

## INTERNATIONAL WORKSHOP

### *Mapping Multimodal Dialogue (MaMuD 3)*

### Acquisition of multimodal interaction

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## ABSTRACTS



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# Mapping Multimodal Dialogue (MaMuD 3)

## Acquisition of multimodal interaction

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## 1. INVITED SPEAKERS

**Aliyah Morgenstern**

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### *Children's multimodal grammar under construction: The example of negation*

We consider language as being composed of a vast set of semiotic means on which speakers rely to construct meaning and which are all part of our socially learned, intersubjective communicative system that can be analyzed as an integrative multimodal system, particularly in adult-child interaction.

The study of the expression of negation in longitudinal data of adult-child conversations is a privileged locus for a multimodal approach to language acquisition. Indeed, previous research on first language acquisition has highlighted a tight relation between actions, gestures, signs and speech to express negation. As discussed by Spitz (1957) and Clark (1978), children's first negative constructions seem to take over from early gestures of rejection and avoidance. In parallel to this developmental observation, for Kendon (2002), in many cultures, gestures of negation are a progressive ritualization of spontaneous actions. In both cases, bodily reactions and actions are transformed into communicative gestures. A number of authors have observed the transmodal continuity in the expression of negative speech acts (Bates et al. 1979) and how negation is expressed through head shakes, index waves, palm up epistemic gestures as early as the end of the first year, sometimes before first verbal markers (Guidetti 2005).

The aim of our research is the construction of a developmental multi-semiotic overview of children's expression of negation and the blossoming of their multimodal skills with a focus on similarities between children but also on individual and cross-linguistic differences. We coded and analyzed all the actions, gestures, vocalizations and verbal productions of monolingual and bilingual children speaking or signing various languages filmed one hour a month between the ages of 10 months and four, along with those of their adult interlocutors.

We developed a specific multimodal coding system relying on previous typologies of negation (Bloom, 1970; Antinucci & Volterra, 1979; Pea, 1980; Choi, 1988). We combined the use of EXCEL, CLAN and ELAN with video data aligned with transcriptions to analyze the functions of different forms of negation according to context in dialogue. Results indicate that the children use several modalities throughout the data with a diversification of negative functions, but with individual differences. During their fourth year, all children gradually master multimodal means of expressing the subtleties of negation and the visual-gestural modality makes a striking comeback in the hearing children's data with the use of co-verbal gestures.

When we analyze the forms used in detail, we can observe that the children are multimodal from the very beginning of the data but that the use of multimodality differs according to their cognitive, motor and linguistic development. The multimodal resources are first used in an integrative manner in the service of a global communicational intent. The productions become more complex as the children grow older and each modality can then be used with specific functions, which either reinforce or complement each other. This study thus illustrates why we must analyze the interfaces between different linguistic levels and different modalities in order to understand children's mastery of the multimodal expression of negation.

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## Marion Tellier

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### *Do we design our gestures for a non-native interlocutor?*

Over the past few years, the use of gestures in second language acquisition has been explored by a growing body of research (for reviews, see Gullberg, 2010; McCafferty & Stam, 2008). Most of these studies have focused on learners' gestures and only a few have examined gestures produced by a native speaker when engaged in foreigner talk (Adams, 1998; Tellier & Stam, 2012) or foreign language teachers' gestures in the classroom (Tellier, 2008). This talk will deal mostly with the study of gesture production in an interaction between a native and a non-native, in face-to-face conversation as well as videoconference-based online interaction. In both cases, the native speakers are future French teachers engaged in a training process and who are more likely to use gestures as a teaching technique. Teaching gestures appear to be somewhat different from regular co-speech gestures. They are used by a teacher as a scaffolding strategy (Bruner, 1983) to help the learner (whose proficiency in the target language is weaker) to understand what is being said. Thus, they are often iconic and can sometimes be compared to mimes. Teaching gestures also seem to be produced more consciously than usual co-speech gestures. Most language teachers are able to describe their teaching gestures, and some even have a complete gestural code that they share with their students. Teaching gestures are thus a real professional technique that can be improved with experience and worked on in teacher training (Cadet & Tellier, 2007 and 2014).

