

# Sensory perception metaphors in sign languages

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## Abstract

This chapter uses the framework of Sign Language Typology, the systematic comparative study of grammatical/semantic domains across sign languages (Zeshan & Palfreyman 2017). For the first time, we explore perceptual metaphors across a convenience sample of data from 24 sign languages. Sign languages differ from spoken languages due to iconic mapping, that is, the tendency for signs of perception to be articulated at/near the sense organs. This is the basis for two types of signs: those with double-stage metaphors have literal and metaphorical lexical meanings, while those with single-stage metaphors lack literal lexical meanings of perception and instead rely on sublexical iconicity. We cover cross-linguistic patterns of metaphorical extensions of meaning in these signs, and the grammaticalisation of a class of prefixes that are associated with sensory perception.

## Keywords

sign languages, Sign Language Typology, sublexical iconicity, sense prefixes, grammaticalisation, re-metaphorisation

## 1. Introduction

The aim of this chapter is to compile and analyse information from sign languages on metaphors that have sensory perception as their source domain. This is of interest for two reasons. Firstly, the discussions in this chapter are situated in the framework of sign language typology. In sign language typology, a grammatical, functional or semantic domain is compared across a diverse range of sign languages (Zeshan & Palfreyman 2017), and over the past decade there have been several major studies, focusing on clause types (interrogative and negatives, Zeshan 2006), possession and existence (Zeshan & Perniss 2008), and the semantic fields of colour, kinship and quantification (Zeshan & Sagara 2016). The initial observations made in this chapter constitute a first step towards more extensive typological studies in the domain of sensory perception metaphors across sign languages.

Secondly, sensory perception is of intrinsic interest for the purpose of comparison between signed and spoken language modalities. As sign languages, in most cases, have emerged within communities of deaf people,<sup>1</sup> they are based on language users whose sense perception is radically different from users of spoken languages. This raises some intriguing questions. For instance, how do deaf sign language users talk about visual and auditory perception, and how are relevant expressions recruited for metaphors? Are metaphors based on aural perception excluded from sign languages, and conversely – given how deaf people are often referred to as visual people – is there a preference for visual perception as the source of metaphors in sign languages? Moreover, what is the role of iconically motivated sign-meaning correspondence – the fact that many signs "look like what they mean" – that is so pervasive across sign languages?

We address such issues in this chapter, beginning with a look at how signers talk about sensory perception (Section 2). This is followed by a summary of the data on perceptual metaphors in sign languages used in this chapter (Section 3). In Section 4, we then examine the properties of metaphors across sign languages that draw upon sensory perception. By adducing evidence from a variety of sign languages around the world, it is our hope that this will stimulate more in-depth research in the future.

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<sup>1</sup> A sub-type of sign languages have arisen from mixed communities of deaf and hearing people, where the community, typically a small-scale rural community, has long-standing hereditary deafness resulting in an unusually high proportion of deaf people (see Zeshan & De Vos 2012 for an overview). These communities have sometimes been referred to as "shared signing communities", among other names, (Kisch 2008), and their sign languages are co-created and co-used by deaf and hearing people together.

## 2. Talking about sensory perception in sign languages

Before we embark on a discussion of perceptual metaphors in sign languages, it is useful to consider some basic facts about how signs are structured and the way in which sensory perception is expressed in sign languages. At the word level, signs in sign languages consist of so-called "parameters", that is, the sublexical formational elements that are equivalent to phonemes in spoken languages. However, unlike in spoken languages, parameters are largely simultaneous with each other rather than sequential (cf. Brentari 1998; Wilbur, 2000; Sandler et al., 2011). The main parameters recognised in sign language linguistics are the handshape, place of articulation (PoA), movement, and hand orientation; sometimes, it is necessary to consider an additional parameter, namely non-manual aspects of signs such as eyebrow movement, eye gaze, and mouth patterns.

The example in Figure 1 shows a sign meaning 'to see' in many different sign languages. The sign has a handshape with two extended fingers, a hand orientation with the palm facing the signer and the finger tips pointing upwards, a straight movement away from the signer, a PoA in front of the signer's body at head height, and no specific non-manual formational features.



**Figure 1.** The sign SEE<sup>2</sup>

At the same time, this sign illustrates another general principle that operates across sign languages. In sign languages, the semantics of sensory perception is visible in the form of the sign in an overwhelming number of cases. We call this the Transparency Principle of Sensory Perception in sign languages. In the case of perception signs, this principle means that the PoA of a perception sign is linked to its meaning. The mapping is as follows:

<b>Meaning of the sign</b>	<b>Place of articulation (PoA)</b>
seeing	eye(s) or near the eye(s)
hearing	ear(s) or near the ear(s)
smelling	nose or near the nose
tasting	tongue, lips, or near the mouth
feeling	torso or upper limb(s)

Signs can involve contact with the body part (e.g. touching the tongue), or a proximal and/or distal movement (e.g. towards or away from the ear). The only meaning where there is more variation across sign languages is with signs for 'feeling' (in the haptic sense). It is common for signs with this meaning to be articulated on the chest, but other places of articulation are possible, such as the arm in Turkish Sign Language. A double meaning of both haptic perception and emotion, as in English 'feel', is common across sign languages. Signs for sensory perception often have a handshape with an extended index finger (or two extended fingers in the case of 'seeing' to represent the two eyes) but other handshapes are possible.

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<sup>2</sup> Customarily, the manual forms of sign languages are represented by glosses, in capital letters, that correspond to the meaning of the sign. Researchers now routinely use 'ID-glosses' for a given sign language, whereby each form is assigned a unique gloss (Johnston 2008). In this article we discuss many sign languages, and sometimes refer to forms that have a similar meaning in different sign languages; our glosses reflect only forms and meanings, and should not be understood as ID-glosses.

