

## Pluralization in German Sign Language \*

Marjorie Herbert

## Abstract

Like many other signed and spoken languages, German Sign Language (Deutsche Gebärdensprache; DGS) makes use of multiple strategies for the plural marking of nominal signs. The plural marker is realized in three ways. The first default realization is lateral reduplication, in which the sign is reduplicated as the hands move laterally through the signing space. The second is simple reduplication in the same position in space. The third case is zero-marking, with no overt realization of the plural marker. The realization of the plural depends critically on the phonological properties of the base sign, making this a case of phonologically triggered allomorphy.

However, as is the case for almost all sign languages, DGS can make use of classifier constructions in conjunction with these nouns. Classifier constructions are available to all noun classes in DGS for a variety of uses, but in the case of underspecified nouns, or the nouns that display zero-marking in the plural, a laterally reduplicated version of the classifier handshape is also available. I argue that this type of classifier is more grammatically regular in its use than it is in other classifier constructions, which suggests that it is being used as an alternative pluralization strategy. I offer a detailed description of the criteria that divides nouns into phonological categories and how these nouns can be alternatively pluralized by means of classifier constructions and spatial localization, a phenomenon in which the articulation of the sign both introduces the noun into the discourse and designates it as an entity within the signing space.

## 1. Background

This paper investigates pluralization strategies in German Sign Language, or Deutsche Gebärdensprache (DGS). Lateral reduplication seems to be the underlying plural marker in the language, but this reduplication is sometimes blocked from overt realization at the surface level (Pfau and Steinbach 2005). This phenomenon produces three possible realizations of the plural marker, lateral reduplication, simple reduplication, and zero-marking, which each pattern predictably with certain classes of nouns that share certain phonological properties.

Thus, the paper begins with an investigation of how nouns in DGS pattern together along

---

\* Thanks to Professors Ted Fernald, Donna-Jo Napoli, Nathan Sanders, and Rachel Sutton-Spence for their invaluable input on this work. Thank you also to Amira Silver-Swartz and Mary Lane for their helpful criticism. Thanks to my consultants Janna Fiesselmann and Elke Hallmann.

phonological lines. According to Pfau and Steinbach (2005), there are four classes of nouns in DGS: body-anchored nouns, nouns with complex movement, lateral nouns, and midsagittal nouns, all of which are explained in detail in section 2. The first two classes, which seem to be more phonologically complex, are not licensed for reduplication. Nouns that belong to these classes only display zero-marking in the plural. The third class, lateral nouns, displays sideward reduplication. The fourth class, midsagittal nouns, displays simple reduplication.

However, these four classes of nouns do not adequately describe the full range of nominal signs that I observed in DGS. Therefore, I propose a fifth class, compound signs, which also displays zero-marking in the plural. Compound nouns are inherently complex because they are composed of at least two nominal signs that can stand on their own. Thus, the zero-marking in the plural is to be expected.

Although these authors posit that reduplication is the underlying plural form of all nominal signs in DGS, only a small number of signs overtly realize this form, for the nouns for which plural reduplication is licensed, lateral nouns and midsagittal nouns, comprise a small number of the total number of signs available in DGS. The majority of signs pattern with the other three classes and display zero-marking in the plural. Furthermore, in the data I analyzed, I never observed a bare noun, nor a noun with no overt plural marking. This means that, in the majority of plurals in DGS, alternative pluralization strategies must be used. The alternative pluralization strategies I observed were classifier constructions and spatial localization, both of which will be discussed at length in section 3. In this paper, I give a detailed description of the noun classes and classifier constructions that occur in DGS by drawing from the data I gathered. This work also addresses underdescribed phenomena in these two areas. Finally, it points to some novel conclusions regarding the role of classifier constructions in DGS.

In order to have a technical understanding of the concepts presented in this work, the following brief introduction to sign language and sign language linguistics has been included.

### **1.1 Sign Languages: Modality and Structure**

Although sign languages are natural languages just like spoken languages, the difference in the visual-spatial modality as opposed to the auditory-vocal modality incites differences in the informational structure of each language type. In general, spoken languages tend to favor a sequential ordering of linguistic units, whereas sign languages incorporate more simultaneity in the articulation of these units (Wilbur 2009). In sequential ordering, phonemes are articulated one after another in real time, and syntactic structure relies heavily on the sequential realization of constitutive phrases. For example, word order in spoken English is important syntactically because the linear sequence in which words are produced conveys the syntactic structure of the utterance. By contrast, simultaneity involves the simultaneous articulation of two or more units of linguistic information. This is not to say that spoken languages never exhibit simultaneity; an example of simultaneity in spoken language can be found in tonal languages. Conversely, sequential expression of signs in sign languages is very common (Wilbur 2009).

