Cross-cultural variation of speech-accompanying gesture: A review

Kita, Sotaro

[Link to publication on Research at Birmingham portal](#)

Cross-cultural variation of speech-accompanying gesture: A review

Sotaro Kita

University of Birmingham

Correspondence address

Sotaro Kita

University of Birmingham

School of Psychology

Edgbaston

Birmingham B15 2TT

United Kingdom

s.kita@bham.ac.uk

Abstract

This article reviews the literature on cross-cultural variation of gestures. Four factors governing the variation were identified. The first factor is the culture-specific convention for form-meaning associations. This factor is involved in well-known cross-cultural differences in emblem gestures (e.g., the OK-sign), as well as pointing gestures. The second factor is culture-specific spatial cognition. Representational gestures (i.e., iconic and deictic gestures) that express spatial contents or metaphorically express temporal concepts differ across cultures, reflecting the cognitive differences in how direction, relative location and different axes in space are conceptualised and processed. The third factor is linguistic differences. Languages have different lexical and syntactic resources to express spatial information. This linguistic difference is reflected in how gestures express spatial information. The fourth factor is culture-specific gestural pragmatics, namely the principles under which gesture is used in communication. The culture-specificity in politeness of gesture use, the role of nodding in conversation, and the use of gesture space are discussed.

Key words: culture, language, conversation, gesture, space

Cross-cultural variation of speech-accompanying gestures: A review

Speaking and gesturing are tightly linked systems. The link can already be observed at the very first phase of our linguistic lives. Children in the one-word stage coordinate speech and gesture in a systematic way (e.g., Butcher & Goldin-Meadow, 2003; Iverson & Goldin-Meadow, 2005; Stefanini, Bello, Caselli, Iverson, & Voltera, this issue). The link develops in children even if they have never seen gestures. Congenitally blind children spontaneously develop speech-accompanying gestures, though the frequency of gestures is not as high as in sighted children (Iverson,Tencer, Lany, & Goldin-Meadow, 2000). The link is strong enough that speech-accompanying gestures do not disappear even when the addressee does not have a visual access to the gestures (e.g., on the telephone) or even in monologue (Bavelas, et al., 2007; Cohen, 1977). The link manifests itself in a meticulous semantic and pragmatic coordination between a gesture and the concurrent words (McNeill, 1992). Given this tight link between speaking and gesturing and given the fact that speaking is a cultural universal, it is not surprising that to date there is no report of a culture that lacks speech-accompanying gestures. Though the existence of speech-accompanying gestures may be universal, the way gestures are produced can vary across cultures. The goal of this article is to review the literature on cross-cultural variation of gesture. We discuss four relevant factors: conventions of form-meaning association, language, spatial cognition, and pragmatics of gesture use.

Variation due to conventions of form-meaning association

Variation of conventionalised gestures ("emblems")

It is well documented that each culture has a distinct set of conventionalised gestures (e.g., Brosnahan & Okada, 1990; Calbris, 1990; Creider, 1977; Kendon, 1992, 2004; Morris, Collett, Marsh, & O'Shaughnessy, 1979; Payrató, 1993, 2008; Sparhawk, 1978; see the appendix of Payrató 1994 for more). Conventionalised gestures are referred to by different terms in the literature: "emblematic gestures", Efron, 1941/1972, "emblems", Ekman & Friesen, 1972, McNeill, 1992; "quotable gestures", Kendon, 1992; "autonomous gestures", Kendon, 1983, Payatós, 1994). One well-known example of emblems is a ring formed by the thumb and the index finger. This gesture can mean "OK/good" in most European cultures, but the dominant meaning is different from area to area (Morris, Collett, Marsh, & O'Shaughnessy, 1979). The dominant meaning is indeed "OK/good" in Ireland, Britain, Scandinavia, southern and central Spain and southern Italy; however, it is "zero" in France and the bodily orifice (especially the anus) in Greece and Turkey (Morris et al, 1979).

Because the form and the meaning of emblems are related by culture-specific conventions, the relationship is often opaque to the member of other cultures. For example, many of the French emblems were to some extent opaque to Hungarians and more strongly so to Japanese (Calbris, 1990).

Cultural contact is one of the factors that explain the geographic distribution of emblems. Emblem gestures with the same interpretation are often used in geographically contiguous areas, often encompassing multiple national and linguistic areas (Morris, et al., 1979; see Kendon 1981 for further discussion of Morris et al.'s results), suggesting the importance of cultural contact. The impact of cultural contact can be long lasting. For example, in Italy, the head gesture for negation is a horizontal head shake in the northern

part and Rome, but it is a head toss (i.e., a head jerk up- and backwards) in southern Italy, including Naples and Sicily (Morris, et al., 1979). The head toss are seen in the parts of Italy that the ancient Greeks settled more than 2000 years ago, and the only other places in Europe where the head toss for negation are currently used are Greece and its surrounding areas such as Turkey (Morris et al., 1997) and Bulgaria (McClave, Kim, Tamer, & Mileff, 2007). Consequently, Morris and colleagues argue that the head toss spread to southern Italy through the contact with ancient Greek settlers.

Some cultures seem to have an especially rich inventory of emblems, and it has been argued that the local "ecology" for communication may partly explain such richness. Naples (Italy) is known for a large inventory of emblematic gestures (de Jorio, 1832/1990). Because some of them have general discourse functions (e.g., marking topic and comment) or interactive functions (e.g., marking the illocutionary force of question) (Kendon, 1995), they can be used independent of the referential content of the concurrent speech and thus can be used frequently in a wide range of situations. Kendon (2004) argued that the rich gestural culture developed in Naples due to the ecology for communication. For many centuries, Naples has had a densely populated city centre with multi-story buildings, where a network of extended kin members have been living in the same neighbourhood and much of domestic and professional lives have been taken place on the street. The city centre is a busy and noisy environment with a need to communicate at a long distance (e.g., from a balcony on the top floor to the street, from a balcony to a balcony) or to compete for the addressee's attention with many other bustling activities on the street. It is a crowded environment with a need to communicate discretely to a particular person without letting others notice it. It is an environment with

a need to assert one's identity and make oneself stand out, e.g., through a theatrical use of gestures and speech, among many kin members, who are otherwise similar to each other. Such ecology for communication is conducive to frequent and elaborate use of gestures, especially emblems, which could communicate a message without speech. Kendon suggested that this lead to the development of the gesture-rich culture of Naples.

Variation of pointing gestures

Pointing gestures are also shaped by culture-specific conventions. Some cultures distinguish a set of different types of pointing gestures. For example, in Naples, Italy, at least five different types of hand shapes are used for pointing (index-finger pointing with the palm vertical, index-finger pointing with the palm down, open hand pointing with the palm vertical, and thumb pointing), and they have contrastive meanings (Kendon and Versante, 2003). For example, the index finger pointing with the palm down individuates a referent as being distinct from other objects and brings the referent into the centre of discourse focus. The index-finger pointing with the palm vertical, on the other hand, indicates a referent that is relevant to the current discourse but not in the centre of focus.

