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Transfer in Gesture: L2 Placement Event Descriptions

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Abstract

There are cross-linguistics differences in the type of verb used to describe placement events. Dutch uses semantically specific placement verbs (*zetten*, *leggen*), whereas English uses a semantically general placement verb (*put*). This semantic focus is reflected in speaker's gestures, which can be specific and object-focused by showing object-incorporating handshapes, or not. This study investigates the semantic placement event focus of Dutch L2 speakers of English, by investigating verb use and gesture production in placement event descriptions. Results showed that placement verb production was native-like, with a majority correct usage of *put*. However, gesture production showed many object-incorporating handshapes, similar to L1 Dutch gesture production. These results suggest that although the Dutch L2 speakers of English sounded native-like in speech, they were still trying to express Dutch-like placement verb meaning, by showing a continued focus on the object, as expressed in their gesture production.

Keywords: gesture; second language acquisition; transfer; placement events

Placement Events

Placement events are events in which a speaker talks about the relocation of a figure object towards a goal ground (Gullberg & Narasimhan, 2010). Descriptions of placement events occur often in discourse, for example when a speaker says 'She puts the book in the cupboard', or 'He put the cup on the table'. Languages can differ in how they describe these placement events. Specifically, the semantic information given in the placement verbs may differ (Kopecka & Narasimhan, 2012). This study will focus on English and Dutch. Speakers of English tend to use the verb *put*, which is a semantically general placement verb indicating movement and can be used to describe most placement events, regardless of the type of object being placed and the manner of placement. Speakers of Dutch however, have to choose between two more fine grained, or semantically specific, placement verbs, and this choice depends on the type of object being placed and on whether the object is being placed in a vertical manner (*zetten*) or in a horizontal manner (*leggen*). This means that for speakers of Dutch, it is important to not only focus on the general movement of the object but also on the object itself and its specific manner of placement, as this determines which verb needs to be used. Speakers of English do not need to focus on the figure object, as the same general placement verb can be used regardless of the type of object and its specific orientation towards the goal ground (Gullberg, 2009).

The difference between languages with regard to the semantics of placement verbs and the resulting language-specific focus on particular aspects of placement events (i.e. a focus on the general movement, or on the figure object) becomes especially relevant in second language (L2) production. Previous work (Ellis, 1994) has suggested a hierarchy of difficulty when learning an L2, depending on the similarity between the L1 and the L2 in semantic categories. Within this hierarchy, it is assumed that moving from an L1 with two semantic categories (e.g. the Dutch specific placement verbs *zetten* and *leggen*) to an L2 with one semantic category (e.g. the English general placement verb *put*) is easier than the other way around. Indeed, in line with this, previous work (Gullberg, 2009) found that speakers of English have difficulty in describing placement events in L2 Dutch, apparent by the overuse of one of the Dutch specific placement verbs, *zetten*. Whether Dutch speakers of L2 English indeed find it easier than English speakers of L2 Dutch to correctly describe placement events is assumed, but has not been empirically studied yet.

Gesture

Meaning expressed in human communication is multimodal, consisting of speech and gesture. Speech-accompanying gestures are temporally, semantically, and pragmatically coordinated with speech (Kendon, 2004; McNeill, 1992). Although several theories have been proposed about the exact details of the speech-gesture relationship (see Wagner, Malisz, & Kopp, 2014, for an overview), the existence of a close relationship between speech and gesture is undisputed.

The close relationship between speech and gesture is reflected in cross-linguistic differences in gesture production, across various linguistic levels. For example, Kita and Özyürek (2003) studied motion event descriptions in Japanese and Turkish and found that cross-linguistic differences in the number of clauses needed to describe an event were reflected in the number of gestures produced. Also at the level of semantics, research has shown that differences between languages are reflected in differences in gesture production. For example, Gullberg (2011) describes how speakers of French, like speakers of English, used a general placement verb (*mettre*) indicating general movement to the goal ground when describing placement events. Their gesture production also indicated a focus on the movement, and not on the object, with gestures showing path only. Speakers of Dutch, however, when describing placement events, used many semantically specific placement verbs (*zetten* and *leggen*), for which they need to

focus on the figure object of the placement event. This focus on the figure object was reflected in their gesture production, with a majority of gestures showing object-incorporating handshapes.