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### **Remi Van Trijp**

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#### ***Integrating multimodal information in constructions***

Communicative interactions require humans to combine various modes of perception and sensorimotor control in order to construct and comprehend meaning, including text/speech, images and gestures. One of the biggest mysteries is how we are able to integrate these different sources so rapidly and without any obvious effort. In this presentation, I will argue that traditional linguistic theories – both generative and functional – organize language and linguistic communication in terms of different modules and therefore require intricate interfaces and procedures to coordinate the information stored in each module. Next, I will show that a constructional account offers a more elegant and straightforward solution, because a *construction* can be considered as a very powerful data structure that is capable of capturing different kinds of information in a unified way, which obviates the need for complex interfaces. This claim is supported by a live demonstration using Fluid Construction Grammar ([www.fcg-net.org](http://www.fcg-net.org)), a computational formalism that allows researchers to explore and operationalize theories of constructional language processing.



## 2. ACCEPTED PAPERS (alphabetical order on first author)



**Raymond B. Becker, Alan Cienki and Irene Mittelberg**

*RWTH Aachen, Vrije Universiteit Amsterdam, Moscow State Linguistics University*

### *Time for change: Political flip-flops in gesture*

The use of space to think about time has been studied in gesture research for many years (for a review, see Cienki & Müller, 2008). Recent work has shown that the orientational metaphor of TIME AS SPACE manifests itself in co-speech gestures when speakers talk about the past or the future (Núñez & Cooperrider, 2013). However, very little, if any, research has investigated the temporal order of change in the context when someone changes their mind, or *flip flops* from one position to another. For example, a politician could be for same-sex marriage *before* being against it. We analyzed arguments in political debates and their media coverage in the USA to investigate how change is communicated. Our preliminary findings suggest that there is a set of co-speech gestures that appear again and again in the media. These findings will be discussed with respect to embodied cognition and conceptual metaphor.

First, we analyzed American presidential debates from 2000 to 2012 that included *before* or *and now* statements. We found several examples of rightward co-speech gesture strokes while producing a *before* utterance (e.g., *He was for an assault rifle ban, before he was against it.*) This consistent directionality of the gesture stroke implicates the use of a mental timeline, where the left is the past and the right is the future.

Next, we discovered a second type of gesture that co-occurred with the linguistic expression of a 180-degree turn. For instance, one of the speakers points his fingers in opposing directions in the center of his body, and make circular motions. After completing one circular motion, his index fingers traced a path in the air outward and in opposite directions. We argue that the purpose of this gesture was to show confusion on the part of the political opponent with respect to where the evolution of his thought process would lead.

We suggest that these examples of co-speech gestures during temporal order statements and other *flip-flop* expressions are evidence for embodied experience. In the case of *before* utterances, politicians tend to use gestures that suggest a mental timeline is accessed. For flip flops, a type of co-speech gesture was used that shows a confused path is communicated to the audience. In both of these cases the political figure is making use of space to talk about time; a fundamental tenet of conceptual metaphor.

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**Jana Bressemer & Cornelia Müller**

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### *The “Negative-Assessment-Construction”: A multimodal pattern*

This talk offers an analysis of a multimodal construction of negative assessment, which takes as the starting point a particular recurrent gesture: The Throwing Away gesture. Recurrent gestures show “a recurrent form-meaning pairing” (Ladewig 2011, 2014; Bressemer and Müller 2014). Thus Throwing Away gestures have a characteristic *form*: cupped hand, palm facing away, downward flap and a *shared meaning*: negative assessment. The meaning is based on the semanticization of the “Away action scheme”, in which the *point of departure* is an unpleasant situation, that is *caused* by

annoying objects close by, an *action* of removal and an *endpoint* and *goal* in which the unwanted objects are removed and the unpleasant situation is finished (Bressemer and Müller 2014; Teßendorf 2014).

The Away Gesture is used in five different contexts of use: in conjunction with modal particles (e.g., *egal* ("never mind")), interjections (e.g., *ach* ("alas")), negation and independent of a particular lexical element (e.g., phrases, sentences). We suggest that the multimodal construction consists of the "getting rid of something gesture + lexical element(s)". The contexts would be considered as subtypes of the construction by adding a modal, affective or negative qualification or by simply specifying the referent. In this talk, we would like to explore how this relates to Goldberg's "Scene Encoding Hypothesis" (Goldberg 1995) and propose that the "negative-assessment-construction" designates and encodes scenes essential to human experience. Moreover, we put forward the argument that speech and gesture take over particular relevance for the construction by profiling different elements of a scene.