A different system of pointing gestures is found among the speakers of Arrernte (an Australian Aboriginal language in Central Australia) (Wilkins, 2003). They distinguish six types of pointing gestures with contrastive functions: index-finger pointing, open-hand pointing with the palm down, open-hand pointing with the palm vertical, "horn-hand" pointing (with the thumb, the index finger and the pinkie extended), lip pointing (a pointing by protruded lips), and eye pointing. Open-hand pointing with the palm vertical, for example, is used to indicate each straight segment of a complex route. Horn-hand pointing indicates the direction of the end point of a route.

Lip pointing has been documented in other parts of the world as well, such as in Panama in Central America (Shertzer, 1973), Central Australia (Wilkins, 2003), East Africa (Creider, 1986), and Laos in Southeast Asia (Enfield, 2001). It can serve a different function from hand pointing. For example in Loas, lip pointing is used when the referent is in the focal element in discourse and the gesturer assumes that the addressee is likely to know what the referent is, whereas hand pointing is the default way of gestural deixis that can be used in a broader range of contexts (Enfield, 2001).

Summary

Emblems vary across cultures. Two factors that explain the geographic distribution of emblems have been suggested. First, emblems seem to spread by cultural contact, whose effect can be visible many centuries after the purported contact that brought emblems from one culture to the other (Morris, et al. 1978). Second, some cultures may have specific set of social and physical conditions for communication, which is especially conducive to communication by gestures, especially gestures (Kendon, 2004). This may explain why Naples in Italy has such a rich gesture culture.

Though it may not be obvious at first glance, pointing gestures also show a considerable cultural variation. Cultures vary as to specific meaning associated with specific form of pointing.

The cross-cultural variation in form-meaning mapping in emblems and pointing gestures can be captured within the classic Saussurean (de Saussure, 1916/1983) conception that a sign is an association between form and meaning, and different signs are in opposition with each other. Gestures, however, are much more than form-meaning associations. Gestures communicate thought to others in coordination with language.

Thus, when the thought to be expressed, the language to communicate with, and the way communication is carried out (i.e. pragmatics) vary across cultures, gesture should also vary accordingly across cultures. In the following sections, we will review evidence for these three types of cross-cultural variation of gesture.

Variation due to cognitive diversity across cultures

Gestures often iconically represent spatial concepts (McNeill, 1992; Rauscher, Krauss, & Chen, 1996), and spatial information is conceptualised and processed differently across cultures (e.g., Pederson, et al., 1996; Majit, Bowerman, Kita, Haun, Levinson, 2003; Levinson, 2003; Levinson, Kita, Haun, & Rasch, 2002). Gestures systematically vary cross-culturally due to the differences in spatial cognition. This type of variation has been demonstrated in three lines of research.

Gestural encoding of space in the "absolute" vs. "relative" frame of reference

The first line of research concerns how direction and relative locations on the horizontal plane is represented. When we encode direction and relative locations we can represent the information relative to the orientation of our own body (e.g., "the cup is to the right of the apple", where the relation "right" is defined by the left-right axis of the body). Because this type of encoding of spatial information changes as a function of who the speaker is and which direction s/he is facing, it is called a "relative" frame of reference (Levinson, 1996). Another way to represent the same situation is to use a coordinate system that is absolute in the sense that it does not change no matter what the orientation of our body is (e.g., the cup is to the west of the apple). This type of encoding is based on an "absolute" frame of reference (Levinson, 1996).

Some cultures predominantly use the relative frame of reference to encode space and others use the absolute frame of reference in both linguistic and non-linguistic tasks. Speakers of European languages such as English and Dutch typically use words such as "left" and "right" with the relative frame of reference to encode direction and relative locations (Pederson et al., 1996; Levinson, 2003). Even when they use words like "east" and "west" to refer to large-scale spatial relations (e.g., "Portugal is west of Spain"), the underlying conceptualization may still be based on the relative frame of reference (e.g., the meaning of "west" is essentially equivalent to "left on the map") (Levinson, et al., 2002). When speakers of these languages encode the spatial relationship between objects in a *non-linguistic* memory task, they recall the relative location of the object in the relative frame of reference (Pederson, et al., 1996; Levinson, 2003; but see also the debate between Li & Gleitman, 2002 and Levinson et al. 2002). For example, the participants were presented with a sequence of three toy animals on a table, and the order of the animals was a cow, a sheep and a horse from left to right, which also happened to be from north to south. When the participants were asked to turn around 180 degrees and recreate the order of the animals on another table, they preserved the left-right order, namely, putting a cow, a sheep, and a horse from left to right, but did not preserve the order in terms of north and south (now the northern most animal is a horse, not a cow) (Pederson, et al., 1996; see Levinson, 2003, Majit et al., 2004 for similar results on other non-linguistic spatial tasks.)

In contrast to speakers of European languages, speakers of some languages predominantly use the absolute frame of reference in both linguistic and non-linguistic tasks. For example, some of the Australian Aboriginal languages such as Guugu

Yimithirr (Haviland, 1993) and Arrernte (Pederson et al. 1996) do not have words that encode spatial relations in the relative frame of reference (e.g., "right" and "left"), but they exclusively use words using the absolute frame of reference, equivalent to cardinal direction terms in English such as "north", "south", "east" and "west". Thus, in these languages, the relationship between a cup and an apple on a table will be described with cardinal direction terms (e.g., "the cup is to the west of the apple."). Moreover, the speakers of these languages use the absolute frame of reference in *non-linguistic* spatial tasks. For example, when recreating a sequence of toy animals in the above mentioned task, they preserved the north-south order but not the left-right order (Pederson, et al., 1996; see also Levinson, 2003, Majit et al., 2004). In other words, physically the same spatial array or direction can be processed in qualitatively different ways across cultures in both *linguistic* and *non-linguistic* tasks.

This difference in the predominant frame of reference for encoding spatial information is reflected in the way speech-accompanying gestures encode space. The members of a culture that predominantly uses the relative frame of reference, for example American English speakers, gesturally represent the direction of motion with the relative frame of reference. When American English speakers saw an entity moving to the right and later describes the event, the gesture accompanying the description depicted the event with a hand movement to the speaker's right (Kita & Özyürek, 2003; McCullough, 1993). This was the case even though the speaker did not mention the word "left" or "right" at all. Thus, the way the speaker encodes the spatial relation in memory was reflected in the gestural representation. In contrast, the members of a culture that predominantly uses the absolute frame of reference, for example Guugu Yimithirr speakers in Australia,

gesturally represent the direction of motion with the absolute frame of reference (Haviland, 1993; Levinson, 2003). Haviland (1993) documented two instances in which a Guugu Yimithirr speaker recounted his own experience. In one telling, he was facing west, and in the other, he was facing north. It was found that the gestures consistently depicted motion and location in terms of the absolute frame of reference. For example, the movement from west to east was gesturally depicted as a movement away from the body when facing east, but as a movement from left to right when facing north. Such absolutely anchored gestures were found in both utterances with and without cardinal direction words. Thus, the use of absolute frame of reference in gesture was not simply due to semantic coordination with the concurrent utterance, but it reflects the nature of underlying representations of space.

