

Running title: Placement events in gestures

## Language-specific encoding of placement events in gestures<sup>\*</sup>

Marianne Gullberg

Max Planck Institute for Psycholinguistics, Nijmegen, the Netherlands

In Pederson, E. & Bohnemeyer, J. (Eds.). *Event representations in language and cognition* (pp. 166-188). New York: Cambridge University Press.

Address correspondence to:

Marianne Gullberg (marianne.gullberg@ling.lu.se)

Centre for Languages and Literature

Lund University

PO Box 201

221 00 Lund

Sweden

---

### Notes

<sup>\*</sup> I gratefully acknowledge financial and logistic support from the Max Planck Institute for Psycholinguistics, and funding from the Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO; MPI 56-384, The Dynamics of Multilingual Processing, awarded to M. Gullberg and P. Indefrey). I thank Asifa Majid, Bhuvana Narasimhan, Asli Özyürek, Eric Pederson, Mandana Seyfeddinipur, and David Wilkins for their valuable input and thoughtful comments. I am also grateful to Wilma Jongejan, Arna van Doorn, and Merlynn Williams for assistance in data collection, coding, and establishing reliability.

## 1. Introduction

What information do speakers attend to as they prepare to speak about the world? This question lies at the heart of concerns about how language might influence the ways in which humans deal with the world. As we plan to talk about events around us, we must select which information is relevant for expression and how to encode it in speech. This activity is alternatively known in the literature as macro-planning, linguistic conceptualization, event construal, and perspective taking (e.g. Levelt 1989; Von Steutterheim and Klein 2002; Von Steutterheim, Nüse, and Murcia-Serra 2002). Various suggestions have been made regarding what constrains such information selection. One approach focuses on the effects of the linguistic categories themselves. It suggests that speakers' choices of information are guided or 'filtered' through the linguistic categories afforded by their language, specifically by the categories they habitually use to express events (e.g. Berman and Slobin 1994; Carroll and Von Steutterheim 2003; this volume; Slobin 1991; 1996a; Von Steutterheim and Nüse 2003; Von Steutterheim et al. 2002). This idea is known as the *thinking for speaking* hypothesis (e.g. Slobin 1991; 1996a). Language-specific rhetorical styles, views or perspectives arise through the habitual use of linguistic categories that select for certain types of information to be expressed (Slobin 2004; Talmy 2008). This view of the effect of linguistic categories on speaking differs in scope from the so-called linguistic relativity or 'neo-whorfian' hypothesis. Linguistic relativity proper explores the effect of language on general cognition (e.g. Gumperz and Levinson 1996; Lucy 1992). The focus here, however, is on the effect of linguistic categories on the activity of information selection or linguistic conceptualization for speech.

It may seem self-evident that insofar as languages provide different linguistic categories encoding different meanings, this will affect what type of information speakers should focus on and how they talk about the external world (cf. Pederson 1995). Nevertheless, it remains a vexing question to what extent differences in 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. That

is, it is far from clear whether event representations are always reflections of semantic categories or whether speakers have neutral event representations that are guided by properties of events themselves. Although semantic distinctions in verbs, for instance, seem to steer attention to certain types of information, speech may not reflect all aspects of the information that speakers actually consider. That is to say, speech may be under-specified with regard to the details of representations. The question then arises how to ascertain what information is considered. Different types of behaviors have been shown to reflect linguistic activities. For instance, studies using eye-tracking techniques have shown that speakers' gaze behavior is influenced by language in that they look at precisely those entities they are about to talk about (Meyer 2004; Meyer and Döbel 2003). Importantly, speakers of different languages look at different entities and locations, reflecting subtle distinctions made in the languages spoken (Carroll and Von Steutterheim, this volume). This paper explores yet another source of information, namely speech-associated gestures. Although gestures convey information in a very different format from speech, their forms and timing have been shown to reflect the expression of linguistic information (e.g. Kita and Özyürek 2003; McNeill 1992).

The target domain for this study is that of placement, an event type firmly grounded in sensori-motor experience and a popular candidate for a universal, language-neutral event type. This event type has not been examined before in terms of language-specific event construal in speech and gesture. This paper asks the following questions. Do the semantic properties of verbs habitually used to describe placement events guide speakers' attention to different types of spatial information, keeping syntactic and information structure constant? What can gestures tell us about language-specific linguistic event representations beyond speech in this concrete domain?

## **2. Gestures**

Speech-associated gestures, defined as the movements speakers perform while they speak as part of the expressive effort, might at first glance seem like an ideal place to look for language-neutral perspectives on events. After all, gestures seem well suited to represent what is seen or

done iconically and mimetically. However, the relationship between gestures, what is seen (percepts) and done (actions) is complicated by the impact of language, at least when gestures accompany spoken descriptions. In fact, gestures, speech and language are intricately linked to each other (Kendon 1980, 2004; McNeill 1985, 1992). The integration between the modalities is seen both in comprehension and in production. For example, gestures affect the interpretation of and memory for speech (e.g. Beattie and Shovelton 1999a; Cassell, McNeill, and McCullough 1999; Graham and Argyle 1975; Kelly, Barr, Breckinridge Church, and Lynch 1999; Özyürek, Willems, Kita, and Hagoort 2007). They also appear to be integral to speech production in that speakers deliberately distribute information differently across modalities depending on whether interlocutors can see their gestures or not (e.g. Bavelas, Kenwood, Johnson, and Phillips 2002; Holler and Beattie 2003; Melinger and Levelt 2004). The link between speech and gesture is also seen in their parallel development in childhood (Goldin-Meadow 2003; Mayberry and Nicoladis 2000; Volterra, Caselli, Capirci, and Pizzuto 2005), and breakdown in disfluency (Seyfeddinipur 2006) and stuttering (Mayberry and Jaques 2000). Several recent theories attempt to formalize the relationship between gesture, language, and speech production (e.g. Alibali, Kita, and Young 2000; De Ruiter 2000; Kendon 2004; Kita and Özyürek 2003; Krauss, Chen, and Gottesman 2000; McNeill 1992; 2005). Although the details of the relationship are not yet fully understood and the theories differ in their views on the mechanics, the relationship itself remains undisputed.

Of particular relevance here is the steadily growing evidence that gestures reflect linguistic choices. It has been observed at various levels of granularity that gestures and speech often are temporally and semantically coordinated such that they express closely related meaning at the same time. More specifically, gestures reflect information selected for expression (what is relevant and newsworthy) and also the way in which it is then (lexically) encoded in speech. At the level of information selection, a number of studies have shown that gestures tend to co-occur with elements in speech that represent new or focused information (e.g. Levy and McNeill 1992; McNeill 2000b; McNeill and Levy 1982; McNeill, Levy, and Cassell 1993). Crosslinguistic differences in discourse organization and its implementation in linear speech are therefore mirrored in language-specific gesture patterns (e.g. Duncan 1996; McNeill and Duncan 2000).

For instance, in narratives Dutch, Swedish, and French speakers treat discourse referents' actions as newsworthy and structure discourse such that actions become focused information. Japanese speakers instead treat discourse referents' locations and the setting as newsworthy and structure discourse accordingly. These different linguistic foci result in different narrative gesture patterns, with Dutch, French and Swedish speakers generally gesturing more about actions, and Japanese speakers gesturing more about entities that are part of the setting (Gullberg 2003, 2006; Yoshioka and Kellerman 2006).

Turning to how information is expressed, gestures also reflect the way in which specific information is encoded in speech (e.g. Duncan 1996; Kita and Özyürek 2003; McNeill 1992, 2000a; Müller 1994). For instance, in the domain of voluntary motion Kita and Özyürek have shown that gestures accompanying motion expressions in English look different from the corresponding Turkish and Japanese gestures (Kita and Özyürek 2003; Özyürek, Kita, Allen, Furman, and Brown 2005). English speakers tend to express manner and path of motion in one single verbal clause (e.g. *he rolls down*) and in one single gesture that encodes both manner (*roll*) and direction of the motion (*down*) in one movement. In contrast, Turkish and Japanese speakers typically express the manner and the direction of motion in two separate verbal clauses (e.g. *the ball descends rolling*) and typically in two gestures, one expressing the direction (*descends*) and the other the manner of motion (*rolling*) independently. Kita and Özyürek have argued that the separate gesture patterns reflect the linguistic encoding patterns in these languages, a claim strengthened by the observation of within-language variation depending on what structures speakers actually use (Özyürek et al. 2005).