Signs for sensory perception are distinct from signs for sense organs, the latter typically being indicated by (index finger) pointing, touching, or holding, which is also used for indicating other body parts that are not sense organs. Although iconically motivated, perception signs abstract away from the biological basis of human perception. For instance, although biologically visual perception is caused by light entering the eyes, the common sign in Figure 1 has a movement away from the eyes. Takashima (this volume) argues for Japanese Sign Language that this indicates an active reaching for visual information rather than passive visual experiencing. In Kata Kolok, a rural sign language from Bali, to talk about a hearing person the hand is placed next to the ear and the fingers flicked open with the fingertips pointing away from the ear. By contrast, in Indian Sign Language, a similar sign with the same meaning has the fingertips pointing towards the ear. However, it is not necessary or possible to interpret each formational aspect of a sign individually, and besides the PoA, other parameters in perception signs may well be arbitrary.

The iconic basis for many sensory perception signs involves metonymy, in that a sense organ is conventionally recognised as the ‘seat’ of a particular sensory phenomenon, and can stand symbolically for that sensory modality. This interpretation is strengthened by the observation that the same kind of metonymy also applies to other semantic “families” of signs, for example signs of cognition (with the head/temple as the ‘seat’ of cognition), or signs that are related to time concepts, with the wrist as the place of articulation (Zeshan 2003). The fact that sensory perception signs “look like what they mean” makes sign languages radically different from spoken languages in this domain, and this aspect will be important for the discussion in the Section 4.

### **3. Data on perceptual metaphors in sign languages**

To date, no systematic surveys have been undertaken on perceptual metaphors in sign languages. Therefore, this chapter relies on a collection of several types of information. Firstly, informal interviews have been conducted with several native signers who have high levels of metalinguistic understanding – often deaf professional linguists or advanced students of linguistics. We have an extensive network of deaf colleagues from around the world, and we used convenience sampling to generate data. Our interviewees are deaf users of Chinese Sign Language (ZGS), Indian Sign Language (ISL), Indonesian Sign Language (BISINDO), South Korean Sign Language (SKSL), Turkish Sign Language (TİD) and British Sign Language (BSL).

It is worth providing some background about these languages. While they are not known to be related, the very notion of ‘sign language families’ is problematic because it is not clear what constitutes a ‘genetic relationship’ between sign languages (Palfreyman, Sagara and Zeshan 2015). As a rule, little is known about the origins of these sign languages, as all of them emerged prior to the 1960s in a time when their linguistic nature was overlooked by, for example, philologists. Only relatively recently has it been possible to capture sign languages using technology, and even for the best documented sign languages, such as ASL, comparatively few recordings are available.

There is evidence to suggest that what is now known as BSL may have been a conventional language as early as the second half of the seventeenth century (Cormier 2007), which might suggest a time-depth for BSL of something like 350 years. On the other hand, BISINDO has a likely time-depth of just over 60 years (Palfreyman 2017). It is likely that signed languages are considerably younger than spoken ones, and the implications of this are not well understood. However, language change for sign languages has been documented at the phonological level (Frishberg 1975) and in grammaticalisation processes (Pfau and Steinbach 2011), while synchronic variation also occurs (Schembri and Johnston 2012).

Returning to the interviews, we explained the notion of perceptual metaphors, and gave examples known to us from other sign languages. Informants were then prompted to come up with examples from their own native sign language. We discussed these examples to make sure the meanings were clear, and that they were genuine instances of perceptual metaphors. We then made notes on each example. The interviews took place on a one-to-one basis, except for informants from South Korea and China, who were interviewed together. Some of the interviews were held in person, while others were conducted via Skype.

The second source consists of signs publicly available on the website [www.spreadthesign.com](http://www.spreadthesign.com), which originated from an EU-funded project, and therefore mainly incorporates European sign languages. However, some non-European sign languages are also included, for example, from Brazil, Japan, and India. This site is organised on the basis of word-to-sign matches, and therefore it is mainly a word list. The site is searchable on the basis of written words that can be typed into the search window. The search output is in the form of clickable tabs of the target countries' flags, and videos of the signs open from the tabs.

It should be noted that this site was not constructed for the purposes of research, and therefore has limitations from the point of view of being used as a source for research. For instance, complexities of meaning may not be represented. This is particularly important given that this chapter deals with subtle semantic distinctions. Because of these issues, signs taken from this website have been used cautiously and only to provide additional evidence for phenomena already identified elsewhere, in order to get a better idea of their distribution across sign languages. Moreover, arguments where subtle semantics would be important are not based on signs taken from this website.

Finally, some published data have also contributed to this chapter. As mentioned in the introduction, publications in this area are rather limited, but where available and important for the arguments being made, we have relied on published sources. In particular, this applies to the data from Israeli Sign Language, discussed in Section 4.2. Dictionaries and wordlists on sign languages, though available for a substantial number of languages, have not been consulted because of time constraints. However, we did rely on our own respective personal knowledge of BSL, ISL, BISINDO, TİD, and International Sign. For reference, a list of all sign languages mentioned in this article, with associated acronyms, is presented in Table 1.

