

TYPES OF SPACE AND THEIR USE IN SIGN LANGUAGE

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Abstract

This article analyses and reviews the literature currently available on sign languages' use of space. It focuses on two main topics within the literature: the types of signing space and how space is used at different linguistic levels. The first part focuses on the three types of signing space: real, topographic and syntactic space. Moreover, it includes an explanation of the different perspectives of signing, the structured use of syntactic space, and a summary of the experiments that support the distinction between topographic and syntactic space. The second part describes how the signing space is used at the phonological, morphological and discourse level, including key topics such as verbs that use space, pointing and time lines. Although this article focuses mainly on British Sign Language (BSL), it also includes literature on other sign languages (Australian Sign Language, American Sign Language and Danish Sign Language) since there seems to be relatively little research on the use of space within BSL research.

Introduction

THE AIM OF this article is to review the literature currently available on the use of space in sign languages. Since the way sign languages use space is the most important difference between spoken and sign languages, research on this is more than significant. Although this article is mainly concerned with the literature on the different types of space, it will include a brief explanation of the use of space at different linguistic levels; in particular, it will mention the phonological use of space, and elaborate on the morphological and discourse level use. Thus, it will cover topics such as verbs that are used in space, indexing and time lines in sign languages. Although this article focuses on British Sign Language (BSL), there seems to be relatively little research on the topic within BSL research, even though the use of space is a well-researched area in other sign languages. Therefore, since there are fundamental

similarities in the use of space across sign languages due the modality, alongside BSL, this article will also include a literature review of different sign languages, namely Australian Sign Language (Auslan), American Sign Language (ASL), and Danish Sign Language.

Types of Signing Space

It has been argued that there are three different types of signing space, or rather, different ways of using the same space, based on how, and for what, they are used (Klima and Bellugi 1979; Sutton-Spence and Woll 1999; Emmorey 2002; Liddell 2003; Johnston and Schembri 2007): real space, topographic space and syntactic space (Klima and Bellugi 1979; Sutton-Spence and Woll 1999; Emmorey 2002; Liddell 2003; Johnston and Schembri 2007).

In terms of real space, the environment in which the signers currently are is used, which can include pointing at people or objects that are present in order to refer to them (Klima and Bellugi 1979; Liddell 2003; Johnston and Schembri 2007). The topographic use of space (or motivated use of space: see Cormier et al. 2015) is similar to real space in that it depicts the way objects or places are in the real world, however, the signer does not have to be at the location or with the people they are talking about (Klima and Bellugi 1979; Sutton-Spence and Woll 1999; Johnston and Schembri 2007). Moreover, Emmorey (2002) established that there are two ways of using topographic space based on the perspective of the signer: diagrammatic space and viewer space. In case of diagrammatic space (also referred to as depicting space by Liddell 2003), the space is used as a 'scaled-down model or map of the physical environment' (Johnston and Schembri 2007, 165). On the other hand, when a signer is using viewer space (also known as surrogate space; see Liddell 2003), they can act as if the

environment was currently surrounding them, and thus, objects, for example, are life-sized (Brennan 1992; Johnston and Schembri 2007). Thus, the main difference between diagrammatic space and viewer space is the perspective: whether the signer views the environment from within, or from an outsider's perspective. Moreover, Emmorey (2002) claims that this distinction is the same as between route and survey perspective in the case of English speakers. Furthermore, she also states that diagrammatic space can be used on the horizontal or the vertical plane; however, while the horizontal plane can represent both two- and three-dimensional space, the vertical plane is limited to being two-dimensional.

The third type of space is commonly referred to as syntactic space (Sutton-Spence and Woll 1999; Emmorey, 2002), abstract space (Johnston and Schembri 2007) token space (Liddell 2003), spatialized syntax (Emmorey 2002), or arbitrary use of space (Cormier et al. 2015). In contrast to topographic space, syntactic space does not have a locative function; instead, it is used to explain abstract concepts, which can be done by the signers placing them in the space so that they can refer to them or use spatial verbs between them to express their connection (Enberg-Pedersen 1993). Thus, although its aim is not to locate the concepts, it places them in space but for a different reason. An example of using syntactic space is provided by Sutton-Spence and Woll (1999): signers can compare and contrast two groups, however, these groups are not actually on the right or the left of the signer; and the same can be said about different abstract concepts, such as honesty and wealth.