A further observation is that gestures are particularly well suited to express spatial and/or imagistic information such as size, shape, directionality, etc., because of their imagistic and synthetic nature (e.g. Beattie and Shovelton 1999a, 1999b; Beattie and Shovelton 2002). Such spatial information is in fact more likely to be encoded in gesture than in speech. Gestures therefore often express additional or complementary spatial information to speech (cf. Beattie and Shovelton 1999a; De Ruiter 2007; Kendon 2004). In this sense, gestures provide a fuller picture

of what spatial information is taken into account for speaking than can be gleaned from speech alone.

To summarize, then, gestures reflect linguistic choices both at the level of information structure and at the level of linguistic, structural choices. Moreover, complementary spatial information that is not easily expressible in speech may be revealed in gestures. Insofar as speakers of different languages target different sorts of (spatial) information for expression, i.e. display language-specific event construal or linguistic conceptualizations, this difference may be reflected in gestures either in terms of where gestures fall (what is newsworthy) or in terms of how gestures look (what meaning elements are taken into account). If meaning elements are relevant to the event construal but not readily expressed in speech, they may nevertheless be visible in gesture as additional spatial information. Note again that because of their link to language and linguistic choices, gestures are well suited to explore linguistic event representations, but not linguistic relativity proper, i.e. effects of language on general cognition.

### **3. The test domain: Placement events**

Placement events are mundane, frequent events where somebody moves an object to a location, as in putting a coffee mug on a desk. These events can be described more technically as caused motion events involving an action where an agent causes an object (the figure object) to move to an end location (a goal ground) to which it will relate in a resulting spatial relationship. Typically, the agent maintains manual control over the figure object until it reaches its end location (Bowerman, Brown, Eisenbeiss, Narasimhan, and Slobin 2002; Slobin et al., this volume; Talmy 1985).

Placement events are an interesting test domain for language-specific event construal because they are popular candidates for a cognitively basic and universal event category with language-neutral representation. A number of properties speak for such a position. First, placement events have a firm experiential basis involving sensori-motor patterns of manual grasping of objects. Partly based on this observation, it has been suggested that causing something to move somewhere is a basic category also for language, often encoded in

semantically general or light verbs such as *put* (e.g. Goldberg 1995; Pinker 1989). It has further been proposed that children come preordained with a basic placement category at the outset of the language learning task, and then simply map a linguistic label from the input language onto it (e.g. Gleitman 1990; Piaget and Inhelder 1956; Pinker 1989). The acquisition of placement terms should therefore be early and effortless. The view of placement as basic and universal is further bolstered by recent evidence suggesting a common neurological basis for action, perception, and language. Seeing someone grasping an object or hearing words like *pick* activates the same areas of motor cortex as when the action is actually performed (e.g. Pulvermüller 2005).

There are, however, also reasons to question the basic, universal, and language-neutral representations of placement and instead expect language-specificity. First, the basicness of placement is called into question by the observation that placement verbs do not seem to be acquired as early, easily, and uniformly as previously thought. In fact, even the acquisition of the meaning of general placement verbs like English *put* is protracted and involves stages where children as old as three years of age use targetlike forms in ways that differ from adult usage (Bowerman 1978, 1982).

Second, the universality and language-neutrality of placement seems questionable in view of the considerable crosslinguistic variation in the domain. Languages vary greatly in how placement events are encoded linguistically and in how the information about the figure object, the ground, and the relationship between the two, is distributed across the clause (cf. Sinha and Kuteva 1995). Depending on the language, the spatial information can be encoded in the adpositional or adverbial phrases describing the goal ground (*on the table*), in local case markings, in spatial nominals (e.g. *top*, *side*), and in locative verbs (Levinson and Meira 2003; Levinson and Wilkins 2006).

The semantic specificity of placement verbs further varies extensively across languages (Ameka and Levinson, 2007; Bowerman et al. 2002; Kopecka and Narasimhan, to appear; Newman 2002a; Slobin et al, this volume). Light verbs (Jespersen 1965) or 'general-purpose' verbs like *put* cover a range of events and tend to encode cause and change of location. Other verbs have more specific semantics and constrained extensions to specific events. For instance,

locative posture verbs (e.g. *set*, *stand*, *lay*) encode cause and change of location, but also take properties of the figure object and its orientation and disposition with respect to the ground into account. They must each be applied to specific events. Such systems are typical in Germanic languages (e.g. Berthele 2004; David 2003; Gullberg and Burenhult to appear; Hansson and Bruce 2002; Lemmens 2002a; Newman and Rice 2004; Pauwels 2000; Serra Borneto 1996; Van Oosten 1984), but are also found in many other languages (see various in Ameika and Levinson, 2007; Kopecka and Narasimhan, to appear; Newman 2002b). In other languages verbs encode distinctions like path, such as *meter* 'insert' in Spanish (cf. Slobin et al., this volume), or a combination of path and final end state, such as the difference between final containment vs. support from below, like *kkita* in Korean meaning 'to place by inserting tightly between two pinching surfaces' (Bowerman et al. 2002; Bowerman and Choi 2001; Choi, McDonough, Bowerman, and Mandler 1999). In some languages verbs are so specific as to be classificatory or dispositional as with *tz'apa* in Tzeltal meaning 'standing of stick-shaped object vertically erect with base buried in support' (Brown 2006). Some languages display a degree of optionality such that both a general and a semantically specific system exist in parallel. English, for instance, has both a general placement verb, *put*, and what Levin (1993) calls 'verbs of putting in a spatial configuration', exemplified by *set*, *stand* and *lay*. While both groups of verbs are available, the most frequently or habitually used expression is often the general verb, whereas the specific system is reserved for making contrastive or otherwise pragmatically motivated distinctions. For instance, Tamil speakers will use a general verb, *veyyii* 'put', the first time they see a given object being placed (Narasimhan and Gullberg 2006). If they encounter the same object again, they will typically use a more specific verb, *nikka veyyii* 'make stand' or *paDka veyyii* 'make lie', to highlight the contrast to the first mention.

**Kommentar:** Is this a reference to *Linguistics* 45(5) as an entire issue? The bibliography seems to suggest that the to appear is just their article.

#### Placement in French and Dutch

French and Dutch differ with respect to the division of labor between prepositions, existential verbs, locating verbs, and posture verbs (e.g. Chenu and Jisa 2006; Hickmann 2007; Hickmann and Hendriks 2006; Lemmens 2006; Van Oosten 1984). French encodes locative information



mainly in prepositional or adverbial adjuncts. Most caused motion or placement events can be described in French using the general placement verb *mettre*, 'put', followed by a prepositional phrase (1).

(1) elle met le bol sur la table

'she puts the bowl on the table'

The general placement verb mainly encodes cause and change of location. A range of more specific verbs also exist which focus chiefly on the manner of attachment, conflating action and relation or path such as *accrocher* 'hang, hook', *insérer* 'insert', or even the nature of the figure object as in *verser* 'pour into' (e.g. Chenu and Jisa 2006; Hickmann 2007). In addition, there is a trade-off in specificity such that the general verb is followed by greater specificity in the expression of ground carried by specific prepositions, whereas the specific verbs are followed by more general prepositions (Chenu and Jisa 2006; Hickmann 2007).

Dutch encodes locative information across posture verbs and prepositions. To describe placement events one of a set of caused posture verbs is typically used which encode information about figures and the end configuration on the ground as well as cause and change of location towards that ground (cf. Slobin et al., this volume). Crucially, for any given event, a posture verb is chosen, and the choice depends on the properties of the object being located: its shape, its orientation, and its disposition with respect to the ground. Specifically, the semantic distinctions concern the presence of a functional base and whether the figure object is resting on it, and whether the spatial extension or projected axis of the object is vertical or horizontal (Lemmens 2002a, 2006; van Staden, Bowerman, and Verhelst 2006). For objects resting on their base, *zetten* 'set' is typically used. For objects lacking a functional base and/or extending horizontally, *leggen*, 'lay', is preferred. The posture verbs are followed by locative prepositional phrases as exemplified in (2).

(2) ze zet/legt het kommetje op de tafel

'she sets/lays the bowl on the table'

In addition to the posture verbs, Dutch also has a range of placement verbs that typically encode the manner of placing or attaching something, such as *plakken* 'stick, glue', but also verbs that conflate manner of placing with final containment like *stoppen* 'put.into' (Lemmens 2006).

