Up, down, in & out:

Following the Path in speech and gesture in Danish and Italian

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Abstract

This paper investigates cross-linguistic speech-gesture differences in a 'prototypical' satellite framed language (Danish) and a language with split system possibilities for lexicalization (Italian). It is often claimed that languages have specific inventories for lexicalizing motion which are reflected in gestural repertoires. But how are gestures expressed in a language that easily encodes PATH of motion either in verb roots or in satellites? Results from Danish and Italian show cross-linguistic differences in speech and gesture patterns and suggest that gesture production is more a result of the speakers' on-line utterance conceptualization processes rather than language-specific cognitive diversity.

1 Introduction

People often gesture when they speak. These speech-accompanying gestures are closely tied semantically and temporally with speech and language (Kendon 1980; McNeill 1992, 2005). Because of this tight link, speech and co-speech gestures are increasingly seen as planned and processed together at a conceptual level (McNeill 2005) although the nature of the link is still debated (de Ruiter 2007). One way to investigate the speech-gesture relation involves looking at cross-linguistic differences in semantic fields. Languages vary substantially in how meaning is expressed, especially when speaking about motion (Berman and Slobin 1994; Levinson and Wilkins 2006).

Motion is a frequent and everyday topic in human discourse and all languages have means for describing it. A motion event is basically a FIGURE in MOTION along a PATH in respect to a GROUND (for translational motion). Typologically different languages vary considerably in lexicalization of how the semantic features e.g. MANNER of motion (the way the FIGURE moves) and PATH of motion (the direction of the FIGURE) are mapped onto linguistic form (Slobin 2004; Talmy 1985, 1991). These lexicalization patterns are also claimed to influence the syntactic packaging at the level of a clause (Slobin 1996). Based on how and where PATH of motion is framed, languages are generally classified into at least two major categories (Talmy 1985): verb framed languages (e.g. Romance, Turkish, Japanese and Semitic) encoding directionality (PATH) in the verb root, and satellite framed languages (e.g. Indo-European languages except Romance) encoding directionality in satellites to the verb e.g. prefixes, verb particles, adverbs. This categorization leads to the assumption that speakers of different languages have different thinking-for-speaking patterns, also known as linguistic conceptualization (Cadierno and Ruiz 2006; Slobin 1987, 1991, 1996). The term *thinking-for-speaking* refers to the possible effects of language on the kind of thinking that occurs online while speaking a particular language. Cross-linguistic studies reveal striking differences in how speakers of specific languages

allocate attentional and other resources to features of events that the language they speak either foregrounds or provides readily accessible expressions for (Slobin 2004; Cadierno 2012).

This means that speakers of different languages do not attend to the semantic concepts of MANNER and PATH equally since their language does not weight these factors of motion in an equally salient way. Thinking-for-speaking "*involves picking those characteristics that (a) fit some conceptualization of the event, and (b) are readily encodable in the language*" (Slobin 1987, 435). Speakers therefore construe situations in terms of those dimensions that are privileged in their own language which leads to different patterns of lexicalization.

1.1 Cross-linguistic differences in gestures

Insofar as languages differ in how meaning is organized syntactically, co-speech gestures will often reflect these cross-linguistic differences (Gullberg 2011; Kita et al. 2007; McNeill and Duncan 2000; Stam 2006). The influence of lexical packaging of information on gestural output is demonstrated in a number of studies investigating gesture production in typologically different languages (Kita and Özyürek 2003; Brown 2007; McNeill and Duncan 2000). Speakers of satellite framed languages are claimed to focus more on the MANNER component (Slobin 2006) though targeting both MANNER and PATH in speech. They typically express both elements in a single spoken clause and produce a single gesture containing MANNER, PATH or MANNER *and* PATH together in one gesture reflecting the tightness of clause structure (Brown and Gullberg 2008; Negueruela et al. 2004; Kellerman and van Hoof 2003; Kita and Özyürek 2003). Speakers of verb framed languages, on the other hand, more often focus on, and target, PATH of motion in speech and to a minor extend MANNER. MANNER is an optional element and often omitted in speech, possibly due to smaller manner lexicons (Slobin 2003) and/or complexity in subordination of manner. Therefore speakers often distribute MANNER and PATH in two spoken clauses accompanied by two gestures i.e. one gesture per clause. Path gestures tend to align with path verbs and Manner or Manner-Path conflated gestures with MANNER subordinated clauses (Hickmann, Hendriks, and Gullberg 2011; Stam 2006; Kita and Özyürek 2003).