Moreover, Engberg-Pedersen (1993) points out that the way Danish Sign Language signers locate things in the syntactic space is not randomised. She proposes that the placement of a sign in the syntactic space always follows one of four conventions: the convention of

semantic affinity; the convention of the canonical location; the convention of comparison; and the iconic convention. In addition to these, she also points out two more ways (the authority convention and the choice of locus and point of view) of locating things in the syntactic space. Later, Emmorey (2002) added both to the list of conventions, when paraphrasing Engberg Pedersen's work. All six of these conventions will be explained as they are all relevant to the the organisation of the syntactic space.

First, in case of the convention of semantic affinity, the same locus can be used for two semantically related things, for example a person and his or her workplace, or the town they are from (Emmorey, 2002). Second, in the convention of the canonical location, a person or an object can be placed where they can usually be found. This convention also applies when the signer uses the usual location of the referent even though he or she is currently absent. Although the fact that this convention is a subtype of the convention of semantic affinity is pointed out by the author, their difference is rather difficult to grasp from the examples she gives. Thus, further examples might provide the reader with a better understanding. Third, two referents or concepts can be placed at the two sides of the signing space so that the signer can compare and contrast them. Fourth, placing two things at different places to explain their spatial relations when the signer is describing a situation, leaving out irrelevant details, which, according to Emmorey (2002), is the base of the spatial language. Fifth, referents that are perceived to have authority tend to be placed at the upper part of the signing place, for example someone's boss, school or the government. Sixth, the signing space's diagonal dimension can be used to show that the signer empathises with one of the referents. In this case, the referent with which the signer empathises the most is placed closer to the signer, while the one with which the signer empathises the least is placed at the

other end of the diagonal dimension (either forward-left or forward-right, depending on whether the signer is left- or right-handed). It is also important to mention that Engberg-Pedersen points out that these conventions are not like rules, in that signers sometimes make exceptions. However, semantic relations do have an impact on the choice of the locations. Thus, locations in the syntactic space are far from arbitrary.

Although some have argued that there is a clear difference between topographic and syntactic space (Barberá 2014), it has also been proposed that there is no difference between them (see Liddell, 2003). However, the few experiments and little research that have been conducted concludes that there does seem to be a difference between the two types, based on how the brain deals with them. In one experiment by Emmorey (2002), participants were asked questions about whether or not a sign was part of a sentence they had been shown earlier. In some cases, the sentence involved the use of topographic, and in other cases the use of syntactic, space. Also, when asking them questions afterwards, the questions sometimes included placing the right sign (that was part of the sentence) at the wrong location. Participants were quicker at deciding when a sign that was used in the syntactic space was in the wrong place, than when the sign was in the wrong place but it was used in topographic space. In other research that involved brain imaging while signing, certain parts of the brain were activated to a greater extent when the participants were using topographic space than when they were using non-topographic space (MacSweeney et al. 2002). Thus, it has been suggested that the difference between the two types of space is real. However, it has also been suggested that these can overlap, and that signers sometimes alternate between their use, which makes differentiating between them rather difficult (Engberg-Pedersen 1993; Sutton-Spence and Woll 1999).

The Use of Space at the Phonological Level

At the phonological level, the use of space is limited to articulatory functions. In other words, the location is one of the parameters that define a sign (Valli et al. 1992; Emmorey 1999; Barberá 2014). Considering the fact that changing only one parameter of a sign results in a different sign, location is rather significant. However, in this case it does not have a semantic role (Emmorey 2002).

The Use of Space at the Morphological Level

Emmorey (1999) describes sign languages' morphological use of space by comparing it to spoken languages: while in English suffixes are joined to the stems to create words that are morphologically complex, sign languages use space to create morphologically complex signs. The best example of this is the way verbs use space.

