Reconstructing verb meaning in a second language. How English speakers of L2 Dutch talk and gesture about placement

Gullberg, Marianne

Published in:
Annual Review of Cognitive Linguistics

DOI:
10.1075/arcl.7.09gul

2009

Reconstructing verb meaning in a second language: How English speakers of L2 Dutch talk and gesture about placement

Marianne Gullberg

Radboud University Nijmegen and Max Planck Institute for Psycholinguistics

Published in *Annual Review of Cognitive Linguistics,* 2009

Corresponding author:

Marianne Gullberg

Max Planck Institute for Psycholinguistics

PO BOX 310

6500 AH Nijmegen

The Netherlands

Email: marianne.gullberg@mpi.nl

Abstract

This study examines to what extent English speakers of L2 Dutch reconstruct the meanings of placement verbs when moving from a general L1 verb of caused motion (*put*) to two specific caused posture verbs (*zetten/leggen* 'set/lay') in the L2 and whether the existence of low-frequency cognate forms in the L1 (*set/lay*) alleviates the reconstruction problem. Evidence from speech and gesture indicates that English speakers have difficulties with the specific verbs in L2 Dutch, initially looking for means to express general caused motion in L1-like fashion through over-generalisation. The gesture data further show that targetlike forms are often used to convey L1-like meaning. However, the differentiated use of *zetten* for vertical placement and dummy verbs (*gaan* 'go' and *doen* 'do') and intransitive posture verbs (*zitten/staan/ligge*n 'sit, stand, lie') for horizontal placement, and a positive correlation between appropriate verb use and target-like gesturing suggest a beginning sensitivity to the semantic parameters of the L2 verbs and possible reconstruction. (158 words)

Keywords: second language acquisition, placement verbs, caused motion, semantics, event representation, gesture

Acknowledgements

A portion of this data set was collected by Marieke Hoetjes as part of her MA work. I thank Arna van Doorn, Marieke Hoetjes, Wilma Jongejan, Ilonka Petal, Anne Rijpma, and Sonja Wichert for help with data collection, transcription and coding, and I gratefully acknowledge funding from the Max Planck Institute for Psycholinguistics and the Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO; MPI 56-384, *The Dynamics of Multilingual Processing*, M. Gullberg, P. Indefrey & W. Klein).

Reconstructing verb meaning in a second language: How English speakers of L2 Dutch talk and gesture about placement

Languages differ in what meanings they select for expression and how they package them. Crosslinguistically this means that few word pairs completely overlap semantically or conceptually. For instance, the simple English verb *put* has no direct translation equivalent in Dutch. Dutch has two specific verbs, *zetten* 'set' and *leggen* 'lay' and lacks a general superordinate term that corresponds to 'put'. Similar differences have been found in the nominal domain. For example, speakers of French and Flemish categorise concrete objects such as bottles differently with French speakers distinguishing *bouteille* and *flacon* where Flemish speakers have only one category, *fles* (e.g., Ameel, Storms, Malt, & Sloman, 2005). Crosslinguistic differences in meaning and semantic representations raise important challenges for second language learners. To acquire language-specific meanings a learner must first detect differences in meaning between words in the first and the second language (L1, L2). The reconstruction of meaning then involves redefining concepts and shifting the semantic boundaries of L1 categories (cf. Ijaz, 1986), a process hypothesised to cause considerable difficulties (e.g., N. Ellis, 1994; Kellerman, 1995). This study focuses on such reconstruction, specifically in cases where learners move from a single, general category in the L1 to multiple, more specific categories in the same domain in the L2. Looking at how English speakers of L2 Dutch cope with verbs of placement, it also explores the possible influence of low-frequency L1 cognates on this process. Finally, to probe the details of what learners mean by a given form, the study draws on all expressions of meaning and analyses both speech and speech-associated gestures.

The development of meaning in L2

A steadily growing body of research examines the L2 acquisition of vocabulary, investigating the difference between productive and receptive vocabulary, incidental vs. intentional vocabulary learning, contexts of acquisition, models of frequency effects and a host of other topics (e.g., papers in Bogaards & Laufer, 2004; Laufer & Hulstijn, 2001; Meara, 2007; Nation & Meara, 2002). Despite this interest in lexical acquisition, the L2 acquisition of *meaning* and processes of

semantic reorganisation have received comparatively little attention. Both linguistic and psycholinguistic accounts of L2 lexical acquisition assume that early lexical learning involves the mapping of new L2 forms onto an old or L1-based meaning representation, often via translation and positive transfer through the reliance on similarities of forms in L1 and L2 (e.g., Jiang, 2000). Models of bilingual lexical processing suggest that L1 word forms are directly linked to meaning at the conceptual level, but that L2 meaning is accessed via L1 word forms (e.g., the Revised Hierarchical Model; Kroll & Stewart, 1994; Kroll & Sunderman, 2003). Surprisingly few studies have examined in any detail how L2 meanings develop from such an initial translation stage towards more L2-based meaning through the reorganisation of meaning representations (for an exception, see Schmitt, 1998). However, studies do identify 'errors' of meaning both in L2 comprehension and in production. For instance, advanced L2 speakers have been found to differ from native speakers in the meanings they ascribe to tense-aspect distinctions (*passé composé* and *imparfait*) and pre- vs. postnominal adjectives in French (Coppieters, 1987), and to spatial prepositions in English (Ijaz, 1986). Such findings suggest that semantic reorganisation towards L2 meaning is difficult to achieve although L2 forms look appropriate.

The assumption of early mapping of an L2 form onto an L1 meaning sets up an expectation of crosslinguistic influence. The older literature on transfer noted that different types of L2 difficulties (with more or less likely transfer) arise depending on the relationship between categories crosslinguistically (e.g., Stockwell, Brown, & Martin, 1965). A hierarchy of difficulty was posited where equivalence between L1 and L2 categories was deemed easiest, followed by the mapping of two L1 categories onto one L2 category (moving from many-to-one and from specific to general categories); the abandoning an L1 category; the creation of a new L2 category; and the splitting of an L1 category into two L2 categories (moving from one-to-many and from general to specific categories; cf. R. Ellis, 1994: 307). Although all transitions in principle require reorganisation (cf. Gullberg, submitted-b), the last type of transition is assumed to be particularly vexing as it involves the need to shift semantic boundaries of existing categories in the L1 and re-structure semantic-conceptual representations. The difficulties of this operation are well documented. For instance, English learners of Spanish have persistent trouble producing the distinction between *ser* and *estar*, 'to be', distinguishing the permanent vs.

temporary states of being. Learners commonly over-generalise *ser* and use it more correctly than *estar* even at advanced levels (e.g., Geeslin, 2003, and papers in Guijarro-Fuentes & Geeslin, 2008). Similarly, English learners of L2 Russian have been found not to distinguish *serdit'sia* (to be experiencing anger, to be actively cross, angry, mad at someone in particular) and *zlit'sia* (to be experiencing anger in general) but to over-generalise the first term (Pavlenko & Driagina, 2007). Overgeneralisation and simplification in the form of avoidance seem to result from such transitions (e.g., Viberg, 1998). The difficulties are thus obvious, but it remains unclear what meanings L2 speakers ascribe to over-general verbs, and what shifts of the semantic boundaries towards a more differentiated and target-like meaning look like.

Placement verbs across languages and modalities

A domain displaying crosslinguistic differences in semantic specificity is placement, a sub-domain of caused motion, where an agent causes a figure object to move to an end location while maintaining (manual) control over the object until it reaches its final destination (*Peter put the cup on the table*, cf., Goldberg, 1995; Slobin, Bowerman, Brown, Eisenbeiss, & Narasimhan, to appear). The crosslinguistic diversity and semantic complexity in this domain is considerable (e.g., Kopecka & Narasimhan, to appear; Newman, 2002). Verb inventories range from systems with a single general placement verb (e.g., the French *mettre*; Hickmann, 2007), via small sets of obligatory verbs often based on posture (e.g., the Swedish caused posture verbs *sätta/ställa/lägga* 'set/stand/lay'), to large sets of classificatory verbs (e.g., Tzeltal verb roots *xij-* 'place sticklike things regardless of orientation'; Brown, 2006).