In summary, the placement verbs habitually used in French (the general verb *mettre* 'put') and Dutch (the caused posture verbs *zetten* 'set/stand' and *leggen* 'lay') select different types of spatial information for expression. It is therefore possible that speakers of Dutch and French consider different types of spatial information as they prepare to talk about placement and have language-specific event construals of placement.

#### 4. This study

This study explores whether the semantics of Dutch and French placement verbs affect speakers' linguistic conceptualization of -- or *thinking for speaking* about -- placement, and whether these lead to language-specific event representations. Specifically, the study asks whether speakers of languages whose verb categories encode different spatial information actually attend to different types of information (language-specific event construal), or whether they attend to the same information despite differences in linguistic distinctions (language-neutral event construal). In contrast to existing studies of event representations, this study targets a concrete domain where a language-neutral, experience-based representation with a focus on the same basic spatial information is likely. Overt differences in speech alone between Dutch and French will not necessarily address this issue. In Dutch, the lexical encoding is specific, and so the event representation can be assumed to be as well. In French, the lexical encoding is coarse-grained. However, coarse-grained, under-specified speech does not preclude an event representation that takes other information into account even if it is not realized in speech. Therefore, to probe event representations further, all vehicles of meaning will be considered, namely both speech and speech-associated gestures. Gestures may reveal additional aspects of what spatial information Dutch and French speakers take into account when talking about placement and reflect differences in event construal. Also in contrast to existing studies, this study will compare

instances where the organization of information structure and syntactic structure is kept constant across languages in order to explore the effect of verb semantics alone.

Two possibilities can be posited. First, if linguistic conceptualization of placement is language-neutral and instead guided by general properties of the event itself, then French and Dutch speakers should attend to the same types of spatial information as they prepare to talk about it, even though the verb categories differ. Dutch and French speakers should gesture similarly as they describe the same placement events, perhaps representing placement as an enactment of the observed, practical action in both languages.

Second, if the linguistic conceptualization of placement events is guided by verb semantics, then French and Dutch speakers should construe these simple events differently, and attend to different types of spatial information as they prepare to talk about them. Dutch and French speakers should then gesture differently as they describe the same placement events keeping information and syntactic structure constant across languages.

If Dutch and French speakers gesture differently while using similar syntactic structures, the following predictions can be made regarding the form and content of their gestures. Given that the semantics of the Dutch posture verbs *zetten* 'set/stand' and *leggen* 'lay' conflate caused motion with object properties, Dutch speakers should attend to the figure object in order for verb selection to proceed. Gestures accompanying Dutch placement expressions may reflect this object focus in hand shapes that reflect the physical properties of the object (object incorporation), as well as the movement of the physical action encoded as gestural path.<sup>1</sup> In

---

<sup>1</sup> Hand shapes are a likely gestural reflection of object incorporation. The act of grasping or moving a real object involves a motor pattern whereby the hand encloses the object and so moulds itself around the shape of the object. The shape of the hand therefore reflects the properties of the object. A gestural representation – that is, a symbolic movement without the real, physical object – that incorporates the imagined object with the placement movement might draw on this same pattern and thus represent the object in a hand shape. This is in potential contrast to expressions that target the object itself, for example existential expressions like *there was a big bowl*. Such expressions may yield other object-related gestural expressions such as

contrast, the French placement verb *mettre*, 'put', encodes only the caused movement towards the ground. French speakers should therefore typically attend to the movement towards the ground but, crucially, not to the figure object. Gestures accompanying French placement expressions may therefore express only the movement towards the goal encoded as gestural path, but not information about the figure objects.

#### Method and data

A referential communication task was used to elicit event descriptions. The task was a director-matcher game (Clark, Carpenter, and Just 1973; Clark and Wilkes-Gibbs 1986) where a speaker watches video clips of placement events on a laptop screen and then describes them to an interlocutor. The stimulus clips show an actor putting away objects found on the floor of a messy room. The stimulus comprises 32 placement events where 32 objects are placed on 14 grounds. The 32 events are distributed over 8 video clips with each clip showing 4 events. The first and last clips also include an introductory and a wrap-up sequence showing the actor entering and leaving the room, respectively. The task requires a Describer to watch one clip at a time, i.e., the placement of four objects. When the screen goes blank, she must describe from memory to a Drawer what the agent in the video did to the objects. The Describer has a list of the object nouns as memory support so as not to omit any object (e.g. *chair, tablecloth, bowl, bananas*). The Drawer, in turn, has a picture of the empty room and has to draw in the objects in their final destinations. The elicitation set-up is illustrated in Figure 1.<sup>2</sup> The task is interactive and self-

---

gestures that trace the shape of an object. However, such object-focused expressions are not under study here.

<sup>2</sup> The low barrier between the interlocutors might have obscured some of the Describer's gestures from the Drawer's view (although not from the Analyst's view). Although this raises interesting questions about whether the Drawer made use of the gestural information (e.g. Beattie and Shovelton, 1999a; Kelly et al. 1999), as well as whether the Describer intended some of the gestures to be seen by the Drawer (e.g. Gullberg 2006; Holler and Beattie 2003; Melinger and Levelt 2004), these issues are not relevant for the current study.

paced. Oral and written instructions called for a description of "what happened" in order to focus the description on the placement activity. No mention was made of gesture. A post-test questionnaire ascertained that participants were unaware of the focus on gestures.

INSERT FIG 1 HERE

Descriptions were elicited from 12 pairs of native speakers of French and 12 pairs of native speakers of Dutch. The role as Describer and Drawer was assigned randomly and kept throughout the task. Participants were paid for their participation and provided written consent to use the data. Only speech and gesture data from the Describer went into the analyses.

#### Data treatment and coding

##### *Speech*

The placement descriptions were transcribed verbatim by native speakers of each language. The descriptions include the first complete and minimal description of the target events with mention of the figure object, the placement verb, and often also the ground location. Only the first spontaneous, simple renditions of the target scene i.e. the placement event itself, exemplified in italics in (3)-(4), were analyzed. Elaborations on the precise locations, often prompted by the interlocutor's questions, were not included.

(3) ze pakt de prullenbak *die zet ze rechtop naast het bureau*

'she takes the wastepaper basket she sets it straight next to the desk'

(4) elle prend la poubelle *elle la met à droite du bureau*

'she takes the wastepaper basket she puts it to the right of the desk'

All placement verbs were extracted from these first renditions. Excluded were cases of self-motion plus placement (e.g. 'bring'), cases of giving something to an animate recipient, answers to where-questions, and self-repetitions (cf. Slobin et al., this volume). The interrater reliability for the placement verb coding was Cohen's kappa .95.

##### *Gesture*

The digital video recordings were coded frame-by-frame using video annotation software (Mediatagger 3.1, see Brugman and Kita 1995). All representational gestures occurring within the

first spontaneous renditions of the target event in speech (i.e. the italicized parts in (3) and (4) above) were identified (N=238). The analysis targeted gestural strokes, i.e. the most effortful and meaningful parts of manual movements (Kendon 1980; Kita, Van Gijn, and Van der Hulst 1998; McNeill 2005: 32). Excluded from analysis were gestures occurring with lengthy descriptions of the figure objects themselves when introduced; substitutive gestures, i.e. gestures replacing speech in expressions such as "She did like this"; and clearly compensatory gestures in cases of word finding problems (cf. Gullberg 1998). The remaining gestures were coded without sound for form as either Figure-incorporating or encoding Simple-path. Gestures displaying hand shapes reflecting the figure object were coded as Figure-incorporating. Gestures expressing a "spatial excursion" (cf. Kendon 2004) with either a pointing hand shape or no particular hand shape, i.e. a relaxed, floppy hand, were coded as Simple-path. The two coding categories are mutually exclusive for each gesture. The interrater reliability for the gesture identification and form coding was Cohen's kappa .89, and .94, respectively.

Finally, the speech precisely co-occurring with the gesture strokes was noted and coded for word class.

## 5. Results

### Crosslinguistic placement in speech

The speech data overall confirm the language-specific patterns proposed for Dutch and French. First, in terms of information structure, both Dutch and French show a clear preference for introducing the figure object in a separate clause (underlined in examples (3) and (4) repeated here for convenience), followed by a target event clause expressing the placement (in italics).