Representational use of the lateral axis of space in gestures

The second line of research that demonstrated a cultural difference in gesture due to cognitive diversity concerns how motion and relative location are represented. This research compared two closely related Mayan cultures in Central America, Mopan (in Belize) and Yucatec (in Mexico) (Danziger, Kita, & Stolz, under review). These two groups split from common ancestors only one thousand years ago and they still share many cultural traits. However, their spatial conceptualizations differ in an interesting way. The lateral (left-right) axis is conceptually contrastive for Yucatec speakers, but not for Mopan speakers. First, the Mopan language does not linguistically distinguish left and right, whereas the Yucatec language does, just like speakers of European languages. More specifically, the Mopan language does not have any words equivalent to English "left" and "right" that denote spatial relationship based on the relative frame of reference,

whereas the Yucatec language does. In a referential communication task, Mopan speakers gave essentially the same description to two lateral mirror images (e.g., one with a man on the left and a tree on the right, and the other with a tree on the left and a man on the right), whereas Yucatec speakers gave descriptions that distinguish mirror images. Second, in a *non-linguistic* pattern-matching task, Mopan speakers often treated lateral mirror images to be the same (more often than Yucatec speakers). In summary, Mopan and Yucatec speakers give different representational values to the lateral axis (i.e. left-right axis) of space in both *linguistic* and *non-linguistic* tasks.

This difference in processing of spatial information is reflected in representational use of space in gesture. Mopan speakers do not use the left-right axis in space contrastively in their gestural representations, but Yucatec speakers do (Danziger, et al., under review; Kita, Danziger, & Stolz, 2001). The gestures that represent motion and location in telling of traditional stories were analyzed. As the stories were mythical stories, exactly where the events took place was unknown, and thus they were not associated with any actual physical location. Because these events were free from the physical environment, the speakers had freedom as to how they chose to gesturally represent the location and direction of events. It was inferred that because Mopan speakers do not use the lateral axis contrastively for representational purposes, they should not represent motion and relative location in these stories with gestures with predominantly lateral movement because such gestures would assign two points along the lateral axis different semantic values (e.g., source vs. goal of motion, or two distinct entities that are located in different places). Mopan speakers should instead use the sagittal axis (the front-back axis) to represent motion and relative location. Consistent

with this prediction, it was found that the Yucatec speakers produced more lateral gestures during the description of motion and location than the Mopan speakers, and the Mopan speakers' gestures were predominantly non-lateral. Furthermore, it was found that the difference between Mopan and Yucatec speakers extended to gestural representation of abstract contents such as time flow or opposition between two abstract concepts (Kita, Danziger, & Stolz, 2001). For example, a Mopan speaker's gestures placed a sequence of events along the sagittal axis, while Yucatec speaker's gestures did so along the lateral axis.

Thus, the representational significance of the lateral axis of space differs between Moapn and Yucatec speakers, and this difference is reflected in the gestural difference between the two cultures. More specifically, Mopan speakers tend not to use lateral gestures to represent concrete concepts such as motion and relative location[1], as well as abstract concepts such as temporal sequence. In contrast, Yucatec speakers readily use the lateral gestures in these contexts.

Gestural representation of deictic time

The third line of research demonstrating a cultural difference in gesture due to cognitive diversity concerns how gestures represent deictic time, namely the concepts of past and future. It has been claimed that, like many other abstract concepts, we understand concepts of past and future in terms of more concrete and tangible spatial concepts (Núñes & Sweetzer, 2006). The evidence for this claim comes from the existence of metaphorical expressions for the concepts of past and future that use spatial

---

[1] When motion and location are associated with actual physical environment, then Mopan speakers' gestures can be anchored to the actual space, especially when the relevant actual space is not too far from the speaker (Danziger, Kita, & Stolz, under review).

concepts, in particular, the concepts of front and back: "bright future is ahead of us", "difficult times are behind us". As in these English examples, many languages use the sagittal axis (the front-back axis) for the metaphor of past and future.

However, not all languages map the future to the front and past to the back. It is argued that Aymara spoken in Chilean Andes metaphorically maps the future to the back and past to the front (Núñes & Sweetzer, 2006). In Aymara, expressions of past often include the word for "front": last year = "front year", a long time ago = "at much front time", past time = "front time". Expressions of future include the word for "back": in the next year = "at the back year", a future day = "a back day", future time = "back time". This suggests that Aymara speakers' understanding of past and future is based on a conceptual scheme that what is known (e.g., past) is in front and what is unknown (e.g., future) is in the back, which in turn is based on the fact that vision is an importance source of information.

This conceptual scheme is reflected in gestural representation of deictic time. Núñes and Sweetzer (2006) found that Aymara speakers, especially older individuals with limited Spanish, gesturally represented past as a direction towards the front and future as a direction towards the back. For example, a Ayamara speaker talking about past and future (in Spanish) produced gestures with forward movement as he said, "old times", and then points backwards over the shoulder as he said, "future". This pattern of gestural representations was observed even when the concurrent temporal terms did not have spatial meaning (e.g., the Spanish words for "old times" and "future" above). In contrast, the members of Ayamara community who were Spanish monolinguals (Ayamara is an endangered language) represented past as a direction towards the back

and future as a direction towards the front. A converging finding has been reported for French speakers (in France) who represented past and future in the same way as the Spanish monolinguals above (Calbris, 1990). Thus, the spatial metaphor for the concepts of future and past differs across cultures, and this difference is reflected in how gestures represent these concepts.

Summary

Gestural representation of motion, relative locations, and deictic time differ across cultures because of the cultural variation in the way spatial information is conceptualised and processed: the absolute vs. relative frame of reference, the semantically contrastive vs. non-contrastive lateral axis, and the metaphorical mapping of past-front and future-back vs. the reverse mapping. This cognition-gesture correspondence cannot be fully explained by utterance-level semantic coordination of speech and gesture (e.g., gesturing towards north when the concurrent speech has the word "north"). The culture-specific patterns of gesturing persisted even when the concurrent sentence did not show any obvious culture-specific semantics. Furthermore, at least in the study of the relative vs. absolute frames of reference and that of the semantically contrastive vs. non-contrastive lateral axis, the cross-cultural cognitive differences went beyond how people linguistically described space, and extended to how people processed spatial information in non-linguistic tasks. Therefore, the cross-cultural cognitive differences were not just simply differences in thinking-for-speaking (Slobin, 1996), but were "deeper" differences in spatial cognition in general. Thus, we can infer that the spatial cognition specific to a given culture shaped gestural representation in that culture. In other words, gestures vary cross-culturally because cognition varies cross-culturally.

Variation due to linguistic diversity across cultures

Different languages are spoken in different cultures, and languages have different lexical and syntactic resources for expressing thought. Even when describing exactly the same event, languages may differ as to what aspects of the event are encoded lexically or left out from the description or as to how the words describing various aspects of the event are distributed syntactically. It has been found that how the information is linguistically packaged influences how it is gesturally expressed.