**Table 1.** Sign language acronyms

ASL	American Sign Language	LIBRAS	Brazilian Sign Language
BISINDO	Indonesian Sign Language	LIS	Italian Sign Language
BSL	British Sign Language	LSE	Spanish Sign Language
CzSL	Czech Republic Sign Language	LSF	French Sign Language
DGS	German Sign Language	LSL	Latvian Sign Language
ESL	Estonian Sign Language	NS	Japanese Sign Language
GSL	Greek Sign Language	ÖGS	Austrian Sign Language
IS	International Sign	PJM	Polish Sign Language
ISL	Indian Sign Language	SKSL	South Korean Sign Language
IsraelSL	Israeli Sign Language	STS	Swedish Sign Language
ÍTM	Icelandic Sign Language	TİD	Turkish Sign Language
LGP	Portuguese Sign Language	ZGS	Chinese Sign Language

In line with the exploratory nature of this research, the scope of our search domain was kept quite broad and therefore, examples discussed in this chapter go well beyond simple perception verbs. Rather, the domain of perception is considered more comprehensively, and data include metaphorical mappings from a wide range of concepts related to sensory perception. Identifying examples was partly guided by consultants' intuitions and partly facilitated by the Transparency Principle, in that it was often helpful to try and think of other signs using the targeted PoAs.

#### **4. Properties of sensory perception metaphors in sign languages**

In this Section, the properties of signs that are used in perceptual metaphors are considered in two parts. In Section 4.1 we examine two kinds of perceptual metaphor that occur across sign languages. We then turn to the formational properties of some signs in this domain in Section 4.2. As the latter Section is framed in terms of grammaticalisation theory, it also includes semantic aspects along with phonological and morphological properties.

#### 4.1 The semantics of sensory perception metaphors in sign languages

Signs that express metaphors derived from sensory perception can be grouped into two types, depending on the kind of semantic shift involved. The two types of semantic shift are referred to as “single-stage metaphor” and “double-stage metaphor” here. Neither of them occurs in spoken languages in quite the same way.

##### (i) Double-stage metaphors

Double-stage sensory perception metaphors are partially similar to the type of metaphorical semantic shift familiar from spoken languages. That is, one and the same sign has both a literal meaning and a metaphorical meaning, and both meanings coexist in the current state of the language. Metaphorical mappings such as those between hearing and obeying, seeing and understanding, etc, are found across spoken languages (Sweetser 1990), and similar examples from sign languages are shown in Figures 2-6. However, spoken languages do not involve any sub-lexical iconicity, whereas in sign languages the semantics involves an initial sub-lexical level of iconicity (the PoA), and then an additional semantic shift from lexical to metaphorical meaning (hence the term “double-stage metaphor”).



**Figure 2.** BLIND / NOT-WANT-TO-KNOW-ABOUT (ZGS, SKSL)

The sign in Figure 2 is identical in the sign languages found in ZGS (northern China) and SKSL.<sup>3</sup> The sign means both “blind” in the literal sense, and “not want to know about (something)” in the metaphorical sense. The metaphorical sense is based on the association between seeing and knowing that is well-documented across spoken languages (e.g. Lakoff & Johnson, 2003). However, there is an added, volitional sense – that is, if someone who is not blind actively puts one’s hand over one’s eyes, it signals that one does not want to see what is there, and by metaphorical extension means that one does not want to know about something. While the form of the sign is the same, this volitional element is obtained when it is used by a signer who is *not* blind, and who therefore does not ‘want’ to see.

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<sup>3</sup> Sign language varieties in China have a major split between northern and southern varieties (Fischer & Gong, 2010). The Korean consultant is from South Korea. It is not known how different the sign language varieties in North Korea are from those in the South.



**Figure 3.** WINK / SECRET-UNDERSTANDING (ISL)

Figure 3 shows a sign from Indian Sign Language that means both "a wink/winking at someone" or "a secret understanding/tip" (the finger tips touch each other briefly, as in a pinching motion). Here the metaphorical meaning is based on the fact that, in the surrounding gestural culture, winking at someone often means that one has a secret understanding with them. Interestingly, in its metaphorical meaning, the sign is formationally fixed and cannot be modified. By contrast, in its literal meaning, the sign can be modified if the signer wants to express the exact way in which the wink was executed. For example, there could be an additional head movement or body posture, and the duration of the wink could be shorter or longer. When used in a metaphorical sense, these details are not relevant as the meaning abstracts away from the physical eye movement, and therefore such modifications cannot be added to the sign. However, it is still possible and common to have the formationally identical sign expressing both meanings.



**Figure 4.** LOOK (with straight movement) and LET'S-SEE-ABOUT-THAT (with repeated tap) (TİD)

The sign in Figure 4 is from Turkish Sign Language, and there is a subtle difference in form that distinguishes between the literal and the metaphorical meanings. With a straight outward movement, the sign means "look" but it is also used in the sense of "let's see about that", in which case the hand movement is shorter and repeated, as if tapping the cheek just below the eye. This sign is used to express uncertainty about what may happen and implies being non-committal about an upcoming decision or action. For example, when discussing whether and how to put forward an official proposal, a person using this sign may express that they are unable to decide now and have to "wait and see" first how the situation develops and what additional information becomes available. When used in this sense, this sign is often accompanied with a Turkish mouthing *bakalım*, which also means "let us see". In its literal sense, the sign may have no mouthing, or may have the mouthing *bak*, which is the verb stem as well as the singular imperative of the Turkish verb "to look". A formally similar sign occurs in British Sign Language, with the meaning "let's wait and see".

In BISINDO, the sign EYE-BROKEN has the literal meaning of 'broken eye', for example as a result of being hit, but is used metaphorically to explain or excuse lack of visual attention. For example, one might use this sign if one drives over a pothole in the road on one's motorbike, because one is careless and not looking at the road. Another appropriate context for the sign would be turning

up for an engagement at the wrong time because one misread the invitation. The sign comprises a point to the eye followed by a sign meaning broken (the latter sign, BROKEN, is usually articulated with two hands, but in this case one hand is dropped, and the PoA of the sign is moved closer to the eye, to facilitate assimilation with the indexical sign).