At the lexical level, sign languages also seem to display a higher degree of iconicity than spoken languages (Sandler and Lillo-Martin 2006). Iconicity refers to the transparent relation between the form of a word and its meaning. An example of iconicity in spoken language is onomatopoeia. In onomatopoeic words, the pronunciation of the word has a direct relationship to the sound that that word represents, such as *tick-tock* in English. In the visuo-spatial modality, sign languages afford the opportunity to express the visual elements of our world iconically (Sandler and Lillo-Martin 2006). Also, the fact that all sign languages develop from systems of gesture might contribute to their iconic nature, if gestures are considered to be common to all

humans. As a system of gesture becomes more regular, these gestures become grammaticalized and lexicalized to form a natural language and lexical items become more arbitrary (Sandler and Lillo-Martin 2006). Also, since sign languages share this common origin, they tend to share more commonalities than spoken languages, whose origins are almost exclusively arbitrary. The fact that sign languages have gestural origins and are perceived visually contribute to the motivatedness in form at the level of the sign (Sandler and Lillo-Martin 2006).

At the same time, sign languages are not completely iconic, because there is just as much inter-language variation among lexical units in sign languages as there is in spoken language (Sandler and Lillo-Martin 2006). For example, the sign TREE in British Sign Language is different in form from the same sign in American Sign Language, which is different in form from the same sign in Israeli Sign Language. Further evidence for the non-iconic nature of sign languages was provided by an experiment conducted by Klima and Bellugi. In the experiment, signers made phonological substitutions on word-recall, not meaning substitutions, which would be expected if sign languages were primarily iconic (Klima and Bellugi 1979).

## **1.2 Sign Language Linguistics**

Whereas spoken languages make use of the tongue as the primary articulator, sign languages have two articulators: the dominant and non-dominant hands, or the primary articulator and secondary articulator (Sander and Lillo-Martin 2006). The dominant hand is usually the same hand that is predominately employed in other common activities, such as writing. This means that left-hand dominant signers will articulate the majority of signs with the left hand, and right-handed signers vice versa.<sup>1</sup> The primary and secondary articulator articulate signs within the signing space, which is a rectangular area that extends laterally about a foot

---

<sup>1</sup> Native signers will sometimes 'switch hands', meaning they will change which hand is serving as the primary articulator within a conversation.

from the edge of the signer's body and vertically from the top of the signer's head to the bottom of the pelvis (Fig. 1) (Emmorey 2001). The neutral signing space is a smaller area contained within the signing space, which is the default location for located in front of the body within the body's periphery. Its upper limit includes the area slightly below chest level, while its lower limit is at mid-pelvis level (Emmorey 2001). Locations in space where signs are articulated in sign language are analogous to the places of articulation in the mouth and throat where the tongue articulates sounds in spoken language.



Figure 1. The signing space

Just like spoken language phonology is described in terms of how the articulator is shaped and how it interacts with the places of articulation to produce sounds, sign language phonology is described in terms of how the hands are shaped and how they interact with each other and places of articulation within the signing space to produce visual images.

In sign languages, one articulator always has primacy over the other (Sandler and Lillo-Martin 2006). This relationship is expressed in the terminology of primary and secondary articulator (also known as H1 and H2). The secondary articulator can support the primary articulator by serving as a mirror image of the primary articulator's articulation, or it can compliment the primary articulator's motion in some way (Sandler and Lillo-Martin 2006). It can also function as a place of articulation for the primary articulator, or not be involved in the production of the

sign at all (such is the case in one-handed signs). The coarticulator is the articulator that is serving to reinforce the articulation of the primary articulator (Sandler and Lillo-Martin 2006).

There are manual, i.e. the primary and secondary articulator, and non-manual articulators available to signers. Non-manuals include facial gestures, mouthings, and mouth gestures. According to Hohenberger and Happ (2001), facial gestures are grammatical facial expressions, whereas mouthing is the silent articulation by the mouth of the corresponding spoken word during the articulation of a sign and is usually the result of language contact with a spoken language. Finally, mouth gestures are shapes that the mouth can take on to indicate prosodic structure. Non-manuals can be articulated simultaneously with the articulation of the manual articulators.

According to Sandler and Lillo-Martin (2006), there are four categories of phonological characteristics in sign languages: point of articulation or location, movement, handshape and hand orientation. The first, location, describes where a sign is articulated within three-dimensional space. A sign can be articulated at any point within the signing space. It can also be articulated at locations on the signers body, such as the shoulder, chin, etc.