Variation due to cross-linguistic lexical differences

The influence of the lexical packaging of information on gestural representation was demonstrated in a cross-linguistic study (Kita & Ozyurek, 2003). The speakers of Japanese, Turkish, and English were shown an animated cartoon, and asked to describe it to a listener who did not see the cartoon. There was a particular event in the cartoon, for which the lexical resources available in the three languages differed. In this event, the protagonist of the cartoon swung on a rope (like Tarzan) from a window in a tall building to a window in another tall building across the street. English has the intransitive verb *swing* to express a change of location with an arc trajectory; however, Japanese and Turkish do not have any equivalent intransitive verb or any easy and concise paraphrase for the concept referred to by the English verb. Consequently, Japanese and Turkish speakers' description of the event did not encode the arc trajectory but instead used more generic verbs of motion such as to *go* or to *jump*, while all English speakers used the verb *swing*. The gestural representation of the event showed a parallel cross-linguistic difference. Japanese and Turkish speakers were more likely to produce "straight

gestures", which did not show the arc trajectory than English speakers. English speakers mostly used "arc gestures" that depicted both the change of location and the arc trajectory. In other words, when the speech does not encode a particular aspect of an event, the accompanying gestures tended not to depict it either. Thus, the difference in lexical resources across languages can create cross-cultural variation in gestural representation.

Variation due to cross-linguistic syntactic differences

The variation of the syntactic packaging of information can also influence gestural representation. This effect was demonstrated using the following difference across languages. The same aspects of motion events are expressed by different syntactic structures across languages (Talmy, 1985). For example, the manner of motion (how the motion was carried out) and the path of motion (the directionality of the motion) can be distributed over one or two clauses, depending on the language. For example, when one describes an event in which an entity rolls down a slope, then languages like English typically express the manner (rolling) and the path (down) of the event with a single clause (e.g., *it rolled down the slope*), whereas Japanese and Turkish typically express the two pieces of information with two separate clauses (e.g., *it descended as it rolls*).

This syntactic difference has an implication for the speech production process, and in turn, for the gesture production process. A clause is considered to be an important processing unit for the speech formulation process (Bock & Cutting, 1992; Garret, 1982; Levelt, 1989). Thus, when a language expresses manner and path of motion event in two separate clauses, it is beneficial for the speaker to conceptualize the two pieces of information separately so that the speech formulation process can encode the information

one at a time. If speech-accompanying gestures reflect imagistic representations in the conceptual planning for speaking (Alibali, Kita, Young, 2000; Hostetter, Alibali, & Kita, 2007; Kita, 2000; Kita, & Özyürek, 2003; Kita & Davis, in press; Melinger & Kita, 2007), then gestural representations of manner and path may also express the two pieces of information separately. It was indeed found that Japanese and Turkish speakers were more likely to represent manner and path in two separate gestures, whereas English speakers were more likely to represent manner and path in a single gesture (e.g., a hand moves in a circular trajectory while moving sideways to depict something rolling down) (Özyürek & Kita, 1999; Kita & Özyürek, 2003). In other words, how manner and path were packaged in a clause in a given language is reflected in how the two pieces of information were packaged in gestural representations (see also Özyurek, et al. 2005; Özyürek, et al., 2008).

The crosslinguistic difference in gesture is unlikely to be caused by general cognitive differences between speakers of the three languages. It is rather caused by different ways in which the speaker conceptualises events for the purpose of speaking. The evidence for this view comes from a study that investigated the effect of syntactic frames on gestural representation of manner and path by English speakers (Kita, Özyürek, Allen, et al. 2007). In this study, English speakers described animated cartoons that were specifically designed to elicit both one-clause and two-clause descriptions of manner and path (e.g., *he rolled down* and *he went down as he rolled*, respectively). It was found that English speakers were more likely to express manner and path in a single gesture when they described manner and path within a clause, but in two separate gestures when they described the two pieces of information in two separate clauses. In

other words, the speaker's on-line choice of syntactic frames influenced the gestural packaging of information. The most parsimonious account for this finding on English speakers and the crosslinguistic finding described above is that in both cases the speaker's online utterance-by-utterance conceptualisation process, not general cognitive diversity, was reflected in the gestural variation.

Summary

Gestural representation can vary between speakers of different languages because the lexical and syntactic resources of languages vary. The words and constructions that are available or commonly used in a given language shape the way the speaker organises information for speaking. It was found that what can be linguistically packaged in a unit (e.g. clauses) for speech production in a given language is reflected in gestural representation of the equivalent information. The crosslinguistic difference discussed in this section is probably not caused by "deep" cognitive diversity across cultures, unlike the cases discussed in the previous section on gestural diversity due to cognitive diversity. The effect of syntax on gesture reflects the speaker's utterance-by-utterance adjustment of conceptual representations so as to make them more compatible with the linguistic formulation process. This is because the same effect can be demonstrated in the comparison of gestures accompanying two different types of syntactic constructions in English. Furthermore, unlike some of the cases discussed in the previous section, no evidence has been reported that Japanese, Turkish and English speakers conceptualise the swing event or manner and path of motion events differently in *non-linguistic* tasks. Taken together, the diversity seen in this section reflects diversity in "thinking-for-

speaking" (Slobin, 1996) rather than thinking-in-general. In other words, gestures vary cross-culturally because language varies cross-culturally.

Variation due to diversity in gestural pragmatics across cultures

Just as usage of language for communication is systematic (e.g., Levinson, 1983), usage of gesture for communication is systematic. In this article, we refer to this systematicity as "gestural pragmatics" in analogy to linguistic pragmatics. In the following sections, cross-cultural differences in four aspects of gestural pragmatics are reviewed: politeness of the gesture use, conversation regulating gestures, the use of gesture space and the gesture rate.

Gestural politeness

Communication is a social act, and certain communicative moves can threaten the public self-image (or "face") of the addressee or the speaker him/herself (Brown & Levinson, 1978/1987). One influential definition of linguistic politeness is the strategy for formulating utterances that would minimize the threat to the addressee's face (Brown & Levinson, 1978/1987; but see also, Ide, 1989). The concept of linguistic politeness can be extended to gestures. It is clear that one can be rude to the addressee not only through speech, but also through gesture (e.g., the extended middle finger insult, "giving the finger", in the European and American cultures), and such gestures are avoided in amicable or neutral encounters. A gestural taboo can have a more profound impact on the gesture practice well beyond the suppression of the rude gestures. Kita and Essegbey's (2001) study of a gestural taboo in Ghana (West Africa) documented such a case.

In Ghana along with many other West African countries, the use of the left hand is considered to be inappropriate in actions such as giving, receiving, eating and drinking. Furthermore, a majority of the people in Ghana (about 60% of the participants interviewed in Kita and Essegbey, 2001) consider pointing gesture with the left hand to be rude and disrespectful towards the addressee. It was investigated how this gesture taboo influenced the use of gestures in naturalistic route descriptions elicited on the street of a southern Ghanaian town.