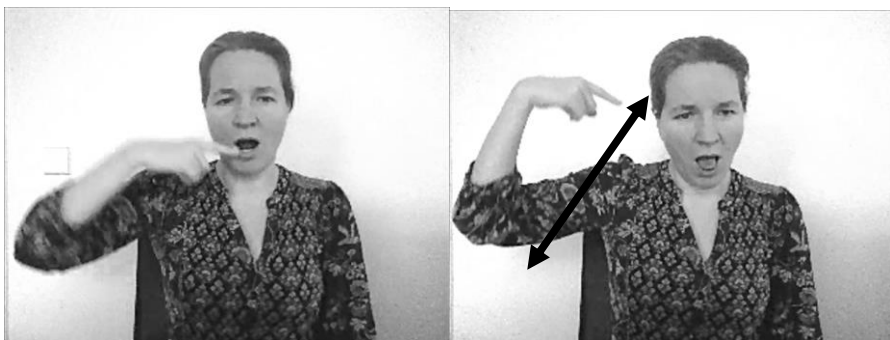


**Figure 5.** The sign BROKEN-EYE / CARELESS (BISINDO)

Perhaps unsurprisingly, sensory perception metaphors that have to do with "seeing" are particularly common across sign languages (see Section 4.3 for a discussion of this point). However, many other types of sensory perception metaphors can also be found easily. The sign in Figure 6a, also from Turkish Sign Language, means "pepper" and is based on the idea of pepper being something that tastes spicy. If the sign is articulated more vigorously, with a larger movement and an additional tongue wiggle, as in Figure 6b, this means "to talk angrily". This is an interesting case because the semantic logic proceeds in three steps, that is, from "spicy taste" to "pepper" to "talking angrily".



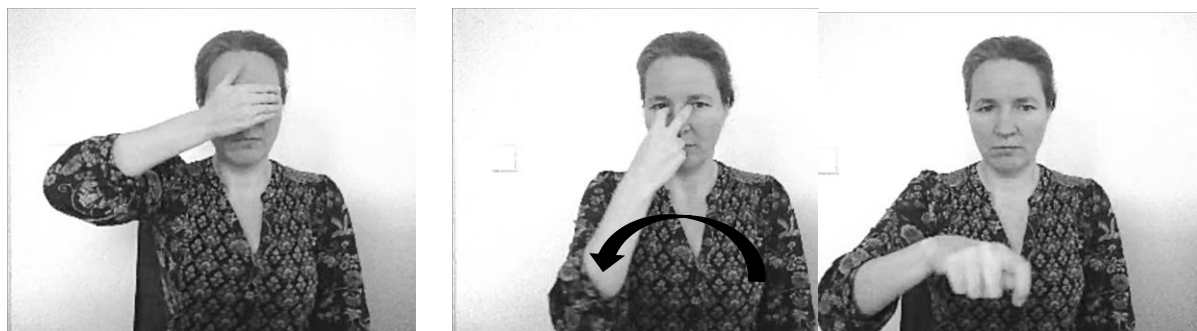
**Figure 6a.** PEPPER (Turkish Sign Language)



**Figure 6b.** TALK-ANGRILY (Turkish Sign Language)

(ii) Single-stage metaphors

Single-stage perception metaphors found in sign languages are unlike perception metaphors in spoken languages. To illustrate the difference between the two types, let us consider the sign in ISL and BISINDO that means "not want to know about (something)", in exactly the same way as the Chinese and Korean signs mentioned above, and that uses the same form as in Figure 2. The difference between ISL and BISINDO on the one hand, and CSL and SKSL on the other, is that in ISL this sign has only one sense, and does not mean "blind". In fact, there are different and formationally unrelated signs for "blind" in ISL (Figure 7a) and BISINDO (Figure 7b).



**Figure 7a.** The signs NOT-WANT-TO-KNOW and BLIND (Indian Sign Language)



**Figure 7b.** BLIND (Indonesian Sign Language)

The Indian and Indonesian signs glossed NOT-WANT-TO-KNOW involve a perceptual metaphor of the type SEEING IS KNOWING but their lexical semantics do not include any literal meaning of sense perception at all. In other words, the metaphor is based on the PoA mapping that associates the signs with visual perception, but the only lexical meaning is in the domain of cognition. The lexical meaning of sense perception from which a lexical meaning with metaphorical extension would normally be derived is absent in this type of sign. The following examples all have these same properties.

The sign in Figure 8 from Indonesian Sign Language also includes a volitional element but in this case the sign involves pretending to take the ear off and throw it away. This sign would be used, for example, if someone is gossiping, and one wishes to indicate that one does or did not want to know the gossip. Although this sign is used by deaf signers, who would perceive gossip that is relayed gesturally rather than audibly, it draws upon the notion of ‘deactivating’ the ear, rather than the eyes.





**Figure 8.** NOT-WANT-TO-KNOW-ABOUT (Indonesian Sign Language)

A similar motivation is behind the signs meaning ‘news/information’ in ISL, CSL and Polish Sign Language (PJM) which all involve a listening gesture with the hand cupped behind the ear (Figure 9 is from ISL).



**Figure 9.** NEWS (Indian Sign Language)

The two-handed South Korean sign NO-INFORMATION (Figure 10) has an up-and-down hand wave next to both ears.

In Brazilian Sign Language (LIBRAS), GREEDY (Figure 11) is related to “making big eyes” for something. “Big eyes” or “eyes opening up widely” is also often associated with SURPRISE across sign languages. However, these signs do not literally mean “to open the eyes widely” but are used in the metaphorical sense only.