The coordination between speech and gesture thus means that gesture can be studied as an additional vehicle of meaning. The above mentioned studies focused on native speakers. A question is what happens when people speak a second language. Does gesture production reflect the semantics of L2 speech, or does the L1 still play a role?

Present Study

Previous work by Gullberg (2009) has shown that when speakers of English are describing placement events, they often (61%) use the general placement verb *put* (see Table 1 for a complete overview of English placement verb distribution), and produce many gestures (63%) indicating the path of the placement event, without a focus on the specific object being placed. Speech and gesture thus indicate that speakers of English focus on the general movement of the event.

Table 1. Mean proportion of placement verbs in L1 English, from Gullberg (2009)

Verb	Percentage
Put	61%
Hang	14%
Stick	5%
Lay	.05%
Set	.05%
Other	19%

Speakers of Dutch, on the other hand, when they are describing placement events, focus on the object being placed, as reflected in their semantically specific placement verbs (with the verbs *zetten* ‘set’, *leggen* ‘lay’, and *hangen* ‘hang’ comprising 66% of verb tokens) and a majority (59%) of object-incorporating handshapes in their gesture production (Gullberg, 2011).

Given this difference in semantics of placement verbs and the resulting difference in placement event focus between Dutch and English, a question is what happens when speakers of Dutch describe placement events in L2 English. As mentioned previously, given the difference in number of semantic categories between Dutch and English placement verbs, the assumption is that speakers of Dutch will not find it difficult to correctly use the L2 English placement verb.

However, the main question the present study aims to address is whether Dutch L2 speakers of English have acquired the semantic meaning of the L2 English placement verb. This would mean that when they speak English, they do not focus on the object being placed anymore, but on the general movement. Here the semantic meaning expressed in gesture becomes relevant. If Dutch L2 speakers of English have acquired the semantics of the English placement verb,

then this should be apparent not only in speech, but also in gesture, with gestures that focus on the general movement, and not on the figure object. Alternatively, Dutch L2 speakers of English may not have acquired the semantics of the English placement verb, and this may be apparent by non-native-like placement verb usage, and/or gesture production that does not focus on the general movement, but on the figure object. This alternative could indicate L1 transfer (Odlin, 1989) of placement verb meaning, and could occur even if placement verb production in L2 speech is native-like.

To address the research question, Dutch participants took part in a placement event description task in L2 English. The task was identical to the one used in previous studies on this topic (Gullberg, 2009, 2011).

Method

Participants

In this study, pairs of participants took part. Ten native speakers of Dutch (6 males, 4 females) took part in the role of Descriptor (age range 22-27, $M=24.4$, $SD=1.6$). The experiment was conducted in English. Prior to the experiment, participants filled out a language proficiency questionnaire (based on Gullberg & Indefrey, 2003). Describers reported an average proficiency in English of 3.8 out of 5 (speaking, listening, writing, reading, grammar, pronunciation).

Three non-Dutch participants (2 males, 1 female) with high levels of fluency in English and little knowledge of Dutch took part in the role of confederate Drawer. The pairing of the Drawers with the Describers meant that the Drawers (age range 18-27, $M= 22.33$, $SD=3.68$) took part several times. The Describers were not aware that the Drawers took part more than once.

Materials

The stimulus videos used were identical to the ones used in Gullberg (2009, 2011) and showed a female actor tidying a messy room by putting away 32 different objects (see Figure 1). The placement of these 32 objects was divided into 8 short video clips. In each video clip, the female actor put away 4 objects. In total, 10 of the events depicted horizontal placement (e.g. putting a bottle on its side), 10 of the events depicted vertical placement (e.g. putting books on a shelf), 6 were suspension events (e.g. putting a shirt on a hanger), 2 events contained a sticky attachment (e.g. putting chewing gum under a table), and in 3 events the actor donned pieces of clothing (e.g. putting a hat on her head). The different types of placement events occurred throughout the 8 video clips.



Figure 1. Screen shot from one of the stimulus videos.