Dutch is a language of the second type. A Dutch speaker is obliged to choose between one of two caused posture verbs *zetten* 'set' and *leggen* 'lay' to label any given placement event. No superordinate term exists. The verb choice for any given placement event is based on factors including (but not limited to) the orientation of the objects placed, the presence of a functional base, etc. (Lemmens, 2006; Van Oosten, 1986).[1] For instance, a bottle placed in an upright position resting on its base must be described with *zetten* 'set' (e.g., *zij zet de fles op tafel* 'she sets the bottle on the table') whereas a bottle placed on its side must be described with *leggen* 'lay' (e.g., *zij legt de fles op tafel* 'she lays the bottle on the table'). English, in contrast, has both a highly frequent single general placement verb, *put*, and a set of infrequent

specific caused posture verbs, *set* and *lay* (David, 2003; Pauwels, 2000). In the default case, *put* will be used for any placement scene. Examples such as *she put the bottle on the table* are appropriate both for bottles made to stand and to lie. If necessary, adverbial additions can be made such as *lying on its side'*. The specific verbs *set* and *lay* are very rarely used in speech (David, 2003; Pauwels, 2000).

The differences in verb meanings are also reflected in systematic crosslinguistic differences in the production of speech-associated gestures (Kendon, 2004; McNeill, 1992). Gestures and speech are tightly coordinated such that the modalities express closely related meaning at the same time. Gestures also mirror information structure and align with newsworthy or focused information. This coordination means that gestures reflect language-specific meaning in different gestural forms and gestural timing relative to speech (Brown & Gullberg, 2008; Duncan, 2005; Gullberg, Hendriks, & Hickmann, 2008; Kita, 2009; Kita & Özyürek, 2003; McNeill, 1992; 2005). For instances, when talking about voluntary motion, English and Turkish speakers gesture differently in ways that reflect lexicalisation of meaning components in speech. English speakers package manner (*roll*) and path (*down*) of motion into one clause (*he rolls down the street)* accompanied by a single gesture expressing both the rolling and the downward movement. In contrast, Turkish speakers express the manner ('rolling') and the path ('descends') in separate clauses and accompany each with a separate gesture expressing manner (roll) and path (downward movement). Similarly, native speakers of different languages gesture about placement in systematically different ways (Gullberg, submitted-a). For instance, native French speakers' gestures tend to express the path element of the movement in a simple pointing hand or a gesture with a flat hand shape moving in a given direction. They align these gestures with the verb in speech (e.g., *met* 'puts'). This pattern reflects a semantic focus on the direction of the action of the caused movement. Native Dutch speakers' gestures, in contrast, incorporate the displaced object in handshapes superimposed on the path of the movement. That is, the hand looks as if it is holding or manipulating the object being moved in a given direction. These object-incorporating gestures align with the verb in speech (e.g., *zet* 'sets'). Dutch speakers thus target the action of causing a specific object to move (Gullberg, submitted-a). Native English speakers' gestures also express only the path of the movement in pointing or

flat hands, as do French speakers' gestures, but English speakers align their gestures with locative ground expressions in speech (e.g., *on the table*). This pattern suggests a semantic focus on the caused motion towards a goal ground (Hoetjes, 2008).

These differences in speech-gesture patterns effectively highlight the crosslinguistic differences in the spatial information targeted and integrated in verbal meaning representations. Crucially, gestures provide additional information on the semantic elements considered and their linking, adding considerable detail to our understanding of verbal meaning representations.

The L2 acquisition of placement verbs

The variation in placement verb inventories and semantic specificity reviewed above cause difficulties for L2 learners, in particular for L2 learners moving from general one-term placement verb systems to semantically specific, multi-term systems. For instance, Spanish, Polish and Finnish learners of L2 Swedish all have difficulties acquiring the semantically specific Swedish caused posture verbs *sätta/ställa/lägga* 'set/stand/lay' (Viberg, 1985; 1998). All learner groups showed evidence of simplification through non-use of placement verbs, but, importantly, the generalisation of one placement verb to all types of placement showed an influence of the L1s. Spanish and Finnish learners, whose L1s make no orientation distinctions, overextended one of the three Swedish verbs and used it across the board, neutralising the language-specific semantic contrasts. In contrast, Polish learners, whose L1 has one verb that means approximately 'stand', and another meaning roughly 'lay', differentiated the Swedish verbs more than the other two groups and used *lägga* 'lay' and *ställa* 'stand' more appropriately, although they did worse with *sätta* 'set'.

Viberg's results suggest that L2 verb choice may be affected by the presence of specific verbs in the L1 even if these are not identical to the L2 verb distinctions. If early L2 learning involves the mapping of L2 forms onto L1 meaning, then the existence of suitable L1 candidates should alleviate the difficulties. Presumably, such one-to-one mapping is even likelier if the L1 candidates are also cognates. The psycholinguistic literature shows that frequency-matched cognates facilitate the L2 processing especially of concrete nouns (De Groot & Nas, 1991; van Hell & de Groot, 1998). Moreover, the literature on crosslinguistic influence generally considers similarity in form to promote a learner assumption of similarity in meaning (occasionally leading

to problems with 'false friends', cf. Meara, 1993). However, both traditions say little about what effect cognates have on the *development* of meaning in the L2 more generally, especially in cases where the cognates are not matched for frequency across the languages. Specifically, in a context where a learner's L1 provides a highly frequent general term as well as low-frequency cognates to the L2 term, it is not clear whether the cognates facilitate the development of L2-typical meaning.

Overall, despite the abundant literature on crosslinguistic influence in SLA identifying L2 'errors' in meaning, we know surprisingly little about what meanings L2 speakers ascribe to specific forms used. We also know little about whether, how, and when they reconstruct their meanings towards the target, especially as they move from a single general semantic category to multiple more fine-grained ones, and what role low-frequency cognates might play.

The current study

This study aims to examine to what extent English speakers of L2 Dutch reconstruct the meanings of placement verbs when moving from a frequent general L1 verb of caused motion (*put*) to two specific caused posture verbs (*zetten/leggen* 'set/lay') in the L2. In addition to the frequent single general placement verb, *put*, English also has a set of optional and low-frequency more specific verbs, the caused posture verbs *set* and *lay*, cognates with the obligatory Dutch caused posture verbs. Therefore, although English L2 speakers face a transition from a highly frequent general single-term category to more specific multiple terms, the cognate low-frequency verbs in the L1 may facilitate the acquisition of the meaning of the L2 verbs, since similarity of form and meaning should be conducive to positive transfer even for verbs (Kroll & Sunderman, 2003; Odlin, 2003; Van Hell & De Groot, 1998).

To probe these issues, this study asks (1) what placement verbs English L2 speakers of Dutch use to describe placement events; and (2) what these verb forms mean. To investigate meaning, the study examines the relationship between verbs and scenes (extension patterns). Furthermore, to provide a more complete picture of learners' intended meanings as they use certain forms, it considers all vehicles of meaning, and analyses speech and speech-associated gestures in combination. Gestures are particularly interesting for studies of meaning

development since they may reveal that L2 speakers' express meaning elements that do not find an outlet in L2 speech, depending on the linguistic means the L2 speaker has available. Gestures can thus provide more information on L2 speakers' intended meanings than speech analysis alone.

The first analysis examines what verbs English speakers of L2 Dutch use to describe placement events in L1 English as well as in L2 Dutch. The second analysis focuses on the extension patterns in L2 Dutch, that is, whether the L2 speakers use the Dutch verbs appropriately relative to the scenes described. The following predictions can be made: if the low-frequency cognates in the L1 play no role, English L2 speakers of Dutch will experience difficulties with the Dutch specific verbs and overgeneralise one verb in the L2 with a single general L1-based meaning (cause to move to ground) leading to a poor match between verb and scene content. However, if the presence of the cognate low-frequency caused posture verbs in English influences the transition into Dutch, then the L2 speakers may use both Dutch placement verbs to differentially label horizontal and vertical placement scenes.

