically less complex. Consequently, the German learners only expressed part of the complex Danish Path description (the upwards vector). However, the one Path device employed by the German learners overlapped part of the meaning expressed in Danish. The Turkish learners provided descriptions that in general were

less complex syntactically, too. In the koala scene, they assigned partly the same meaning as the Danish NSs (vector up). The upwards vector was also expressed in the Turkish L1 data. Furthermore, for the crocodile scene, Turkish learners expressed a goal component. Such a component was not present in the Danish baseline data, but frequently expressed in Turkish L1 data. Thus, the learner groups differed from the baseline data and for the crocodile scene from each other regarding the meanings chosen for Path expression. A comparison of the learner groups to the learners' L1 baseline data revealed the possible sources for variation regarding the meaning of the Path expression: the components that were expressed in the L1 data were expressed in the learners' L2 Danish production.

8. Discussion

We examined if German and Turkish learners are influenced by their L1 in the expression of motion events in Danish as an L2. We considered three aspects: overall Path frequency, Path complexity, and meaning of the Path expression. We identified similarities and differences between learner patterns and Danish baseline patterns. Overall, crosslinguistic influence can be seen as the driving force behind the expression of motion in the L2 on all three aspects.

Regarding the overall frequency of Path expression, the results show that German learners differ from Turkish learners. Overall, the German learners expressed Path as frequently as the Danish NSs. Thus, it may seem that they have mastered the expression of Path to some degree. However, as will be described below, the German learners have not yet mastered the degree of complexity and the correct content of the Path construction in their L2 Danish description.

Overall, the Turkish learners express Path to a much lesser degree when compared to Danish NSs, but in concordance with the Turkish L1 baseline descriptions. Both Turkish groups prefer the expression of a location. It appears that the choice of whether or not to express a Path or location in the description of a scene in L2 Danish is guided by the learners' L1 filter. The frequent expression of a static Ground by both Turkish groups is in line with previous findings in the literature (e.g., Slobin, 1996; Aksu-Koç, 1994; Carroll et al., 2012). For example, *ilerlemek* 'move forward' was the most frequently used verb in the Turkish baseline data and appeared in the construction type Vpath+–DE (locational suffix), e.g. *ağaç-ta ilerlemek* 'on tree move forward'. In Danish, a corresponding Path verb does not exist, but learners used the construction *gå* + *på* 'on' in corresponding scenes. Elsewhere we have therefore argued that *gå* acts as a placeholder for Turkish Path verbs in Danish L2 production (Jessen & Cadierno, forthcoming; also Cadierno, 2010). In Turkish, other Vpath constructions

involve morphological case marking, typically adding Path information, e.g., *ağac-a tirmanmak* 'climb up to the tree' or *ağac-tan inmek* 'move down from the tree', creating complex path descriptions. These constructions cannot be used with the locational suffix –DE. Descriptions of scenes containing a complex Path description, that is Vpath + nominal path marking, in the Turkish baseline data were more likely to yield an explicit Path element in the L2 Danish descriptions than L1 descriptions of scenes containing only a single Vpath + locative –DE. This suggests that a higher degree of complexity in the expression of Path in the L1 increases the likelihood for explicit expression of one or more Path devices in Danish L2. This observation points to the intricate interplay between structural properties and semantic conceptual properties. Overall, the overt expression of Path seems subject to transfer for the Turkish learners of Danish. However, it is difficult to assess whether this transfer is only morpho-syntactic in nature or reflects L1 TfS patterns.

Regarding the degree of Path complexity, results show that both learner groups prefer to express one Path device in their L2 production. This preference is also evidenced in the German and Turkish L1 data. However, the Danish baseline data shows a complex Path-encoding pattern. The two learner groups did not show difficulties regarding the locus of expression. We can thus assume that learning the appropriate L2 lexicalization patterns with Path outside the main verb is not difficult (Vulchanova et al., 2012b). The difficulty for the learners seems to lie in the information selection process, i.e., how many meanings of Path should be selected and expressed. In the TfS framework, this process of information selection is represented as an intricate interplay between linguistic structure and online linguistic conceptualization. As demonstrated in Stutterheim and Nüse (2003) and Bylund and Jarvis (2011), structures are not autonomous, but rather are reflections of linguistic conceptualization. In our case, the morpho-syntactical influence of the L1, i.e., the preference for encoding a simple Path device, has a negative effect on the encoding in the L2, leading to a lack of Path information.