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#### Alan Cienki & Valeriia Denisova

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#### *The category of aspect and co-speech gestures in Russian*

The category of aspect is expressed in different ways in most languages as it plays an important part in constructing how we express events. In the Russian language, like in other Slavic languages, aspect is especially important, which is evident already from the Russian term for aspect (*vid*) that means "view".

Theoretical studies reveal that aspect shows how events proceed in time (Comrie 1976, Maslov 2004) but it is still not clear in what way the use of verbs in different aspectual forms influences our view of events. In our study, the analysis of speech and gesture provides an insight into the mental representation of how an event occurred in time and how people communicate about it.

In our research, in the framework of a project based at Moscow State Linguistic University involving teams of colleagues from France, Germany, the Netherlands as well as Russia, we analyzed 10 short conversations in Russian, paying special attention to co-speech gestures. The data for this study were collected using the prompts from Becker et al. (2011) to elicit short personal narratives about events of different types. Ten pairs of university students served as participants with informed consent in Moscow (native speakers of Russian). The average length of the conversations was ten minutes. Verbs referring to past events were coded for tense and aspect as well as for

the past or non-past time of events narrated, in order to capture any use of the historic present in the coding.

In previous research, Duncan (2002) showed that the duration of gesture strokes tends to be longer and more agitated with event descriptions in the “imperfective” than with those using “perfective” verb forms in English and in Mandarin Chinese, findings that were further confirmed for English by McNeill (2003) and Parrill et al. (2013). The study of our data where co-verbal gestures were analyzed using a system of “boundary schemas” developed for this project, based on (Müller 2000), revealed that there was no significant correlation between the use of verbs in different aspect forms in Russian and “boundary schemas” in speakers’ gestures. In the present study we turned to the analysis of the semantic nature of verbs and its connection to co-speech gestures.

The form of data analysis gives an insight into the speaker’s view of events, building on the claims that gestures embody mentally simulated actions (Hostetter & Alibali 2008). The study supports the idea that the analysis of grammar in connection with co-speech gestures can provide solutions to problems in the sphere of cognitive linguistics.

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### Stijn De Beugher, Geert Brône, & Toon Goedeme

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#### *Towards a system for the semi-automatic annotation of eye gaze data in face-to-face interactions*

Studies on language and cognition in interaction increasingly focus on the role of eye gaze as an important signal in interaction management, reference and grounding (Rossano 2012, Jokinen 2010, Bailly et al. 2010, Richardson et al. 2009). Interlocutors may use eye gaze as a means to take, hold or give the floor in conversation (turn management), to refer to objects or persons in the conversational space (gaze cueing) or to give and elicit feedback (grounding). The use of non-intrusive eye-tracking technology (like eye-tracking glasses or table-top systems) has proven to be an invaluable resource for obtaining detailed information on the distribution of visual attention of multiple participants simultaneously (Jokinen 2010, Oertel & Salvi 2013, Brône & Oben 2015, Oben 2015, Holler & Kendrick 2015). This generates a picture of

the role of eye gaze in interactional dynamics, with speakers and addressees displaying different gaze patterns.

One of the key challenges in the use of mobile eye-tracking technology, however, resides in the processing and annotation of the obtained data stream. To date, the annotation process is largely manual, which is time-consuming and labour-intensive. Part of this work, however, can be automatized using recognition algorithms from vision technology (De Beugher, Brône & Goedemé 2013). In this paper, we present one such system for the semi-automatic recognition of human faces, torso and hands, thus providing a first categorization of targets on which the gaze data of the eye-tracking systems can be mapped. In other words, the system analyses data captured by the scene camera of the eye-tracker, calculates scores for the annotation classes (face, torso, hands), and then searches for matches between gaze coordinates and annotations (i.e. are there gaze fixations on faces, torsos and hands?).