The third analysis explores participants' gesture production both in L1 English and in L2 Dutch to examine what meaning components are targeted. The prediction is that if English L2 speakers of Dutch operate with an L1-based meaning, their gestures will overall look English-like. Based on previous findings (Hoetjes, 2008), this suggests that they should express mainly path in gesture and align their gestures with locative goal expressions. If, however, they have shifted their attention towards the object in line with Dutch verb semantics, their gestures should look more Dutch-like and incorporate objects in handshapes and align with verbs in speech (Gullberg, submitted-a). To explore the possibility that L2 speakers express semantic content in gesture before using appropriate verbs in speech, the co-expressivity between speech and gesture is also examined. That is, the analyses will examine whether English L2 speakers of Dutch express information about objects in gestural handshapes although they may be using inappropriate verb forms in speech. Finally, this analysis also investigates whether gesture production differs between those L2 speakers whose L2 verb use is appropriate vs. those whose verb use is not.

Method

Participants

Ten English L2 speakers of Dutch participated in this study. For the purposes of this analysis, however, we excluded all participants who produced fewer than five gestures during the task, leaving 6 participants in total for analysis. At the time of testing the participants were exchange students (age 21-25) or professionals working in Nijmegen (age 36-56). Length of residence in the Netherlands ranged from 4 months to 33 years (*M* = 11 years, *SD* = 14 years). The participants took a standardized Dutch placement test and filled out a language background questionnaire (Gullberg & Indefrey, 2003). The proficiency scores put the participants in an intermediate-upper intermediate proficiency range (*M* = 81% correct, *SD* = 14 %, range 65% - 98%). Table 1 summarizes the biographical information.

TABLE 1 HERE

Materials and procedure

Data were collected through a video-based event description task in the form of a dyadic director-matcher game. The task requires a speaker (the Describer) to watch video clips of placement events on a laptop screen and then to describe them to an interlocutor (the Drawer) who cannot see them and who must draw the objects on a picture of the empty room based on the description (cf. Gullberg, to appear; submitted-a; submitted-b).

The stimulus clips show a female actor putting away 32 objects found on the floor of a messy room (two items are always mentioned together and are therefore collapsed in the following). Ten scenes depict horizontal placement (e.g., tablecloth on table, bottle on its side) 10 vertical placement (e.g., books on shelf), predominantly labelled by *leggen* and *zetten*, respectively, by native speakers of Dutch (Gullberg, to appear; submitted-a). Six scenes represent suspension events (e.g., shirt on hanger), two sticky attachment (e.g., chewing gum under table), and three events involve donning items of clothing (e.g., hat on head).

The 32 events were distributed over 8 video clips with each clip showing 4 events. The clips were projected on a laptop screen. Describers watched one clip at a time and when the

screen went blank they had to describe from memory to confederate Drawers what the agent in the video did to the objects. A list of the object nouns was provided as memory support (e.g. *tablecloth, bowl*). Oral and written instructions called for descriptions answering the question "What happened?" to focus the description on the placement activity. No mention was made of gesture. The sessions were audio- and videotaped. The participants did the task both in L1 and L2 with orders counter-balanced, describing the events to a native English speaker in L1 sessions and to a native Dutch speaker in L2 sessions.

Coding

Speech

Native speakers transcribed the first spontaneous description of each placement event, excluding elaborations following questions. Examples are given in (1) (native English) and (2) (L2 Dutch), with the first description underlined.

(1) *then she finds a hat <u>which she puts on her head</u>* (7E1)

(2) *vervolgens ziet ze een rood hoedje […] <u>en dat doet ze op haar eigen hoofd</u>*

'then she sees a red hat […] <u>and that she does onto her own head</u>' (7E1D2)

In cases of self-corrections, the first immediately following interpretable description was retained. The analysis focuses on the verbs used to describe the placement event (e.g., *puts* and *doet* 'does' in the examples given).

Gesture

The analysis targets gesture strokes (the expressive part of the gestural movement) and post-stroke holds (cases where hands are temporarily held immobile in space), excluding gestures occurring with disfluencies or multiple hesitation phenomena (Gullberg, 1998). Strokes and post-stroke holds occurring with the first descriptions of the placement events were identified through frame-by-frame analysis of the video (Kendon, 1972; 2004: 111-112; Kita, Van Gijn, & Van der Hulst, 1998; Seyfeddinipur, 2006). With sound turned off, these were then coded for form, specifically for whether they expressed: (a) object information in handshapes reflecting the object; or (b) only direction or path of movement in lax hands performing a 'spatial excursion' laterally, vertically or sagittally from the speaker's body (cf. Kendon, 2004). With sound turned

back on, gestures were also coded for timing relative to speech such that speech that co-occurred exactly with the gesture was re-transcribed and categorised into Verb (e.g., *zet* 'set'), Figure Object (*de fles* 'the bottle'), Locative phrase (*op de tafel* 'on the table'), and Other (*diagonaal met de punt naar beneden* 'diagonally with the corner downwards').

The interrater reliability for gesture identification was .93 (*N*=229) and for form coding (object-incorporation vs. path-only) .90. In cases of discrepancy, the judgement of the second coder was retained.

Gestures were also coded for co-expressivity with speech. A narrow definition of co-expressivity focuses on the speech that overlaps exactly in time with the gesture stroke (Gullberg, Hendriks & Hickmann, 2008). However, a broader definition is adopted here, and the analysis examines whether the semantic elements expressed in gesture overlapped with those expressed in the placement verbs. Three relationships were identified: (a) cases of Total overlap (object information in gesture and posture verbs in speech; simple path information in gesture and general caused motion verbs in speech); (b) Gesture adding information (object information in gesture but general caused motion in speech); (c) Speech adding information (simple path in gesture but posture verbs in speech).

Analysis

Non-parametric statistical tests were used, specifically Wilcoxon for comparisons of two related samples and Friedman for comparisons of several related samples. Because the dependent variables are proportions, they were arcsine transformed for statistical analysis (Howell, 2002); however, non-transformed values are reported in tables, figures and text.

Results

Overall verb use in native English and L2 Dutch

TABLE 2 HERE

Table 2 lists the mean proportion of verbs used to describe the stimulus events in the participants' L1 English and in L2 Dutch. As expected, the verb used most often in L1 English was *put*. Two more specific verbs also occurred with some frequency, namely *hang*, used to

describe suspension events (e.g., clock on wall, shirt on hanger) and *stick* for sticky attachment events (e.g., chewing gum under a table). A range of other verbs (Other in Table 2) also occurred once or twice each (e.g., *throw, roll*). The specific caused posture verbs *set* and *lay* occurred only once each in the data set (produced by two different speakers). Interestingly, they were not employed even in cases of contrast (e.g., bottle set upright followed by bottle laid on its side). These findings replicate previous results from monolingual English speakers describing the same materials (Hoetjes, 2008). The general verb *put* was the default and although specific verbs like *hang* and *stick* were used, the semantically specific caused posture verbs *set* and *lay* were virtually absent in the native English production.

Native Dutch speakers describing the same scenes consistently use *zetten* 'set' for vertically placed objects and objects resting on a base (e.g., bowl on table), *leggen* 'lay' for horizontally placed objects and objects without a base to rest on (e.g., bottle laid on its side and football in drawer). They employ *hangen* 'hang' for suspended objects and *plakken* 'stick' for sticky attachment (Gullberg, to appear; submitted-a). The Dutch L2 data look quite different. In L2 Dutch the most frequently used verb was *zetten* 'set' (example 1). The L2 speakers also frequently used *zijn* 'to be' in existential constructions (2) and the intransitive posture verbs *zitten, staan, liggen* 'sit, stand, lie' (3). The use of *zijn* in basic locative constructions is not appropriate in Dutch and is not found in native production (cf. van Staden, Bowerman, & Verhelst, 2006). The intransitive posture verbs are only appropriate in static descriptions. Further, the L2 speakers often used dummy caused motion verbs like *gaan* 'go' (4) and *doen* 'do' (5). *Gaan* is rarely used by native speakers of Dutch for placement whereas *doen* is used occasionally (Gullberg, to appear). The L2 speakers predominantly used *hangen* for suspension events (6). The least frequent verb in L2 was *leggen* 'lay (7).