Procedure

The event description task was identical to the one used in Gullberg (2009, 2011). Describers and Drawers were seated at a table opposite each other (see Figure 2), and were given written instructions and the opportunity to ask questions. The Describers then watched the 8 video clips on a laptop. The videos were not visible to the Drawer. After watching each video clip, the laptop screen went blank and the Descriptor had to describe the placement events seen in the video to the Drawer. As memory support, the Descriptor had a piece of paper listing all objects, in the order in which they were being shown in the videos, in front of him/her. The Drawer then had to, on the basis of the description provided, draw the final location of the objects on a picture of an empty room. These drawings were not analysed, and merely served as an ostensible goal to the experiment.

The analyses were based on the speech and gesture in the placement event descriptions provided by the Descriptor. The experiment took part in L2 English, and no mention was made of gestures. Participants were debriefed at the end of the experiment.



Figure 2. Experimental setup with the Drawer on the left and the Descriptor on the right

Coding

The video material was coded using the multimodal annotation program ELAN (Wittenburg, Brugman, Russel, Klassmann, & Sloetjes, 2006). The first spontaneous description of each placement event was transcribed orthographically. This means that introductions of the figure object or detailed follow-up descriptions of the object itself or its placement, provided spontaneously or in response to questions by the Drawer were excluded. Example 1) below shows a typical event description structure, with a figure object introduction (which was not analysed), followed by an underlined description of the actual placement event (i.e. the analysed part). For speech, the verbs used to describe the placement events were of interest. For each placement event description, one main placement verb was used in the analyses.

- 1) *“she has a plush hippopotamus she puts it right next to the crocodile”*

Gesture coding consisted of several aspects. First, it was coded whether a placement gesture was produced during a transcribed placement event description. A gesture was considered a placement gesture if it occurred closely in time to the description of the stimulus item and if it appeared to convey meaning of the placement event. The selection criteria meant that there was a maximum of 1 placement gesture for each placement event description. The placement gestures were then coded without sound for form in two ways: whether the gesture showed path or direction of movement of the object in lax hands (i.e. “path”), and whether the gesture showed an object-incorporating handshape, meaning that the shape of the figure object was reflected in the gesture (i.e. “handshape”).

Coding was as conservative as possible, e.g. a flat hand when gesturing about the placement of books was not coded for showing a handshape, since the flat hand could not only reflect the books but also the ground on which the books were placed. Note that the coding for gesture form was not mutually exclusive; a gesture could show only path or handshape, but a gesture containing both path and handshape was also possible.

In short, for each placement event, it was annotated which placement verb was used, whether a placement event gesture occurred, and if so, whether this gesture showed the path of the movement, and/or also an object incorporating handshape.

Analyses

Descriptive analyses were done on the type of placement verb used. Verbs used during the transcribed placement event were grouped according to their infinitive form. For the gesture analyses, it was analysed in how many cases the gestures showed path, and in how many cases the gestures showed a handshape. Analyses then focused on whether the number of times path and handshape were shown in the placement gestures differed from 50% chance level.

Results

Verb use

In total, 286 placement verbs were used. This number was slightly smaller than the total number of stimulus items (10 participants x 32 items) because, despite the memory support, some participants forgot to describe some of the placement events. In addition, there were some cases where more than one item was described in one placement event (e.g. taking bananas and putting them in a bowl was often described in one and not 2 placement event descriptions). Of the 286 placement events descriptions, 188 (65%) contained the placement verb *put*. The verb *put* was the most frequently used verb in 26 of the items. Some other frequently used placement verbs were *hang* (9%), which was mainly used for specific suspension stimuli (e.g. hanging a shirt on a hanger), and *place* (8%). The Dutch cognates *set* and *lay* were used sparingly (see Table 2). Other placement verbs were verbs that were used only once (e.g. *throw*, *kick*). For 9 of the 10 participants, *put* was the most frequently used verb. For one participant the most frequently used verb was *place*, contributing to 15 of 24 cases of the use of this verb.

Table 2. Placement verbs by frequency

Verb	Frequency	
Put	188	(65%)
Hang	25	(9%)
Place	24	(8%)
Stick	11	(4%)
Lay	3	(1%)
Set	2	(1%)
Other	35	(12%)

Gesture production

Participants produced a total of 181 placement gestures (i.e. a placement gesture was produced in 63% of all placement event descriptions). Of these 181 placement gestures, 149 (82%) showed path. This percentage differed from chance level (binomial test, $p < .0001$).

In 64% of the 181 gestures, participants produced a gesture with an object incorporating handshape. This percentage also differed from chance level (binomial test, $p < .0001$, see Figure 3 for individual differences and figure 4 for an example of a gesture with an object incorporating handshape).