**Figure 10.** NO-INFORMATION (SKSL)



**Figure 11.** GREEDY (LIBRAS)

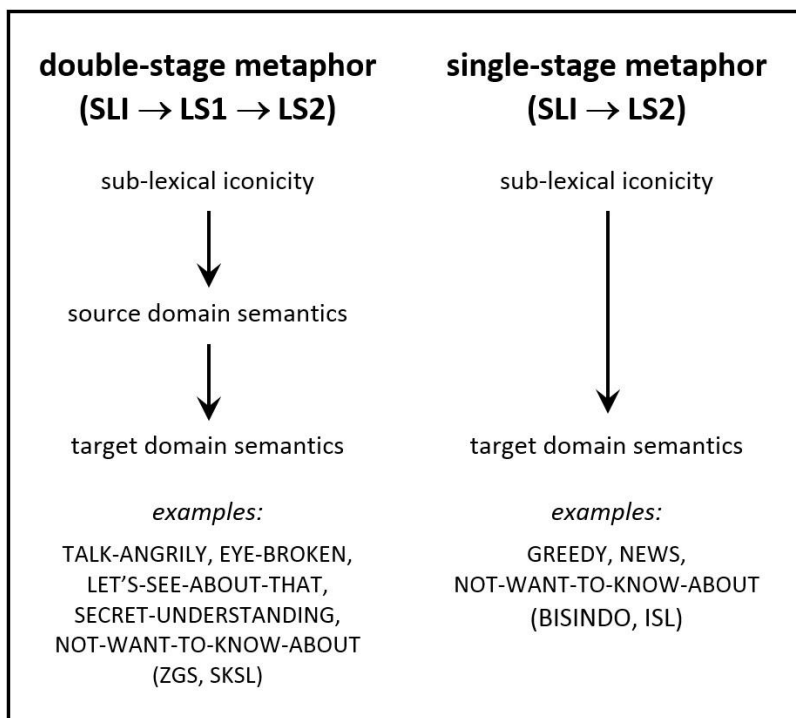
It is remarkable that we find signs with meanings that have to do with taking in information and which are based on the auditory sense. Since deaf people do not actually take in information by hearing, this is initially somewhat surprising, and one might argue that the expected conceptual metaphor for information-related meanings in sign languages would be based on the visual sense. In

fact, this does happen, for example with signs for “(visual) learning” or “(visual) information intake” that are directed towards the eyes. Despite the fact that signers perceive visually rather than aurally, a metaphorical extension from hearing to knowing, as in Figures 9 and 10, is also regularly attested across sign languages. Moreover, other metaphorical extensions are also based on spoken communication, as we shall see below.

The reason why these signs can have their semantic motivation in a perceptual metaphor even though they do not have any literal meaning of sense perception has to do with the Transparency Principle mentioned in Section 2. The sense perception is evoked by the fact that the PoA of the signs is located at the sense organs. The PoA is itself a sublexical component in each of these signs. The fact that sublexical components can have meaning due to their iconicity, without having morphemic status, is characteristic of sign languages in general, as discussed in more detail in Zeshan (2003). Equivalents in spoken languages are sound symbolic components of words such as ‘spl’ in *splash*, *splatter* etc., where a sound in a word mimics the sound of the referent.

While this is relatively rare in spoken languages, it is pervasive in sign languages and has led some sign language linguists to posit that the phoneme-morpheme distinction does not hold for sign languages (e.g. Cuxac 2000, 2004). However, Zeshan (2003) argues that it is appropriate to maintain the phoneme-morpheme distinction for sign languages but to allow for meaningful sublexical units in signs, which are due to their visual iconicity. The same principle is at work in the examples in Figures 8-11.

Importantly, this implies that whether or not a single-sense sign involves a metaphorical transfer can be a matter of interpretation, as it depends on whether one feels that sense perception is invoked by virtue of the PoA or not. For example, the BSL sign SEEM is articulated from the nose, with a flat hand with fingertips pointing upwards moving away from the face. It is a matter of interpretation whether this is regarded as a metaphorical extension from smell to intuition, or whether one regards the PoA as an arbitrary sublexical component of the sign.



**Figure 12.** Schematic difference between two types of signs based on sensory perception metaphors

The differences between the two types of signs discussed in this section are schematically represented in Figure 12. Both types involve meaningful sublexical components based on the iconic mapping between the PoA and the associated sense of perception. In the first type, the initial step is from sublexical iconicity (SLI) to a sign whose initial lexical semantics (LS1) falls within the source

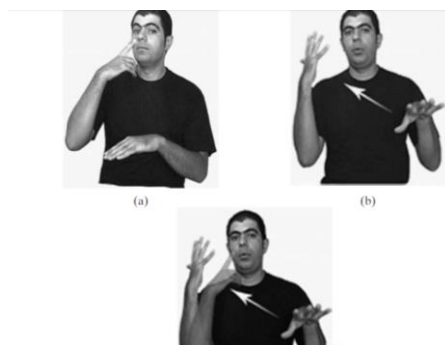
domain semantics of sensory perception in the actual, literal sense. The second step is the transfer from the source domain to the secondary lexical semantics (LS2) of the target domain, which involves metaphorical mappings such as from seeing to knowing, hearing to knowing, smelling to intuition, etc. The label SLI → LS1 → LS2 reflects the fact that two separate lexical semantics are involved.

By contrast, in the second type, the conceptual transfer proceeds directly from sublexical iconicity to the target domain semantics. There is no lexical meaning of sensory perception involved at all, which is why we use the label SLI → LS2, reflecting the fact the literal lexical meaning (LS1) is absent.