The approach we present in this talk partly builds on previous work on the detection of human torso and faces (De Beugher, Brône & Goedemé 2013) but has been improved for the computational cost of the algorithms. The detection of hands, on the other hand, is based on an accurate segmentation in combination with advanced tracking mechanisms and a validation of human poses. The algorithms we used are embedded in a semi-automatic tool, which calculates the confidence of the hand detections. If the confidence drops below a certain threshold, the automatic analysis is halted and the user is asked for manual annotation. After this intervention, the system automatically continues the processing of the remaining frames. Using such an approach results in a highly accurate system at a minimal cost of manual interventions (average accuracy: 90%, manual interventions: 1,7% of the annotations, average processing time per frame: 150ms). As a last step, we map our detections on the gaze data and export those data to an ELAN compatible file, making the tool integratable with existing annotations.

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**Farina Freigang & Stefan Kopp***CITEC Bielefeld University, Germany****Brushing up or aside? – Analyzing the modifying functions of gesture in different multimodal utterance contexts***

Gestures can contribute to the meaning of an utterance not only by adding symbolic information, but also by modifying verbally or gesturally signified content. In most analyses, the propositional content is seen as the part that was intended to be communicated. From our perspective, however, utterance givers also communicate their viewpoints, convictions, knowledge, attitudes, among others. One way to achieve this is to use one modality to modify - in an analogue way - the propositional content of the other modalities. We define a modifying function to act upon and to carry meaning beyond mere propositional content. These functions are not as clearly signified, but are nevertheless communicatively efficient and significant for how recipients interpret the multimodal utterance as a whole. In some cases, the functions and meanings of different modalities can even appear incongruent, with the simplest but most pronounced case being a positive versus a negative element within an utterance.

One interesting example are 'brushing gestures', which may appear in various utterance constellations. In Freigang and Kopp (2015) we present a cluster analysis of a rating study, in which participants judge the functions of gestures in different multimodal utterance contexts (drawn from our Bielefeld Natural Interaction Corpus). First of all, we find that brushing gestures seems to change the utterance in a discounting or downtoning way (and sometimes are emotionally coloured), or as stated similarly by Payrató and Teßendorf (2014, p. 1536) (see also Müller and Speckmann (2002)), they express a 'negative stance towards the object in question'. Secondly, depending on the tonal and facial expressions accompanying the brushing gesture, the combined meaning of an utterance may differ. If a normal video snippet (baseline condition) of a participant with a positive tone of voice and positive facial expressions is given, the whole utterance is interpreted as emphasising and humorous. If the same video is played to raters, without showing the head of the participants in the video and muting the tone (gesture-only condition), the utterance is marked as rather discounting or downtoning, affirmative, critically and not humorous. If a participant shows a neutral facial expression, the utterance is interpreted almost the same in both conditions. Also, in the gesture-only condition, brushing gestures are rated more accurately, which may hint to the fact that in the baseline condition they are overwritten by other modalities.

In our presentation, we will examine the functions of the brushing gesture and the contexts in which they appear in more detail by analysing the exact form features and inferring the different meanings of those body movements in interaction with the rest of the multimodal utterance. We are particularly interested in the contradictory elements of the negativity of a brushing gesture and the positivity that may be indicated through a positive tone of the voice or facial expressions and, further, how the negativity of a brushing gesture is related to the baseline meaning of the utterance. The results presented are based on five brushing gestures (in total the study consisted of 36 videos with various body movements) and neighbouring categories such as point-brushings and throwing gestures. A broader corpus analysis is needed in order to investigate this phenomenon further.

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### Janett Haid, Dorothea Horst & Benjamin Marienfeld

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#### ***MultiModal Constructions of Threat: Conceptualizing danger and enemies in populist discourse about the EU in Germany and Poland***

The seed money project *MultiModal Constructions of Threat: Conceptualizing danger and enemies in populist discourse about the EU in Germany and Poland* (MMCT) aims at analyzing multimodally constructed images of threat in political discourse on migration in Europe (as in right-wing populist parties, for example) and related topics by the use of several linguistic means. For this purpose, a combination of Critical Discourse Analysis and the tools developed within the research field of dynamic multimodal communication offers a rich methodological base for analysis.