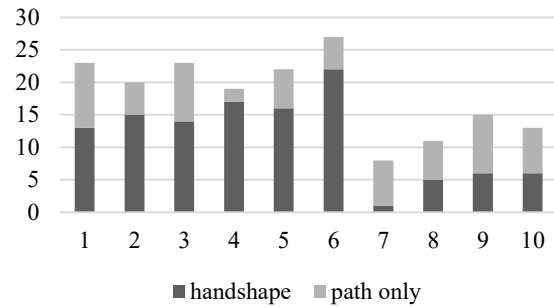


Figure 3. Distribution of number of gestures with an object-incorporating handshape, as compared to number of gestures showing path only, for each of the 10 participants.

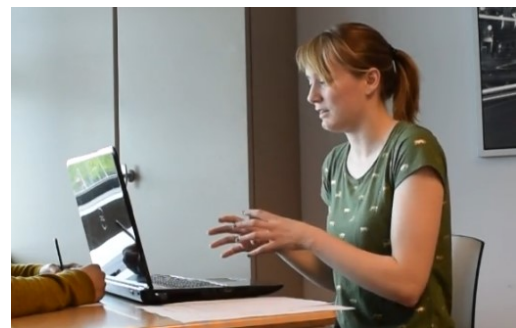


Figure 4. Example of participant producing a gesture with an object-incorporating handshape. The participant was describing the placement of a bowl, by saying (gesture during underlined part) “*she puts it on the right side of the desk*”.

Discussion

In this study, the research question was whether Dutch L2 speakers of English have acquired the semantic meaning of the English placement verb *put*. Two sources of expressing semantic meaning were studied: speech and gesture. Fluent Dutch L2 speakers of English described 32 placement events to an interlocutor. Analyses were conducted on the placement verbs used and the form of the gestures produced during the placement event description. Results showed that in the majority of cases (65%), the general placement verb *put* was used. Previous work by Gullberg (2009) on native speakers of English, using these same stimuli, found that the verb *put* was used in 61% of cases. When we compare Table 1 and Table 2, we can see that the use of other placement verbs in L2 English in the present study was also similar to previous findings by Gullberg (2009) in L1 English. This means that the L2 speakers of English in the present study were native-like in their placement verb production. Speech results thus suggest that the Dutch L2 speakers of English acquired the L2 meaning of the placement verb.

Results of the gesture analyses showed that in 64% of the gestures produced in placement event descriptions by the Dutch L2 speakers of English, object-incorporating

handshapes were used. These findings are not in line with earlier work on gesture production by native speakers of English. Gullberg (2009) found that in only 37% of gestures by native speakers of English object-incorporating handshapes were used. The current gesture findings are, however, in line with previous work on native speakers of Dutch. In Gullberg (2011), it was shown that, when describing these same placement event stimulus videos, native speakers of Dutch produced object-incorporating handshapes in 59% of their gestures. Thus, the gesture findings suggest that the Dutch L2 speakers of English express a semantic meaning of the placement event which, like in Dutch, has a focus on the figure object. The Dutch-like focus on the object is also reflected in the fact that in 18% of all gestures, participants produced a gesture *only* containing an object-incorporating handshape and no direction of movement (path) at all. Given the almost inherent spatial excursion of gestures, it is surprising that gestures without direction of movement were produced.

The findings from this study indicate that although Dutch L2 speakers of English' placement event descriptions were similar in speech to native speakers of English with regard to placement verb usage, gesture production showed a different picture. Dutch L2 speakers of English used the verb *put* most often in their placement event descriptions, but the object-incorporating handshapes in gesture production suggest a remaining L1-like focus on the object of the placement event. In other words, the semantic placement verb meaning expressed in speech and the semantic meaning expressed in gesture did not match, and provide evidence of transfer of Dutch L1 meaning when describing placement events in L2 English. These findings are in line with previous work on motion events, where it was also found that speakers may be native-like in their L2 speech, but show gesture use that is L1-like, or in between their L1 and L2 (Brown & Gullberg, 2008; Stam, 2006). Moreover, we can interpret the findings as providing evidence that speakers of L1 Dutch, when talking about placement events in L2 English, show different thinking-for-speaking patterns (Slobin, 1991) than native speakers of English.