#### 4.2 Grammaticalisation of sense prefixes

In this section, we turn to morphologically complex signs in the domain of sensory perception metaphors. The detailed evidence discussed here comes from Israeli Sign Language (IsraelSL), where the phenomenon of so-called “sense prefixes” has been discussed in several publications (Aronoff et al. 2005; Aronoff, Meir & Sandler, 2005). As we shall see, similar forms also occur in other sign languages, although the distribution of these forms is not yet known.

Figure 13 illustrates what is meant by a sense prefix. The prefix consists of a short contact on or near one of the sense organs with an extended index finger. In the example, this involves the “eye” prefix, followed by the sign SHARP. In combination, the sign EYE+SHARP means “to discern visually”. The initial index finger form is a prefix because it only occurs in combination with the following sign as the stem, to which it is attached. In the case of EYE+SHARP, this does not involve a sensory perception metaphor but retains the literal meaning of visual perception.



**Figure 13.** EYE+SHARP “to discern visually” in IsraelSL (from Aronoff et al. 2005).

When looking at additional signs in IsraelSL that have the same characteristics, it becomes clear that there is an organised group of signs with sense prefixes which has been affected by processes of grammaticalisation. Grammaticalisation theory (e.g. Hopper & Traugott, 1993; Heine & Kuteva, 2002) systematically accounts for processes by which grammatical markers develop, the most typical instances tracing the development of bound affixes. These processes can be found in many unrelated languages, often operating in similar ways (see Heine & Kuteva, 2002), and therefore one can identify grammaticalisation pathways that are valid cross-linguistically (e.g. Heine, 1997 on the domain of possession).

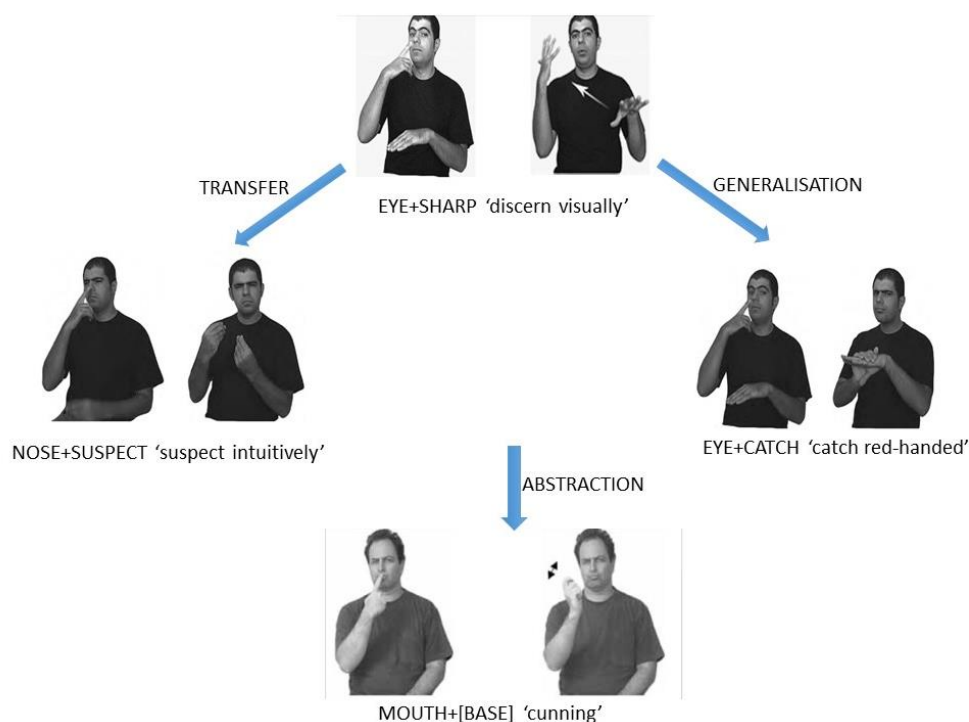
In the case of IsraelSL sense prefixes, we can identify the same sub-processes in the development of affixation that have been found across many spoken languages, and indeed signed languages (cf. Steinbach & Pfau, 2007; Pfau & Steinbach, 2011). One of these sub-processes affects the combinatorial meaning of the constituents in a grammaticalised morphologically complex form. To illustrate this, Figure 14 shows several other members of the family of signs with sense prefixes in IsraelSL. The arrows between signs indicate semantic shifts away from the literal sensory perception meaning.<sup>4</sup>

<sup>4</sup> The pictures of signs and their glosses and translations are from Aronoff, Meir & Sandler (2005) but their arrangement in the figure and the labelled arrows are our own

As mentioned above, the first sign EYE+SHARP shows no transfer away from the source domain yet. The sign NOSE+SUSPECT meaning "to suspect intuitively", involves the familiar metaphorical transfer from the source domain of smelling to the target domain of intuition, which was discussed in Section 4.1. The literal meaning of "smell" is no longer present in this sign.

A different semantic shift is seen in the next sign, EYE+CATCH meaning "to catch red-handed". Originally, this sign would have meant catching someone on the basis of visual evidence. However, judging from the translation, it appears that the meaning has been generalised and now involves catching someone on the basis of any source of information, not only visual evidence. Semantically, this patterns with the shift from *experiencing via a specific sense* to *experiencing in general* discussed above. Transfer, as in the case of NOSE+SUSPECT, and generalisation, as in EYE+CATCH, are two different ways in which the meaning of signs can shift away from the original semantics of sense perception.

Finally, the sign MOUTH+[BASE] meaning "cunning" is a complete semantic abstraction, and therefore even further removed from the original lexical meaning. Not only is the meaning unrelated to the PoA, whether in terms of speaking, tasting, or any other action or property of the mouth, but the second sign also has no meaning on its own. It only occurs in combination with sense prefixes, which is why it is glossed [BASE], as its meaning independently of this particular combination cannot be established.