(1) *blijkt van het lijst een nijlpaard te zijn die <u>zet</u> ze bij de muur* (12E1D2)
'[it] seems from the list to be a hippo that she <u>sets</u> by the wall'

(2) *en de andere bal <u>is</u> in de ding in de tafel ja de hoogste la* (5E1D2)
'and the other ball <u>is</u> in the thing in the table yes the top drawer'

(3) *de bananen <u>liggen</u> in de kom op de tafel* (14E1D2)
'the bananas <u>lie</u> in the bowl on the table'

(4) *een wekkertje en die gaat op het bureau* (12E1D2)

'an alarm clock and that goes on the desk'

(5) *een broek en die vouwt ze dan op en die doet ze in de onderste la* (7E1D2)

'trousers and she folds them and does [puts] them in the bottom drawer'

(6) *de kleerhanger hangt op de hoogste ding aan de linkerkant* (5E1D2)

the coat hanger hangs on the highest thing on the left side'

(7) *stripboeken […] die legt ze dan op dezelfde plank* (7E1D2)

'comic books […] she lays them on the same shelf'

This simple overview of the L2 placement verb inventory thus already suggests an over-generalisation of *zetten* 'set', an under-use of *leggen* 'lay', as well as learner-specific solutions with intransitive posture verbs and dummy verbs.

Extension patterns in L2 Dutch – matching verb to horizontal and vertical scenes

The second analysis examines whether English speakers of L2 Dutch use an appropriate verb form for a particular scene. This analysis focuses on the 10 horizontal and 10 vertical scenes predominantly labelled by *leggen* and *zetten*, respectively, by native speakers of Dutch. First, for each orientation the proportion of responses per verb, including inappropriate forms, were computed. Second, the proportion of *appropriate* verbs by orientation was calculated, focusing both on caused posture verbs and on intransitive posture verbs, since the use of both categories require a focus on the object orientation.

FIGURE 1 A AND B HERE

For horizontal placement native Dutch speakers overwhelmingly prefer the caused posture verb *leggen* 'lay' (Gullberg, to appear; Narasimhan & Gullberg, submitted). The L2 speakers showed a strikingly different pattern (Fig. 1a). They used a range of different verbs to the same extent, as reflected in the absence of a statistical effect of verb type, Friedman, χ^2 (4, 6) = 4.55, p = .34. Despite the lack of statistical difference, the dummy verbs *gaan* and *doen* (M = 30% SD = 28%) and the intransitive placement verbs (M = 27% SD = 29%) were used numerically more often than the other verbs. The appropriate verb *leggen* was rarely used (M = 12% SD = 10%) and roughly as frequently as the inappropriate verb *zetten* 'set' (M = 15% SD = 15%).

For vertical placement native Dutch speakers massively prefer the caused posture verb *zetten* 'set' (Gullberg, to appear; Narasimhan & Gullberg, submitted). The L2 speakers seemed more attuned to this preference (Fig. 1b). Although, again, there was no statistical effect of verb type, Friedman, χ^2 (4, 6) = 6.49, p = .17, the appropriate verb *zetten* was numerically most frequent (M = 43% SD = 39%). The intransitive caused posture verbs were also relatively frequent (M = 32% SD = 34%). The inappropriate verb *leggen* was rarely *used* (M = 3% SD = 8%).

Next, the *appropriate* use of the caused and intransitive posture verbs relative to scene content and orientation was examined. Table 3 lists the mean proportions of appropriate verbs used for horizontal and vertical placement, respectively. L2 speakers were (marginally) significantly more accurate in their use of caused posture verbs for vertical (*zetten*, M = 61% SD = 49%) than for horizontal placement (*leggen*; M = 31% SD = 25%), Wilcoxon, Z = -1.89, p = .06.

The first analysis identified *zetten* 'set' as the most frequently used verb overall cross both orientations in L2, suggesting that L2 speakers over-generalise *zetten* to label all placement events. However, the analysis of verb use by scene reveals a more complex picture. Two observations can be made. First, there *is* evidence of an overgeneralisation of *zetten* since it was used to label both vertical and horizontal scenes. However, second, there was also an asymmetry in verb use across the orientations. *Zetten* was predominantly used to (appropriately) label vertical placement, whereas a variety of non-target-like verbs, mainly dummy verbs and intransitive posture verbs, were used for horizontal placement. This means (a) that the seemingly appropriate use of *zetten* for vertical scenes could be an artefact of the overgeneralisation, but also (b) that the overgeneralisation does not apply across the board, since L2 speakers differentiate the orientations through different verb preferences. Note that all L2 speakers had trouble with horizontal placement regardless of proficiency and length of residence. 7E1, with 33 years of residence in the Netherlands, did no better in the description of horizontal placement than 5E1 who had only spent 4 months there. Another interesting fact obscured by the group analysis is the individual preference for intransitive instead of caused posture verbs and the surprising accuracy of their use. For instance, 5E1 who almost

exclusively uses *zitten, staan, liggen* ‘set, stand, lie’, shows 75% accuracy in the horizontal (8) and 100% accuracy in the vertical (9) dimension. The choice of intransitive verbs appears to be a strategy serving as an alternative to over-generalisation of one of the caused posture verbs.

(8) *en de doek ligt op de tafel* (5E1D2)
‘and the cloth lies on the table’

(9) *en de fles staat fles staat op de tweede plank ja* (5E1D2)
‘and the bottle stands bottle stands on the second shelf yes’

Gesture production in native English and L2 Dutch

The third analysis explores what the participants’ gesture production reveals about the semantic elements they target when speaking about placement, that is, what they mean by the L2 forms they use. As a baseline, the participants’ gesture production in the L1 was first examined. In L1 English the participants produced gestures whose forms predominantly expressed only path towards the goal ground (M = 63%, SD = 19%), and less often gestures expressing handshapes incorporating the object (M = 37%, SD = 26%). Moreover, they predominantly aligned their gestures with spoken Locative expressions (M = 61%, SD = 18%). The L1 gesture data thus suggest that native speakers of English focus on the caused motion towards the goal ground when using the verb *put*, replicating findings for monolingual English speakers (Hoetjes, 2008).

The gesture production in L2 Dutch looked remarkably similar. The participants predominantly produced gestures whose forms expressed only path (M = 61%, SD = 18%), and less often handshapes incorporating the object (M = 39%, SD = 13%). A within-subject comparison of gesture forms used in L1 and L2 showed no difference across language, Wilcoxon, Z = -.31, p = .75. Moreover, the L2 speakers chiefly aligned their gestures with Locative expressions in L2 speech (M = 59%, SD = 9%). Again, a within-subject comparison of gesture alignment in L1 and L2 showed no cross-language difference, Wilcoxon, Z = -.11, p = .92. In other words, the participants behaved the same gesturally in their native English and in L2 Dutch.

Although no statistical comparison can be made to native Dutch gesture production in this study, the similarity between L1 and L2 gesture production suggests that the English speakers of L2 Dutch have not shifted their attention to objects and actions to match the

semantic focus of native speakers of Dutch (Gullberg, to appear; submitted-a). That is to say, as a group the L2 speakers' gesture patterns strongly suggest a continued focus on caused movement and goal grounds even in the L2.