(3) ze pakt de prullenbak *die zet ze rechtop naast het bureau*

'she takes the wastepaper basket she sets it straight next to the desk'

(4) elle prend la poubelle *elle la met à droite du bureau*

'she takes the wastepaper basket she puts it to the right of the desk'

Further, the placement verbs project similar structure in both languages. The elements in the target event clause in Dutch (3) are ordered figure object – verb – agent – (adverb) – location. In

French (4) the order is agent – figure object – verb – location. These orders accounted for 67% of all Dutch and 62% of all French descriptions. The next most frequent orders in Dutch have either fronted location (location – verb – agent- object, 9%), or verb (verb – agent – object – location, 7%). In French, the next most frequent orders are agent – verb – object – location (17%) and location – agent – verb – object (7%).

Second, concerning the verbs used, the Dutch descriptions include 21 verb types (35 if particle constructions like *neerzetten* 'set down' and *opzetten* 'set on' are considered separately). Three verb types constitute 66% of the tokens. *Zetten* 'set/stand' is used to describe scenes where figure objects are located in a vertical position on a base, and *leggen* 'lay' is used about scenes where objects are placed in a horizontal position. *Hangen* 'hang' is applied to scenes where objects are suspended over or around something or are attached to a vertical surface. Three other verbs are fairly frequent, namely *stoppen* 'put.in, insert', *plakken* 'stick, glue', and a light verb, *(in)doen* 'do' or 'make(into)', which together account for a further 24% of the tokens. The French descriptions include 33 verb types. One verb, *mettre* 'put', accounts for 51% of all tokens in the set. Moreover, it is used to describe all scenes. For scenes where objects are located in a vertical position, *poser* 'put, set down' is sometimes also used, accounting for 18% of the tokens. Four other verb are moderately frequent: *accrocher* 'hang, hook', *coller* 'stick, glue', *ranger* 'put away, in order', and *replacer* 're-place, put back' (17% of the tokens).

The particular verb choices in this data set are obviously dependent on the elicitation tool. Nevertheless, two clear patterns appear for each language. Overall, in Dutch, three verbs dominate the descriptions and constitute the most frequent verbs: *zetten* 'set/stand', *leggen* 'lay', *hangen* 'hang'. These verbs are all posture verbs that are specific with regard to object properties and spatial relationships between figure and ground. They are each applied to different scenes. In French, in contrast, one single verb dominates: *mettre* 'put'. It is a general placement verb that mainly encodes movement. It can be used to describe all scenes. More specific verbs are much less frequent and are only found for scenes that involve suspension or sticky attachment.

## Crosslinguistic placement in gesture

The analysis of all gestures occurring with the first spontaneous renditions of the target placement events reveals two language-specific gestural patterns for Dutch and French at the level of gestural form as illustrated in Figures 3 and 4. The Dutch speaker in Figure 3 talks about the stimulus scene shown in Figure 2, the placing of a bowl of bananas on the desk. She uses one of the two posture placement verbs, *zetten* 'set/stand'. She accompanies the description with a bi-manual gesture displaying cupped hand shapes, as if holding the bowl, moving to her right. The French speaker in Figure 4 describes the same scene using the general placement verb *mettre* 'put'. Her gesture is strikingly different. She accompanies the description with an open-handed gesture moving sagittally outwards. This gesture only indicates the path outwards towards the ground and reflects no object properties at all. This difference in what information is encoded in gesture constitutes a robust preferential pattern across the languages. Dutch speakers are significantly more likely to incorporate figure object information in their gestures than are French speakers (Dutch on average 59% vs. French 35%;  $p \leq 0.05$ ). Conversely, French speakers are significantly more likely to encode only simple path information in gestures than are Dutch speakers (Dutch on average 41% vs. French 65%;  $p \leq 0.05$ ).

INSERT FIGS. 2, 3, 4 HERE

Crucially, the difference in gestural form is not related to a difference in the timing of gestures relative to speech. In both language groups, gestures occurred most frequently with verb phrases (on average 49% in Dutch and 55% in French), followed by prepositional phrases (on average 30% in both Dutch and French). In other words, the difference in form does not reflect a difference in what aspects of the event are targeted as being newsworthy or focused in the two languages. In particular, the French gestural focus on path is not a reflection of gestures aligning with prepositional phrases expressing ground location as opposed to Dutch gestures aligning with verbs. Instead, both languages treat the action as the most newsworthy element and align gestures with verbs.

A further important observation is that neither the Dutch nor the French speakers imitate the action seen in the stimulus video. The stimulus scene in Figure 2 shows the actor placing of a



bowl of bananas on the desk using a single left hand to put the bowl on the desk, gripping it around the rim. Both the Dutch in Figure 3 and the French speaker in Figure 4 gesture something different. The Dutch speaker uses a bi-manual gesture moulding the entire bowl as she moves it instead of gripping it (cf. Müller 1998). The French speaker moves her open right hand sagittally outwards, not gripping or moulding anything. Neither gesture resembles the action in the video, which is particularly obvious in the case of the French gesture. There is therefore no simple and direct one-to-one mapping between the percept and the gesture that accompanies the description of the percept, nor between the practical action that is described and the gesture that accompanies the description of the action. Put differently, speakers do not necessarily gesture what they see or what they would do if they performed the physical action, but rather what they say (cf. De Ruiter 2007).

The crosslinguistic differences in gestural form thus reflect a difference in what spatial information Dutch and French speakers select for gestural expression, and, by extension, what spatial information they consider to be relevant for speaking about placement events. The gesture data therefore seem to support the notion that there is a crosslinguistic difference in placement event construal in French and Dutch with two different foci: one (French) focus on the movement towards the goal ground encoded in gesture as simple path; another (Dutch) focus on the movement of a particular object towards the goal ground, encoded in gesture as object-incorporation with the path.

#### Alternative explanations? Gesture chains and lingering hand shapes

As seen above, the syntactic structures onto which the semantic elements map are similar in both languages. Moreover, both languages organize information in similar ways, with the figure object typically introduced as a direct object in a separate clause, followed by another clause in which the object is reduced to a pronoun and the action of moving and the ground constitute the new, focused information. Given that gestures often occur with new information in a clause, gestures may accompany the introduction of the figure object in one clause, and be followed by another gesture for the action in the subsequent clause. If the gesture concomitant with the introduction of

the object reflects some aspect of that object, the subsequent gesture accompanying the placement action could display lingering hand shapes since gestures influence each other as they occur in gesture chains. This might account for a tendency towards object-incorporating gestures.

In both languages half of the figure objects were accompanied by gestures when first introduced. In Dutch, the gesture on the figure was followed by a gesture on the verb that encoded figure information. However, in French, gestures on the figure were followed by gestures on the verb encoding path information. In other words, although it cannot be ruled out that the figure focus on verbs in Dutch is an effect of a lingering hand shape from the preceding gesture with the introduction of the object, no such pattern can be detected in French. Gestures with object information do not carry over to the verb expressing the actual placement in French, since gestures aligned with verbs overwhelmingly encode only path. There is thus a shift in focus between the two utterances in French, again supporting the notion that the construal of placement events in French does not include figure objects.

#### The effect of individual verbs vs. habitual usage

If the semantics of the individual placement verb guides linguistic attention to figure objects as they are deployed to describe a particular scene, French and Dutch speakers might be expected to gesture in different ways depending on verb use. For instance, when French speakers apply one of the more specific placement verbs in French, such as *coller* 'stick, glue', or *accrocher* 'hang, hook', they might attend to and gesture about objects to the same extent as Dutch speakers. Conversely, on those rare occasions where Dutch speakers use the general term *doen* 'make, do', they might show no interest in objects, but rather focus on and gesture about movement or ground information.

INSERT FIGS. 5, 6, 7 HERE

A closer inspection of the gesture data shows this not to be the case however. The Dutch speaker in Figure 5 uses the most general Dutch verb, *doen* 'do, make', to describe putting bananas into a bowl. Although this verb encodes only causation, the accompanying gesture reflects a focus on the figure object, the bananas, visible in the tight grip displayed by the right

hand as it moves down. Similarly, the Dutch speaker in Figure 6 uses the verb *duwen* 'push', to describe a scene where a woman sticks a chewing gum under the desk. This placement verb encodes the manner of moving but does not seem to necessarily require any object information. Nevertheless, the gesture accompanying the expression displays a hand shape incorporating the chewing gum. In other words, Dutch speakers display a focus on the object in gesture regardless of the semantic specifics of the verb chosen. Conversely, the French speaker in Figure 7 uses one of the specific placement verbs in French, *coller* 'stick', to describe the chewing gum scene. His gesture shows no trace of the figure object. It displays only a flat hand moving upward under the table, reflecting a focus on the path towards the ground.