**Figure 14.** Semantic shifts in IsraeliSL signs with sense prefixes (photographs from Aronoff, Meir & Sandler, 2005)

The loss of specific semantic content in forms that participate in grammaticalisation processes is referred to by theoreticians as desemanticisation (Heine & Narrog 2010). Typically, the element in question assumes a more general, abstract meaning, and loses its original literal meaning. In this case, the meaning of the sense prefix becomes dislodged from physical sensory perception, becoming more abstract and non-embodied (as in "smell" to "intuition" in NOSE+SUSPECT), or becoming generalised (e.g. from "visual evidence" to "any kind of evidence" in EYE+CATCH).

In addition to semantic changes, a range of other changes typically associated with grammaticalisation processes are also in evidence in signs that have sense prefixes. These characteristics are phonological, morphological, and grammatical. At the phonological level, it is evident that the sense prefixes, consisting merely of a brief initial contact with the index finger, are

phonologically reduced in comparison with signs that are free forms. Morphologically, the initial index finger tap has become a bound morpheme, and the resulting sign is morphologically complex.

Moreover, the sense prefixes constitute a closed class of five items, each with their own distribution restrictions in terms of which stems they can combine with. In other words, we see a paradigm formation, and this is typical of grammaticalisation processes. The five prefixes are EYE, EAR, NOSE, MOUTH, and HEAD, the last one participating in the same paradigms with the same characteristics even though its meaning is related to cognition and does not involve sensory perception.

Sometimes the same stem can co-occur with several different sense prefixes. This may result in different meanings of the morphologically complex signs, while in other cases, there is no clear difference in meaning. For example, the last sign in Figure 15 MOUTH+[BASE] "cunning" has another counterpart with the same stem, but a different prefix HEAD+[BASE], meaning "smart". On the other hand, NOSE+SUSPECT and EYE+SUSPECT seem to have no obvious difference in meaning.

Forms looking very much like the IsraeliSL sense prefixes are also found in other sign languages. For example, the sign CHECK has an EYE prefix in ASL, LIBRAS, TĪD, Portugal (LGP), Britain (BSL), and India (ISL), and a NOSE prefix in the sign languages of the Czech Republic (CzSL), Iceland (ÍTM), and Poland (PJM). It would clearly be worthwhile to undertake a systematic survey of these signs across a larger number of sign languages. At the moment, no such data is available.

#### 4.3 Cross-linguistic patterns in perception metaphors in sign languages

Based on the data observed within this study, there are several recurring patterns with respect to semantic correspondences that one can observe. In addition to the above-mentioned *seeing to knowing* and *hearing to knowing* transfers – which are also common across spoken languages – several other patterns are repeatedly attested in the data under consideration here.

The metaphorical extension from smelling (source domain) to intuition (target domain), mentioned earlier in this section, is attested in several sign languages, and fits well with similar correspondences in spoken languages. These examples belong to the single-stage metaphor type (SL1 → LS2). In French Sign Language (LSF), Portuguese Sign Language (LGP) and PJM, the sign SUSPECT has a PoA at the nose. Similarly, tapping the tip of the nose with the index finger several times means "to have a feeling about something" in Indian Sign Language. All of these are monomorphemic signs. The BSL sign SEEM discussed above also potentially belongs in this group. By contrast, in Israeli Sign Language, the index finger contact with the tip of the nose is a prefix, as discussed in Section 4.2.

Another common semantic extension goes from spoken communication to general communication. These signs are articulated at or near the mouth, often with a movement away from the mouth to evoke the concept of a message moving from a sender to an addressee. Although these signs do not fall under the category of sensory perception, they are included here because of similarities in the underlying logic.

In TĪD and Greek Sign Language (GSL), for example, the sign NEWS/INFORM moves outward from the mouth (see Figure 15). In SKSL, the sign GOSSIP is also articulated near the mouth. Just as in the case discussed above where news/information is iconically linked to hearing (Figure 8), in these cases, signs with a meaning of communication use the mouth as PoA, despite the fact that deaf signers generally do not communicate vocally, but convey information via the visual-gestural channel. In many sign languages, signs meaning "telling", "talking" and the like, have movements that start at the mouth. Therefore, there is a semantic abstraction from communication in spoken language to communication in general.



**Figure 15.** NEWS/INFORM (TID, GSL)

Another similar semantic extension that does fall in the domain of sensory perception is the abstraction from “experiencing via a specific sense” to “experiencing in general”. For example, the BSL sign CHECK begins with brief contact just under the eye (see Figure 16), suggesting visual checking. However, CHECK is also used in contexts where other senses are involved, not just in the case of visual checking. For example, in order to say that one needs to taste whether the soup has enough salt in, or feel whether the bathwater is the right temperature, the same sign CHECK can be used.



**Figure 16.** CHECK (BSL)

A sign meaning ‘uncomfortable’ in BISINDO is another semantic extension, although in this case the previous specific sense was taste rather than sight. The sign comprises an indexical point to the mouth, followed by a negative suffix based on a negative handshape. It meant ‘bad taste’, and has extended to refer to ‘something that feels bad’. A sign in BSL deploys a similar metaphor, which can best be translated using the English idiom ‘leave a bad taste in the mouth’.



**Figure 17.** TASTE-BAD / UNCOMFORTABLE (BISINDO)

From the limited data available for this chapter, there seems to be some preliminary evidence showing that visual perception is prioritised over the other senses in the domain of perception metaphors. Table 2 shows some cross-linguistic examples of the same meaning expressed in different sign languages. The table highlights which of the senses is involved in the metaphor, but conflates the various semantic and morphological subtypes discussed in Sections 4.1 and 4.2. The aim is merely to identify which of the senses is involved in the metaphor, irrespective of its formal realisation in individual languages.