To assess whether L2 speakers expressed object-related information in gestures although their verbs did not, an analysis of co-expressivity was conducted (Fig.2) revealing a significant difference between speech-gesture combinations, Friedman, χ^2 (2, 6) = 7.91, p = .02. L2 speakers were most likely to produce gestures fully co-expressive with speech (M = 57%, SD = 32%). Moreover, in cases of discrepancy, speech was significantly more likely to add information to gesture (i.e., to be more specific) (M = 39%, SD = 30%) than gesture was to add information to speech (M = 4%, SD = 7%, Wilcoxon, Z = -2.02, p = .04). Put differently, there was little evidence that L2 speakers used gesture to express object-related information that they were not expressing in speech in a compensatory fashion. Instead, they were more likely to use a caused posture verb in speech while gesturing about path, that is, to use a targetlike form in speech but to express L1-like meaning in gesture.

FIGURE 2 HERE

A final analysis examined the relationship between appropriate use of caused posture verbs and object-incorporation in gesture. There was a significant positive correlation between the proportion of *appropriate* uses of transitive caused posture verbs (*zetten, leggen*) relative to scene content and the proportion of object-incorporating gestures (Spearman's r(6) = .85, p = .03). That is, participants who used the specific caused posture verbs appropriately for a given scene were also more likely to gesture in Dutch-like fashion, producing handshapes suggesting a shift of focus towards the figure object.

Discussion

This study examined what verbs English speakers of L2 Dutch use to describe placement events and what the verbs they use might mean using both speech and gesture analysis to examine meaning. Specifically, it explored whether a move from the semantically general verb *put* in English causes difficulty with the semantically specific Dutch caused posture verbs *leggen* 'lay' and *zetten* 'set' in L2. The results can be summarised in three points. First, in their native English the participants predominantly used *put* and virtually never the English specific caused

posture verbs *lay* and *set,* cognates to the Dutch target verbs. In L2 Dutch, they over-used one of the caused posture verbs, *zetten* 'set', and rarely used the other, *leggen* 'lay'. They also used dummy caused motion verbs like *gaan* 'go' and *doen* 'do', as well as the intransitive posture verbs *zitten, staan, liggen* 'sit, stand, lie'. Second, although *zetten* 'set' was over-generalised to all placement scenes, participants differentiated verb use depending on scene content (horizontal vs. vertical placement). *Zetten* was most often appropriately used for vertical placement whereas horizontal placement was mainly labelled with dummy verbs and intransitive posture verbs. Third, English L2 speakers of Dutch gestured similarly in their L1 and L2, mainly expressing the path of the caused movement in gesture and aligning their gestures with locative expressions in both languages. There was thus little evidence of a shift towards object-incorporation and alignment with verbs, a pattern reflecting the typical Dutch focus on objects and actions. Instead, the gesture data suggest that when the English speakers used Dutch verb forms, these roughly meant the equivalent of *put*. However, the more L2 speakers produced gestures expressing a Dutch-like focus on objects, the more likely they were to appropriately use caused posture verbs relative to scene content in the L2.

Overall, the results support the prediction that English speakers of L2 Dutch should experience difficulties with the transition from a single general placement verb to the semantically specific Dutch placement verbs despite the existence of specific cognate caused posture verbs in their L1. This is perhaps not surprising given how rare the cognate L1 verbs *set* and *lay* are in the speakers' own L1 production.[2] The L2 speakers' strategy for dealing with the transition towards the Dutch verbs seems to be look for ways to express the L1-typical general caused motion meaning (cf., 'transfer to nowhere', Kellerman, 1995). Since Dutch offers no superordinate term like *put*, they over-extend one of the Dutch caused posture verbs, *zetten* 'set', and use dummy caused motion verbs such as *gaan* 'go' or *doen* 'do' as stand-ins. The choice of *zetten* 'set' as a default form over *leggen* 'lay' is interesting. Dutch children overgeneralise *leggen* (Narasimhan & Gullberg, submitted) and child L2 learners of Swedish whose L1s are not Germanic also display an over-use of *lägga* 'lay' (Viberg, 1993:361). In Dutch *zetten* and *leggen* are equally frequent (the log frequencies of the lemmas *zetten* and *leggen* in CELEX are 2.6 and 2.6, respectively; Baayen, Piepenbrock, & van Rijn, 1993).

However, *zetten* has more extended uses beyond concrete placement than *leggen* (e.g., *koffie zetten* 'make coffee', etc.), which in turn makes it semantically less transparent. Dutch children's choice of *leggen* over *zetten* as a default verb seems to be goverend by a preference for semantic transparency. Adult learners might have been expected to make the same choice. An intriguing possibility, therefore, is that the choice of *zetten* is motivated by the cognate *set* in English. Although neither posture verb is very frequent in English, *set* is more frequent than *lay* (9,552 occurrences of *lay* vs. 44,220 occurrences of *set* in the British National Corpus Online; Hoetjes, 2008; Pauwels, 2000). If the choice of *zetten* as the default caused motion verb in adult L2 Dutch is indeed influenced by the frequency of the cognate form in English, this is a very different and indirect way in which the cognate forms (but not necessarily their meanings) affect the development of the placement verbs in L2 Dutch.

Interestingly, the over-generalisation of *zetten* is not a strategy applied across the board, however. The different verb preferences for labelling vertical and horizontal scenes suggest that the L2 speakers are distinguishing these. Specifically, the use of dummy verbs and intransitive posture verbs for horizontal placement seems to suggest that the L2 speakers have developed some sensitivity to the relevance of orientation in Dutch and a beginning re-construction of meaning. Of particular interest is the use of the intransitive posture verbs. These are not a simpler option than the caused posture verbs for an L2 speaker since they too encode object-related orientation information. The fact that they are used and accurately so relative to the orientation in the scene suggests that the difficulty in the transition from a general to more specific caused motion verbs does not simply reside in the addition of the object orientation element. Participants using the intransitive posture verbs have no trouble targeting and expressing the resulting end state of the object in L2. Instead, the problem may reside in the conflation of the caused motion and the end state into one monomorphemic form. Interestingly enough, the use of intransitive verbs as stand-ins for the causative, transitive set have also been found in L2 Swedish (Viberg, 1998) and in child L1 acquisition of Dutch where children use intransitive posture verbs correctly while simultaneously using *leggen* 'lay' as a default for caused placement (Narasimhan & Gullberg, submitted). Again, the English speakers' ready

focus on the resulting end state may be influenced by the presence of the cognates in the L1, although further testing is required to probe this issue.

The gesture evidence indicates that despite the beginning sensitivity to more fine-grained distinctions in the L2, the L2 speakers as a group generally still focused on caused motion towards the ground, that is to say, a meaning compatible with the meaning of *put* in the L1. Put differently, in many cases when a caused posture verb like *zetten* 'set' is used, the gesture data indicate that the intended meaning conveyed is more like that of *put* as seen in English-like gestures conveying only path and no information about objects. This suggests that the L2 speakers' verb meaning representations have not been (fully) reconstructed towards the Dutch target. However, speakers who did use the Dutch caused posture verbs appropriately relative to scene content also gestured about placement in Dutch-like fashion. Reconstruction therefore does not seem to be entirely out of reach.

It is striking that there is little evidence of gestures being used as a compensatory device for expressing object-related information not expressible in speech. The overall co-expressivity across the modalities instead suggests that gestures reflect a change in focus only once a semantic element has been fully integrated into the verb's meaning representation. That said, it would be premature to conclude that gestures will never foreshadow changes in speech. More participants with a more even distribution across proficiency levels should shed further light on the distribution of semantic elements across modalities during development. As an aside, one may wonder whether native speakers notice the difference between native and non-native-like gesturing. Although many studies indicate that listeners attend to and integrate gestural information (e.g., Gullberg & Kita, accepted; Kelly, Barr, Breckinridge Church, & Lynch, 1999; Özyürek, Willems, Kita, & Hagoort, 2007; Riseborough, 1981), no study to date has tested native speakers' sensitivity to 'foreign gesture'. This is clearly a worthwhile enterprise.