But gesture patterns seem not to be language-specific in the sense that a specific language holds a certain 'mode' of gesturing. Kita et al. (2007) investigated the effect of syntactic frames on gestural representation of MANNER and PATH in English, a satellite framed language, by manipulating elicitation material to elicit both one and two-clause constructions. They found that English speakers were more likely to alter gestural distribution relative to the syntactic construction of the motion description. When describing motion in two separate clauses, speakers were more likely to produce two separate gestures. They thus concluded that the speaker's choice of syntactic framing influences the packaging of information in gestures. Therefore gestural variation reflects the speakers' on-line utterance conceptualization process rather than a habitual cognitive diversity.

1.2 Danish and Italian

Very little attention has been paid to Danish and Italian regarding speech-gesture patterns. There are several reasons for why the languages in question are of interest. Danish and Italian belong to two different typological patterns (Cadierno and Ruiz 2006). Danes typically express PATH through an elaborate system of satellites (e.g. *op*, *ned*, up, down) whereas Italians, although verb framed, have multiple possibilities for expressing PATH in verb roots (e.g. *salire*, *scendere*, ascend, descend), with verb particle constructions (e.g. *andare su*, *salire su*, go up, ascend up) (Folli 2008; Iacobini and Masini 2006) or with manner verbs and directional adverbs (*rotolare su*, roll up). This variety of possibilities in a verb framed language show properties of a 'split system' typology (Talmy 2000, 64).

Italian is particularly interesting as verb particle constructions seem to be more frequently used in than previously thought (Slobin 2004) and as Italian is believed to possess a manner verb inventory that is more comparable in size to English (Iacobini 2010), but see Cardini (2008) for alternative perspectives.

In respect to gesture studies, Rossini (2005) investigated how different levels of lexicalization could affect gestural distribution and found that Italians do express PATH in satellites to the verb far more often than chance (58%) and synchronize gestures with either the lexical item or verb + satellite, but she fails to mention the semantic content of the co-expressive gesture on a quantitative level. Rossini hypothesizes that the distribution of gestures is the result of the tightness of lexicalization patterns i.e. whether the verb and the satellite are bound tightly or clearly separated by other grammatical constituents or prosodic features. Other studies also probe into speech-gesture differences in Italian (and English) finding significant differences in gesture rate and gesture space between the languages when narrating motion events, but do not explain whether these differences are due to habitual differences alone or to linguistic packaging of lexical items as well (Cavicchio and Kita 2013, 2013).

The question remains whether Danish and Italian have different gestural repertoire based on a preferred linguistic pattern of that particular language or if their co-speech gestures are a result of the on-line utterance choice and syntactic structuring of semantic elements.

1.3 Present study

This study investigates how different strategies for expressing MANNER and PATH in Danish and Italian influence the content of co-speech gestures. Since speech and gestures are increasingly seen as integrated in production we expect to see inter-typological differences (between Danish and Italian) and intra-typological in-language variations (for Italian). We ask whether Danish and Italian speakers generally have different gestural patterns based on their preferred typological pattern or whether gestures reflect the speaker's online strategy for lexicalization of motion events.

2 Method

2.1 Participants

Ten Danish (7 female) native speakers (M_{age} 38.3; SD 14.1, range 24-69) and ten Italian (6 female) native speakers (M_{age} 26.3; SD 6.38, range 19-42) participated in the study. They were all university students or postgrads from the University of Copenhagen/Copenhagen Business School and University of Rome (Roma Tre) respectively. All participants were individually shown the elicitation material on a laptop and narrated the events to a confederate listener. All participants were video recorded for further analysis. All data is analysed in Anvil 5.17 (Kipp 2004).

2.2 Material

The elicitation material in this experiment consisted of two sets of four motion events (eight in total). The first set; *the Tomato man movies* (Özyürek, Kita, and Allen 2001) [1] contained translational up and downwards motion (either rolling or jumping) as in figure 1.