**Table 2.** Senses involved in metaphorical extensions across sign languages.

target meaning	relevant formational aspect	eye / seeing	ear / hearing	nose / smelling	mouth/ throat/ tasting	instantiated in sign languages
IGNORE/ DISREGARD	Outward movement away from sense organ			X		ASL, LIBRAS, ÖGS
		X				NS
			X			BSL, ISL, PJM
CHECK	Sense prefix	X				ASL, BSL, ISL, IsraelSL, LIBRAS, PGL, TİD
				X		CzSL, ÍTM, IsraelSL, PJM
			X			IsraelSL
	PoA at sense organ	X				ZGS, SKSL
CURIOUS	PoA at sense organ			X		CzSL, DGS, ESL, ÍTM, LGP, LIS, LSE, LSF, LSL, ÖGS, STS
		X				LIBRAS, NS
GREED / GREEDY	PoA at sense organ				X	ISL, ÍTM
		X				LIBRAS, TİD
SUGGEST	Sense prefix	X				IsraelSL
					X	IsraelSL

Although Table 2 is not in any way a systematic compilation, there is a suggestive pattern in that the visual sense metaphor is the only one that appears with each meaning. While each meaning covers more than one sense metaphor, visual perception as the source domain is the only channel that is always an option for generating a sensory metaphor. Further research is needed in order to ascertain whether this is a robust pattern, or whether the predominance of visual perception metaphors in these examples is a coincidence.

This pattern accords well with the frequent characterisation of sign communities as prioritising the visual channel, and deaf people, in particular those born deaf, as “visual people”, that is, making use of visual perception both for linguistic and non-linguistic purposes to a greater extent than hearing people (MacSweeney et al 2002; Bottari et al 2011; see also the discussion in Takashima, this volume). However, as visual perception is also a very common source domain for metaphors in spoken languages, it is not yet clear whether this pattern is related to the visual modality of sign languages.

On the other hand, some of the examples above, have also demonstrated that in some instances, the physical realities of visual perception and communication among deaf people are actively disregarded in some perceptual metaphors (see the signs meaning “news”, “information”, “telling”, “talking”, etc). In this regard, the sign in Figure 17 from Indian Sign Language is worth consideration. Like its counterpart in Figure 9, this sign means “news, information” but with an explicit focus on the visual channel, as the PoA is on the eye and not on the ear. This is an example of re-metaphorisation, where the auditory perception metaphor is replaced with the visual perception metaphor. This sign is a recent innovation and is used by younger signers in India. Takashima (this volume) reports a similar example from Japanese Sign Language, where a sign meaning “go in one ear and out the other” in the sense of “receive information but not retain it” has been changed by younger signers: instead of

articulating the sign at the ears, in line with the idiom also found in spoken Japanese, the sign is articulated at the eyes, so as to say “go in one eye and out the other”.



**Figure 17.** ‘(Visual) news, information’ (ISL)

While Table 2 deals with seeing, hearing, smelling and tasting, we have said next to nothing in this chapter about the fifth sense, touch. There is evidence of a small number of signs that are linked with touch, including SENSITIVE in BSL, which is articulated by delicately making contact with the middle finger of one hand on the back of the other (Figure 18). Here, a sign that indicates sensitive skin has come to refer to the quality of sensitivity in general (for example, a person who is sensitive to bright light, or sensitive in a psychological sense). The relative lack of touch-based metaphors compared to other senses can perhaps partly be explained by the absence of a single PoA associated with touch. As mentioned in Section 1, the sense of “touching/feeling” can be associated with a number of different PoAs.



**Figure 18.** SENSITIVE (BSL)

## 5. Conclusion

This chapter has provided ample evidence that the topic of perceptual metaphors is a rich ground for research and discoveries in sign languages. Certainly, a more in-depth systematic review across a larger number of sign languages would be very welcome.

The data show some parallels with spoken languages, such as the well-known "hearing to knowing" and "seeing to knowing" metaphorical transfers from a sensory source domain to a more abstract, cognitive target domain (e.g. Sweetser 1990, Evans and Wilkins 1998, Vanhove 2008). At the same time, it is very clear that by virtue of modality, sign languages behave very differently from spoken languages in some respects. This is mainly due to the Transparency Principle, i.e. the fact that unlike words in spoken languages, signs on sign languages "look like what they mean". As has been argued in this chapter, this has radical consequences for the use of metaphors that are based on sensory perception. In particular, sign languages have two types of metaphors in the domain of sensory perception metaphors, called single-stage and double-stage metaphors here, both of which are different from what we find in spoken languages due to the role of sublexical iconicity in these signs. The pattern of both parallels and modality related differences is typical of other research findings in



Sign Language Typology (Zeshan et al 2013; Palfreyman, Sagara & Zeshan 2015; Zeshan & Palfreyman 2017).

Finally, it is striking to observe the relative absence of perception metaphors in sign languages that have cognition as their target domain. In our data, the examples with signs meaning "news, information" and the like are very rare and certainly not nearly as frequent as equivalent metaphors in many spoken languages. This may be due to the fact that across sign languages, there is a very strong tendency for the semantics of cognition to use a separate metaphor, namely the head as PoA. For the entire semantic domain of cognition, including notions such as thinking, knowing, remembering, forgetting, as well as quality, such as smart, stupid, etc, the head (in particular the temple) is a widely preferred PoA. Some sign languages, in particular in East Asia, use the torso instead, which is based on a different metaphor. The existence of ready metaphors for cognition across sign languages seems to act as a barrier to employing sensory perception metaphors in this domain.

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