The English participants' persistent difficulties in reconstructing meaning when moving from a single semantically general to multiple semantically specific verbs in Dutch are in stark contrast to studies examining transitions in the opposite direction. Dutch and German classroom learners of French go from many-to-one inventories of placement verbs. Their L1s have sets of specific caused posture verbs (*zetten/leggen* 'set/lay' in Dutch; *stellen/legen* 'stand/lay' in

German). These learners quickly use the appropriate general French verb *mettre* 'put'. Interestingly, although some learners show evidence of continued reliance on L1-specific semantic distinctions in gesture, there are also learners whose speech and gesture patterns look French. Dutch learners shift focus away from objects towards simple paths, as seen in gestural forms, and German learners shift focus away from locative expressions towards verbs, as revealed in gestural timing patterns (Gullberg, submitted-b). That is, although they are classroom learners who have had no explicit instruction on the differences in verb semantics, some of them nevertheless seem to reconstruct the meaning representations towards the target, effectively shifting attention to different spatial information. Such findings highlight the qualitative difference between shifting attention to other specific information and shifting attention to new information. It remains an important matter for further experimental research to explore whether transitions from many-to-many are easier than the transition from one-to-many even when the type of specific information across L1 and L2 differ.

In conclusion, the transition from a semantically general single-term system to a specific multiple-term system causes difficulties leading L2 speakers to look for ways to express L1-typical, general meaning. The speech and gesture evidence presented here suggest that English speakers of L2 Dutch essentially try to find ways to express *put* in Dutch. The reconstruction of categories, shifts of semantic boundaries, and redirection of attention to novel types of information remains a challenging L2 task even when the L1 offers cognate forms to draw on. However, the data also show evidence of gradual shifts towards a focus on objects as reflected in differential verb use for horizontal and vertical placement. This in turn opens for the possibility that the existence of low-frequency cognates in the L1 nevertheless help sensitise L2 speakers to distinctions in the L2 which may otherwise be harder to detect such as object orientation. Although the L2 speakers are not yet target-like in their analysis of how the information about object orientation maps onto the caused motion verbs in the target language, they do seem to have detected its relevance. Part of the mapping problem may reside in the conflation of multiple semantic elements (e.g., the caused motion and the end state of the object) into one form. L2 speakers must not only identify the relevance of the object itself, but specifically its end state orientation, and then package this information along with the element of

caused motion into one single lexical item. The differential verb use observed in the English speakers of L2 Dutch may reflect the first steps towards full reconstruction of placement verb meaning in L2: the use of dummy verbs suggests a focus on caused motion; the use of intransitive posture verbs a focus on the object's end state. Further studies may reveal transitional stages where these two elements come together more systematically in speech and in gesture. What is clear at this point is that the reconstruction of meaning in an L2 is no trivial matter. Since we presumably acquire second languages to convey our thoughts and meanings, it seems urgent to improve our understanding of what L2 speakers mean and how they come to mean what they seem to be saying.

References

Ameel, E., Storms, G., Malt, B. C., & Sloman, S. A. (2005). How bilinguals solve the naming problem. *Journal of Memory and Language, 52*, 309-329.

Baayen, H., Piepenbrock, R., & van Rijn, H. (1993). The CELEX lexical database [CD-ROM]. Philadelphia: Linguistic Data Consortium, University of Pennsylvania.

Bogaards, P., & Laufer, B. (Eds.). (2004). *Vocabulary in a second language: Selection, Acquisition and testing*. Amsterdam: Benjamins.

Brown, P. (2006). A sketch of the grammar of space in Tzeltal. In S. C. Levinson & D. P. Wilkins (Eds.), *Grammars of space. Explorations in cognitive diversity* (pp. 230-272). Cambridge: Cambridge University Press.

Brown, A., & Gullberg, M. (2008). Bidirectional crosslinguistic influence in L1-L2 encoding of Manner in speech and gesture: A study of Japanese speakers of English. *Studies in Second Language Acquisition, 30*, 225-251.

Coppieters, R. (1987). Competence differences between native and near-native speakers. *Language, 63*, 544-573.

Costa, A. (2005). Lexical access in bilingual production. In J. F. Kroll & A. M. De Groot (Eds.), *Handbook of bilingualism* (pp. 308-325). Oxford: Oxford University Press.

David, C. (2003). *Les "verbs of putting": Typologie, schéma syntaxique et organisation sémantique des constructions prépositionnelles en anglais contemporain.* Unpublished PhD diss, Université de Poitiers, Poitiers.

De Groot, A. M. B., & Nas, G. L. J. (1991). Lexical representation of cognates and noncognates in compound bilinguals. *Journal of Memory and Language*, *30*, 90-123.

Duncan, S. D. (2005). Co-expressivity of speech and gesture: Manner of motion in Spanish, English, and Chinese. In C. Chang, M. J. Houser, Y. Kim, D. Mortensen, M. Park-Doob & M. Toosarvandani (Eds.), *Proceedings of the 27th Annual Meeting of the Berkeley Linguistic Society, Feb. 16-18, 2001* (Vol. General Session and parasession on Gesture and Language, pp. 353-370). Berkeley, CA: Berkeley Linguistics Society.

Duyck, W., Vanderelst, D., Desmet, T. & Hartsuiker, R. J. (2008). The frequency effect in second-language visual word recognition. *Psychonomic Bulletin & Review*, 15, 850-855.

Ellis, N. C. (1994). Implicit and explicit language learning - An overview. In N. C. Ellis (Ed.), *Implicit and explicit learning of languages* (pp. 1-31). London: Academic Press.

Ellis, R. (1994). *The study of second language acquisition*. Oxford: Oxford University Press.

Geeslin, K. L. (2003). A comparison of copula choice: Native Spanish speakers and advanced learners. *Language Learning, 53*, 703 - 764.

Goldberg, A. (1995). *Constructions: A construction grammar approach to argument structure*. Chicago: University of Chicago Press.

Guijarro-Fuentes, P. & Geesin, K. L. (2008) (Eds.). Language acquisition, bilingualism and copula choice in Spanish. Special issue *Bilingualism: Language and Cognition, 11*.

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. (to appear). Language-specific encoding of placement events in gestures. In E. Pederson & J. Bohnemeyer (Eds.), *Event representations in language and cognition*. Cambridge: Cambridge University Press.

Gullberg, M. (submitted-a). Linguistic representations influence speech-associated gestures in the domain of placement.

Gullberg, M. (submitted-b). What learners mean. What gestures reveal about semantic reorganisation in advanced L2.

Gullberg, M., Hendriks, H., & Hickmann, M. (2008). Learning to talk and gesture about motion in French. *First Language, 28*, 200-236.

Gullberg, M., & Indefrey, P. (2003). Language Background Questionnaire. Developed in project The Dynamics of Multilingual Processing. URL http://www.mpi.nl/research/projects/Multilingualism.

Gullberg, M., & Kita, S. (accepted). Attention to speech-accompanying gestures: Eye movements and information uptake. *Journal of Nonverbal Behavior*.

Hickmann, M. (2007). Static and dynamic location in French: Developmental and crosslinguistic perspectives. In M. Aurnague, M. Hickmann & L. Vieu (Eds.), *The categorization of spatial entities in language and cognition* (pp. 205–231). Amsterdam: Benjamins.

Hoetjes, M. (2008). *Event representation of English placement events. The use and usefulness of gestures.* Unpublished MA thesis, Radboud University Nijmegen, Nijmegen.

Howell, D. (2002). *Statistical methods for psychology* (5th ed.). Pacific Grove, CA: Duxbury.

Ijaz, I. H. (1986). Linguistic and cognitive determinants of lexical acquisition in a second language. *Language Learning, 36*, 401-451.

Jescheniak, J. D., & Levelt, W. J. M. (1994). Word frequency effects in speech production: Retrieval of syntactic information and of phonological form *Journal of Experimental Psychology: Learning, Memory, and Cognition, 20*, 824-843.

Jiang, N. (2000). Lexical representation and development in a second language. *Applied Linguistics, 21*, 47-77.