The second category, movement, describes how an articulator moves through space from one signing location to another. In this category, the handshape either stays constant or changes once during the articulation. For example, in DGS, the verb THROW starts at the shoulder level with the primary articulator in a fist. It then moves forward through the signing space away from the body as hand of the primary articulator opens up and the fingers spread. The movement that the articulator undergoes to get from its starting location to end location is called path movement. The movement that the fingers undergo in THROW to move from the fist at the beginning of the sign to the open hand at the end is called internal movement (Sandler and Lillo-Martin 2006).

The final category, handshape, describes the configuration of extended and non-extended fingers in relation to the palm on a single hand. Extended fingers can be fully extended or slightly bent. They can also be ‘closed’, like on the signer’s left hand in Figure 2, in which all five fingers are extended and touching each other, or they can be ‘open’ (Fig. 3), in which the fingers are extended but spread away from each other, or open (Sandler and Lillo-Martin 2006). Fingers that are not extended lie flush with the palm of the hand.



Figure 2. Closed Hand

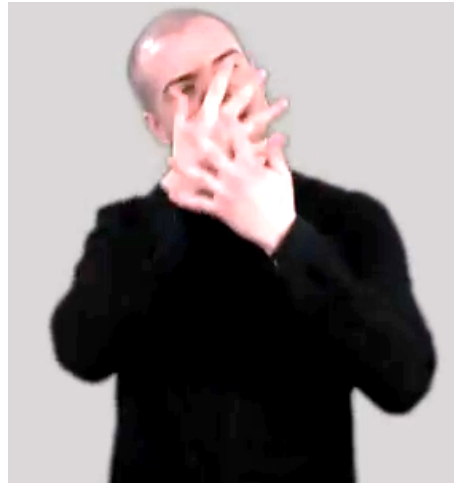


Figure 3. Open Hand

The overall shape of the configuration of fingers and palm is the handshape. Hand-orientation involves how this handshape is oriented in space: is the palm face up or down, left or right? Hand-orientation has been shown to be a subcategory of handshape in sign language because orientation characteristics may assimilate on their own, but if handshape assimilates, orientation must necessarily assimilate as well (Sandler 1987).

### 1.3 Background: German Sign Language

DGS is the indigenous sign language of Germany. According to Lewis (2009), it is a minority language, and there are approximately 50,000 DGS native signers in Germany today. Like most sign languages, the precise origins and genealogy of DGS is unclear; it shares commonalities with French Sign Language or ‘Langue des Signes Française’ (LSF) and other

European sign languages, including Polish, Swiss German, and Austrian Sign Language. On account of the very small amount of historical documentation of DGS, it is unclear whether its relation to these other European Sign Languages is incidental or genetic. It is known that the finger alphabet used in DGS is derived from that of LSF with some modification (Lewis 2009).

According to Gedula List (1994), the historical development of DGS is intimately related to the deaf education system in Germany. After 1880, the “German Method” or oralism dominated in Europe and especially in Germany. This method demanded that all deaf children learn to communicate in the auditory modality by learning to read lips and to ‘vocalize’, or produce spoken German orally. For obvious reasons, vocalizing is extremely difficult for deaf children. Since they cannot hear the sounds they are producing, they cannot self-correct their mistakes, and as a consequence, deaf children seldom learned to produce speech like their hearing peers. Furthermore, when reading lips, deaf individuals only pick up on average thirty percent of information conveyed (Conrad 1977). For these reasons, oralism has had consequences for the development of DGS. Oralism has its longest tradition in Germany, which might explain why DGS displays one of the highest incidences of mouthing of the world’s sign languages (Gedula List 1994).

Oralism did not cause DGS to cease to exist. Signing was not allowed in the classroom, but it was still alive and well in hallways, on the playground, and at home; however, the fact that little is known about the historical development of DGS is a consequence of this oppression. The degree of standardization of DGS, the participation and/or acceptance of it by deaf people in Germany, and the consolidation of language levels around the country cannot be compared with that of American Sign Language (ASL), which is one of the most well described and acknowledged sign languages (Zeinert 1994). The consequential diversity of sign language used



by deaf Germans is an impediment to DGS becoming the national language of the deaf in Germany. Sign language research on DGS also lags behind that of ASL. Until 1975, sign language learning was not focused on in research, and until 1980, there was almost a complete lack of sign language interpreters (Günter List 1994); however, with today's surge in academic interest in the language, DGS has started to undergo a revitalization. More and more DGS classes are being taught in German universities, and researchers focusing on development of tools for bilingual education and the compilation of online sign dictionary.