The second set; *Boundary ball* (Wessel-Tolvig 2013) contained translational motion in or out (of a house) either rolling or jumping as in figure 2.

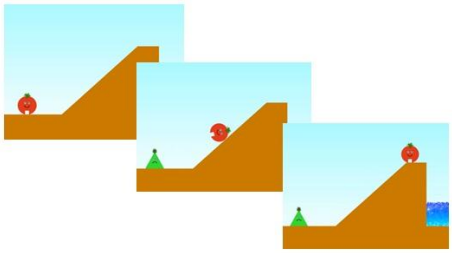

Figure **1**: Tomato man movies

[1] Used with permission from Sotaro Kita (University of Warwick).

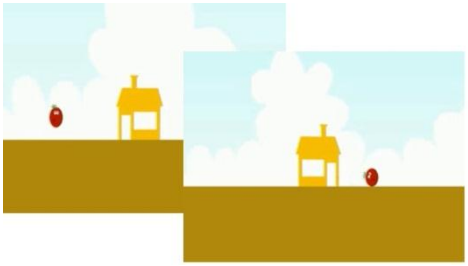

Figure **2**: Boundary ball

2.3 Coding

All participants saw and narrated all 8 motion events. For each narration the target event (the figure moving up and down the hill or in and out of the house) was selected for the analysis. Speech utterances were divided into clauses defined as "*any unit that contains a unified predicate*" (Berman and Slobin 1994, 660) as in (1) and (2). Gestures were coded using McNeill's coding scheme (1992, 377-378).

(1) The ball **[bounced down]** the hill

(2) The ball **[descended]** the hill | as it **[bounced]**

Thus speech clauses were coded for containing either PATH only (he ascends), MANNER only (he rolls), MANNER verb + PATH particle (he rolls up) or PATH verb + subordinated MANNER (he ascends rolling/as he rolls). Gestures were coded as to how they expressed MANNER information (the way the figure moved, gesture mainly depicting a rolling or jumping motion with no directionality), PATH information (the direction of the movement with no indication of how the figure moved), or MANNER and PATH conflated into one single gesture e.g. both MANNER and PATH information simultaneously (the manner of how the figure moved and the direction in respect to the background). The attributes for speech and gesture coding are shown in table 1. Gestures were linked to the concurrent speech clause to clarify how speech and gestures aligned in motion descriptions across the two languages.

Sometimes people do not gesture when speaking, but for data analysis, all motion events were collected whether speakers gestured or not.

Attribute	**Value**
Speech	PATH only MANNER only PATH verb + $\text{SubM}_{\text{ANNER}}$ MANNER verb + satellite
Gesture	Manner only Path only Manner and Path conflated

Table **1**: Annotation features

3 Results

Results show both inter-typological differences in speech patterns and gesture distribution and intra-typological or in-language differences in how gestures are distributed and aligned with speech elements in Italian.

3.1 Speech results

Speech was first transcribed and tokenized, each word constituting a token. The vocal elision of some Italian articles + nouns contracted in written form e.g. *all'interno* (within) was counted as two tokens. For the Danish participants 89 motion events were recorded, and 77 for the Italian speakers. The Danish speakers produced 638 words (only counted within the target motion) whereas the Italians produced 448 words. The Danish participants in the experiment produced more words per motion event than their Italian counterparts as table 2 shows. This can be due to the fact that many Italian motion descriptions only included PATH descriptions (lacking MANNER component), due to implicit subject in Italian, and/or the fact that Danish use directional adverbs + prepositions for PATH + GROUND descriptions.

	Motion events (ME)	Tokens	Tokens/ME Mean	SD
Danish	89	638	7.17	2.8
Italian	77	448	5.82	2.19

Table **2**: Speech results

Congruent with the typology proposed by Talmy (1985), Danish speakers expressed PATH in verb particles (op, ned, ind, ud –*up, down, in, out*) and encoded MANNER in the verb root in one clause constructions (e.g. ruller ned – *rolls down*) as can be seen in figure 3. Italians on the other hand described motion events using a variety of different syntactic constructions including PATH

in verb roots with or without MANNER subordination (entra nella casa | rotolando - *enters the house* | *rolling*) and MANNER verbs followed by PATH particles (rotola giù per la collina - *he rolls down the hill)*. Speech patterns are shown in figure 4 shows.