Quantitatively, object-incorporating gestures are as likely to accompany the posture verbs in Dutch (74% aggregated across participants) as they are to accompany other verbs (72%). Conversely, in French the gestures encoding simple path are as likely to accompany *mettre* 'put' and *poser* 'place' (55%) as to accompany more specific verbs (52%). The gestural preferences and the language-specific gestural focus on figure objects vs. paths thus seem to spread to all other placement verbs in both languages, regardless of the semantic specificity of the individual lexical items.

## 6. Discussion

This study investigated whether the semantics of Dutch and French placement verbs affect speakers' linguistic conceptualization or construal of placement events, and specifically whether they select and attend to different types of spatial information as revealed by their speech-associated gestures. There are four key findings. First, Dutch and French speakers talk differently about placement. Dutch speakers typically use one of three posture verbs, *zetten* 'set/stand', *leggen* 'lay' and *hangen* 'hang'. The verbs are specific with regard to object properties and spatial relationships between figure and ground, and so are used to describe different scenes. French speakers typically use one single general placement verb, *mettre* 'put', encoding movement, which is used to describe all scenes.

Second, Dutch and French speakers also produce two distinct preferential gesture patterns when talking about placement. Dutch speakers gesture about figure objects along with the movement, seen as object-incorporating hand shapes. French speakers gesture only about the path of the placement movement. Neither group imitates the perceived action.

Third, the different gesture patterns are not due to differences in syntactic or information structure. The placement verbs in the two languages project similar syntactic structures and information is organized in the same way with objects being introduced in separate clauses followed by clauses describing the placement events. What differs are the verb semantics of the placement verbs. Information about the figure object, which is necessary to select the right verb in Dutch, is visibly present in Dutch gestures accompanying the placement descriptions. In contrast, this information is conspicuously absent from gestures co-occurring with the corresponding descriptions in French.

Fourth, language-specific gesture patterns permeate the entire placement domain. Figure incorporation occurs in Dutch across all placement verbs, not only in cases where the actual choice of a posture verb hinges on figure information. Conversely, the focus on path in French gestures also occurs regardless of the actual verb used.

The study set out to answer the question whether speakers of different languages whose verb categories differ also consider different types of information when talking about placement. Based on the gestural findings, the answer seems to be that they do. The gesture data indicate that Dutch and French speakers consider and select different sorts of spatial information when they describe the same placement events as reflected in the two distinct and language-specific gesture patterns. Moreover, because syntactic structures and information organization are the same across both languages, the semantics of the placement verbs themselves are the likeliest source of differences in selection of spatial information: a Dutch focus on figure objects in conjunction with the path of movement (driven by posture verbs), and a French focus on simple paths towards grounds (driven by a general placement verb). The findings therefore provide support for the hypothesis that linguistic categories like verbs (and the meanings they encode) influence what information speakers consider and select for expression. That is to say, they

support the notion of language-specific representations, event construal or *thinking for speaking*. Speakers of Dutch and French construe every-day placement events differently as they prepare to talk about them and have two different ways of *thinking for speaking* about placement events.

Notice that these findings provide little support for the notion that placement events are cognitively basic or universal with a language-neutral representation. However startling it may seem in view of their grounding in sensori-motor patterns and practical actions, the construal of placement events nevertheless seems to be influenced by habitual linguistic encoding. The different gesture patterns in Dutch and French indicate two different construals of placement which differ both from each other and – crucially – also from actions observed, suggesting no simple action-related or language-neutral representation. Moreover, the fact that the evidence for language-specificity comes from gesture – the same modality used for the practical placement actions – considerably strengthens the claim of language-specific representations and conceptualization of placement.

What about the finding that the language-specific gesture patterns permeate the entire placement domain regardless of actual placement verb used? At first glance, this result seems to falsify the hypothesis that event representations are based on the semantics of the placement verbs. However, the thinking for speaking hypothesis suggests that it is the most frequently or habitually used verbs that guide information selection, not necessarily the verb used for a specific description (Berman and Slobin 1994; Carroll and Von Stutterheim 2003; Pederson 1995; Slobin 1996b). In Dutch, the most frequently and habitually used placement verbs are the posture verbs, *zetten* and *leggen*, which require object information for the appropriate selection to be made. In French, the most frequent and habitual verb is the general placement verb, *mettre*, which only cares about the translocation to the goal ground, not about the object being moved. Therefore, the language-specific event representations reflect the different parts of the spatial information that is habitually attended to as a direct result of the semantics of the placement verbs that are most frequently used in the respective language. The customary attention to certain types of information for habitual encoding of placement events affects encoding of other types of placement as well such that the construal of what might be called *Basic Placement*

*Constructions*<sup>3</sup> for linguistic encoding is governed by a 'default setting'. The figure focus constitutes the default in Dutch, whereas the path is the default in French.

Notice that habitual event construals are not static but may change under the influence of specific pragmatic or expressive needs. For instance, a focus on figures can be induced in French if it becomes relevant for pragmatic reasons. For example, if an object occurs a second time in the stimuli and in a different position, this promotes a contrastive focus on the figure. French speakers may mention the orientation of the object explicitly in speech (*poser à plat*, 'put flat', *coucher*, 'lay', *mettre comme ça*, 'put like that'), and sometimes produce concomitant gestures that incorporate the figure object. The crucial observation, however, is that French speakers do not typically do this, unless there is a reason to, whereas Dutch speakers regularly consider the object. Even at first encounter, they pick the posture verb that is appropriate to the orientation of the object. This verb choice is not governed by the contrast but is simply the default way of labeling the two scenes. In other words, the fine-grained focus on objects is habitual or a 'default' in Dutch and driven by the semantics of the verbs, whereas it is optional and pragmatically driven in French (cf. Narasimhan and Gullberg 2006).

The suggested differences in linguistic event construal between French and Dutch can also be considered in terms of the familiar distinction between satellite- and verb-framed languages (Talmy 1985, 2000, 2003). Slobin (1996b; 2004) has shown how satellite-framed languages like Dutch focus on manner of movement and multiple components of path (source, goal, and medium of path). Verb-framed languages like French instead focus on states and settings, and generally mention only one component of the path per clause. The patterns for placement have been re-formulated as a Dutch focus on the manner of being located (posture-focus), and a French focus on being in a location or state (location-focus) (Berthele 2004; 2006; Hickmann 2007; Lemmens 2002a, 2002b). The important contribution of gesture analysis and of this study is to allow such characterizations to become more precise, especially regarding what aspects of an event really are or are not part of the event construal. The Dutch satellite-framed focus on manner of movement and posture includes a focus on figure objects in the domain of

---

<sup>3</sup> I owe this term to David Wilkins.

placement. The figure object focus could be surmised on the basis of the verb semantics, but its actual presence is only confirmed by the gesture analysis. Conversely, the French verb-framed focus on settings and the state of being located *could* easily have included information about the figure object even if not overtly realized in the spoken verb, but again, the gesture analysis shows that it does not. Gesture has the same level of specificity generally as exhibited by the verb selection. That is to say, gestures allow us to see that French speakers in fact do not consider object-information but target exactly the information suggested by the verb.

## 7. Final remarks

This study shows that representations of placement events are not language-neutral but appear to reflect distinctions in verb semantics – at least as people prepare to talk about them. These findings contribute to a growing body of evidence for language-specific event representations, even in very concrete domains such as placement. Moreover, the results undermine the notion that placement events are a universal, basic event category not affected by language. Despite the experiential basis of these events, their representations are mediated by language.

More generally, the study illustrates that gestures can reveal what spatial information speakers consider for expression beyond what is detectable in speech alone. Bridging the divide between linguistic and spatio-visual representations, gestures can provide more specific details about the information contained in event representations crosslinguistically. They therefore allow more detailed characterizations to be made of crosslinguistic differences in event construal in online speech production.