It was found that the left hand taboo shaped the Ghanaian gestural practice in may different ways. Not surprisingly, the participants who acknowledged the left-hand gesture taboo produced fewer left-hand gestures than those who did not acknowledge the taboo. The gesture taboo, however, had further implications for the participants' gesture behaviours. First, a natural consequence of left-hand suppression was that the right hand was overused. Even when the referent was located on the left-back side of the gesturer's body, the right arm crossed the body midline and wrapped around the neck to point to the left-back direction (an example of "hyper contra-lateral" gestures). Second, there was a conventional "respect position" for the left hand. Namely, it was considered to be polite to put the left hand on the buttocks as if to hide it from the addressee. Third, two-handed pointing gestures, which are not common in other cultures (Kita, 2003a), were sometimes used. In two-handed pointing, the palms of the right and left hands were put together and both hands swung together to indicate a direction. Such gestures were considered to be not rude. This is an instance of a more general taboo neutralisation principle, in which left-hand actions (e.g., giving, pointing) are not considered to be rude when the right hand is in contact with the let hand. Fourth, when the left hand produced a pointing gesture, the

gesture was physically reduced into a mere flick of a wrist, positioned well below the waist. Such gestures were inconspicuous due to the size and location, and more importantly, were *not* considered to be a gesture by Ghanaians for the purpose of the taboo. Because such gestures were often not visible to the addressee, and they tended to appear immediately before or with the description of a left-turn, Kita and Essegbey (2001) suggested that such left-hand gestures may be triggered by cognitive needs to facilitate the speech production when verbally expressing the concept "left" (see, e.g., Kita, 2000; Krauss, Chen, & Gottesman, 2000 for further discussions of self-oriented functions of gesture).

The Ghanaian case illustrates how a particular taboo influences both how not to gesture but also how to gesture. In other words, a gesture taboo creates a complex system of gestural politeness, which gives the Ghanaian gestural practice a distinct flavour.

Role of gesture in conversation

Gestures play an important role in conversational exchange. Gestures elicit verbal or gestural responses from the addressee (de Fornel, 1992; Furuyama, 2000; Heath, 1992; Streeck, 1994). Gestures can specify how a spoken utterance should be interpreted. For example, different gestures specify different speech acts (Kendon, 1995) or discourse statuses ("topic" vs. "comment", Kendon, 1995; "foregrounded" vs. "backgrounded", Enfield, Kita, & de Ruiter, 2007) associated with the concurrent spoken utterance. For example, the location information is considered to be foregrounded in the answer to a where-question. In such cases, pointing gestures that indicate the location tends to be expansive with the whole arm articulation (Enfield et al., 2007). In contrast, the location

information is backgrounded in utterances in which the location information is not new information in discourse. Even in such utterances, pointing gestures can still be produced to indicate the location if the speaker is not sure whether the listener really knows the location. Such pointing gestures are small with hand/lower-arm only articulation.

Gestures can also serve as cues relevant for turn-taking in spoken utterances (Goodwin & Goodwin, 1986; Schegloff, 1984; Streeck & Hartge, 1992). For example, during word-finding difficulty, the speaker may gesturally show the concept s/he wants to encode to the addressee, thereby inviting the addressee to take over the speaking role (Goodwin & Goodwin, 1986). Though the important roles of gesture play in conversation is clear, the cross-cultural variations have not been documented very often. One exception, however, is the use of head nods in conversation.

The frequency and the pattern of distribution of nods vary considerable across cultures. Japanese speakers nodded three times more often than American English speakers in a naturalistic conversation task (Maynard, 1993). This higher frequency in Japanese conversation is due to both the speaker's nods and the addressee's nods. The nodding by the speaker is far more common in the Japanese conversation than in American English conversation (Maynard, 1993), and these nods serve, among other things, a function of eliciting responses from the addressee (Kita & Ide, 2007; Maynard, 1983). The addressees' nods are frequent in the Japanese conversation because Japanese addressees nod in places American English addressees do not. Both Japanese and American English addressees nod when the utterance they are listening to comes to the end of a proposition (Maynard, 1993), which is a possible place where conversational turn-taking could take place (Sacks, Schegloff, & Jefferson, 1974). By nodding at such

places, the addressee indicates that s/he does not intend to take over the turn, thereby indicating to the speaker that s/he can continue to speak (Maynard, 1993) and/or that the addressee shares evaluative stance on the events and situations being described by the speaker (Stivers, 2008). In addition to the proposition final nods, the addressee in Japanese conversation systematically nods in the middle of a proposition (Maynard, 1993; Kita & Ide, 2007). The major phrase boundaries are all potential locations for the addressee to nod (e.g., "yesterday [nod], my best friend [nod] gave a present [nod] to her boy friend [nod]."). Such proposition-internal nods not only greatly increase the frequency of nodding in Japanese conversation, but also allow Japanese speakers to establish a social bond with each other in a flexible manner (Kita & Ide, 2007).

It has been suggested the culture-specific patterns of nodding is due to what is considered to be important in social interaction in the culture. Frequent exchange of nodding in Japanese conversation may stem from Japanese emphasis on cooperation and consideration for others or more generally from socially defined self in Japanese culture (Kita & Ide, 2007). Japanese tend to see "oneself as part of an encompassing social relationship and [recognize] that one's behavior is determined, contingent on, and to a large extent organized by what the actor perceives to be the thoughts, feelings, and action of others in the relationship" (Markus & Kitayama, 1991:277).

To summarise, the frequency and the pattern of distribution of nods differ greatly between Japanese and American English conversation. In other words, nodding shapes conversation in different ways across cultures. Culture specific values regarding communication and the social interaction in general may contribute to such differences in nodding.

Use of gesture space

Unlike spoken language, gestures are physically realized as a movement through space. The way gestures use space as the representational medium changes, depending on various communicative and situational contexts (Gullberg, 2005; Holler & Stevens, 2007; Holler & Stevens, this issue; Özyürek, 2002). For example, depending on where the addressee is seated relative to the speaker, the speaker changes the direction of gestures that depict the same motion event (Özyürek, 2002).

Cultural conventions also shape the use of gesture space. Gestures vary across cultures in terms of the position, the size, and the plane (lateral, sagittal, or vertical) on which gestures are predominantly performed, and the positioning. A seminal study by Efron (1941 / 1972) compared gesturing by Southern Italian and Eastern European Jewish immigrants in New York City who had not been assimilated into the main stream American culture, through observations of naturally occurring gestures. He found that gestures by the Italian immigrants were spatially expansive, moving the entire arm from the shoulder, and tended to use the lateral (transversal) plane. In contrast, gestures by the Jewish immigrants were spatially compact, moving mainly the elbow and wrist joints, and tended to use vertical and frontal (sagittal) planes. In a more recent study (Müller, 1998), gestures produced by Germans and Spaniards in a naturalistic conversation task were compared. It was found that Spaniards produced more gestures above the shoulder height than Germans.

One implication of how gestures use space is the prominence of gestures. Large arm movements on the lateral (transversal) plane, as frequently observed in Southern Italian immigrants (Efron,1941/1972), loom large in the visual field. Similarly, gestures

that are positioned near the speaker's face, as frequently observed in Spanish speakers (Müller, 1998), are highly noticeable as the face is the area the addressee typically attends to (Gullberg & Holmqvist, 2006) in the European and Euro-American culture. Therefore, gestures by the people from the Mediterranean region are very prominent. This difference in gesture prominence might at least partially contribute to the folk intuition that people from the Mediterranean region produce more gestures (Müller, 1998). In this connection, it is interesting to note that the gesture frequency did not differ significantly between Germans and Spaniards in Müller's (1998) study. Such a finding opens up the possibility that prominent gestures create an "illusion" that people from the Mediterranean region gesture frequently.

