

Iconic plurality across modalities

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Abstract

Iconicity permeates human language in all its modalities and can be employed to express a multitude of meanings. This chapter describes how iconicity can be used as a device to express *plural* meaning, in a broad sense, in spoken, signed and gestured languaging. The perceived resemblance-mapping between plural form and plural meaning has long been acknowledged with respect to repetition and reduplication. In this chapter, a broader, cross-modal view is adopted, with which iconic expressions of plurality can be observed on many levels of linguistic structure – from texts and sentences down to words, phonemes, and phonetic features. Whereas some strategies are found across modalities (e.g. repetition and reduplication) others depend on the use of space and availability of multiple articulators, and are thus mainly found as a strategy in signed and gestured languaging.

Key terms: iconicity, plurality, modality, signed language, spoken language, gesture

1 Introduction

An often-mentioned property of human language is the idea that word forms are generally arbitrary – that is, there is no resemblance in form between words and what they denote (de Saussure 1916). However, Saussure, too, acknowledged that words *can* be motivated and iconic (de Saussure 1916; Joseph 2015), but more recent work on signed and spoken languages argue for iconicity being not so much a peripheral and marginal phenomenon, but a rather important and useful device for creating and learning language (Perniss, Thompson & Vigliocco 2010; Dingemanse et al. 2015; Perlman et al. 2018; Meir & Tkachman 2018). The term *iconicity* itself has been defined in a number of different ways. For this chapter, I follow the definition used by Dingemanse (2019: 18), defining iconicity as “[a] perceived resemblance between aspects of form and meaning.” This definition highlights the perceptive part of iconicity, which is important since iconic mappings may involve perception in various modalities with different senses (visual, auditory, tactile, etc.), but also acknowledges that iconicity is gradient and a (partly) subjective experience (see Occhino et al. 2017).

In this chapter, I will discuss the role of iconicity in the expression of plurality when *languaging* – that is, making meaning through communicating with languages and semiotic resources (see Swain 2006), including gesturing. Here, the relevant type of iconicity is not the direct resemblance-mapping between (word) form and (physical) referent, but rather the schematic or diagrammatic (see e.g. Haiman 1980; Ahlner & Zlatev 2010, and Chapter X [Peirce] in this volume) mapping between the perceived plurality of a linguistic construction and the concept of plurality or multiplicity. The definition of plurality adopted here will be quite broad, encompassing both number as a grammatical category of nouns (Corbett 2000), pluractionality in verbs and ideophones (Newman 2006; Cabredo Hofherr & Laca 2012; Henderson 2016; Mattioli 2020, and Chapters X [Reduplication] and X [Ideophones] in this volume), and the form and meaning of lexical plurals (Acquaviva 2008; Lauwers & Lammert 2016).

The chapter will follow a structure from larger to smaller linguistic constructions, outlining the ways in which plurality can be expressed iconically by mapping a schematic plurality of form to plural meanings. In Section 2, I will describe various types of plural expression through sequential repetition of linguistic form. This will most notably involve reduplication which is arguably the most well-known iconic expression of plurality (and which is also dealt with in other chapters, see Chapters X [Reduplication] and X [Ideophones]): Section 2.1 deals with basic reduplication; Section 2.2 deals with repetition with some internal form change; and Section 2.3 deals with spatially displaced repetitions common among signed languages. In Section 3, I will describe how the use of multiple articulators can be used to iconically map form to meaning simultaneously and below the word level (see also Chapters X [Formational properties signed language] and X [Simultaneous morphology]): Section 3.1 deals with the use of the two hands/arms in signed language and gesture; Section 3.2 deals with the use of additional articulatory channels (e.g. non-manual articulation in signed language); and Section 3.3 deals with ways in which plurality can be expressed iconically within a single articulator or articulation. The chapter is concluded by some final remarks in Section 4.

2 Sequential plurality

Although words of human languages were long described as mostly arbitrary, in that the form of a word does not (or, rather, needs not) resemble its referent (de Saussure 1916; Joseph 2015), the fact that linguistic form on a structural level can be motivated has long been acknowledged. Arguably one of the more well-known examples of this is the sequential ordering of events to mirror real-world chronology: either as a simple temporal ordering of events (e.g. *veni, vidi, vici* ‘I came, I saw, I conquered’) or as dependencies stemming from conditions and resulting outcomes (e.g. *if X then Y*) (e.g. Greenberg 1963; Haiman 1980). Figure 1 shows a schematic representation of the iconic mapping of sequential events in the famous utterance *veni, vidi, vici*, in which the linguistic reference to each unique event is sequentially arranged – produced linearly in time – to represent the chronological order of actual events.

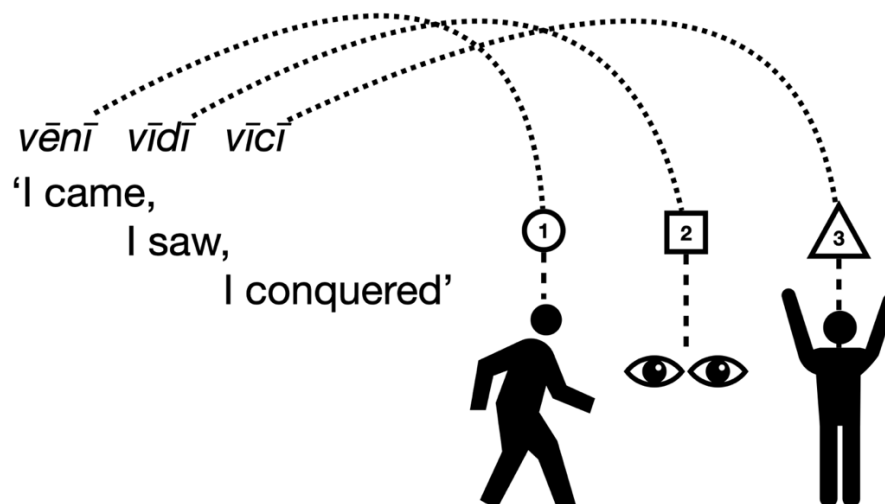


Figure 1: Schematic representation of the iconic mapping of sequential events.

Building on this pattern of multiplicity of distinct, *different* events (or entities), it is easy to see how repetition of the *same* linguistic form in a sequence can express ‘more of the same’, whether referring to events (Figure 2) or entities (Figure 3).

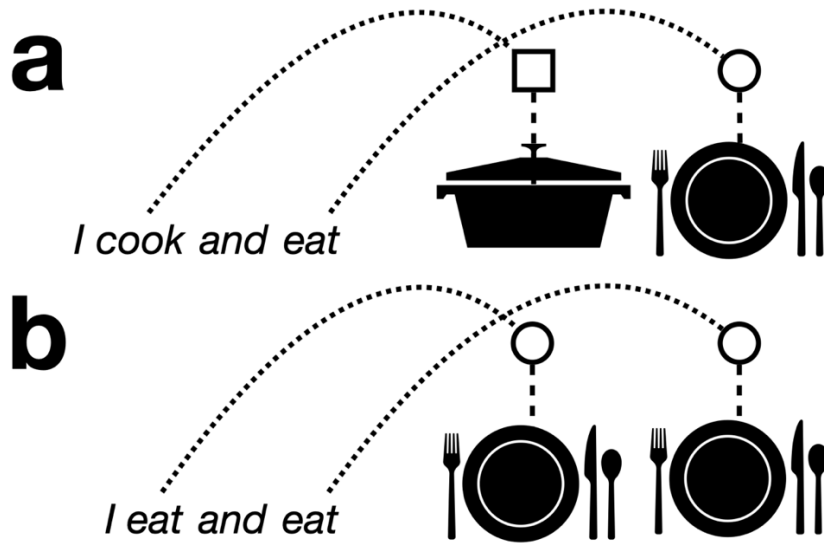


Figure 2: Schematic representation of the iconic mapping of different (a) vs. identical (b) events.

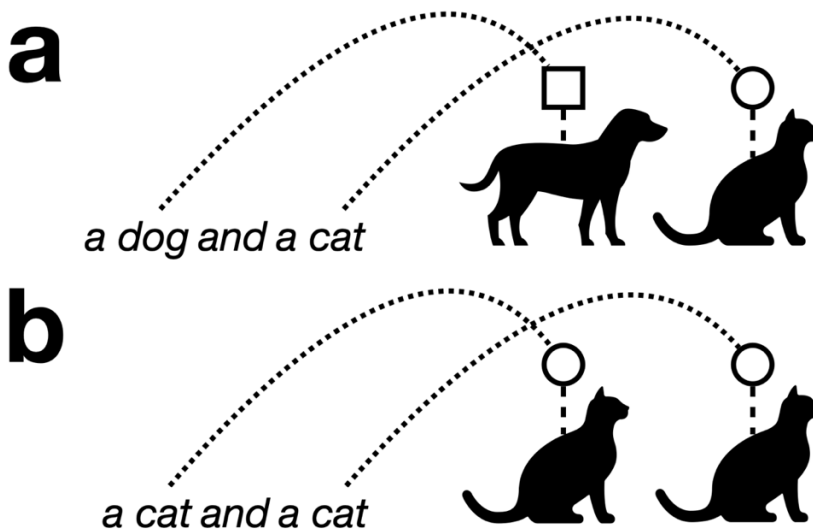


Figure 3: Schematic representation of the iconic mapping of different (a) vs. identical (b) entities.