The findings have important implications for language acquisition (cf. Slobin et al., this volume). With regard to first language acquisition, although children may come equipped with innate concepts such as 'cause to move', data of this type highlight that children must nevertheless attune these concepts to the specifics of the input language. That such attunement is a complex process involving much adjustment is indicated both by the development of placement verb usage (Narasimhan and Gullberg, To appear) and of concomitant gesture patterns in later childhood (Gullberg and Narasimhan, To appear). In the case of adult second

language acquisition, adults with fully developed event representations in one language face the difficulty of adjusting such representations as they move to another where other distinctions might be made if they are to be native-like or 'idiomatic'. There is ample evidence that such adjustments are difficult, slow and gradual (e.g. Carroll, Murcia-Serra, Watorek, and Bendiscoli 2000; Kellerman 1995; Odlin 2005). Even very advanced second language learners, whose speech is formally accurate, continue to express the types of information they typically consider as relevant in their first language event construals, rather than shifting an interest to the information native speakers of the target language select. This gives them what has been labeled a 'discourse accent'. In the context of placement, Dutch learners of French and French learners of Dutch would have to consider different types of spatial information if they wanted to construe placement events in an idiomatic fashion relative to native speakers of each language. Dutch learners of French, for instance, would have to demote their interest in the object as being irrelevant to French placement (Gullberg, submitted).

More generally, the notion that event representations differ crosslinguistically and that categories like placement are not universal and language-neutral raises a slew of problems for models of language processing and of the (multilingual) mental lexicon. In such frameworks it is a standard assumption that there are language-neutral conceptual representations onto which new or multiple labels can simply be mapped (for overviews, see e.g. Green 1998; Gullberg 2009; La Heij 2005; Pavlenko 1999). The existence of language-specific event representations and findings like the ones presented here put such models under considerable pressure to account for the intricacies of crosslinguistic differences in semantic-conceptual structures. New types of data and techniques are going to be necessary to explore, develop and model these issues further. Speech-associated gestures constitute one such data type that show us a little more about event representations and about what information speakers consider as relevant as they set out to talk about the external world.



## References

- Alibali, M. W., Kita, S., and Young, A. J. 2000. Gesture and the process of speech production: We think, therefore we gesture. *Language and Cognitive Processes*, 15(6), 593-613.
- Ameika, F., and Levinson, S. C. 2007. (Eds.). Special issue on locative predicates. *Linguistics*, 45 (5/6).
- Bavelas, J. B., Kenwood, C., Johnson, T., and Phillips, B. 2002. An experimental study of when and how speakers use gestures to communicate. *Gesture*, 2(1), 1-17.
- Beattie, G., and Shovelton, H. 1999a. Do iconic hand gestures really contribute anything to the semantic information conveyed by speech? *Semiotica*, 123(1/2), 1-30.
- Beattie, G., and Shovelton, H. 1999b. Mapping the range of information contained in the iconic hand gestures that accompany spontaneous speech. *Journal of Language and Social Psychology*, 18(4), 438-462.
- Beattie, G., and Shovelton, H. 2002. An experimental investigation of some properties of individual iconic gestures that mediate their communicative power. *British Journal of Psychology*, 93(2), 179-192.
- Berman, R., and Slobin, D. I. 1994. Filtering and packaging in narrative. In R. Berman and D. I. Slobin (Eds.), *Relating events in narrative: A cross-linguistic developmental study* (pp. 515-554). Hillsdale, NJ: Erlbaum.
- Berthele, R. 2004. The typology of motion and posture verbs: A variationist account. In B. Kortmann (Ed.), *Dialectology meets typology. Dialect grammar from a cross-linguistic perspective* (pp. 93-126). Berlin: Mouton de Gruyter.
- Berthele, R. 2006. *Ort und Weg. Die sprachlich Raumreferenz in Varietäten des Deutschen, Rätoromanischen und Französischen*. Berlin: Mouton de Gruyter.
- Bowerman, M. 1978. Systematizing semantic knowledge: Changes over time in the child's organization of word meaning. *Child Development*, 49(4), 997-987.

- Bowerman, M. 1982. Starting to talk worse: Clues to language acquisition from children's late speech errors. In S. Strauss and R. Stavy (Eds.), *U-shaped behavioral growth* (pp. 101-146). New York: Academic Press.
- Bowerman, M., Brown, P., Eisenbeiss, S., Narasimhan, B., and Slobin, D. I. 2002. Putting things in places. Developmental consequences of linguistic typology. In E. V. Clark (Ed.), *Space In Language. Location, Motion, Path, and Manner. The Proceedings of the 31st Stanford Child Language Research Forum* (pp. S1-S122). Stanford, CA: CSLI Publications.
- Bowerman, M., and Choi, S. 2001. Shaping meanings for language: universal and language-specific in the acquisition of spatial semantic categories. In M. Bowerman and S. C. Levinson (Eds.), *Language acquisition and conceptual development* (pp. 475-511). Cambridge: Cambridge University Press.
- Brown, P. 2006. A sketch of the grammar of space in Tzeltal. In S. C. Levinson and D. P. Wilkins (Eds.), *Grammars of space. Explorations in cognitive diversity* (pp. 230-272). Cambridge: Cambridge University Press.
- Brugman, H., and Kita, S. 1995. Impact of digital video technology on transcription: a case of spontaneous gesture transcription. *KODIKAS/CODE: Ars Semeiotica An international journal of semiotics*, 18, 95-112.
- Carroll, M., Murcia-Serra, J., Watorek, M., and Bendiscoli, A. 2000. The relevance of information organization to second language acquisition studies: The descriptive discourse of advanced adult learners of German. *Studies in Second Language Acquisition*, 22(3), 441-466.
- Carroll, M., and Von Stutterheim, C. 2003. Typology and information organization: perspective taking and language-specific effects in the construal of events. In A. G. Ramat (Ed.), *Typology and second language acquisition* (pp. 365-402). Berlin: Mouton de Gruyter.
- Cassell, J., McNeill, D., and McCullough, K.-E. 1999. Speech-gesture mismatches: Evidence for one underlying representation of linguistic and nonlinguistic information. *Pragmatics and Cognition*, 7(1), 1-33.

- Chenu, F. and Jisa, H. 2006. Caused motion constructions and semantic generality in early acquisition of French. In E. V. Clark and B. F. Kelly (Eds.), *Constructions in acquisition* (Vol. 174, pp. 233-261). Stanford, CA: CSLI Publications.
- Choi, S., McDonough, M., Bowerman, M., and Mandler, J. 1999. Early sensitivity to language-specific spatial categories in English and Korean. *Cognitive Development*, 14(2), 241-268.
- Clark, H., H., Carpenter, P. A., and Just, M. A. 1973. On the meeting of semantics and perception. In W. G. Chase (Ed.), *Visual information processing* (pp. 311-382). New York: Academic Press.
- Clark, H. H., and Wilkes-Gibbs, D. 1986. Referring as a collaborative process. *Cognition*, 22(1), 1-39.
- David, C. 2003. *Les "verbs of putting": Typologie, schéma syntaxique et organization sémantique des constructions prépositionnelles en anglais contemporain*. Unpublished PhD diss., Université de Poitiers, Poitiers.
- De Ruiter, J.-P. 2000. The production of gesture and speech. In D. McNeill (Ed.), *Language and gesture: Window into thought and action* (pp. 284-311). Cambridge: Cambridge University Press.
- De Ruiter, J.-P. 2007. Postcards from the mind: The relationship between speech, gesture and thought. *Gesture*, 7(1), 21-38.
- Duncan, S. 1996. *Grammatical form and 'thinking-for-speaking' in Mandarin Chinese and English: An analysis based on speech-accompanying gesture*. Unpublished PhD diss., University of Chicago, Chicago.
- Gleitman, L. R. 1990. The structural sources of verb meanings. *Language Acquisition*, 1(1), 3-55.
- Goldberg, A. 1995. *Constructions: A construction grammar approach to argument structure*. Chicago: University of Chicago Press.
- Goldin-Meadow, S. 2003. *Hearing gesture: How our hands help us think*. Cambridge, MA: The Belknap Press.