Our expectation is that particular linguistic means, especially figurative language, personal pronouns, and prosodic marking, are used in different types of communication (political speeches, contributions in talk shows, and interviews) in order to create an effective image of threat. Such an image links the perception and understanding of EU-related topics to a subjectively constructed framework that is persuasively exploited. Therefore, the project aims at investigating these multimodal manifestations (verbal, gestural, paraverbal) in personal pronouns, metaphors, and metonymies in populist discourse in two neighboring European countries: Germany and Poland. We assume that these linguistic means are used to constitute an ingroup (mostly being conceptualized as we) and an outgroup (deviating from the ingroup and presented as threatening to its members). Such communicative strategies of constructing in- and outgroups obviously provide the basis for EU-critical populist discourse. The MMCT project, theoretically and empirically, focuses on dynamic borders in political discourses situated in the interdisciplinary field of research of border studies.

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***How discourse shapes the understanding of gesture***

So far, cognitive linguists who have studied the emergence of gestural meaning largely focused on the producer's side of multimodal utterances and applied phenomenological and descriptive approaches to the investigation of dynamic multimodal meaning (McNeill, 1992; Müller, 2008). In this talk, we will present a slightly different take on the phenomenon of multimodal meaning creation by focusing on the recipient's side of multimodal utterances and by conducting comprehension experiments. In doing so, we approach the question of whether the dynamic flow of discourse really matters for the understanding of gestures.

The study to be presented, addresses gestures replacing spoken constituents of utterances in sentence final position (Ladewig, 2012, 2014). These gestures were taken from a corpus of 20 hours of naturally occurring conversations and built the stimuli for three perception experiments. First, we investigated gestures without speech. Second, we examined gestures only in the context of the utterance, they complete and third, we studied gestures in their larger discourse contexts. In each condition, 66 video clips were shown to 15 people (8 female, 7 male). The subjects were asked to watch the video clips and write down a lexical choice they considered best suited for the gesture. Altogether, 2960 lexical choices were elicited which built the basis for the investigation of the comprehended gestural meaning. The extracted gestures as well as the lexical choices were investigated thoroughly with respect to the image schematic and motor patterns they exhibited (Cienki, 2005; Mittelberg, 2010). The flow of discourse was reconstructed by applying the timeline annotation procedure for documenting the sequencing of metaphors across modalities, over time and speaker (Müller & Ladewig, 2013).

We found that subjects were able to reconstruct gestural meaning in all three conditions. However, we could observe that the comprehended gestural meaning became increasingly specified the broader the discourse context became. Two different ways of specification could be identified, regarding different aspects of gestural meaning constitution:

1. The semantic information of gestures is foregrounded through the flow of discourse, making the gestural meaning more specific. This regards the *intensional meaning* of gestures.
2. The semantic space, the gesture occupies, is narrowed down and specified through the flow of discourse, giving rise to a different or a specified gestural reference object. This regards the *extensional meaning* of gestures.

Based on our observations, we argue that discourse affects the perception and the understanding of gestures. Gestures are capable of conveying meaning on their own but the way gestural meaning is "construed" (Langacker, 1991) highly depends on the flow of discourse a gesture is situated in.

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### **Maarten Lemmens & Julien Perrez**

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#### ***Location, direction, and gesture (in L1 and L2)***

This paper builds on our previous analyses of expressions of *static* locative relationships in French and Dutch, for L1 speakers as well as for francophone learners of Dutch (L2) (see, e.g. Lemmens & Perrez 2010, Perrez & Lemmens 2012, Lemmens & Perrez (subm.)). The data analysed is drawn from video-taped picture descriptions where subjects were asked to talk about the location of certain entities on these pictures. The focus of the present talk will be on the gestures used by speakers when locating entities. Tutton (2012, 2013a) has observed that in spatial descriptions gestures often express information that remains unexpressed in the verbal production and that typically the information that is gesturally expressed is directional. Our data only partially confirm his findings: in most cases, gestures express information that is also expressed verbally. In addition, while gestures are indeed well-suited to express direction, we argue that a clearer distinction is needed between directional and (purely) locational gestures. We suggest that the crucial factor identifying a locative gesture is the fact of the gesture being anchored in the gesture space, an issue that hitherto has not been discussed in the literature. In contrast, directional gestures are not really anchored.