The culture-specific use of gesture space mentioned above can be characterized as conventions for communication, which is social agreement among a member of a community that makes coordination more effective (Clark, 1996). Such variation is distinct from a similar variation in gestural forms due to cognitive diversity across cultures mentioned above. For example, the difference in frames of reference (absolute vs. relative) is associated with not only how gestures encode direction and relative location as discussed above, but also the expanse of gestures. Absolute gestures are expansive and can be directed in all directions (including towards the back of the gesturer), whereas relative gestures are confined to a shallow dish like space in front of the gesturer (Levinson, 2003)[2]. Such gestural variation reflects the variation in the underlying mental representation, rather than differences in convention.

---

[2] The members of the cultures that predominantly use the relative frame of reference can also produce absolutely oriented gestures, e.g., when giving route directions. These gestures are also more expansive than the gestures that are not absolutely anchored (i.e.,

Gesture rate

Clear demonstration of cultural differences in the gesture rate is rare in the literature but Goldin-Meadow and Saltzman's (2000) comparison of mother-child interaction in the USA and Taiwan is an exception. They found that when interacting with their children (3- or 4-year olds) with toys and books, Taiwanese mothers produced gestures at a much higher rate (about three times more) than American mothers. They suggested that this difference could be attributed to the cultural difference in child rearing philosophy. According to Goldin-Meadow and Saltzman, Taiwanese parents put much effort in instructing children because of the Confucian belief that human nature can be altered by hard work and effort, and it is parents' responsibility to instruct their children to shape their nature. In contrast, American parents put more emphasis on children's talent and less focus on the alterability of human nature and they also have a more egalitarian view on the parent-child relationship. This cultural difference was reflected by the fact that Chinese mothers produced a higher proportion of utterances with instructional intent ("It's a bird; birds fly in the sky") than American mothers. Goldin-Meadow and Saltzman suggested that, along the similar vein, Taiwanese mothers produced gestures at a higher rate because of their stronger interest in instructing their children. Thus, like the difference in nodding between American and Japanese conversation, the difference in the gesture rate between Taiwanese and American mothers

---

relatively anchored) (Kita, 2003b). However, the speakers often turn their body to align their torso direction to the direction of the path segment being described so that the absolute and relative directions become the same (Kita, 2003b). Such alignment of relative and absolute directions is not observed among the members of the cultures that predominantly use the absolute frame of reference (Levinson, 2003).

may be attributable to culture specific ideas regarding what is important in social interaction.

Summary

The use of gesture in communication is constrained by various conventions. This leads to culture-specific ways in which gestures are deployed in communication. The left-hand taboo in Ghana engenders a complex system of politeness in gesture use. The way head nods regulate conversation differs between speakers of Japanese and American English. In Japanese conversation, not only the addressee but also the speaker nods often, and the addressee nods not only at the end of a proposition, but also within a proposition. This makes nodding far more frequent in Japanese conversation than in American English conversation. This difference may be due to the Japanese emphasis on coordination and cooperation with others in social interaction. The use of gesture space differs between Mediterranean cultures and other European cultures. Mediterranean cultures use more prominent gestures that are more expansive, elevated, and on the lateral (transversal) plane. Finally, Taiwanese mothers produced more gestures than American mothers while interacting with their children, possibly reflecting the cultural difference in child rearing philosophy.

These studies uncovered four potential ways in which culture-specific ideas about communication can shape gesture use. First, cultures may ascribe negative values to specific surface forms of gestures as in the case of the gesture taboo in Ghana. Second, cultures may ascribe positive values to specific type of coordination in conversational exchange as in the case of Japanese nodding. Third, cultures may ascribe positive values to specific contents to be communicated as in the case of Taiwanese caretakers'

communication with infants. Fourth, cultures may differ in how much gesture is highlighted/foregrounded as a medium of communication as in the case of different uses of gesture space in Mediterranean and northern European cultures.

General Discussions

This paper reviewed evidence that gesture varies cross-culturally because cultures vary in (1) conventions for form-meaning associations, (2) cognition, (3) language and (4) pragmatics for communication. This approach for conceptualising cross-cultural variation of gesture behaviours is based on the view that gesture is a symbol expressing thought in coordination with speech (e.g., McNeill, 1992) and it is an integral part of multi-modal communicative acts (e.g., Kendon, 2004). The review did not simply describe cross-cultural differences in gestures, but identified four specific factors that caused such cross-cultural differences.

In order to further our understanding of cross-cultural differences in gesture behaviours, it would be interesting for future studies to investigate the following questions. As for the cultural difference in conventionalised gestures, it would be interesting to investigate micro-development of gesture conventions. How do conventionalised gestures emerge (or disappear) within a community (cf. Brookes, 2004), how do they spread within and across communities and how do they change their meaning when passed on from generation to generation or from community to community (cf. Morris et al., 1979)? These questions will help us understand the underlying mechanisms that account for the geographic distribution of conventionalised gestures. As for the gestural difference due to cognitive and linguistic differences, it

would be interesting to investigate how cultural differences in gesture, cognition, and language emerge in the course of child development. Such studies may highlight the development of "thinking-for-speaking" and the link between speech and gesture production processes (cf. Özyürek, et al. 2008). Such studies may also help us understand how culture-specific spatial cognition is maintained and transmitted across generations within a community. For example, it has been proposed that language plays an important role in culture-specific cognition (Linguistic relativity hypothesis; see Gumpertz & Levinson, 1996). It may also be the case that not only language but also gesture may play a role in maintenance and transmission of culture-specific cognition (Danziger et al., under review). As for the cultural differences in gestural pragmatics, further work is welcome as to what aspects of the gesture use can be influenced by cultural ideas and values concerning communication. Such work will expand the horizon of what is currently considered to be *linguistic* pragmatics, which tends to just focus on the language use in the narrow sense.

Though speech and gesture are tightly linked systems, gesture is an under-explored phenomenon, as compared to speech. The human communication is typically multimodal and thus the understanding of cultural variation of gesture is as important as the understanding of differences in the structure and processing of various languages. However, there have been a relatively small number of studies that directly compared gestures in multiple cultures and provided explanations for cross-cultural differences in gesture. It is hoped that this review stimulates further studies on the relationship between gesture and culture.

References

Alibali, M. W., Kita, S., & Young, A. J. (2000). Gesture and the process of speech production: We think, therefore we gesture. *Language and Cognitive Processes, 15*, 593-613.

Bavelas, J., Gerwing, J., Sutton, C., & Prevost, D. (2008). Gesturing on the telephone: Independent effects of dialogue and visibility. *Journal of Memory and Language, 58*(2), 495-520.

Bock, K., & Cutting, J. C. (1992). Regulating mental energy: Performance units in language production. *Journal of Memory and Language, 31*, 99-127.

Brookes, H. (2004). A repertoire of South African quotable gestures. *Journal of Linguistics Anthropology, 14*(2), 186-224.