Padden (1988) proposes three types of verbs in ASL: plain verbs, inflecting verbs and spatial verbs. Later, however, the category of inflecting verbs were renamed to agreement verbs (also known as directional verbs (Baker-Shenk and Cokely 1980) or indicating verbs (Liddell 2003; Cormier et al. 2015)). These categories were later adopted by other sign languages as well, including BSL (Sutton-Spence and Woll 1999). Out of these categories spatial and agreement verbs use space, while plain verbs do not. However, it has been argued that their usage is different from each other. According to Cormier et al. (2015), there used to be a general assumption that agreement verbs move in syntactic, and spatial verbs in topographic space. However, they recently concluded, after studying the BSL Corpus, that this notion

seems to be wrong, as signers tend to use agreement verbs in topographic space, and that using them in syntactic space is rare. As they also argued, this is not necessarily the case for other sign languages, and thus, further research is needed.

The Use of Space at the Discourse Level

Referential Pointing

The use of pointing (also known as indexing: see Klima & Bellugi 1979; Sutton-Spence and Woll 1999) has been observed for all sign languages discussed in this article (see: Sutton-Spence and Woll (1999) for BSL; Klima and Bellugi (1979), Valli, et al. (1992), and Sandler and Lillo-Martin (2006), for ASL; Johnston & Schembri (2007) for Auslan; and Engberg-Pedersen (1993) for Danish Sign Language). Pointing can be used for referential functions (Emmorey 1999), for example in real space in order to refer to a person or an object that is present. Moreover, it is also used in both topographic and syntactic space in a similar way: the signer produces the full sign first (Valli, et al. 1992; Emmorey 1999; Sutton-Spence and Woll 1999), then they can point to any location in neutral space that can be used as the referent afterwards. Thus, sign languages use pronouns by pointing at the different locations; for example when signers point towards themselves they use first person whereas pointing at the addressee usually means second person.

Time Lines

As Emmorey (2002) explains, we can use charts and graphs to represent time, which sign languages are also capable of doing, simply by using the signing space. Such representations

of time in sign languages are called time lines and have been observed, for example: for ASL (Emmorey 2002); BSL (Brennan 1983), and Danish Sign Language (Enberg-Pedersen 1993).

Engberg-Pedersen (1993) states that Danish Sign Language makes use of four distinct time lines: the deictic time line, the anaphoric time line, the sequence time line, and the mixed time line. The first three types have also been suggested to exist in BSL (Brennan 1983; Sutton-Spence and Woll 1999), ASL (Emmorey 2002) and Auslan (Johnston and Schembri 2007). In all the above mentioned sign languages the reference point of the deictic line is the signer's body that marks the present, behind this point is the past, and in front of the signer is the future. However, this is not the case for all sign languages, for instance, it has been stipulated that in Urubu Kaapor Sign Language the reverse of this phenomenon can be observed (Kyle and Woll 1985). Moreover, the deictic time line involves signs such as YESTERDAY and TOMORROW in BSL, and can be used to talk about, for example, recent past, or distant future. The anaphoric time line, on the other hand, is a diagonal line in front of the signer and its use includes the nondominant hand. As opposed to the deictic time line, it only holds its meaning for the discourse, in other words, it does not have a default meaning (Engberg-Pedersen 1993; Emmorey 2002; Johnston and Schembri 2007). Finally, the third time line moves from left to right, parallel to the body and is often used to compare events. However, its direction reflects our writing system: from left to right, but, since this is the opposite in some cultures, some sign languages use the opposite direction for this time line (Emmorey 2002).

Moreover, Brennan (1983) also states that the existence of a fourth time line should be taken into consideration, one that is on the signer's dominant side and extends from the

floor. She argues that this time line is used to represent growing up, and signs such as CHILD and ADULT can be used on it. Johnston, however, rejected this view by pointing out that it is only used for signs related to growth in height, and that the reversion of the movement in the sign GROW does not show going back in time, but rather the reduction in height (Johnston and Schembri 2007).

Conclusion

This literature review has focused on the different types of space, as well as the different functions of space, in sign languages at the phonological, morphological and discourse level. In conclusion, the literature on the topic of space seems to be extensive, and thus, it can be considered a well-researched topic within sign linguistics. However, there are some areas in which further research might to be needed, such as how the brain deals with the different types of space, or in which type of space agreement verbs and spatial verbs are used. Moreover, although the literature on sign languages' use of space is well-researched, the same cannot be said for BSL. In particular, it seems that most research has been done for ASL. Although there seem to be several similarities between the ways sign languages use space, as highlighted throughout this article, further research would enable researchers to draw final conclusions about the degree to which the common modality affects the use of space.

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