Naturally, this study has its limitations. Firstly, a limitation is the small number (10) of participants in this study. Given the labour intensive nature of gesture analysis, many previous studies on gesture production, including those on which the present study is based (Gullberg, 2009, 2011; Gullberg & Narasimhan, 2010), used a small number of participants. In this sense this study is not an exception. It is important to keep in mind though, that even though the close relationship between speech and gesture means that cross-linguistic differences in gesture production may be expected, there can also be large individual differences in gesture production (Chu, Meyer, Foulkes, & Kita, 2014). Indeed, inspection of Figure 3 shows that the percentage of gestures with an object-incorporating handshape is more pronounced in some participants than in others. The small dataset in combination with these individual differences in gesture production means that the results do not allow for strong statistical claims.

Hence, the discussion of the results is mainly based on descriptive statistics. Larger datasets would be needed to statistically support the current findings.

A second limitation is that the speech analyses are currently restricted to the type of placement verb used. The 'mismatch' (Goldin-Meadow, 1997) between the semantics of the placement verb used and the semantics of the placement gestures suggest an L1 transfer, apparent in gesture only. However, we only analysed the semantics as expressed in the placement verb. We do not yet know to what extent other words and phrases in the placement event descriptions might also be focused only on the movement, in line with the use of the verb *put*, or whether they might in fact be focused on the figure object. It could be the case that the transferred Dutch-like focus on the figure object is not only reflected in gestures with object-incorporating handshapes, but also in e.g. object descriptions that are more detailed or syntactically more prominent than those given by native speakers of English. These analyses remain to be done.

A methodological point to note is that the confederate Drawers were not native speakers of English. Although care was taken to ensure that the confederates were not native speakers of Dutch and were fluent in English, it could be possible that the fact that they were not native speakers of English might have affected the way in which the participants described the placement events. Future work would ideally use Drawers who are native speakers of the language being studied.

A final point of discussion is whether and why the findings from this study matter. This study has shown that L1 transfer of meaning may occur, even in a relatively easy, also according to Ellis' (1994) hierarchy of difficulty, switch from several L1 placement verb categories to a single L2 placement verb category. It can be argued that, since L2 placement verb production in speech was native-like, it may not matter that much that gesture production expressed a transfer of Dutch L1 placement verb meaning. After all, if speech production is native-like, it is not likely that many communication problems will occur. In other words, one may claim that an L2 speaker of English having a Dutch 'manual accent' (Kellerman & van Hoof, 2003) is not necessarily problematic. It can even be argued that the so-called mismatch between speech and gesture in this study is enriching the communicated message, in the sense that gesture provides the interlocutor with information about the object which is additive to the information given in speech.

There are two points to be made here. Firstly, to the best of our knowledge, no empirical studies have been done yet on the effect of gestural transfer, or, in other words, having a manual accent, on communication. Therefore, we do not know whether a difference between semantics expressed in L2 speech and semantics expressed in L2 gesture, caused by an L1 influence, influences aspects of interaction such as the ease, effectiveness, or success of communication. We simply do not know yet whether listeners are sensitive to a gestural 'accent'. This topic would clearly be relevant to investigate in future research.

Secondly, regardless of whether listeners are sensitive to the L2 speech-gesture mismatches, the current study matters in particular from a speaker perspective. The findings of this study show that by analysing not only speech but also gesture, we can infer what meanings people are trying to express. Since gestures reflect the kind of information that a speaker selects for expression (Gullberg, 2011), they can inform us about the process of second language acquisition (Gullberg, 2006). In this particular case, by considering all vehicles of meaning, not only speech but also gesture, we have seen that the Dutch L2 speakers of English are not fully fluent in English (yet), at least not in the sense that L2 meaning has not yet been fully reconstructed. Gesture production can thus be used as an additional source of information about a speaker's level of fluency in a foreign language.

In conclusion, by taking gesture into account, this study has shown that L1 transfer of meaning can exist even in a supposedly simple switch from specific L1 to general L2 placement verbs, and even when L2 speech production is native-like. Although the Dutch L2 speakers of English were apparently proficient in L2 speech, gesture production showed that the speakers' meaning expressed in the placement events was still Dutch-like. When studying the acquisition of semantic meaning, gestures can therefore be a valuable source of information.

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