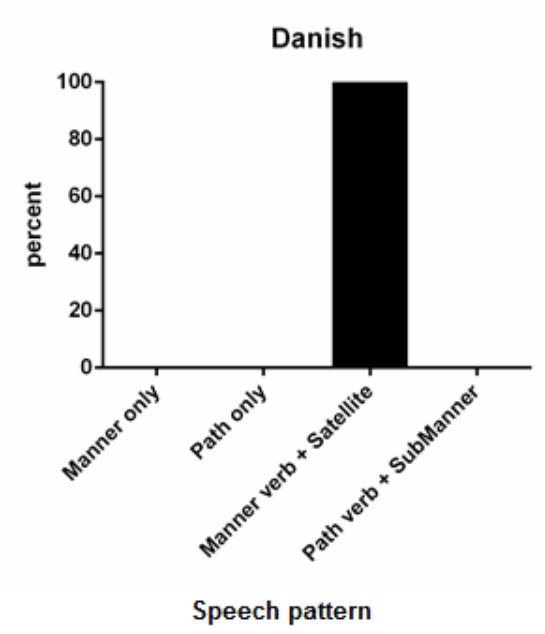

Figure **3**: Speech patterns in Danish

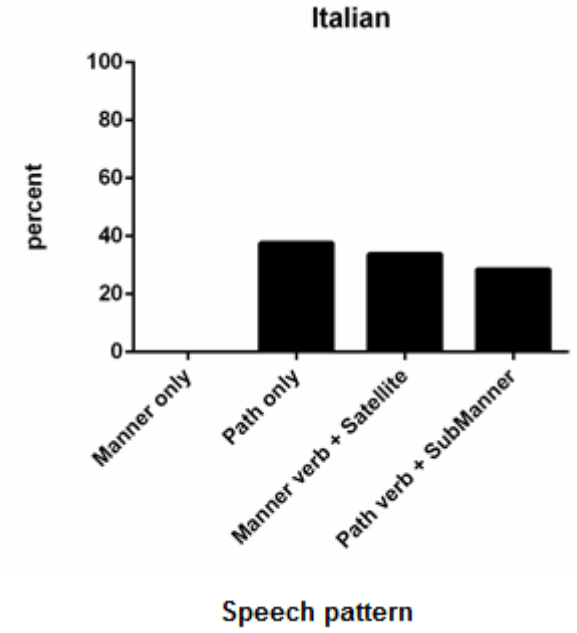

Figure **4**: Speech patterns in Italian

The Italian speakers show a preference for expressing PATH of motion in verb roots (66.2% of all occurrences), but to a high degree also PATH in verb particles (33.8%). The Italian participants often left out MANNER components and expressed only PATH in speech (37.7%). This is congruent with previous research results claiming, that speakers of verb framed languages often leave out MANNER because of syntactic complexity, subordination (Gullberg 2011; McNeill and Duncan 2000), and the fact that motion events can be completed without expressing MANNER e.g. "he enters the house [FULL STOP] | *Jumping*".

Our results for the Italian participants are similar to the findings from Rossini (2005) who also found MANNER verb + PATH particle constructions, but is not similar to the findings by Stam (2006) where none of the Spanish speakers (also verb framed) conflated MANNER and PATH in speech.

3.2 Gesture types

The distribution of gestures shows both similarities and differences between the groups. Extracting the motion events *with* gestures we exclude motion events where no gestures occurred. Many factors govern individual differences in the production of gestures e.g. extraversion/introversion, confederate or naïve listener, shyness, surroundings, repletion/practise etc.

The Danish speakers produced 62 motion events with gestures, which corresponds to 7.05 words per motion event ratio and a 1.05 gesture per motion event ratio, while the Italian speakers produced 68 motion events with gestures corresponding to 5.72 words per motion event ratio and a 1.13 gesture per motion event ratio as can be seen in table 3.