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., & 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. (1972). Some relationships between body motion and speech: An analysis of an example. In A. W. Siegman & B. Pope (Eds.), *Studies in dyadic communication* (pp. 177-210). New York: Pergamon.

Kendon, A. (2004). *Gesture. Visible action as utterance*. Cambridge: Cambridge University Press.

Kita, S. (2009). Cross-cultural variation of speech-accompanying gesture: A review. *Language and Cognitive Processes, 24*(2), 145 - 167.

Kita, S., & 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*, 16-32.

Kita, S., Van Gijn, I., & Van der Hulst, H. (1998). Movement phases in signs and co-speech gestures, and their transcription by human coders. In I. Wachsmuth & M. Fröhlich (Eds.), *Gesture and Sign Language in Human-Computer interaction* (pp. 23-35). Berlin: Springer.

Kopecka, A., & Narasimhan, B. (Eds.). (to appear). *Events of "putting" and "taking": A crosslinguistic perspective*. Amsterdam: Benjamins.

Kroll, J. F., & Sunderman, G. (2003). Cognitive processes in second language learners and bilinguals: The development of lexical and conceptual representations. In C. J. Doughty & M. H. Long (Eds.), *The handbook of second language acquisition* (pp. 104-129). Oxford: Blackwells.

Kroll, J. F., & Stewart, E. (1994). Category interference in translation and picture naming: Evidence for asymmetric connections between bilingual memory representations. *Journal of Memory and Language, 33*, 149-174.

Laufer, B., & Hulstijn, J. (2001). Incidental vocabulary acquisition in a second language: The construct of task-induced involvement. *Applied Linguistics*, 22, 1-26.

Lemmens, M. (2006). Caused posture: experiential patterns emerging from corpus research. In A. Stefanowitsch & S. Gries (Eds.), *Corpora in cognitive linguistics. Corpus-based approaches to syntax and lexis* (pp. 263-298). Berlin: Mouton.

McNeill, D. (1992). *Hand and mind. What the hands reveal about thought*. Chicago: University of Chicago Press.

McNeill, D. (2005). *Gesture and thought*. Chicago: University of Chicago Press.

Meara, P. M. (1993). The bilingual lexicon and the teaching of vocabulary. In R. Schreuder & B. Weltens (Eds.), *The bilingual lexicon* (pp. 279-289). Amsterdam: Benjamins.

Meara, P. M. (2007) Emergent properties of multilingual lexicons. *Applied Linguistics, 27*, 620-644.

Narasimhan, B., & Gullberg, M. (submitted). The role of input frequency and semantic transparency in the acquisition of verb meaning: Evidence from placement verbs in Tamil and Dutch.

Nation, I. S. P., & Meara, P. M. (2002). Vocabulary. In N. Schmitt (Ed.), *An introduction to Applied Linguistics* (pp. 35-54). London: Arnold.

Newman, J. (2002). 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.

Odlin, T. (2003). Cross-linguistic influence. In C. J. Doughty & M. H. Long (Eds.), *The handbook of second language acquisition* (pp. 436-486). Oxford: Blackwells.

Özyürek, A., Willems, R. M., Kita, S., & 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., & Driagina, V. (2007). Russian emotion vocabulary in American learners' narratives. *Modern Language Journal, 91*(2), 213 - 234.

Riseborough, M. G. (1981). Physiographic gestures as decoding facilitators: Three experiments exploring a neglected facet of communication. *Journal of Nonverbal Behavior, 5*(3), 172-183.

Schmitt, N. (1998). Tracking the incremental acquisition of second language vocabulary: A longitudinal study. *Language Learning, 48*(2), 281-317.

Seyfeddinipur, M. (2006). *Disfluency: Interrupting speech and gesture.* Unpublished PhD diss, Radboud University, Nijmegen.

Slobin, D. I., Bowerman, M., Brown, P., Eisenbeiss, S., & Narasimhan, B. (to appear). Putting things in places: Developmental consequences of linguistic typology. In E. Pederson & J. Bohnemeyer (Eds.), *Event representations in language and cognition*. Cambridge: Cambridge University Press.

Stockwell, R., Brown, J., & Martin, J. (1965). *The grammatical structures of English and Spanish*. Chicago: University of Chicago Press.

Van Hell, J. G., & De Groot, A. M. B. (1998). Conceptual representation in bilingual memory: Effects of concreteness and cognate status in word association. *Bilingualism: Language and Cognition, 1*, 193-211.

Van Oosten, J. (1986). Sitting, standing and lying in Dutch: A cognitive approach to the distribution of the verbs *zitten*, *staan*, and *liggen*. In J. van Oosten & J. P. Snapper (Eds.), *Dutch Studies Program, U.C. Berkeley* (pp. 137-160). Berkeley: UCB.

van Staden, M., Bowerman, M., & Verhelst, M. (2006). Some properties of spatial description in Dutch. In S. C. Levinson & D. P. Wilkins (Eds.), *Grammars of space. Explorations in cognitive diversity* (pp. 475-511). Cambridge: Cambridge University Press.

Viberg, Å. (1985). Lexikal andraspråksinlärning. Hur polsk-, spansk- och finskspråkiga lär in svenskans placeraverb [Lexical second language acquisition. How Polish, Spanish and Finnish speakers acquire the Swedish placement verbs]. *SUM-rapport, 2*, 5-92.

Viberg, Å. (1993). Crosslinguistic perspectives on lexical organization and lexical progression. In K. Hyltenstam & Å. Viberg (Eds.), *Progression and regression in language* (pp. 340-385). Cambridge: Cambridge University Press.

Viberg, Å. (1998). Crosslinguistic perspectives on lexical acquisition: The case of language-specific semantic differentiation. In K. Haastrup & Å. Viberg (Eds.), *Perspectives on lexical acquisition in a second language* (pp. 175-208). Lund: Lund University Press.

Table 1. The L2 speakers' language background and biographical information

Speaker information	Mean	Range	*SD*
Age (years)	36	21-56	16
Age of exposure (years)	24	20-31	4
Dutch placement test (of 60)	49	39-59	8
Self-reported proficiency (of 20)	16	12-20	3
Daily Dutch use (h)	7.5	0.5-12	6

Table 2. Mean proportion of verbs used to describe the placement events in English 1 and Dutch 2

	verb	mean %	SD
English 1	put	0.61	0.16
	other	0.19	0.21
	hang	0.14	0.08
	stick	0.05	0.02
	set	0.005	0.01
	lay	0.005	0.01
Dutch 2	zetten ‘set’	0.56	0.28
	intrans (zitten, staan, liggen, zijn ‘sit, stand, lie, be’)	0.28	0.30
	dummy (doen, gaan ‘do, go’)	0.18	0.08
	hangen ‘hang’	0.16	0.03
	other	0.14	0.04
	leggen ‘lay’	0.13	0.09

Table 3. Mean proportion of appropriate use of caused posture verbs (*leggen*/zetten 'lay/set') and of intransitive posture verbs (*liggen* 'lie' and *zitten/staan* 'sit/stand') across orientations