Comparisons across groups regarding the meaning of the Path expressions reveal different preferences for the two scenes investigated. Since the German learners only expressed one Path device, they did not express all the Path semantics provided by Danish NS. They preferred the expression of a simple Path device. The meaning selected for expression is the same in the German learner and the German L1 data. Turkish learners expressed a goal component of Path, which was rare in the Danish baseline data but occurred frequently in the Turkish NS data. Thus, regarding the meaning of Path, both learner groups displayed a reliance on the meanings expressed in the L1s when expressing Path in L2 Danish. In Vulchanova et al. (2012b) the focus was on the locus of Path expression, rather than on Path semantics. However, a closer look at the prepositions used by the Bulgarian learners to express Path in L2

Norwegian reveals that the learners chose items that differed from the lexical items chosen by Norwegian NSs. Equally, in the study by Carroll et al (2012), the non-target like selection of meaning components in the encoding of motion is identified as a reason why very advanced French learners of German or English still do not sound native-like. This non-targetlike selection has its roots in the meaning selection patterns of the learners' L1s.

As described above, this reliance on an L1 pattern of meaning selection is sometimes considered evidence for a reflection of L1 TfS patterns in the L2. Critical claims have been made as to whether differences between an L1 and L2 "regarding linguistic repertoires result in mere surface differences in speech and rhetorical styles, and to what extent, if any, such differences reflect a deeper difference in what information speakers attend to and consider in their construals of events" (Gullberg, 2011). Similarily, Schmiedtova (2011) raises the question whether linguistic results can be taken as evidence for a restructuring in non-linguistic domains. In order to resolve this question, Gullberg (2011) and Brown & Gullberg (2010), among others, use an analysis of speech accompanying gestures as a possible window to conceptualization. Similarly, Schmiedtova (2011) assumes that "eye movements during event conceptualization provide a window on underlying event representations" (p.141) and includes gaze patterns in her analysis.

Thus, we state that there is an influence of the L1 on the L2 that can be called L1 TfS in an L2 or Conceptual Transfer in the respective frameworks. We agree that the augmentation with multiple modalities would enrich studies that ask "Do learners think in their L1 when using the L2?"

9. Conclusion

We asked whether learners think in their L1 when using the L2 or whether learners rethink for speaking. By investigating German and Turkish learners of Danish, we examined three aspects that could help illuminate this question: overall Path frequency, Path complexity, and the meaning of Path. In order to describe a motion event, speakers plan the expression or "non-expression" of a trajectory, whether this trajectory should be simple or complex, and which subpaths are to be selected for expression. We find that the driving force behind the expression of motion in Danish as an L2 is a reliance on preferred planning and selection patterns observed in the L1. These three steps are mutually dependent. Overall, the fact that L1 influence seems present in each step reflects how the interplay between form and meaning is carried over as a whole to the L2. Whereas it becomes obvious that all learners in the study master the locus of expression of Path, it is difficult for the Turkish learners of Danish

to find out when to express a Path. Furthermore, it is difficult for Turkish and German learners to master the degree of complexity and the meaning selection for the typical Danish Path expressions. This is in part due to a lack of frequency and complexity of the Path expression in the L1s and in part due to preferences of Path meaning selection in the L1, when the Path meaning selection differs from Danish. In conclusion, this study shows that the expression of Path in an L2 is subject to L1 influence on different levels, which are mutually dependent. Specifically, the L1 influence not only presents itself as a different form-meaning mapping, rather it is present in the selection of specific meaning for expression. In order to determine whether learners rely on their L1 as a resource in L2 acquisition of motion and the exact nature of this reliance, it would be beneficial not to stop at the examination of lexicalization patterns but to go further and examine the meanings that underlie the lexicalization patterns. This raises the question regarding how exactly the three aspects we examine are interrelated: in the planning process, does the selection of the explicit encoding of a Path element precede the selection of degree of complexity? Can the degree of complexity be established before selecting meaning(s) for the Path expression? This opens the subject for further explorations of a speech production model for L2 learners. Finally, S-languages have been shown to express manner to a higher degree than V-languages (Özçalışkan & Slobin 2003). The question of how learners of Danish as an L2 express the Manner component in the L2 is interesting and subject to another study.

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Appendix A: Results for the Chi-square tests

Comparison	**x-square results**
Danish NS-German NS	x-squared = 45.9303, df = 1, p-value = 1.225e-11
Danish NS-Turkish NS	x-squared = 46.8347, df = 1, p-value = 7.723e-12
Danish NS-German learners	x-squared = 0.1541, df = 1, p-value = 0.6947
Danish NS-Turkish learners	x-squared = 96.2956, df = 1, p-value < 2.2e-16
German NS-German learners	x-squared = 41.4605, df = 1, p-value = 1.203e-10
Turkish NS-Turkish learners	x-squared = 18.6742, df = 1, p-value = 1.551e-05
German learners-Turkish learners	x-squared = 76.4862, df = 1, p-value < 2.2e-16

Appendix B: Snapshots of the 37 video clips used in the study