Brosnahan, L., & Okada, T. (1990) *Japanese and English gesture*. Tokyo: Taishukan.

Brown, P., & Levinson, S. C. (1978/1987). *Politeness: Some universals in language usage*. Cambridge: Cambridge University Press. (Original work published 1978)

Butcher, C., & Goldin-Meadow, S. (2003). Pointing toward tow-word speech in young children. In S. Kita (Ed.), *Pointing: Where language, cognition, and culture meet* (pp. 85-107). Mahwah, NJ: Lawrence Erlbaum.

Calbris, G. (1990). *The semiotics of French gestures* (O. Doyle, Trans.). Bloomington & Indianapolis: Indiana University Press.

Clark, H. H. (1996). *Using language*. Cambridge: Cambridge University Press.

Cohen, A. A. (1977). The communicative functions of hand illustrators. *Journal of Communication, 27*(4), 54-63.

Creider, C. A. (1977). Towards a description of East African gestures. *Sign Language Studies, 14*, 1-20.

Creider, C. A. (1986). Interlanguage comparisons in the study of the interactional use of gesture. Semiotica, 62, 147-163.

Danziger, E., Kita, S., & Stolz, C. (under review). The conversational gestures of culture-specific cognition: Language, space and semiotic relativity in two Mayan speech communities.

de Fornel, M. (1992). The return gesture: Some remarks on context, inference, and inconic gesture. In P. d. L. Auer, A (Ed.), *The contextualization of language* (pp. 160-176). Amsterdam/Philadelphia: Benjamins.

de Jorio, A. (1983/1990). Gestures in Naples and gestures in classical antiquity. (Translated by Adam Kendon). Bloomfield and Indianapolis: Indiana University Press.

de Saussure, F. (1916/1983). *Course in general linguistics* (R. Harris, trans.). La Salle, IL: Open Court.

Duncan, S. (1994). *Grammatical form and 'thinking-for-speaking' in Mandarin Chinese and English: An analysis on speech-accompanying gesture*. Unpublished doctoral dissertation, Department of Psychology, University of Chicago, Chicago.

Ekman, P. & Friesen, W. (1969). The repertoire of nonverbal behavior: Categories, origins, usage and coding. *Semiotica, 11*, 49-98.

Efron, D. (1972). *Gesture, race, and culture*. The Hague: Mouton. (Original work published as *Gesture and environment* 1941)

Enfield, N. J. (2001). 'lip pointing': A discussion of form and function with reference to

data from Laos. *Gesture, 1*(2), 185-212.

Enfield, N. J., Kita, S., & de Ruiter, J. P. (2007). Primary and secondary pragmatic functions of pointing gestures. *Journal of Pragmatics, 39*, 1722-1741.

Furuyama, N. (2000). Gestural interaction between the instructor and the learner in origami instruction. In D. McNeill (Ed.), *Language and gesture*. Cambridge: Cambridge University Press.

Garrett, M. F. (1982). Production of speech: Observations from normal and pathological language use. In A. W. Ellis (Ed.), *Normality and pathology in cognitive functions* (pp. 19-76). London, New York: Academic Press.

Goldin-Meadow, S., & Saltzman, J. (2000). The cultural bounds of maternal accommodation: How Chinese and American mothers communicate with deaf and hearing children. *Psychological Science, 11*(4), 307-314.

Goodwin, M. H., & Goodwin, C. (1986). Gesture and coparticipation in the activity of searching for a word. *Semiotica, 62*, 51-75.

Gullberg, M. (2006). Handling discourse: Gestures, reference tracking, and communication strategies in early l2. *Language Learning, 56*(1), 155-196.

Gullberg, M., & Holmqvist, K. (2006). What speakers do and what addressees look at. *Pragmatics and Cognition, 14*(1), 53-83.

Gumperz, J.J., & Levinson, S. C. L. (Eds.) (1996). *Rethinking linguistic relativity*. Cambridge: Cambridge University Press.

Haviland, J. B. (1993). Anchoring, iconicity, and orientation in Guugu Yimithirr pointing gestures. *Journal of Linguistic Anthropology, 3*, 3-45.

Heath, C. (1992). Gesture's discreet tasks: Multiple relevancies in visual conduct and in the contextualisation of language. In P. d. L. Auer, A. (Ed.), *The contextualization of language*. Amsterdam, Philadelphia: Benjamin.

Holler, J., & Stevens, R. (2007). The effect of common ground on how speakers use gesture and speech to represent size information. *Journal of Language and Social Psychology, 26(*1), 4-27.

Holler, J., & Wilkin, K. (this issue). Communicating common ground: How mutually shared knowledge influence speech and gesture in a narrative task. *Language and Cognitive Processes*.

Hostetter, A. B., Alibali, W. M., & Kita, S. (2007). I see it in my hand's eye: Representational gestures are sensitive to conceptual demands. *Language and Cognitive Processes, 22*(3), 313-336.

Ide, S. (1989). Formal forms and discernment: Two neglected aspects of universals of linguistic politeness. *Multilingua, 8*, 223-248.

Iverson, J. M., & Goldin-Meadow, S. (2005). Gesture paves the way for language development. *Psychological Science, 16*(5), 367-371.

Iverson, J. M., Tencer, H. L., Lany, J., & Goldin-Meadow, S. (2000). The relation between gesture and speech in congenitally blind and sighted language-learners. *Journal of Nonverbal Behavior, 24*(2), 105-130.

Kendon, A. (1981). Geography of gesture. *Semiotica, 37*, 129-163.

Kendon, A. (1983). Gesture and speech: How they interact. In J. M. Wieman & R. P. Harrison (Eds.), *Nonverbal interaction* (pp. 13-45). Beverly Hills: Sage Publications

Kendon, A. (1992). Some recent work from Italy on Quotable Gestures (Emblems). *Journal of Linguistic Anthropology, 2*, 92-108.

Kendon, A. (1995). Gestures as illocutionary and discourse structure markers in Southern Italian conversation. *Journal of Pragmatics, 23*, 247-279.

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

Kendon, A., & Versante, L. (2003). Pointing by hand in "Neapolitan". In S. Kita (Ed.), *Pointing: Where language, culture, and cognition meet*. Mahwah, NJ: Lawrence Erlbaum.

Kita, S. (2000). How representational gestures help speaking. In D. McNeill (Ed.), *Language and gesture* (pp. 162-185). Cambridge: Cambridge University Press.

Kita, S. (Ed.) (2003a). *Pointing: where language, culture, and cognition meet*. Mahwah, NJ: Lawrence Erlbaum.

Kita, S. (2003b). Interplay of gaze, hand, torso orientation and language in pointing. In S. Kita (Ed.), *Pointing: where language, culture, and cognition meet* (pp. 307-328). Mahwah, NJ: Lawrence Erlbaum.

Kita, S., Danziger, E., & Stolz, C. (2001). Cultural specificity of spatial schemas, as manifested in spontaneous gestures. In M. Gattis (Ed.), *Spatial schemas and abstract thought* (pp. 115-146). Cambridge, MA: MIT Press.

Kita, S., & Davies, T. S. (in press). Competing conceptual representations trigger co-speech representational gestures. *Language and Cognitive Processes*.