In Figures 2–3, the constructed examples only serve to illustrate how sequencing strings of linguistic form on the syntactic level – in these examples through coordination – can map onto multiple referents. Whereas an example such as 3b (*a cat and a cat*) is a somewhat redundant and awkward construction in English, the coordination of repeated events such as in 3a (*I eat and eat*) would constitute a case of syntactic repetition in a known form–meaning construction with the reading ‘I eat repeatedly/continuously/a lot’. However, both event and entity reference repetition are used as a pluralizing strategy in many languages, most notably in morphological reduplication (see Section 2.1).

It has been argued that the morphological marking of plural forms – that is, plural forms having more (morphological) content – compared to singular forms is in itself an instance of a motivated mapping between form and meaning. For example, Jakobson (1971: 352) writes: “The signans of the plural tends to echo the meaning of a numeral increment by

an increased length of the form.” Figure 4 illustrates the suggested mapping between *any* plural marking corresponding to an iconic mapping of more form to more meaning.

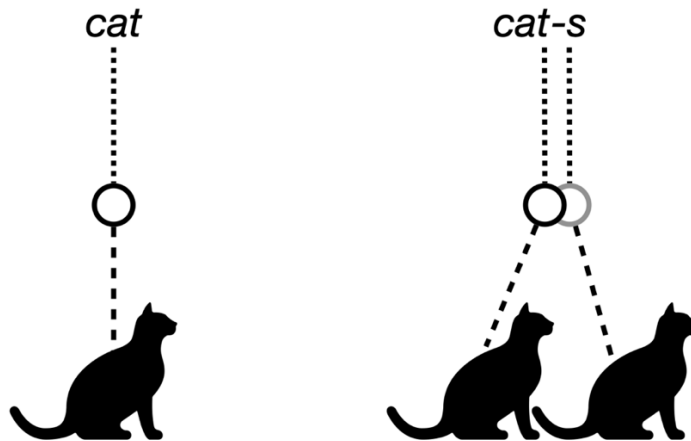


Figure 4: Schematic representation of the iconic mapping of more of form to more of meaning.

The view that plural marking is necessarily longer – and constitutes an iconic mapping – has, rightly, been challenged by several linguists. For example, Tiersma (1982) uses the term *local markedness* to illustrate that meanings that are more commonly associated with a plural meaning – which relates to mass/count nouns, pluralia tantum, and lexical plurals (e.g. Wierzbicka 1985; Wierzbicka 1988; Jackendoff 1991; Koptjevskaja-Tamm & Wälchli 2001; Koptjevskaja-Tamm 2004; Acquaviva 2008; Wisniewski 2010; Lauwers & Lammert 2016) – may *locally* be the unmarked cases, for which the *singular* form is overtly marked. Additional research along this line taking a usage-based approach, has shown that frequency is the stronger predictor here, such that the frequency of occurrences of singular vs. plural forms of a word better explains the directionality of asymmetry. That is, a word more frequently used with a multiplex (plural) reading tends to have a *singulative coding* (special marking of the uniplex [i.e. singular] member), and vice versa (Haspelmath 2008; Haspelmath & Karjus 2017). Nevertheless, when it comes to the marking of plurality through reduplication, arguing for an iconic mapping is somewhat more straightforward, and was even formulated as a metaphor by Lakoff & Johnson (1980: 128): “To our knowledge, all cases of reduplication in the languages of the world are instances where MORE OF FORM stands for MORE OF CONTENT.” Although undoubtedly true that reduplication is frequently used for plural expression among the languages of the world, it is not true that reduplication *always* expresses plurality or follows the metaphor MORE OF FORM stands for MORE OF CONTENT (see Section 2.1). In the following subsections, repetition and reduplication will be discussed mainly as used for iconic expression of plurality (see also Chapter X [Reduplication] in this volume).

2.1 Reduplication

Reduplication has been defined as “[t]he systematic repetition of phonological material within a word for semantic or grammatical purposes” (Rubino 2005: 11) and “involves the doubling of some component of a morphological base for some morphological purpose.” (Downing & Inkelas 2015: 502). Thus, reduplication is generally seen as a morphological process, but clearly overlaps with the type of syntactic level repetition seen earlier in Section

2 (e.g. *I eat and eat*). Although not always iconic in its mapping, reduplication is arguably one of the most well-known examples of iconicity in language, alongside various forms of sound symbolism (e.g. Ahlner & Zlatev 2010; Urban 2011; Blasi et al. 2016; Erben Johansson et al. 2020), such as onomatopoeia, and, occasionally, phonesthemes (e.g. Bergen 2004; Kwon & Round 2015). Reduplication is known to be associated with a number of motivated meanings, such as nominal plurality, verbal plurality (pluractionality), iterativity, and distributivity (Moravcsik 1978; Kouwenberg & LaCharité 2001; Tuggy 2003; Rubino 2005; Inkelas 2006; Stolz 2007; Downing & Inkelas 2015, among others). However, it has similarly been noted by many linguists that reduplication as a morphological process is also associated with meanings and functions directly opposite of the iconic mapping of more form expressing more content, e.g. attenuative (less of) and diminutive (smallness) meanings (Regier 1998; Kouwenberg & LaCharité 2005; Abraham 2005; Stolz 2007; Aboh & Smith 2012; 2015). Nonetheless, several of the most frequent meanings associated with reduplication are iconically motivated. I will not go into detail on the use of reduplication as an iconic device in spoken languages here, as this is the topic of Chapter X [Reduplication] in this volume and has been discussed thoroughly in previous work cited, but I will provide a few examples in the following.

One of the most basic iconic mappings of reduplication is nominal plurality. For example, in Bahasa Indonesia (Malayo-Polynesian), the word *orang* ('person') can be reduplicated to form *orang-orang* ('people'), directly mapping plural form to plural meaning (see Figure 5).

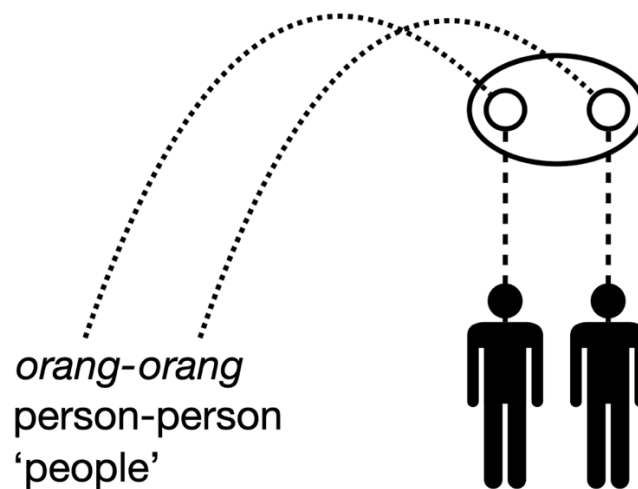


Figure 5: Schematic representation of the iconic mapping of a reduplicated noun to plural meaning in Bahasa Indonesia.

Some languages also use reduplication with numerals to form distributive or enumerated expressions. An example of this can be found in the language Karo Batak (Malayo-Polynesian), in which *sada* means 'one' and *sada-sada* means 'one by one' (Woollams 1996: 101). This is directly analogous to similar phrasal constructions such as English *one by one* or Swedish *en och en* (lit. 'one and one'), each repetition enumerating or listing a numeric quantity.

Reduplication is also frequently associated with the concepts event plurality, verbal plurality, and pluractionality. What these concepts have in common is that they deal with the linguistic expression of plurality of events (generally expressed on/by the verb) that includes repetition of events, as well as distribution of (possibly singular) events across multiple

referents (e.g. Newman 2006; Cabredo Hofherr 2010; Cabredo Hofherr & Laca 2012; Mattiola 2020). Pluractionality as defined by Lasersohn (1995: 240) frames it as a marking on the verb functioning to “indicate a multiplicity of actions, whether involving multiple participants, times, or locations.” An example of a repeated event expressed by reduplication is found in example (1):

(1) Karo Batak [btx] (Malayo-Polynesian) (Woollams 1996: 96) [adapted glossing]

<i>sapu~sapuna</i>	<i>kacing é</i>	
RED~stroke.she	cat that	
‘She stroked the cat again and again.’		

In Figure 6, the iconic mapping of example (1) is illustrated schematically.

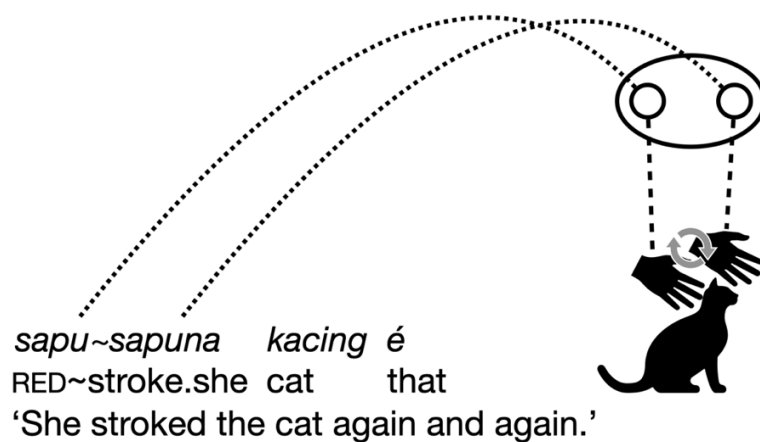


Figure 6: Schematic representation of the iconic mapping of a reduplicated verb to plural meaning in Karo Batak.

In example (1) and Figure 6, the iconic mapping is between the reduplicated form and the repeated action expressed by the verb: the repetition of linguistic form can be said to represent a repetition of the action. With event plurality, the multiplicity of events may also be distributed across participants. In example (2), the reduplication of the verb in this Hausa (Chadic) example indicates multiple subevents distributed across participants or locations.