Also the typological differences are manifest in gesture. In line with Talmy's (2000) typological distinction between verb-framed and satellite-framed languages, Dutch can be described as a location-rich language and the descriptions of the native Dutch speakers abound with locative descriptions, through the highly grammaticalised use of posture verbs but also via other linguistic means (prepositions, adverbs, etc.). French, in contrast, is location-poor; the French narrations have significantly fewer locative descriptions and the locative information is much more general. Instead they add narrative detail and meta-linguistic comments to their descriptions. Strikingly, also the gestures are quite different: the Dutch gestures provide ample locative information (location, direction, shape and size), the French gesture much less frequently (if at all), and their gestures are less precise and of more meta-communicative nature.

Another striking finding is that in the pictures to be described (the same set for all subjects), there are scenes which lead to what Corts (2006) has called "gestures burst", where more speakers gesture and where they tend to gesture more intensively (multiple gestures applied to the same reality). As it turns out, these are typically more complex spatial configurations, where the gestures facilitate and/or augment the descriptive task at hand.

Finally, the gestures reveal interesting patterns related to second language acquisition. Across the board, the francophone learners of Dutch (with 3 levels of proficiency) use more gestures revealing the challenge that free expression in a second language poses. This is particularly the case for learners of the lowest proficiency levels: they use more shape gestures, more enactment gestures (e.g., pulling a drawer, brushing one's hair, etc.), and more deictic gestures (pointing to the picture). In other words, L2 speakers use more *reality-anchored* gestures, but also more meta-

communicative gestures pertaining to their linguistic shortcomings, such as open hands or shrugs, search for words gestures (see Ladewig 2011). In addition, aligned with verbal hesitations and retakes, there is more “gestural stuttering”. Overall, and as can be expected, the low proficient L2 speakers use almost more gestures than words, which can be seen as a gestural compensation for their lack of lexical accuracy. The advanced learners gesture much more in line with the target language, where gestures are (i) more locational in nature and (ii) more discursive, pertaining to the structuring of the discourse.

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#### *Multimodal Marking of Obviousness in German and Dutch: A Contrastive Study*

Jeshion (2001: 955) defines the notion of obviousness as follows: “Proposition p is obvious to agent A at time t if and only if solely in virtue of grasping p at t, p seems to be true to A.” Paraphrasing this definition, we can say that utterances of subjective obviousness express a speaker’s intersubjectively coordinated stance of experiencing a certain state of affairs as obvious. Putting it somewhat bluntly, obviousness is the quality of being easily understood and not being in need of further arguments or proofs.

In both Dutch and German (as in many other languages), there are different ways of marking the obviousness of a claim. These include verbal markers (e.g. the discourse particle *ja* and adverbs such as *natuurlijk/natürlich* ‘naturally’) and morphosyntactic structures such as the aposiopesis. Previous work (e.g. Schoonjans 2014 on German) has shown that gestures also play a role in the marking of obviousness, and that they may do so both in combination with a verbal marker and when they are used on their own.

In this presentation, we bring together first results of empirical studies on the multimodal marking of obviousness in Dutch (Jehoul 2014) and German (Mangelschots 2015), in order to contrast the verbal and kinesic means used to mark obviousness, looking both at the individual elements and their co-occurrence patterns.

Although the data set may benefit from further elaboration, the first results already hint at some interesting similarities and dissimilarities between both languages, which will be the main focus of this talk. In this discussion, external factors that may influence the distribution of the (verbal and non-verbal) markers, such as setting and discourse type, will be taken into account in order to see to what extent they may have played a role. Despite the resemblances between both languages and despite the fact that some of the differences may be related to these external factors, the data thus offer new support for the assumption made by Müller (1998:231), among others, that gestures are language-specific.

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#### *Mental maps and frames as mediating structures between dialoguing minds: How multimodal diagrams underpin collaborative travel planning*

This paper explores how coverbal gestures may function as physically articulated entry points to frames (Fillmore 1982, 1985) and mental maps (Downs & Stea 1977), thus evoking experientially correlated elements and activating larger networks of encyclopedic knowledge and subjective associations (Dancygier & Sweetser 2014). While both semantic frames and diagrams are metonymically organized structures consisting of connected parts, frames are more than conceptual skeletons; they represent rich semantic systems that may guide discourse production and understanding (Ziem 2014). In view of the semiotic resources and collaborative strategies dialogue partners were found to employ when jointly planning a trip in the present study, it will be argued that diagrams and frame structures may not only motivate gestural portrayals and guide their interpretation (see Mittelberg 2013 on the *embodied mind*), but also function as mediating structures enhancing mutual understanding between interlocutors.