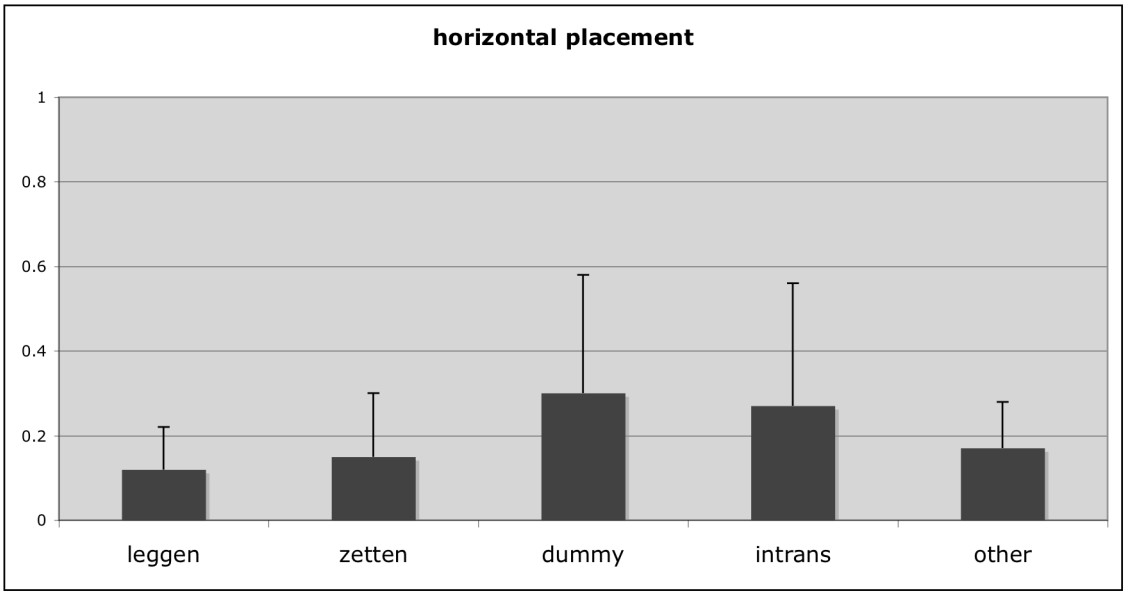
		Mean	SD
Horizontal	leggen 'lay'	.31	.25
	liggen 'lie' (intransitive posture)	.43	.48
Vertical	zetten 'set'	.63	.49
	zitten, staan 'sit, stand' (intransitive posture)	.42	.49

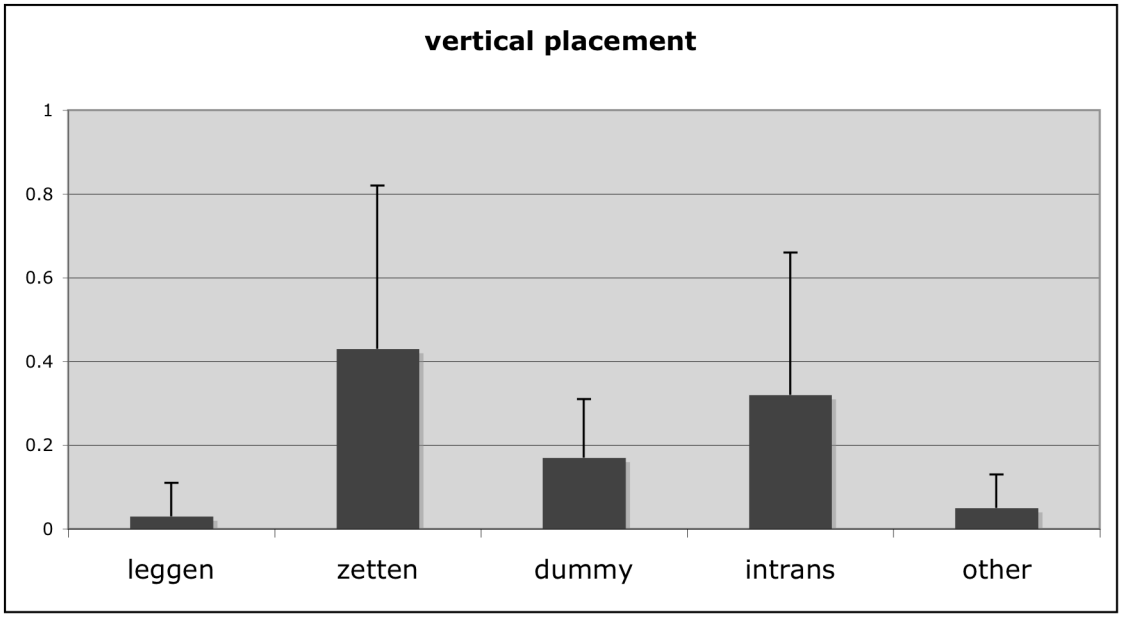
Figure captions

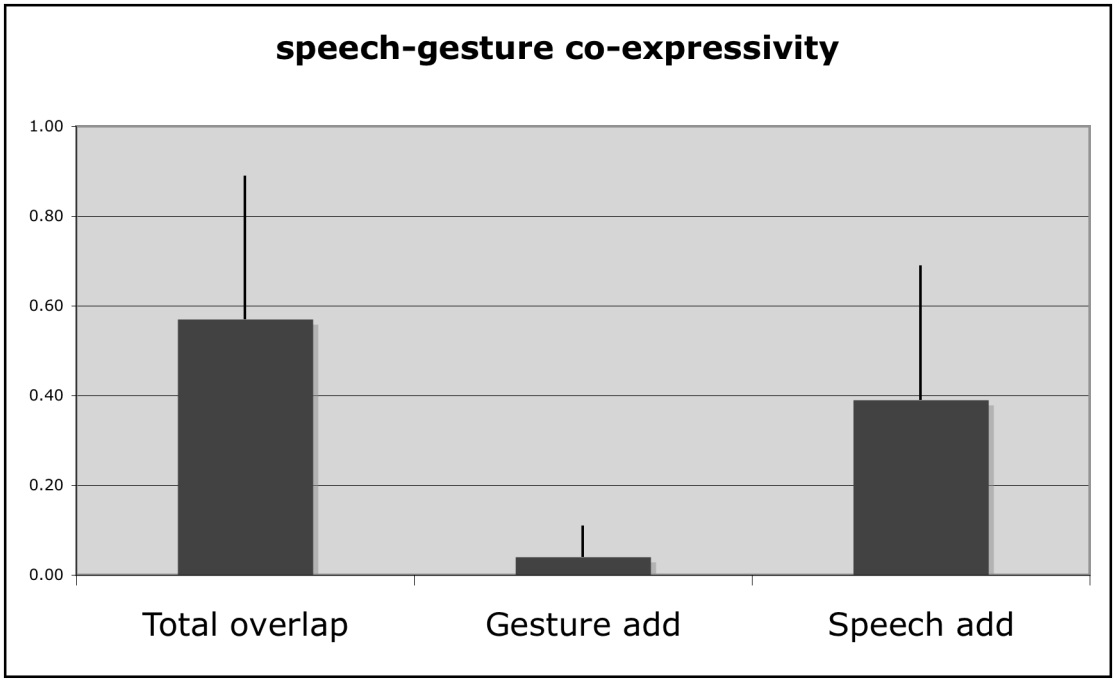
Figure 1 a. Mean proportion of verb use for 10 horizontal placement scenes (error bars = standard dev.)

Figure 1 b. Mean proportion of verb use for 10 vertical placement scenes (error bars = standard dev.)

Figure 2. Mean proportion of speech-gesture overlap (error bars = standard dev.)


horizontal placement
1
0.8
0.6
0.4
0.2
0
leggen
zetten
dummy
intrans
other


vertical placement
1
0.8
0.6
0.4
0.2
0
leggen
zetten
dummy
intrans
other


speech-gesture co-expressivity
1.00
0.80
0.60
0.40
0.20
0.00
Total overlap
Gesture add
Speech add

Biographical note

M. Gullberg is Lecturer at Radboud University Nijmegen and a Research Associate at the Max Planck Institute for Psycholinguistics, Nijmegen, the Netherlands. She leads the project *The dynamics of multilingual processing* with Dr P. Indefrey and co-ordinates the Nijmegen Gesture Centre with Dr A. Özyürek. Her research targets second language acquisition and use, focusing on early learning, semantics and discourse, and the production and perception of gestures.

Notes

[1] Dutch has many other types of verbs for placement which express the manner of placing, e.g. *stoppen* ‘stuff’, *plakken’* stick’, etc. (Lemmens, 2006).

[2] Note that it is far from clear how the cognate facilitation effect (Costa, 2005) and the word frequency effects (Jescheniak & Levelt, 1994) actually interact in bilingual speech *production* and in cases of low to intermediate formal proficiency (see Duyck, Vanderelst, Desmet & Hartsuiker, 2008 for a discussion).