(2) Hausa [hau] (Chadic) (Součková 2011: 101, 96, 95) [adapted glossing]

- | | | | | |
|----|--------------------------------------|------------------|------------------|---------------|
| a. | <i>Mutàanee</i> | <i>sun</i> | <i>fĩr~fĩtoo</i> | |
| | people | 3PL.PF | RED~come.out | |
| | ‘Many people came out.’ | | | |
| b. | <i>Yaa</i> | <i>dad~dàfà</i> | <i>àbinci</i> | |
| | 3SG.M.PF | RED~cook | food | |
| | ‘He cooked different kinds of food.’ | | | |
| c. | <i>Yaa</i> | <i>zuz~zùbaa</i> | <i>musù</i> | <i>shaayi</i> |
| | 3SG.M.PF | RED~pour | to.them | tea |
| | ‘He poured tea for them.’ | | | |

- d. *Yaa zuz~zùbaa shaayi cikin koofunàa*
 3SG.M.PF RED~pour tea in cups
 ‘He poured tea into (different) cups.’

As illustrated by the Hausa examples in (2a–d), pluractionality may involve certain readings of the distribution of multiplicity, such as distributed across participants or locations. Plurality, multiplicity, and ongoing events are also associated with ideophones (e.g. Dingemane 2012; 2015; 2019; Henderson 2016; Duggirala & Murty 2020; McLean 2020), and cases of reduplicated compared to short forms of ideophones with iconic meanings can be illustrated by the Japanese (Japonic) and the word pair *pikapika* (‘flashing’) vs. *pika?* (‘flash!’) (McLean 2020). For further discussion about the iconicity of ideophones, see Chapter X [Ideophones] in this volume.

The use of reduplication (or, repetition) is also found in visual languaging, as it is a known expressive device in both signed languages and gesture. For signed languages, reduplication is a morphological process identified already in the earliest linguistic research. Like in spoken languages, reduplication has been shown to express plurality and pluractionality across many different signed languages, e.g. nominal plurality and iteration or habituality of events (Fischer 1973; Bergman & Dahl 1994; Pfau & Steinbach 2006; Steinbach 2012; Zwitserlood, Perniss & Özyürek 2012; Pfau & Steinbach 2016; Kuhn & Aristodemo 2017; Kimmelman 2018; Kuhn 2019; Quer 2019; van Boven 2021; Pfau & Steinbach 2021) and also in gesturing (e.g. Bresse 2021). For example, in Swedish Sign Language, the sign for ‘boy’ is articulated at the forehead, closing the hand as if gripping or tracing the outline of a cap. The pluralization of this sign is achieved through reduplication, repeating the entire sign form twice. Figure 7 illustrates the iconic mapping of plural (reduplicated) form to plural meaning.¹

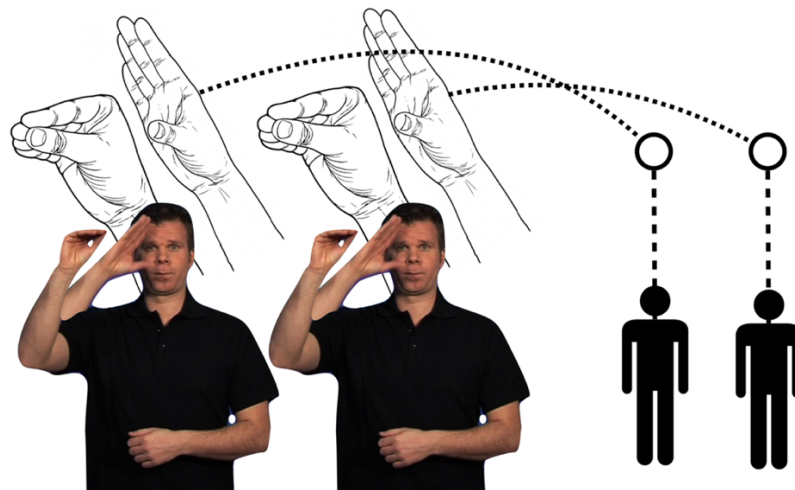


Figure 7: Schematic representation of the iconic mapping of a reduplicated noun to plural meaning in Swedish Sign Language. Basic meaning: ‘boy’; reduplicated meaning: ‘boys’ (Svenskt teckenspråkslexikon 2022: 5903): <https://teckensprakslexikon.su.se/ord/05903>.

Reduplication as a morphological expression of nominal plurality has been identified in a number of signed languages (e.g. Pfau & Steinbach 2006; Steinbach 2012; van Boven 2021). Many signs, across signed languages, tend to have a repeated form in its *citation form*, such

¹ Handshapes in Figure 7 are taken from Svenskt teckenspråkslexikon (2022). Handshapes in other figures come from the handshape fonts created by Centre for Sign Linguistics and Deaf Studies (CSLDS), CUHK.

that the unmarked basic form is already repeated (Pfau & Steinbach 2006; Wilbur 2009), and Pfau & Steinbach (2006) have argued that reduplicated signs are rather *triplicated*, as the articulation tends to happen three (or more) times, although van Boven (2021: 342) observed that corpus data on Sign Language of the Netherlands (NGT) points to variation in the number of repetitions in reduplicated forms, but that a single repetition is common. Furthermore, Pfau & Steinbach (2006) developed a typology of noun types that are associated with different subtypes of reduplication. The reduplication illustrated in Figure 7 involves a simple reduplication of the sign form, but others involve spatial modification (see Section 2.3).

Figure 8 illustrates the reduplication of the sign ‘to ask’ in Swedish Sign Language, which can be interpreted as ‘ask repeatedly’ or ‘ask multiple questions’. The repetition or reduplication of verbs was described early in linguistic research on signed languages and it has been suggested that movement types (e.g. fast vs. slow, large vs. small, etc.) can express differences in meaning, distinguishing between, e.g., iterative, incessant, and ongoing readings (Fischer 1973; Klima & Bellugi 1979; Bergman 1983; Bergman & Dahl 1994). Bergman & Dahl (1994) observed similarities in the use of reduplication in Swedish Sign Language to the use of ideophones in spoken languages, emphasizing the depictive (and iconic) aspect of reduplicated constructions (see also Dingemanse 2015; Ferrara & Hodge 2018). Unsurprisingly, several linguists researching signed languages have noted the similarities in the form and function of reduplication across signed and spoken languages, particularly with regard to pluractionality, such that it may express not only plurality of events, but also distribution across participants and space (Börstell 2011; Zwitserlood, Perniss & Özyürek 2012; Kuhn & Aristodemo 2017; Kuhn 2019). The distributive plural functions of signed language verbs have developed across many signed languages, and are acquired gradually by young signers (Hou 2013; Abner et al. 2022). Some of these pluractional (e.g. distributive) functions of signed language reduplication involves *spatial* modification of the signs – these spatial constructions are discussed further in Section 2.3.

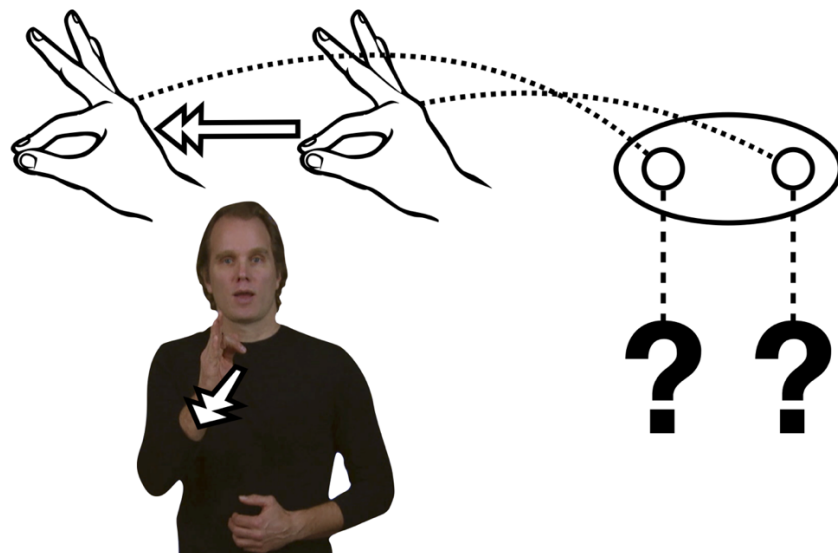


Figure 8: Schematic representation of the iconic mapping of a reduplicated verb to plural meaning in Swedish Sign Language. Basic meaning: ‘to ask’; reduplicated meaning: ‘ask repeatedly’/‘ask multiple questions’ (Svenskt teckenspråkslexikon 2022: 4540): <https://teckensprakslexikon.su.se/ord/04540>.

2.2 Co-compounds, echo constructions, and contrast

Saussure (1916) suggests that whereas most words are arbitrary, some words may be seen as having a *relative* motivation. Saussure gives the example of the French numeral *dix-neuf* ('nineteen'), consisting of the two parts *dix* ('ten') and *neuf* ('nine'). While the words *dix* and *neuf* themselves are not motivated in their respective form–meaning mapping, the complex form *dix-neuf* is relatively motivated as the combined meaning of its parts (10+9=19). In a similar vein, it is possible to analyze *co-compounds* (coordinate compounds) – compound constructions in which the parts denote members of a group (Wälchli 2005a; 2005b) – such that the mapping between multiple forms and multiple entities correspond to those seen in Figures 3 and 5. An example of a co-compound is the Georgian (Kartvelian) word *ded-máma* ('parent(s)', lit. 'mother-father') (Harris 2003: 233), which combines the juxtaposed members of a group to form the word that denotes the group as a unit. The corresponding mapping between form and meaning in this word is shown in Figure 9. Co-compounds of this type are also found across signed languages (Klima & Bellugi 1979; Meir et al. 2004; Richterová, Macurová & Nováková 2016).