- Graham, J. A. and Argyle, M. 1975. A cross-cultural study of the communication of extra-verbal meaning by gestures. *International Journal of Psychology*, 10(1), 56-67.
- Green, D. W. 1998. Bilingualism and thought. *Psychologica Belgica*, 38(3/4), 251-276.
- Gullberg, M. 1998. *Gesture as a communication strategy in second language discourse. A study of learners of French and Swedish*. Lund: Lund University Press.
- Gullberg, M. 2003. Gestures, referents, and anaphoric linkage in learner varieties. In C. Dimroth and M. Starren (Eds.), *Information structure and the dynamics of language acquisition* (pp. 311-328). Amsterdam: Benjamins.
- Gullberg, M. 2006. Handling discourse: Gestures, reference tracking, and communication strategies in early L2. *Language Learning*, 56(1), 155-196.
- Gullberg, M. 2009. Why gestures are relevant to the multilingual mental lexicon. In A. Pavlenko (Ed.), *The multilingual mental lexicon* (pp. 161-184). Clevedon: Multilingual Matters.
- Gullberg, M. Submitted. What learners mean. Gestures and semantic reorganisation of placement verbs in advanced second language production.
- Gullberg, M. and Burenhult, N. To appear. Probing the linguistic encoding of placement and removal events in Swedish. In A. Kopecka and B. Narasimhan, B. (Eds.) (to appear). *Events of "putting" and "taking": A crosslinguistic perspective*. Amsterdam: Benjamins.
- Gullberg, M. and Narasimhan, B. To appear. What gestures reveal about the development of semantic distinctions in Dutch children's placement verbs. *Cognitive Linguistics*.
- Gumperz, J. J. and Levinson, S. C. 1996. Introduction: Linguistic relativity re-examined. In J. J. Gumperz and S. C. Levinson (Eds.), *Rethinking linguistic relativity* (pp. 1-18). Cambridge: Cambridge University Press.
- Hansson, K. and Bruce, B. 2002. Verbs of placement in Swedish children with SLI. *International Journal of Communication Disorders*, 37(4), 401-414.
- Hickmann, M. 2007. Static and dynamic location in French: Developmental and crosslinguistic perspectives. In M. Aurnague, M. Hickmann and L. Vieu (Eds.), *The categorization of spatial entities in language and cognition* (pp. 205-231). Amsterdam: Benjamins.

- Hickmann, M. and Hendriks, H. (2006). Static and dynamic location in French and English. *First Language*, 26(1), 103-135.
- Holler, J. and Beattie, G. 2003. Pragmatic aspects of representational gestures. Do speakers use them to clarify verbal ambiguity for the listener? *Gesture*, 3(2), 127-154.
- Jespersen, O. 1965. *A modern English grammar on historical principles* (Vol. VI: Morphology). London: George Allen and Unwin Ltd.
- Kellerman, E. 1995. Crosslinguistic influence: Transfer to nowhere? *Annual Review of Applied Linguistics*, 15, 125-150.
- Kelly, S. D., Barr, D. J., Breckinridge Church, R., and Lynch, K. 1999. Offering a hand to pragmatic understanding: The role of speech and gesture in comprehension and memory. *Journal of Memory and Language*, 40(4), 577-592.
- Kendon, A. 1980. Gesticulation and speech: Two aspects of the process of utterance. In M. R. Key (Ed.), *The relationship of verbal and nonverbal communication* (pp. 207-227). The Hague: Mouton de Gruyter.
- Kendon, A. 2004. *Gesture. Visible action as utterance*. Cambridge: Cambridge University Press.
- Kita, S. and Özyürek, A. 2003. What does cross-linguistic variation in semantic coordination of speech and gesture reveal?: Evidence for an interface representation of spatial thinking and speaking. *Journal of Memory and Language*, 48(1), 16-32.
- Kita, S., Van Gijn, I., and Van der Hulst, H. 1998. Movement phases in signs and co-speech gestures, and their transcription by human coders. In I. Wachsmuth and M. Fröhlich (Eds.), *Gesture and Sign Language in Human-Computer interaction* (pp. 23-35). Berlin: Springer.
- Kopecka, A. and Narasimhan, B. (Eds.) To appear. *Events of "putting" and "taking": A crosslinguistic perspective*. Amsterdam: Benjamins.
- Krauss, R. K., Chen, Y., and Gottesman, R. F. 2000. Lexical gestures and lexical access: a process model. In D. McNeill (Ed.), *Language and gesture* (pp. 261-283). Cambridge: Cambridge University Press.

- La Heij, W. 2005. Selection processes in monolingual and bilingual lexical access. In J. F. Kroll and A. M. De Groot (Eds.), *Handbook of bilingualism. Psycholinguistic approaches* (pp. 289-307). Oxford: Oxford University Press.
- Lemmens, M. 2002a. The semantic network of Dutch posture verbs. In J. Newman (Ed.), *The linguistics of sitting, standing, and lying* (pp. 103-139). Amsterdam: Benjamins.
- Lemmens, M. 2002b. Tracing referent location in oral picture descriptions. In A. Wilson, P. Rayson and T. McEnery (Eds.), *A rainbow of corpora. Corpus linguistics and the languages of the world* (pp. 73-85). München: Lincom-Europa.
- Lemmens, M. 2006. Caused posture: experiential patterns emerging from corpus research. In A. Stefanowitsch and S. Gries (Eds.), *Corpora in cognitive linguistics. Corpus-based approaches to syntax and lexis* (pp. 263-298). Berlin: Mouton de Gruyter.
- Levelt, W. J. M. 1989. *Speaking: From intention to articulation*. Cambridge, MA: Bradford Books/MIT Press.
- Levin, B. 1993. *English verb classes and alternations*. Chicago: University of Chicago Press.
- Levinson, S. C. and Meira, S. 2003. 'Natural concepts' in the spatial topological domain — adpositional meanings in crosslinguistic perspective: an exercise in semantic typology. *Language*, 79(3), 485-516.
- Levinson, S. C. and Wilkins, D. P. 2006. The background to the study of the language of space. In S. C. Levinson and D. P. Wilkins (Eds.), *Grammars of space. Explorations in cognitive diversity* (pp. 1-23). Cambridge: Cambridge University Press.
- Levy, E. T. and McNeill, D. 1992. Speech, gesture, and discourse. *Discourse Processes*, 15(3), 277-301.
- Lucy, J. 1992. *Language diversity and thought: A reformulation of the linguistic relativity hypothesis*. Cambridge: Cambridge University Press.
- Mayberry, R. I. and Jaques, J. 2000. Gesture production during stuttered speech: insights into the nature of gesture-speech integration. In D. McNeill (Ed.), *Language and gesture* (pp. 199-214). Cambridge: Cambridge University Press.

- Mayberry, R. I. and Nicoladis, E. 2000. Gesture reflects language development: Evidence from bilingual children. *Current Directions in Psychological Science*, 9(6), 192-196.
- Melinger, A. and Levelt, W. J. M. 2004. Gesture and the communicative intention of the speaker. *Gesture*, 4(2), 119-141.
- Meyer, A. S. 2004. The use of eye tracking in studies of sentence generation. In J. M. Henderson and F. Ferreira (Eds.), *The interface of language, vision, and action* (pp. 191-212). Hove: Psychology Press.
- Meyer, A. S. and Dobel, C. 2003. Application of eye tracking in speech production research. In J. Hyönä, R. Radach and H. Deubel (Eds.), *The mind's eye: Cognitive and applied aspects of eye movement research* (pp. 253-272). Amsterdam: Elsevier.
- McNeill, D. 1985. So you think gestures are nonverbal? *Psychological Review*, 92(3), 271-295.
- McNeill, D. 1992. *Hand and mind. What the hands reveal about thought*. Chicago: University of Chicago Press.
- McNeill, D. 2000a. Analogic/Analytic representations and cross-linguistic differences in thinking for speaking. *Cognitive Linguistics*, 11(1/2), 43-60.
- McNeill, D. 2000b. Growth points, catchments, and contexts. *Cognitive Studies. Bulletin of the Japanese Cognitive Science Society*, 7(1), 22-36.
- McNeill, D. 2005. *Gesture and thought*. Chicago: University of Chicago Press.
- McNeill, D. and Duncan, S. D. 2000. Growth points in thinking-for-speaking. In D. McNeill (Ed.), *Language and gesture* (pp. 141-161). Cambridge: Cambridge University Press.
- McNeill, D. and Levy, E. 1982. Conceptual representations in language activity and gesture. In R. J. Jarvella and W. Klein (Eds.), *Speech, place, and action. Studies in deixis and related topics* (pp. 271-295). Chichester: John Wiley.
- McNeill, D., Levy, E. T., and Cassell, J. 1993. Abstract deixis. *Semiotica*, 95(1/2), 5-19.
- Melinger, A. and Levelt, W. J. M. 2004. Gesture and the communicative intention of the speaker. *Gesture*, 4(2), 119-141.
- Müller, C. 1994. Semantic structure of motional gestures and lexicalization patterns in Spanish and German descriptions of motion-events. In K. Beals, J. M. Denton, R. Knippen, L.