Kita, S., & Essegbey, J. (2001). Pointing left in Ghana: How a taboo on the use of the left hand influences gestural practice. *Gesture, 1*, 73-94.

Kita, S., & Ide, S. (2007). Nodding, *aizuchi*, and final particles in Japanese conversation: How conversation reflects the ideology of communication and social relationships. *Journal of Pragmatics*, *39*(7), 1242-1254.

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., Özyürek, A., Allen, S., Brown, A., Furman, R., & Ishizuka, T. (2007). Relations between syntactic encoding and co-speech gestures: Implications for a model of speech and gesture production. *Language and Cognitive Processes, 22*(8), 1212-1236.

Krauss, R. M., Chen, Y., & Gottesman, R. F. (2000). Lexical gestures and lexical access: A process model. In D. McNeill (Ed.), *Language and gesture* (pp. 261-283). Cambridge: Cambridge University Press

Levelt, W. J. M. (1989). *Speaking*. Cambridge, MA: The MIT Press.

Levinson, S. C. (1983). *Pragmatics*. Cambridge: Cambridge University Press.

Levinson, S. C. (1996). Frame of reference and Molyneux's question: Crosslinguistic evidence. In P. Bloom, M. Peterson, L. Nadel & M. Garrett (Eds.), *Language and space* (pp. 109-169). Cambridge, MA: The MIT Press.

Levinson, S. C. (2003). *Space in language and cognition: Exploration in cognitive diversity*. Cambridge: Cambridge University Press.

Levinson, S. C., Kita, S., Haun, D. B. M., & Rasch, B. H. (2002). Re-turning the tables: Language affects spatial reasoning. *Cognition, 84*, 158-188.

Li, P., & Gleitman, L. (2002). Turning the tables: Language and spatial reasoning. *Cognition, 83*(3), 265-294.

Majid, A., Bowerman, M., Kita, S., Haun, D. B. M., & Levinson, S. C. L. (2004). Can language restructure cognition? The case of space. *TRENDS in Cognitive Sciences, 8,* 108-114.

Maynard, S. K. (1987). Interactional functions of a nonverbal sign: Head movement in Japanese dyadic casual conversation. *Journal of Pragmatics, 11*, 589-606.

Maynard, S. K. (1993). *Kaiwabunseki* [conversation analysis]. Tokyo: Kuroshio.

McClave, E., Kim, H., Tamer, R. & Mileff, M. (2007). Head movements in the context of speech in Arabic, Bulgarian, Korean, and African-American Vernacular English. *Gesture, 3*, 343-390.

McCullough, K. E. (1993). Spatial information and cohesion in the gesticulation of English and Chinese speakers. Paper presented at the annual meeting of American Psychological Society, Chicago.

McNeill, D. (1992). *Hand and mind*. Chicago: University of Chicago Press.

Melinger, A., & Kita, S. (2007). Conceptualization load triggers gesture production. *Language and Cognitive Processes, 22*(4), 473-500.

Morris, D., Collett, P., Marsh, P., & O'Shaughnessy, M. (1979). *Gestures, their origins and distribution*. New York: Stein and Day.

Müller, C. (1998). *Redebegleitende Gesten: Kulturegeschichte - Theorie - Sprachvergleich*. Berlin: Berlin Verlag.

Núñez, R. E., & Sweetser, E. (2006). With the future behind them: Convergent evidence from Aymara language and gesture in the crosslinguistic comparison of spatial construal of time. *Cognitive Science, 30*, 401-450.

Özyürek, A. (2002). Do speakers design their cospeech gestures for their addressees? The effects of addressee location on representational gestures. *Journal of Memory and Language, 46*(4), 688-704.

Özyürek, A., & Kita, S. (1999). Expressing manner and path in English and Turkish: Differences in speech, gesture, and conceptualization. In M. Hahn & S. C. Stoness (Eds.), *Proceedings of the twenty first annual conference of the Cognitive Science Society* (pp. 507-512). Mahwah, New Jersey, London: Lawrence Erlbaum.

Özyürek, A., Kita, S., Allen, S., Furman, R., & Brown, A. (2005). How does linguistic framing of events influence co-speech gestures? Insights from crosslinguistic variations and similarities. *Gesture, 5*, 219-240.

Özyürek, A., Kita, S., Allen, S., Brown, A., Furman, R., & Ishizuka, T. (2008). Development of cross-linguistic variation in speech and gesture: Motion events in English and Turkish. *Developmental Psychology, 44*(4), 1040-1054.

Payrató, L. (1993). A pragmatic view on autonomous gestures: A first repertoire of Catalan emblems. *Journal of Pragmatics, 20*, 193-216.

Payrató, L. (2008). Past, present, and future research on emblems in the Hispanic tradition: Preliminary and methodological considerations. *Gesture, 8*(1), 5-21.

Pederson, E., Danziger, E., Wilkins, D., Levinson, S. C., Kita, S., & Senft, G. (1998). Semantic typology and spatial conceptualization. *Language, 74*, 557-589.

Sacks, H., Schegloff, E. A., Jefferson, G. (1974). A simplest systematics for the organization of turn-taking for conversation. *Language, 50*(4), 696-735.

Schegloff, E. A. (1984). On some gestures' relation to talk. In J. M. H. Atkinson, John (Ed.), *Structure of social action: Studies in conversation analysis* (pp. 266-296). Cambridge: Cambridge University Press.

Shertzer, J. (1973). Verbal and nonverbal deixis: The pointed lip gesture among the San Blas Cuna. *Language in Society, 2*, 117-131.

Slobin, D. I. (1996). From "thought and language" to "thinking for speaking". In J. J. Gumperz & S. C. L. Levinson (Eds.), *Rethinking linguistic relativity*. Cambridge: Cambridge University Press.

Sparhawk, C. M. (1978). Contrastive-identificational features of Persian gesture. *Semiotica, 24*, 49-86.

Stefanini, S., Bello, A., Caselli, M. C., Iverson, J. M., & Volterra, V. (this issue) Co-speech gesture in a naming task: Developmental data. *Language and Cognitive Processes*.

Stivers, T. (2008). Stance, alignment and affiliation during story telling: When nodding is a token of affiliation. *Journal of Research in Social Interaction, 41*(1), 31-57.

Streeck, J. (1994). Gesture as communication ii: The audience as co-author. Research on *Language and Social Interaction, 27(*3), 239-267.

Streeck, J., & Hartge, U. (1992). Previews: Gestures at the transition place. In P. d. L. Auer, A. (Ed.), *The contextualization of language* (pp. 135-157). Amsterdam, Philadelphia: Benjamin.

Talmy, L. (1985). Lexicalization patterns: Semantic structure in lexical forms. In T.

    Shopen (Ed.), *Grammatical categories and the lexicon* (Vol. III, pp. 57-149).

    Cambridge: Cambridge University Press.

Wilkins, D. (2003). Why pointing with the index finger is not a universal (in

    sociocultural and semiotic terms). In S. Kita (Ed.), *Pointing: Where language,*

    culture, and cognition meet (pp. 171-215). Mahwah, NJ: Lawrence Erlbaum.