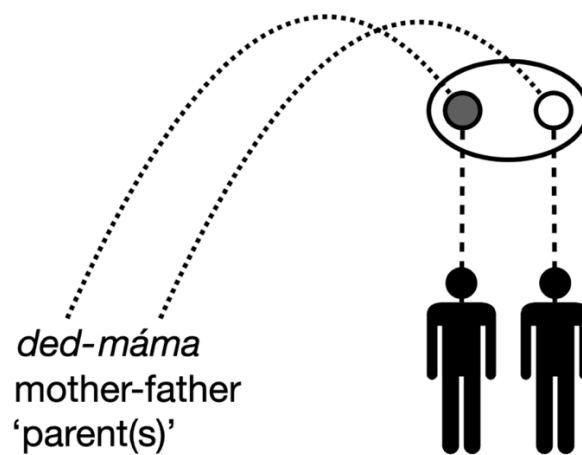


Figure 9: Schematic representation of the relative motivation-mapping of a coordinate compound construction to plural meaning in Georgian.

Another – arguably more – relevant phenomenon is the *echo construction* (or echo formation or echo word), defined by Abbi (2018: 1) as “a partially repeated form of the base word where the reduplicator is a canonically copied form of the base with slight alternation.” Crucially, echo constructions have been seen as an areal phenomenon throughout South Asia reaching the Caucasus and Southeastern Europe with similar function: expressing the meaning ‘X and similar things’ through a sequence of a word and its repetition in a slightly altered form (Haig 2001; Abbi 2018). For example, Hindo (Indo-Aryan) readily forms echo constructions by changing an initial consonant to *v-*, such that *gana* (‘song’) can be echoed as *gana vana* (‘song and such activity’) (Abbi 2018: 2). As seen in example (3), the echo construction is seen as a unit, and morphological marking – here, ergative marking – is associated with the whole echo construction rather than each part separately.

(3) Hindi [hin] (Indo-Aryan) (Abbi 2018: 5)

gay vay ne cara kha-ya
 cow EW ERG fodder eat-3PST
 ‘Cow etc./cattle has eaten their fodder.’

Echo constructions have been identified as a subtype of reduplication by many scholars and are argued to express plurality or distribution of events/entities (Haig 2001; Rubino 2005; Fischer 2011; Moreno Cabrera 2017). The form alteration can be seen as expressing ‘X and X-ish’, where the reading is can be ‘X and similar things’ – as illustrated in Figure 10 with the example from (3) – or ‘X repeated/distributed in some way’. A similar construction is the one sometimes referred to as *ablaut reduplication*, which can be seen in English words like *seesaw*, *ticktock*, and *zigzag*. Here, the contrast is expressed by a difference in vowels between the two parts, which can be mapped onto a difference in reference with plurality, multiplicity, or distribution of similar or paired entities/events.

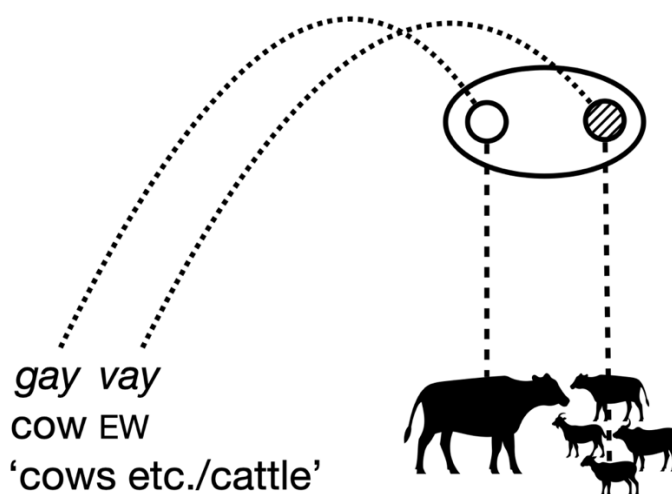


Figure 10: Schematic representation of the iconic mapping of an echo construction to plural meaning in Hindi.

We have thus far seen two types of reduplicative constructions that can be mapped iconically onto a plural meaning: simple reduplication mapped onto identical instances of (repeated) events or entities, and echo constructions mapped onto plural instances of events and entities that are non-identical or otherwise paired or contrary (e.g. in spatial distribution). This directly ties in with the topic of the next section (Section 2.3), which deals with spatial displacement combined with reduplication.

2.3 Spatial displacement

Signed languages and gesture involve languaging produced visibly in space, and spatial modification can be used in many meaningful ways across signed languages (e.g. Engberg-Pedersen 1993; Sallandre 2006; Perniss 2012; Perniss, Zwitserlood & Özyürek 2015; Wilcox & Occhino 2016; Fenlon, Schembri & Cormier 2018; Hou & Meier 2018) as well as in gesture (McNeill 1992; Kendon 2004; Mittelberg 2014; Woodin & Winter 2018). Among other things, space in signed and gestured languaging can be used to express real or imagined locations of referents, as well as metaphorical distinctions like power hierarchies or evaluation – e.g. up is good, down is bad (Wilcox 2000; Cienki & Müller 2008; Meir & Cohen 2018; Woodin & Winter 2018; Börstell & Lepic 2020). As noted by several researchers working on signed languages, the use of space can often be involved in various plural expressions (e.g. Zwitserlood, Perniss & Özyürek 2012). For example, sideward movements – with or without reduplication – may be used to express multiplicity in events (e.g. distributive reading) or simply nominal plurality (Fischer 1973; Padden 1988; Pfau &

Steinbach 2006; Wilbur 2009). When reduplication occurs with a sideward movement between each articulation, it is sometimes referred to as *sideward reduplication*, and this has been shown to be a subtype of plural formation in various signed languages (Pfau & Steinbach 2006; van Boven 2021; van Boven, Hamann & Pfau 2023). Figures 11–12 show examples of the sign meaning ‘person’ in Swedish Sign Language being reduplicated together with a sideward movement (Figure 11) and articulated with a so-called *plural sweep* (Figure 12), a sideward movement associated with plural meaning (see Fischer 1973; Pfau & Steinbach 2006).

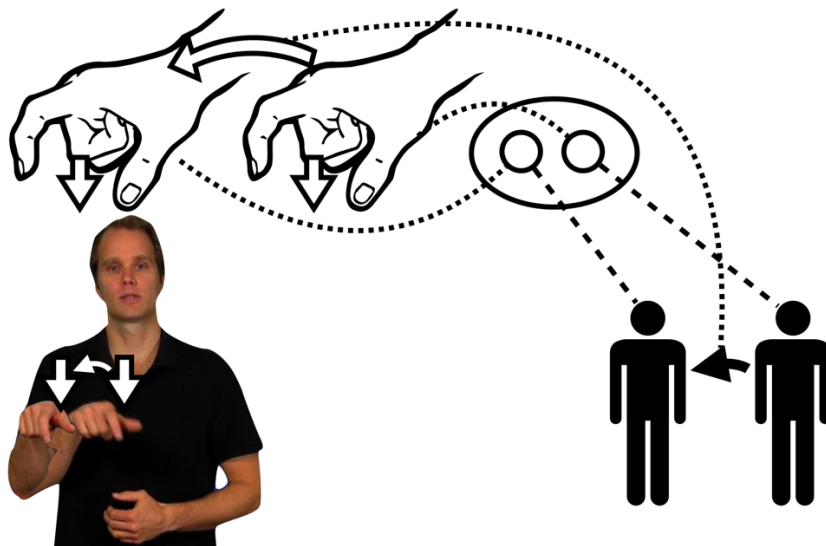


Figure 11: Schematic representation of the iconic mapping of a sideward reduplicated noun to plural meaning in Swedish Sign Language. Basic meaning: ‘person’; reduplicated meaning: ‘persons/people’ (Svenskt teckenspråkslexikon 2022: 8045): <https://teckensprakslexikon.su.se/ord/08045>.

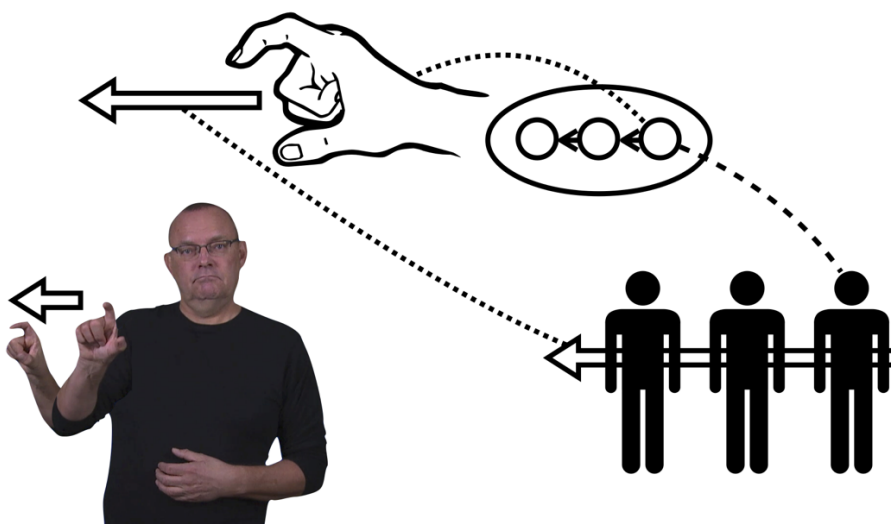


Figure 12: Schematic representation of the iconic mapping of a plural sweep noun to plural meaning in Swedish Sign Language. Basic meaning: ‘person/him/her’; modified meaning: ‘them/people’ (Svenskt teckenspråkslexikon 2022: 20126): <https://teckensprakslexikon.su.se/ord/20126>.