- Melnar, H. Suzuki, and E. Zeinfeld (Eds.), *Papers from the Annual Regional Meeting of the Chicago Linguistic Society. The main session* (Vol. 30, pp. 281-295). Chicago, Ill: Chicago Linguistic Society.
- Müller, C. 1998. *Redebegleitende Gesten. Kulturgeschichte- Theorie-Sprachvergleich*. Berlin: Berlin Verlag Arno Spitz GmbH.
- Narasimhan, B. and Gullberg, M. 2006. Perspective-shifts in event descriptions in Tamil child language. *Journal of Child Language*, 33(1), 99-124.
- Narasimhan, B. and Gullberg, M. To appear. Does input frequency influence children's acquisition of verb meaning?
- Newman, J. 2002a. A cross-linguistic overview of the posture verbs 'sit', 'stand', and 'lie'. In J. Newman (Ed.), *The linguistics of sitting, standing, and lying* (pp. 1-24). Amsterdam: Benjamins.
- Newman, J. (Ed.). 2002b. *The linguistics of sitting, standing, and lying*. Amsterdam: Benjamins.
- Newman, J. and Rice, S. 2004. Patterns of usage for English SIT, STAND, and LIE: A cognitively inspired exploration in corpus linguistics. *Cognitive Linguistics*, 15(3), 351–396.
- Odlin, T. 2005. Crosslinguistic influence and conceptual transfer: What are the concepts? *Annual Review of Applied Linguistics*, 25, 3-25.
- Özyürek, A., Kita, S., Allen, S. E. M., Furman, R., and Brown, A. 2005. How does linguistic framing of events influence co-speech gestures? Insights from crosslinguistic variations and similarities. *Gesture*, 5(1/2), 219-240.
- Özyürek, A., Willems, R. M., Kita, S., and Hagoort, P. 2007. On-line integration of semantic information from speech and gesture: Insights from event-related brain potentials. *Journal of Cognitive Neuroscience*, 19, 605-616.
- Pauwels, P. 2000. *Put, set, lay and place: A cognitive linguistic approach to verbal meaning*. München: Lincom Europa.
- Pavlenko, A. 1999. New approaches to concepts in bilingual memory. *Bilingualism: Language and Cognition*, 2(3), 209-230.



- Pederson, E. 1995. Language as context, language as means: Spatial cognition and habitual language use. *Cognitive Linguistics*, 6(1), 33-62.
- Piaget, J. and Inhelder, B. 1956. *The child's conception of space*. London: Routledge.
- Pinker, S. 1989. *Learnability and cognition: The acquisition of argument structure*. Cambridge, MA: MIT Press.
- Pulvermüller, F. 2005. Brain mechanisms linking language and action. *Nature Reviews Neuroscience*, 6(7), 576-582.
- Serra Borneto, C. 1996. Liegen and stehen in German: A study in horizontality and verticality. In E. H. Casad (Ed.), *Cognitive linguistics in the Redwoods* (pp. 459-505). Berlin: Mouton de Gruyter.
- Seyfeddinipur, M. 2006. *Disfluency: Interrupting speech and gesture*. Unpublished PhD diss., Radboud University, Nijmegen.
- Sinha, C. and Kuteva, T. 1995. Distributed spatial semantics. *Nordic Journal of Linguistics*, 18(2), 167-199.
- Slobin, D. I. 1991. Learning to think for speaking. *Pragmatics*, 1, 7-25.
- Slobin, D. I. 1996a. From "thought and language" to "thinking for speaking". In J. J. Gumperz and S. C. Levinson (Eds.), *Rethinking linguistic relativity* (pp. 70-96). Cambridge: Cambridge University Press.
- Slobin, D. I. 1996b. Two ways to travel: Verbs of motion in English and Spanish. In M. Shibatani and S. A. Thompson (Eds.), *Grammatical constructions. Their form and meaning* (pp. 195-219). Oxford: Clarendon Press.
- Slobin, D. I. 2004. How people move. Discourse effects of linguistic typology. In C. L. Moder and A. Martinovic-Zic (Eds.), *Discourse across languages and cultures* (pp. 195-210). Amsterdam: Benjamins.
- Talmy, L. 1985. Lexicalization patterns: Semantic structure in lexical forms. In T. Shopen (Ed.), *Language typology and syntactic description* (Vol. 3, pp. 57-149). Cambridge: Cambridge University Press.
- Talmy, L. 2000. *Toward a cognitive semantics*. Cambridge, MA: MIT Press.

- Talmy, L. 2003. Concept structuring systems in language. In M. Tomasello (Ed.), *The new psychology of language. Cognitive and functional approaches to language structure* (Vol. 2, pp. 15-46). Mahwah, NJ: Erlbaum.
- Talmy, L. 2008. Aspects of attention in language. In N. C. Ellis and P. Robinson (Eds.), *Handbook of cognitive linguistics and second language acquisition* (pp. 27-38). London: Routledge.
- Van Oosten, J. 1984. Sitting, standing and lying in Dutch: A cognitive approach to the distribution of the verbs *zitten*, *staan*, and *liggen*. In J. van Oosten and J. Snapper (Eds.), *Dutch linguistics at Berkeley* (pp. 137-160). Berkeley: UCB.
- van Staden, M., Bowerman, M., and Verhelst, M. 2006. Some properties of spatial description in Dutch. In S. C. Levinson and D. P. Wilkins (Eds.), *Grammars of space. Explorations in cognitive diversity* (pp. 475-511). Cambridge: Cambridge University Press.
- Volterra, V., Caselli, M. C., Capirci, O., and Pizzuto, E. 2005. Gesture and the emergence and development of language. In M. Tomasello and D. I. Slobin (Eds.), *Beyond nature-nurture: Essays in honor of Elizabeth Bates* (pp. 3-40). Mahwah, NJ: Erlbaum.
- Von Stechow, C., and Klein, W. 2002. Quaestio and L-perspectivation. In C. F. Graumann and W. Kallmeyer (Eds.), *Perspective and perspectivation in discourse* (pp. 59-88). Amsterdam: Benjamins.
- Von Stechow, C. and Nüse, R. 2003. Processes of conceptualization in language production: Language-specific perspectives and event construal. *Linguistics*, 41(5), 851–881.
- Von Stechow, C., Nüse, R., and Murcia-Serra, J. 2002. Cross-linguistic differences in the conceptualization of events. In H. Hasselgård, S. Johansson, B. Behrens, and C. Fabricius-Hansen (Eds.), *Information structure in a cross-linguistic perspective* (pp. 179-198). Amsterdam: Rodopi.
- Yoshioka, K. and Kellerman, E. 2006. Gestural introduction of Ground reference in L2 narrative discourse. *International Review of Applied Linguistics*, 44(2), 171-193.

**Kommentar:** Is this: Ameka, F. K., & Levinson, S. C. (2007). Introduction-The typology and semantics of locative predicates: Posturals, positionals and other beasts. *Linguistics*, 45(5), 847-872



Figure 1. The task set-up with the Describer on the left and the Drawer on the right.



Figure 2. Stimulus: placement of the bowl.



*die zet ze helemaal rechts achter op het bureau*  
'that she puts all the way to the right at the back of the desk'

Figure 3. Placement of bowl in Dutch with a posture placement verb, *zetten*, and a bi-manual gesture encoding object information in the hand shape.



*ce bol elle l'a mis sur le bureau*  
'this bowl she put it on the desk'

Figure 4. Placement of bowl in French with a general placement verb, *mettre*, and a gesture encoding simple path, no object information.



*die doet ze in het kommetje*  
'she does them into the little  
bowl'

Figure 5. Placement in Dutch with a general placement verb, *doen*, 'do, make', and a gesture encoding object information in the hand shape (right hand, grip around bananas).



*dan duwt ze het snel onder het bureau*  
'then she sticks it quickly  
under the desk'

Figure 6. Placement in Dutch with another specific placement verb, *duwen*, 'push', and a gesture encoding object information in the hand shape (grip around chewing gum).



*à gauche au-dessus elle l'y colle*  
'to the left above she sticks it  
there'

Figure 7. Placement in French with a specific placement verb, *coller*, 'stick', and a gesture encoding simple path, with a flat hand, no object information.