	Motion events + gesture	Gestures	Ratio W/ME	Ratio G/ME
Danish	62	65	7.05	1.05
Italian	68	77	5.72	1.13

Table **3**: Gesture results

The results actually show a very similar distribution of gesture types in the two languages. As seen in figure 5 and figure 6 the Danish and Italian participants produce roughly the same

amount of gestures expressing Manner only, Path only and Manner and Path conflated gestures. The most striking finding is perhaps the high number of gestures conflating MANNER and PATH in Italian, which contradicts other results obtained for other Romance languages.

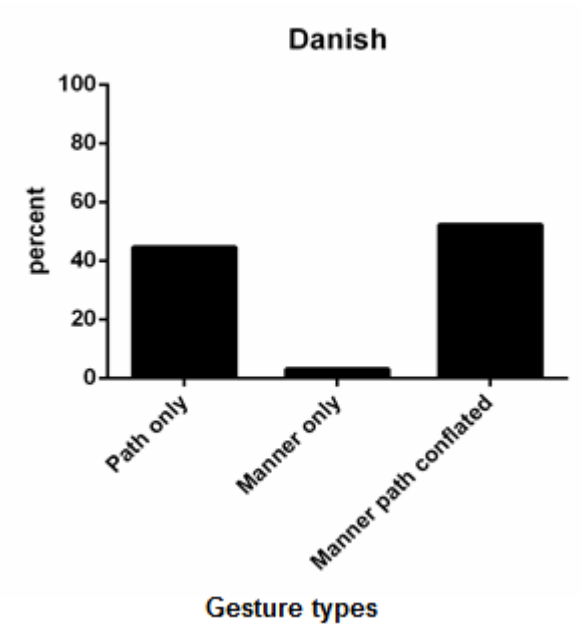

Figure **5**: Gesture types used by Danish speakers

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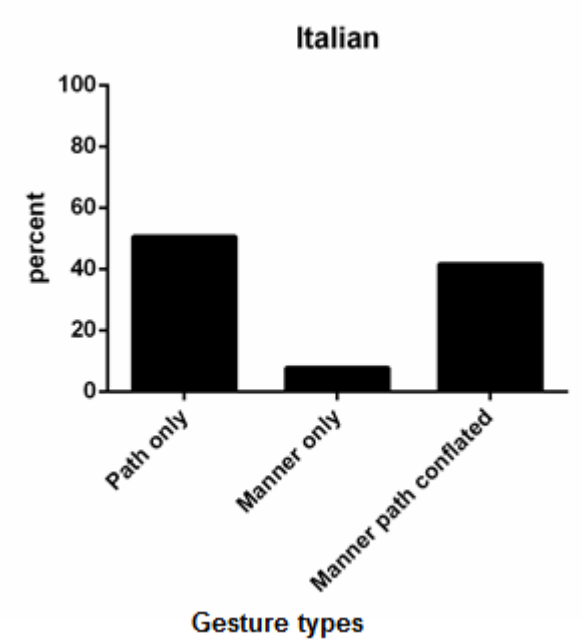

Figure **6**: Gesture types used by Italian speakers

For instance Hickmann, Hendriks, and Gullberg (2011) found none of their French adult speakers conflated MANNER and PATH in gestures. McNeill and Duncan (2000), on the contrary, found Spanish speakers to conflate MANNER and PATH in gestures when expressing motion events with no mention of spoken MANNER. The Manner gesture was therefore not directly tied to a linguistic component, but rather a sign of complementing the verb utterance as it lacked MANNER.

3.3 Gesture distribution

The distribution of gestures (figure 7 and 8) compared with lexical choice shows how Danish speakers in this experiment naturally align all gestures with a MANNER verb + satellite construction (100%) as all gestures in our material co-occur with this type of construction.

More interestingly for Italian the distribution of gestures shows that Path only gestures often align with PATH only speech utterances (MANNER omitted) (e.g. sale per la collina - *he ascends the hill*). This is in line with previous results stating that Path gestures often align with PATH expressions in e.g. Spanish (McNeill and Duncan 2000; Negueruela et al. 2004; Stam 2006).