In both Figures 11 and 12, the use of space adds to the plural reading by creating a clear contrast between referents: the individual articulations are spatially displaced from each other, thus denoting multiple referents. Note that a difference between the meanings of the signs in Figures 11 and 12 involve a simple plural meaning in Figure 11, and a more grammaticalized form in Figure 12 that can relate to generic reference (‘some people’) or a pronominal function (‘they’). The sign for ‘person’ has grammaticalized into a classifier denoting humans in several signed languages (Pfau & Steinbach 2013; Börstell 2019), and it has been shown to be used as a pluralizing marker with a sideward movement as shown in Figures 11 and 12. In such cases, a human-denoting noun (e.g. ‘woman’) can be followed by a pluralized ‘person’-classifier to express pluralization of the noun (e.g. ‘women’) (Pfau & Steinbach 2006; Börstell 2017). The use of the specific handshape and its iconic mapping in Figures 11–12 will be returned to in Section 3.3.

In Börstell (2011), I argued for a more general term, *spatial displacement*, since the spatial modification need not be horizontal with a sideward movement, but may in principle use any spatial dimension. Many signs across signed languages may use a sideward, horizontal movement modification of signs to indicate plural and distributive meanings, which may be seen as a more neutral, grammaticalized plural marking, but this could simply be a consequence of conceptualizing the world as consisting of horizontally distributed entities more often than vertically distributed ones. That is, people and objects tend to be oriented next to, or in front of, one another rather than on top of each other. This does not, however, extend to all referents. Certain entities – concrete or abstract – may rather be conceptualized as vertically distributed and are consequently pluralized with a vertical displacement rather than a horizontal one. For instance, example (4) shows a sequence from the Swedish Sign Language Corpus (Öqvist, Riemer Kankkonen & Mesch 2020) in which two consecutive signs are reduplicated with spatial displacement, the first horizontally (with a horizontal arc movement) and the second vertically.

(4) Swedish Sign Language [swl] (Öqvist, Riemer Kankkonen & Mesch 2020)

https://teckensprakskorpus.su.se/#/video/sslc01_323.eaf?t=132

TWO^HUNDRED DIVIDE ON DIFFERENT GROUP+>+>+>+ LEVEL+^+^+

‘Two hundred [people] are divided into different groups on different levels.’

Here, signs GROUP and LEVEL are displaced along different axes, due to the nature of their respective iconic (metaphoric) distribution: whereas groups are distributed horizontally as if grouping a crowd of individuals standing in front of you, the levels here refer to placement levels in a class, ordering them from beginner to advanced – i.e., metaphorical use of the vertical axis.² Figure 13 shows the relevant signs and the different dimensions of spatial displacement with each iteration in the reduplication.

² The sign GROUP could potentially also be distributed along the vertical axis directly, each iteration being articulated at a higher location, with a spatial iconic mapping referring to ‘groups at different levels’ (e.g. from beginner [low] to advanced [high]).



Figure 13: The signs GROUP and LEVEL in Swedish Sign Language reduplicated with horizontal and vertical displacement, respectively (Öqvist, Riemer Kankkonen & Mesch 2020): https://teckenspraskorpus.su.se/#/video/sslc01_323.eaf?t=132

The use of spatially distributed repetitions to express plurality is also something found in gesturing. For example, as described by Bressem (2021: 59):

“[T]he repetition of the same gesture in different spaces around the speaker’s body results in semantic change (one space vs. several spaces) and thus the creation of a constructional meaning. The different positions in gesture space are not used for the representation of perceived relations but take over structural function. The individual spaces marked by the strokes indicate the notion of a multitude and, as such, can be understood to serve a grammatical purpose in marking plurality.”

Additionally, the spatial modification of signs can involve movement to and from the same location in space. Unlike spoken languages, signed languages can make use of “reversed” articulation of signs to indicate a reverse pattern – e.g. ‘(I) give (you)’ is produced from the signer’s body towards the addressee, whereas ‘(you) give (me)’ is produced from the addressee’s position towards the signer’s own body (Padden 1988; Meir 1998). If such constructions are produced in sequence, the reading can be that of a reciprocal construction – i.e. ‘I give you and you give me’ or ‘we give each other’ – and this has been argued to be modality-specific as spoken languages do not reverse the pronunciation of words to indicate directionality of actions (Pfau & Steinbach 2005) and is yet another example of sequential patterns of plural expression in languaging. In the following Section 3, we will look closer at the types of simultaneous iconic expressions of plurality that are readily found across signed languages.

3 Simultaneous plurality

One of the main differences when comparing spoken to signed languages is the simultaneity of the latter (see e.g. Vermeerbergen, Leeson & Crasborn 2007). When articulating a sign, several of the form parameters (e.g. handshape and orientation) are consistent throughout the movement (see e.g. Sandler 2003), and the fact that signing involves not only the hands – of which there are two, unlike the speech organs for spoken language – but also non-manual articulation by the head, face, and body (see also Chapters X [Formational properties signed language] and X [Simultaneous morphology] in this volume). In the following sections, I will describe how these properties of signed language – to some extent shared by gesturing – can be employed to further construct iconic plural mappings.

3.1 Multiple articulators

Signed languages make use of a main set of two paired articulators: the two hands. This immediately differentiates signed languages from spoken languages since it is possible to simultaneously articulate two things at the same time. This is, in fact, a property that signed languages readily exploit for word formation purposes as well as for various types of modification. Any sign can be either one-handed or two-handed in terms of how many hands are part of the articulation of the sign. Börstell, Lepic & Belsitzman (2016a) showed that across several lexical databases of different signed languages, the distribution was surprisingly even in terms of number of sign entries that were one- and two-handed, respectively – thus, the choice of one or two hands may appear random. However, as shown later in that study, building on the previous work reported in Lepic et al. (2016), the distribution is even but not random, and different signed languages tend to encode the same concepts with two-handed sign forms. Specifically, what these studies showed was that concepts that inherently have plural or distributive meaning are much more likely to be encoded as two-handed sign forms across signed languages. This was especially clear with lexical plurals – that is, meanings that involve multiple participants, members, or parts (e.g. ‘to meet’, ‘group’, ‘scissors’). Figure 14 shows an example, with the Swedish Sign Language sign meaning ‘to meet’, in which each hand is iconically mapped to each of the two (or more) participants necessarily involved in ‘meeting’.

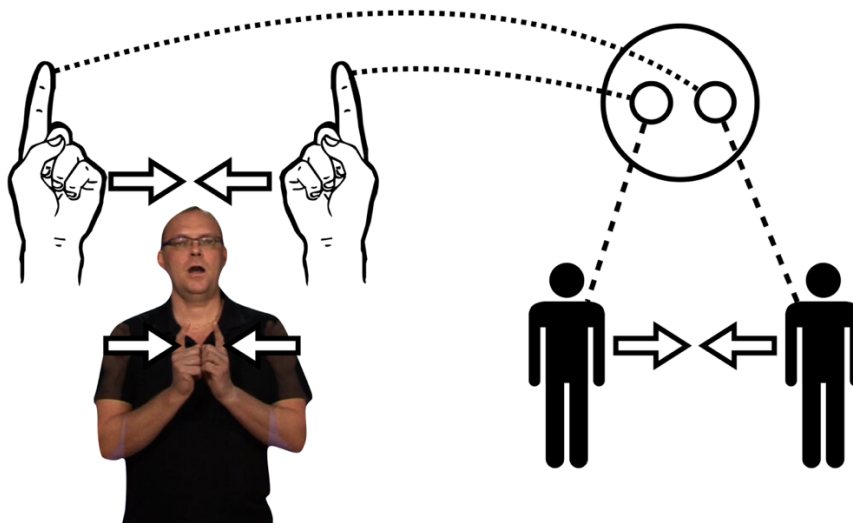


Figure 14: Schematic representation of the iconic mapping of the lexical plural ‘to meet’ in Swedish Sign Language (Svenskt teckenspråkslexikon 2022: 3194): <https://teckensprakslexikon.su.se/ord/03194>.

The preference of two-handed forms for signs denoting lexical plurals was further supported by a study by Östling, Börstell & Courtaux (2018) who identified this same pattern across a sample of 31 different signed languages, further confirming the presence of a cross-linguistic pattern based on an iconic mapping of plurality. In a series of experiments on hearing non-signers asked to produce silent gestures – that is, gesturing without simultaneous speech – it was shown that the same two-handed preference was visible for plural meanings (Börstell, Belsitzman & Lepic 2014; Börstell, Lepic & Belsitzman 2016b).

The two hands may also be mapped onto abstract entities or reference points. For example, the two hands can represent the relative configuration between two entities, locations, or points in time – metaphorically using space to represent time (Lepic et al. 2016).