Previous research on gestural diagrams has revealed that people engage in different semiotic practices when mapping out logical, temporal, or other kinds of relations between things, places, events, concepts, people, discourse contents, and so forth (e.g., Enfield 2009; Haviland 2000; Mittelberg 2008; Tversky 2011). Since speakers usually create such evanescent structures on the fly and in front of their interlocutors, points and lines constituting diagrams may become visible and thus intersubjectively sharable reference structures in gesture space. Involving interactive gestures (Bavelas et al. 1992) and various kinds of material anchors (Hutchins 1995), e.g., human bodies, physical actions, gestural signs, and the environment, such collaborative practices of diagrammatic thinking and gesturing may be said to participate in processes of distributed cognition (e.g., Streeck, Goodwin & LeBaron et al. 2011).

The data used for this study stem from the MuSKA (Multimodal Speech and Kinesic Action) Corpus collected in the Natural Media Lab, and combine audio, video and motion-capture data streams. The analysis presented here focuses on selected sequences of recorded German conversations, in which dyads of participants perform the task of jointly planning an Interrail tour through Europe (see Brenger & Mittelberg

(2015) for details regarding study design and methods). Our analysis evidences that while diagrams are as a whole *icons of relations* (Peirce 1960), in the gestural modality such abstract figurations emerge through a combination of iconic and indexical sign processes. For example, an index finger pointing at locations in gesture space, e.g. travel destinations, may go on to draw connections, i.e. paths, between points. Using motion-capture data we will present visualizations of these diagrams and their position in the shared gesture space.

In particular, we will discuss how through gestural and linguistic cues the interlocutor may pragmatically infer cities and regions on the virtual map, and thus follow the verbal exposition along gesturally traced lines (Panther & Thornburg 2003). Building on Langacker's (1993, 1987) notions of *reference points* and *active zones*, we use the term *embodied reference points* (Mittelberg & Rekkittke fc.; Talmy 2013) to refer to gestures that may function as manual guideposts profiling a certain element or zone, e.g. a location or region, within a mental map or frame (e.g., TRAVEL frames, the INTERRAIL frame, the SOUTHERN FRANCE frame). These may activate geographical and cultural knowledge, but also stereotypes and subjective memories and ideas about those places. Gestural pointers and movements reflecting the cardinal coordinate system further allude to areas in the metonymic proximity or distance (Fricke 2007; Mittelberg & Waugh 2014). Finally, the interlocutors may integrate the various pieces of information into a coherent mental representation about the trip, i.e., an approximately construed, personalized TRAVEL frame with a diagrammatic itinerary providing the overall spatio-temporal structure of places, events, and movement.

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### *Gesture and humor: the role of head movements in humorous interaction*

The growing interest in humor within the field of Cognitive Linguistics these past few years (Brône and Feyaerts 2003; Veale *et al.* 2006; Brône 2008) has led to the conclusion that humor exploits inferences through linguistic imagery and is highly creative. Following Yus (2003: 1299), we assume that humor uses discourse markers that allow the audience to see that what is being said should not be taken seriously. In this study, based on a large corpus of examples extracted from two American television series (*House M.D.* and *The Big Bang Theory*), we add a yet unexplored multimodal perspective — that of head movements accompanying humorous utterances in different humor types. Head movements, more specifically head tilts and head nods, are frequently used in our data to mark certain elements in the humorous utterances that are more important than others (i.e., the key element) for the understanding of the humorous message. Our study analyzes humorous utterances against the background of Clark's layering model and Fauconnier's mental spaces theory (Brône 2008). We illustrate how these gestures function as "gestural triggers", allowing the hearer to make the connection between explicature (i.e., what is explicitly communicated by an utterance; cf. Carston 2002) and implicature (assumptions that are not explicit and that the hearer has to infer from the contextual environment, cf. Grice 1989). As such, we show that these gestures play an important role in the understanding of the humorous message because they guide the hearer to interpret utterances in a humorous way and they contribute to meaning construction.

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