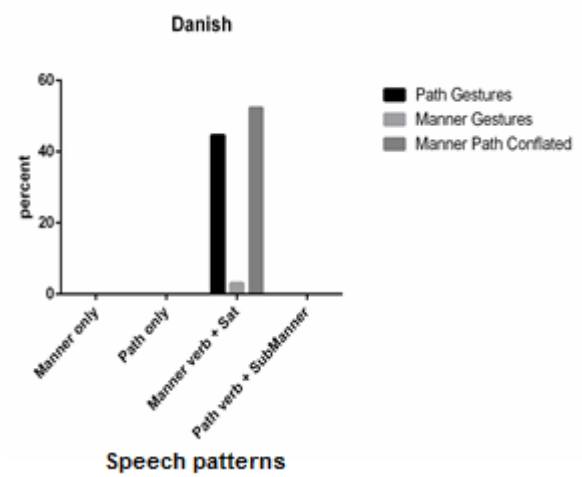

Figure **7**: Distribution of gestures on speech constructions in Danish

Results also reveal that Italian path verb + $SubM_{ANNER}$ constructions (entra nella casa | rotolando - *enters the house* | *rolling*) yield a large distribution of both Path only and Manner

and Path conflated gestures. When the Italians produce MANNER verb + PATH particle (as in satellite framed constructions) they produce Manner and Path conflated gestures.

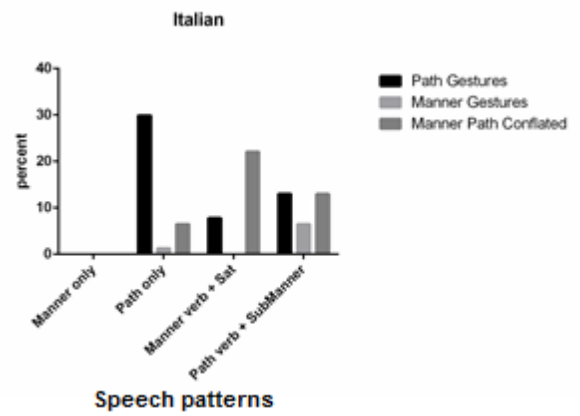

Figure **8**: Distribution of gestures on speech constructions in Italian

4 Discussion

Although the MANNER verb + PATH particle construction is not as frequent in Italian (33.77%) as in Danish (100%) the verb particle construction may be a more recurring element in modern Italian (Iacobini and Masini 2006; Korzen 2012) than previously thought (Slobin 2004). The "deviation" from the more standard verb framed forms is not as pervasive as found in Rossini (2005) who reported 58% of motion occurrences in a study of Italian to be satellite framed. This discrepancy could be explained by several factors like linguistic regional variation of north/south Italy, individual variation (and small datasets) and the fact that half of this study's elicitation material involved the animated character crossing a physical boundary. As indicated by Aske (1989) and Slobin and Hoiting (1994) crossing boundaries using PATH particles in Romance languages is not a possibility (boundary crossing constraint). MANNER of motion in verb framed languages can only be mapped onto the verb root in non-boundary crossing situations (Cadierno and Lund 2004) although there are indications in this material that Italians can *and do* express boundary crossing situations with MANNER verbs and PATH particle constructions. This variation in lexicalization makes Italian an interesting field of study regarding gesture representation of events. The data show how the frequent use of satellite framed constructions in Italian has an influence on the gestural representation. Lexicalizing motion with verb particle constructions promoted the use of Manner-Path gestures more frequently than when MANNER was omitted. The results seem to support the idea that gesture production is influenced by the choice of syntactic packaging of semantic elements, but not to the extent that we can speak about a certain habitual (Italian) way of gesturing. This is in compliance with the idea that gesture production is influenced not only by the preferred speech patterns of the particular language you speak, but more precisely by the on-line utterance planning and syntactic construction you choose for describing a motion event.

5 Conclusion

Although linguistic conceptualization is a well-studied area and also growing within gesture studies, only a handful of languages are recently investigated. The need for baseline data from other languages is vital, and especially data from languages not following standard verb or satellite framed forms (like Italian) can provide detailed information to a range of theoretical issues in language and gesture production and in cognitive studies. Future analyses will focus on how Danish learners of Italian learn to cope with the dual Italian strategy for expressing motion. Preliminary results indicate a re-organization of semantic representation and a shift in attention towards a uniform verb-framed system which is opposite of the Danish L1 system, but which does not really correspond to the reality of spoken Italian.

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