In Figure 15, the Swedish Sign Language sign meaning ‘period (time)/semester’ is illustrated with each hand iconically mapped to a start and end point (in time), respectively. That is, the static non-dominant hand refers to one point in time (start time) and the dominant hand moves to a halt some distance away to refer to another point in time (end time). The hands thus delineate a bounding box, with the space in between denoting time as space. The type of mapping illustrated in Figure 15 associates the two hands to multiple reference points, but the resulting meaning is not a plural one, but is motivated by the conceptualization of multiple reference points for the delimitation of space (or, metaphorically, time). While the use here is metaphoric and abstract, the same principle is also used to express quantity in terms of size, shape, extent, and volume, where the two hands (or, fingers) delineate the outer boundaries of some space. This is also a known strategy employed also in co-speech gesturing when referring to quantities (e.g. Woodin et al. 2020) – for example showing that you caught a fish that was ‘this big’. Thus, the mapping can be analyzed as mapped on to multiple sub-parts in the conceptualization, while denoting a single referent.

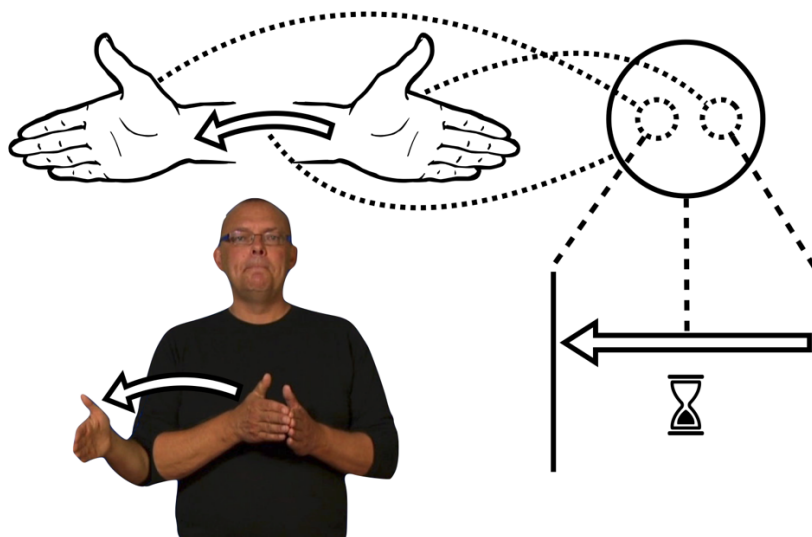


Figure 15: Schematic representation of the iconic mapping of the sign meaning ‘time period’ in Swedish Sign Language (Svenskt teckenspråkslexikon 2022: 14590): <https://teckensprakslexikon.su.se/ord/14590>.

Besides encoding plural meanings with two-handed lexical signs, the addition of a second hand can also modify an existing one-handed sign, often to express plurality. For example, Figure 16 shows a signer from the Swedish Sign Language Corpus signing on one occasion the regular form of GROW-UP meaning ‘growing up’ in the context of talking about himself, and a modified two-handed form when talking about himself and his addressee, with the meaning ‘[the two of us] growing up together’. Here, the sign simply adds a second hand that exactly mirrors the form of the basic one-handed form, both hands articulating in synchrony, expressing a symmetric, simultaneous pluractional event (in this case, dual referents both experiencing the same event).



Figure 16: The sign GROW-UP in Swedish Sign Language produced with a one-handed citation form (left) and two-handed modified form (right). The modified sign meaning ‘[the two of us] grew up [together]’ (Öqvist, Riemer Kankkonen & Mesch 2020):

https://teckenspraskorpus.su.se/#/video/ssl01_063.eaf?t=30 (left) and

https://teckenspraskorpus.su.se/#/video/ssl01_064.eaf?t=16 (right).

The addition of a second hand may also have the function of a reciprocal, in which each hand is associated with a different referent. Like the lexical sign form ‘to meet’ shown in Figure 14, reciprocal forms often have the hands facing each other to depict an action being directed towards the other. In Figure 17, the one-handed sign LOOK-AT meaning ‘look at’, depicting the gaze from one’s paired set of eyes, is mirrored by the added second hand and results in a reciprocal meaning ‘look at each other’. The use of either reduplication or doubling of articulators, or a combination of the two, is a known type of reciprocal marking from other signed languages, too (Padden 1988; Pfau & Steinbach 2003; Pfau & Steinbach 2005).



Figure 17: The sign LOOK-AT in Swedish Sign Language produced with a modified two-handed form. The modified sign meaning ‘look at each other’ (Öqvist, Riemer Kankkonen & Mesch 2020): https://teckenspraskorpus.su.se/#/video/ssl01_045.eaf?t=30.

The addition of a second hand as an expression of plurality can also combine with reduplication. We can see an example of this in Figure 18, where the signer not only adds a

second hand to the sign meaning ‘to go home’ but also reduplicates it with alternating movements – that is, articulating with the right hand, followed by the left hand, then again with the right hand. The meaning expressed here is a pluractional one ‘they all went home’ expressing multiple events distributed across participants and in different spatial directions.



Figure 18: The sign GO-HOME in Swedish Sign Language produced with a modified two-handed form with alternating reduplication. The modified sign meaning ‘they all went home’ (Öqvist, Riemer Kankkonen & Mesch 2020):

https://teckenspraskorpus.su.se/#/video/sslc01_286.eaf?t=68.

The addition of a second hand has also been observed to be a pluralizing strategy for some nouns in some signed languages (see van Boven 2021). As an example, the American Sign Language sign for ‘child’ is a one-handed sign, whereas ‘children’ is articulated with two hands, each with mirrored sideward reduplication – see ASL Signbank (Hochgesang, Crasborn & Lillo-Martin 2022: 76).³

3.2 Multiple channels

Besides the two hands, signing involves the whole body and may thus involve expressions that are simultaneously signaled by different *channels*. As Nyst (2012: 562) puts it: “Multi-channelled signs are signs that are not only articulated by the hands, but also involve non-manual articulators, such as the face, the mouth, the leg, or the body as a whole.” In Börstell (2011), I pointed out that signs in Swedish Sign Language may also use *body reduplication*, particularly signs that consist of a very minor movement or a hold, or are articulated on the body, may be reduplicated through a rocking movement of the whole body, potentially with added spatial displacement, shifting the body somewhat with each motion. This was, however, found to be used much less than manual reduplication. Another more interesting type of multi-channel expression of plurality was found in the same study in the use of mouthings – that is, the mouth “miming” (part of) the form of a spoken word simultaneously with the manual part of the sign (Boyes Braem & Sutton-Spence 2001; Sutton-Spence 2007; Bank, Crasborn & van Hout 2011; Crasborn et al. 2008; Mesch, Schönström & Embacher 2021; Bisnath 2022). Whereas manual reduplication was found to express – among other things – pluractionality in Swedish Sign Language, it is also iconic such that each manual repetition is mapped onto a separate event. Here, the manual reduplication is often combined with oral reduplication, repeating the mouthing, and the two often align such that both are repeated in synchrony (see Bergman 1983; Bergman & Dahl 1994). However, Börstell (2011) found that the pluractional reading is frequently associated with the alignment of manual and oral reduplication, whereas if a manual sign is articulated with a single movement, but accompanied with oral reduplication, or vice versa, the reading may suddenly be that of an ongoing process. An example of this is shown in (5), where the sign DARK ‘dark’ is

³ <https://aslsignbank.haskins.yale.edu/dictionary/gloss/76.html>.

articulated with a single but slow and extended movement (top row), whereas the accompanying mouthing (middle row) articulates the Swedish word *mörk* ‘dark’ (reduced into the visible /mø/, or /bilabial, round/) repeated six times simultaneously with the single manual articulation. Had the manual sign been repeated, the resulting meaning would have been either ‘(multiple objects are) dark’ or ‘dark (at multiple locations or points in time)’. Thus, the simultaneous combination of marking through separate channels – the hands and mouth – may result in different interpretations of the event structure.

(5) Swedish Sign Language [swl] (Börstell 2011: 53) [adapted glossing]

DARK-----
/bilabial, round/++++++
‘becoming dark(er and darker)’

Similar findings were later reported by Makaroğlu (2021) for Turkish Sign Language (TİD), for which both manual and oral marking are involved in the expression of pluractionality. For Sign Language of the Netherlands (NGT), the use of oral reduplication was also found to express nominal plurality (van Boven 2021).

Signed languages may also distribute different referents across different body parts. An example of this is the use of depicting constructions for which each hand may represent a different referent, and the interaction between them can be depicted with their respective movements (Emmorey 2003; Ferrara & Hodge 2018). While the two hands may be mapped onto separate referents also in lexical signs (Section 3.1), it has been argued that symmetry constraints apply such that each hand cannot be completely individuated with its own handshape and own complex movement when denoting a single concept (Battison 1978). This symmetry constraint has also been found in the gestures of non-signers, suggesting that the cognitive idea of a single concept – albeit possibly internally plural – imposes restrictions on the production (Kita, van Gijn & van der Hulst 2014). However, asymmetry may be easier to overcome when the hands map onto conceptually separate referents such as in a depicting construction (Engberg-Pedersen 1993). In highly iconic depictive signing, it is possible to let different body parts refer to different referents simultaneously, resulting in a construction blending multiple perspectives at once (Dudis 2004), illustrating how the multi-channeled nature of signing lends itself to plural expressions in several dimensions.

3.3 Articulator- and articulation-internal plurality

The final type of iconic mapping of plurality to be discussed here involves articulator-internal and articulation-internal plurality, each referring to iconic plural mappings that relate to the internal form of the articulator or articulation. In both signed languages and gesturing, using different handshapes to represent numbers is well attested. For example, the number of extended fingers can directly map onto the numerical quantity expressed, although the exact handshapes and their ordering may differ (Taub 2001; Fuentes et al. 2010; Zeshan & Sagara 2016; Safar et al. 2018). Figure 19 shows an example of how different handshapes can be iconically mapped onto numeric values, such that each finger represents a single unit.

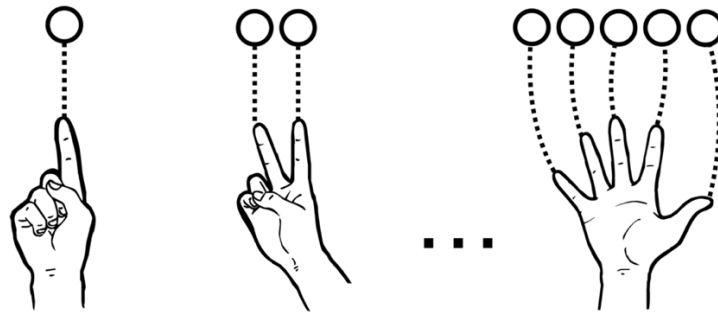


Figure 19: Schematic representation of the iconic mapping of possible numeral handshapes to numeric meanings.

Besides using such handshapes in cardinal numerals, many signed languages also make use of *numeral incorporation*. This term refers to signs with meanings that are readily quantified – e.g. time units, money (Zeshan & Sagara 2016; Safar et al. 2018) – and also pronominal pointing (Cormier 2012), which can be modified for different numeral handshapes to express numeric meanings. That is, the basic form of a sign has the meaning of a (singular) unit, and replacing the handshape with a numeral gives the combined meaning of numeric value + unit – e.g. ‘two hours’, ‘five pesos’, ‘we three’. Besides numeral incorporation, which involves exact numeric values, some signs may modify their handshape to indicate general plurality. For example, in several signed languages, a sign for ‘question’ uses the index finger handshape tracing the curved shape of a question mark. In the case of multiple questions, this sign can be modified by adding more selected fingers in the handshape – Figure 20 illustrates this modification. As Klomp (2021) describes for Sign Language of the Netherlands (NGT), this form can use either one or two hands, and “resembles numeral incorporation but does not indicate a precise numeral, only plurality” (Klomp 2021: 238) – that is, the meaning is ‘multiple questions’ rather than ‘four questions’, and the form tends to show up only as a four finger version (on one or both hands simultaneously), but does not refer to those exact numbers (i.e. four or eight).

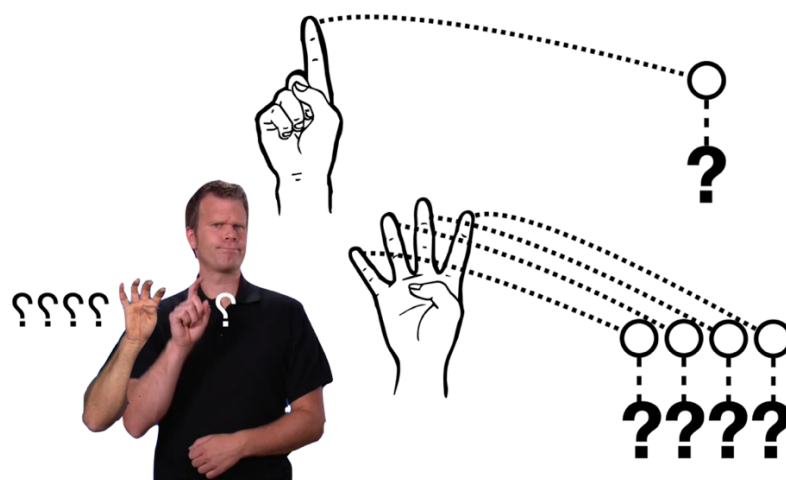


Figure 20: Schematic representation of the iconic mapping of the meanings ‘question (mark)’ vs. ‘multiple questions’ in Swedish Sign Language (Svenskt teckenspråkslexikon 2022: 3521): <https://teckensprakslexikon.su.se/ord/03521>.

A similar construction can be found in, e.g., American Sign Language fingerspelling, in which the letter <z> is produced by tracing the Z shape in the air with a single bent index finger. When fingerspelling words with a <zz> sequence, the handshape can be changed to a bent-V tracing a Z shape once – i.e., using the two fingers to each represent one letter in a plural sequence.⁴

The iconic mapping involving the individual fingers as instances of plurality is also frequently employed in word formation (see e.g. Brennan 1990; Taub 2001; Lepic & Occhino 2018). Börstell, Lepic & Belsitzman (2016a) argued that this is one of many instances of *articulatory plurality*, basically ways in which plural meanings are mapped onto articulation, whether through repetition (reduplication), spatial distribution/displacement, or the number of hands or fingers employed – in short, the known ways in which plurality may be expressed iconically in languaging. Just as we saw the two hands being employed to represent points in time in Figure 15, we can see that handshapes in which the two (groups of) fingers represent points or outlines, such as using the thumb and index finger to delineate the boundaries of some shape. This handshape is also found in quantification in gestures, denoting a quantity of a certain size that fits within the boundaries marked by the fingers (Hassemer & Winter 2018; Woodin et al. 2020). There are many ways in which a single handshape can be iconically mapped onto its associated meaning, since there may be different *construals* of what the handshape represents and depicts. Occhino (2017) provides a detailed description of how a handshape can have many different iconic mappings, each with a different part of its form highlighted as the meaningful representation. For example, the meaningful representation of a handshape can be the relative distance between the two selected fingers, such that it can be used to trace an outline or represent the outer boundaries of an entity, either as the boundaries themselves or as fingers pinching that entity, as in a quantifying gesture mentioned above. In some signs, the fingers can represent concrete parts of a whole, such as in Figures 21 and 22, representing the cleft tongue of a snake and the two wings of an airplane, respectively. In other signs, the fingers may represent more abstract entities, such as the horizontal lines of a text (Figure 23). Each of these signs denotes a single referent but is formed on the basis of an iconic mapping involving inherent/internal plurality.

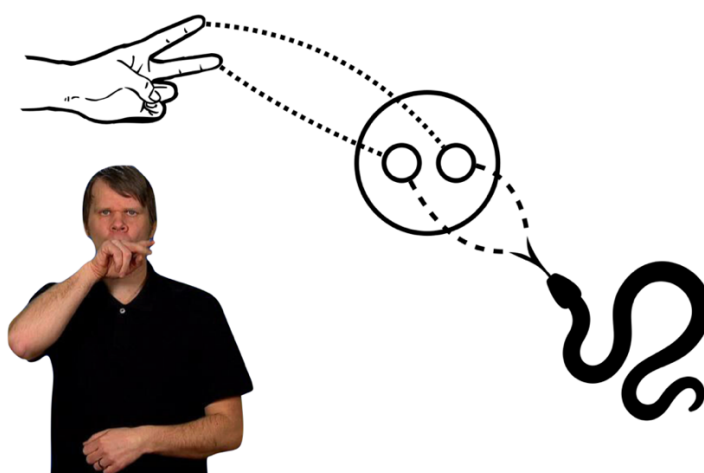


Figure 21: Schematic representation of the iconic mapping of the plural fingers to plural parts in the sign meaning ‘snake’ in Swedish Sign Language (Svenskt teckenspråkslexikon 2022: 8232): <https://teckensprakslexikon.su.se/ord/08232>.

⁴ See, for example, this sign for ‘pizza’: <https://aslsignbank.haskins.yale.edu/dictionary/gloss/904.html> (Hochgesang, Crasborn & Lillo-Martin 2022: 904).

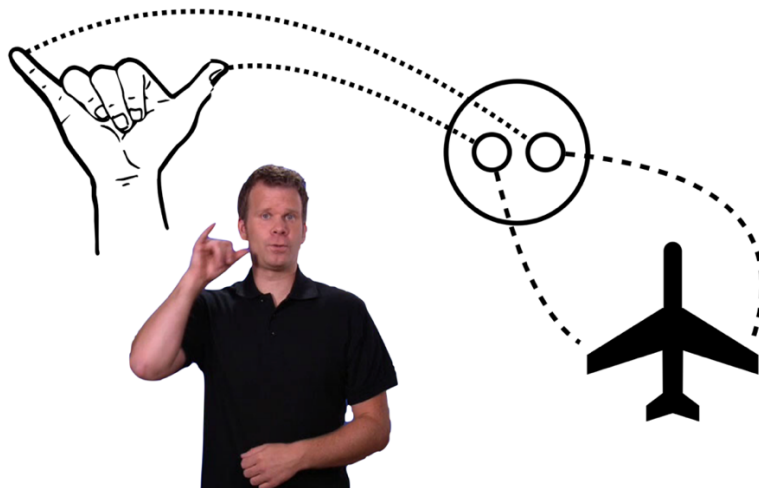


Figure 22: Schematic representation of the iconic mapping of the plural fingers to plural parts in the sign meaning ‘airplane’ in Swedish Sign Language (Svenskt teckenspråkslexikon 2022: 4497): <https://teckensprakslexikon.su.se/ord/04497>.

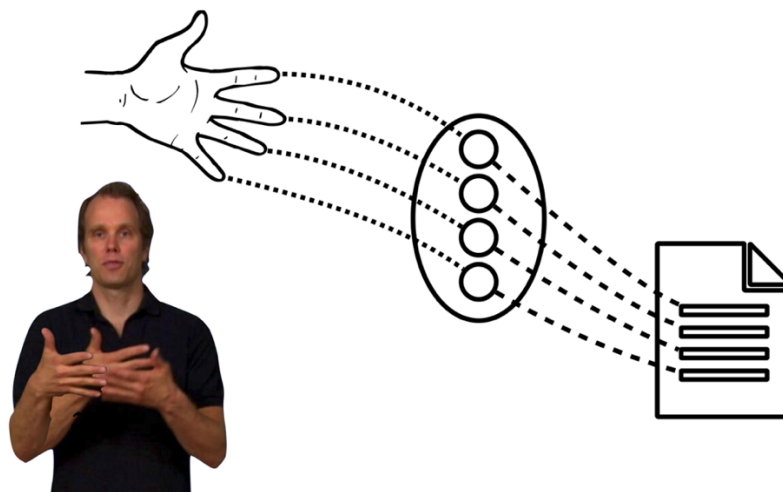


Figure 23: Schematic representation of the iconic mapping of the plural fingers to plural parts in the sign ‘text’ in Swedish Sign Language (Svenskt teckenspråkslexikon 2022: 11658): <https://teckensprakslexikon.su.se/ord/11658>.

Looking at the sign for ‘text’ in Figure 23, we can easily see the similarities in iconic mapping with the sign for ‘list’ in Figure 24. Here, the mapping of plural fingers to plural lines/items on a flat surface is the same, but to express additional multiplicity the hand moves downwards to indicate a long, vertical arrangement of such items – again, showing that spatial displacement for plural meaning uses the vertical as well as the horizontal axis.

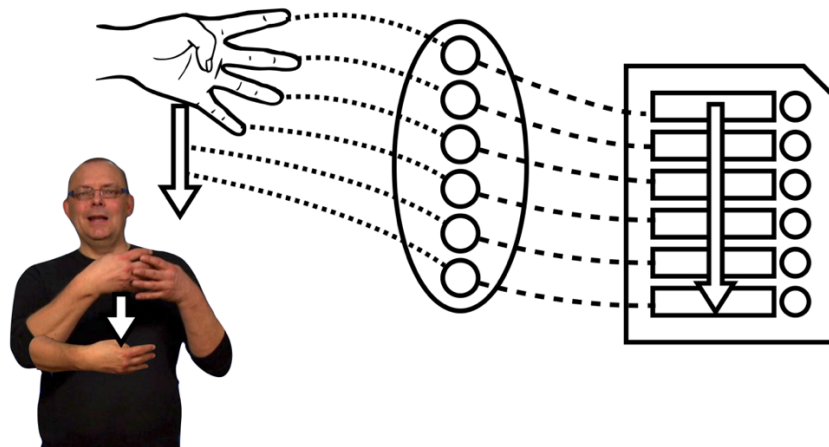


Figure 24: Schematic representation of the iconic mapping of the plural fingers to plural parts with vertical displacement in the sign meaning ‘list’ in Swedish Sign Language (Svenskt teckenspråkslexikon 2022: 9142): <https://teckensprakslexikon.su.se/ord/09142>.

The plurality expressed by multiple fingers can also combine with the meaningful use of the two hands. In Figure 25, the two hands represent the jaws of a crocodile, whereas the fingers represent the many teeth in each jaw. Thus, the plurality is simultaneously expressed by separate articulators, and internally in each hand by the multiple fingers selected. This use of the handshape (sometimes referred to as Claw-5) follows one of the mappings described by Occhino (2017) for American Sign Language and Libras (Brazilian Sign Language), in that each finger represents an individual part of a whole, in this case teeth.

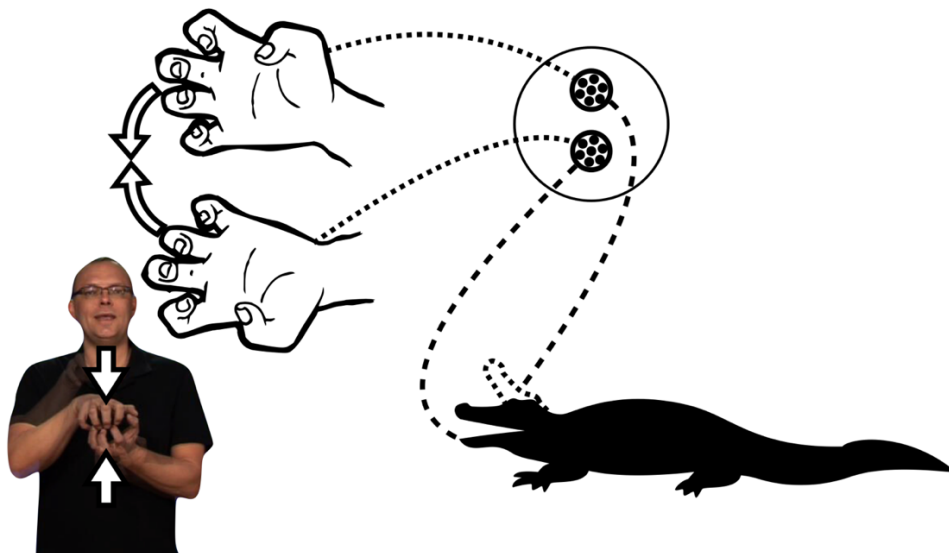


Figure 25: Schematic representation of the iconic mapping of the plural hands and plural fingers to plural parts and subparts in the sign meaning ‘crocodile’ in Swedish Sign Language (Svenskt teckenspråkslexikon 2022: 7250): <https://teckensprakslexikon.su.se/ord/07250>.

The use of multiple articulators is hard to relate directly to spoken languaging, unless accounting for the simultaneous use of plural gestures, as multiple (mirrored) articulators seem to mainly be a property of signed language and gesture. However, I would argue that spoken languages exhibit an interesting analogy in articulation. In a paper looking at a large sample of spoken languages, Winter et al. (2022) investigate the use of a trilled /r/ phoneme

and its use in words with meanings associated with ‘rough’ textures. Their results indicate that spoken languages, across language families, strongly favor trilled /r/ sounds in words denoting roughness compared to those that do not. The authors argue that this “pattern is likely grounded in the acoustically and articulatorily discontinuous nature of trills, which may be associated with the intermittent discontinuity in surface texture that is known to be the primary determinant of roughness judgements.” (Winter et al. 2022). Thus, it can be argued that even phonetic features of individual phonemes – here, the repeated opening and restricting of airflow in a trilled articulation – can be iconically mapped onto a plural meaning. Figure 26 illustrates the mapping of the acoustic pattern of an extended /r/ articulation to the plurality of ridges characteristic of a rough surface. The fact that language creates associations between many different sensory perceptions is something known from ideophones (Dingemans 2019; McLean 2020), and there are also descriptions of how tactile signing involves the iconic mapping to shape and texture through the use of the articulators representing the shapes and surfaces themselves, perceived through touch (Mesch, Raanes & Ferrara 2015).

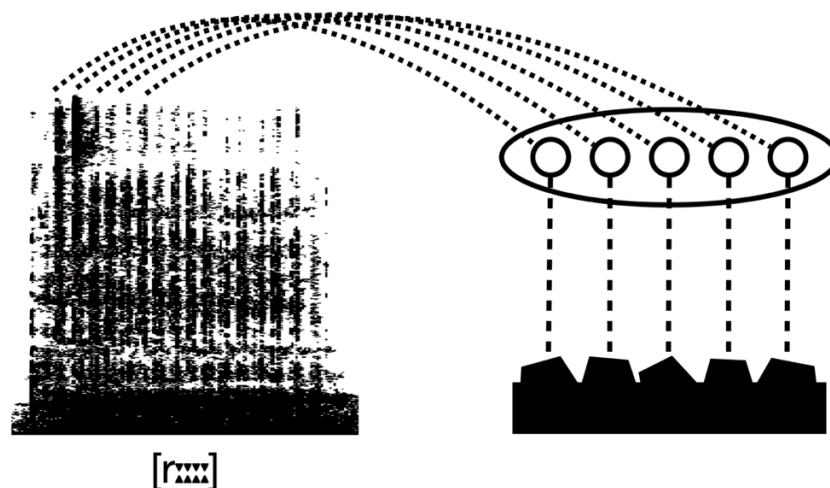


Figure 26: Schematic representation of the iconic mapping of the acoustic pattern of a trilled /r/ to the plurality of ridges of a rough surface.

4 Final remarks

In this chapter, we have seen how languaging – across modalities – shows iconic expression of plurality on multiple levels. On text and sentence levels, linguistic forms (sentences, phrases, and words) can be repeated to express repetition of occurrences of events or entities (see also Chapter X [Literature] in this volume). This same mapping is found across signed and spoken languages as a morphological process of plural marking, expressing nominal and verbal plurality. In signing and gesturing, the availability of simultaneous articulators (hands, arms, head, and body) enables multiple ways of distributing iconic mappings of plurality onto different articulators, separately or in combination. For signed languages, we see that the multiple articulators in terms of both hands and fingers – individually and in combination – can express plurality at the level of word formation. This can be seen in two-handed signs being preferred to encode lexical plurals and in morphological processes modifying signs for pluralization. Lastly, the articulation-internal plurality of a trilled articulation may, too, constitute an instance of iconic mapping of plurality across spoken languages. Considering these form–meaning mappings across modalities and throughout levels of linguistic structure, from the largest to the smallest units, it is clear that plurality is a concept that lends itself to

iconic mappings in a structural (diagrammatic) fashion. Thus, it is unsurprising that we also find iconic mappings of plurality in other representations of language and meaning, such as writing systems (e.g. iconicity in numeric characters, see Chapters X–X [all on writing systems] in this volume) and visual depictions such as comics (Cohn 2018, and Chapter X [Comics] in this volume). Iconicity permeates human language in all its modalities and can be employed to express a multitude of meanings, of which a prominent one is plurality.

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