Despite all this, DGS still struggles for acknowledgement from the hearing majority, and the language received political recognition from the German government only in 2002 (Boyes-Braem and Rathman 2010). Deafness is still treated as a defect by medical practitioners, and linguistic research on DGS still has a long way to go before it catches up with that of languages like ASL. Thus, DGS is an important language for study by linguists because it is so exceedingly underdescribed.

#### **1.4 Methodology**

I began with elicitations of nominal signs for my work on DGS. I worked with two consultants to create my elicitation videos: Jana Fiesselmann, 22, and Elke Hallmann, 19. Jana is a hearing woman born to deaf parents, so she is bilingual in German and DGS. She was born and raised in Berlin. Elke is also hearing and born to deaf parents, but she began learning DGS in Tübingen before moving to Berlin with her parents at age 7. Both consultants are currently university students and active members of the deaf association in Berlin, GGKG e.V.

These were not adequate, though, because, in order to study how DGS signers naturally engage with the pluralization strategies available to them, I need footage of more natural signing. I turned to videos of story-telling and newscasts. These I drew from the website for the

GGKG e.V., which posts a newscast in DGS every other week on its website, and Youtube. I asked my consultants to check the videos that I pulled from Youtube to make sure that they actually featured signers of native or near-native language competency in DGS. From this source, I gleaned a variety of videos ranging from the story of deaf little red riding hood to a five-part travel guide on Hamburg.

Over the course of writing this work, I had periodic contact with my consultants. The conversations I had with them were very informal; I asked them about how they felt about certain descriptions or generalizations I had made about the language. The figures in this work and the data used to back up my conclusions are drawn from both elicitations and online videos.

## **1.5 Overview of this Work**

Section 2 gives an overview of the four noun classes used to describe nominal signs in DGS, with an additional fifth category that I propose. Section 3 deals with reduplication patterns found in the various pluralization strategies discussed in the work. The first half details the overt realization of morphological plural markers, while the second half deals with alternative strategies of pluralization, namely classifier constructions and spatial localization. Section 4 is a discussion of the findings in section 3. Finally, section 5 outlines the conclusions that can be drawn from this discussion.

## **2. Noun Classes in DGS**

According to Pfau and Steinbach (2005), nominal signs in DGS fall into four classes based on common phonological characteristics. These classes are analytically useful because they accurately predict how each class patterns differently when citation forms of signs are transformed in everyday language use. Most importantly for this work, these classes pluralize in consistently different ways. The most recent categorization of the class of nouns in DGS has

been proposed by Pfau and Steinbach (2006). In this analysis, nominal signs are divided into four categories based on common phonological properties: lateral nouns, midsagittal nouns, nouns with complex movement, and body-anchored nouns.

## 2.1 Class 1: Body-Anchored Nouns

The first category is body-anchored signs. Body-anchoring usually involves contact between the primary articulator and an area on the body, which can be on the torso arms, head, or secondary articulator, that serves to ‘anchor’ the sign to that place of articulation on the body; however, body-anchored signs do not necessarily imply a direct contact relationship of the primary manual articulator with the place of articulation, i.e. body anchor (Pfau and Steinbach 2005). This point is illustrated by the difference between IDEA (Fig. 4) and MAN (Fig. 5).



Figure 4. IDEA

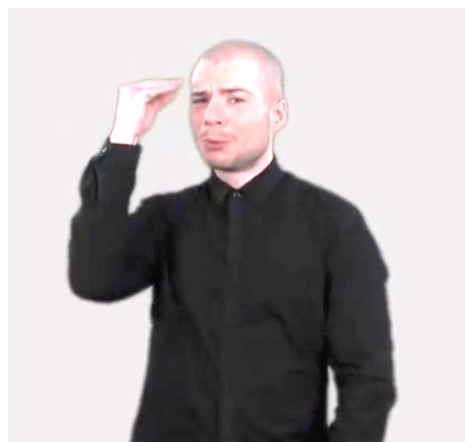


Figure 5. MAN

IDEA is articulated by the primary articulator in a handshape where the pinky finger is extended and makes contact with the temple on the signer’s dominant side (the right-hand temple for the signer in Fig. 4), then moves away from the head diagonally in the signing space. In contrast, MAN, which is articulated at an almost identical point of articulation, does not make contact with the temple. Instead, the signer opens and closes his hand twice in an area directly to the right of the temple (from the signer’s perspective) while mouthing the German word *Mann* to

articulate the sign.

## 2.2 Class 2: Midsagittal Nouns

The midsagittal noun class is characterized by articulation of the signs on or about the midsagittal plane, the vertical plane that cuts vertically down through the signing space, dividing the face, chest, and abdomen in half. Nouns with mirror-like symmetry, in which primary and secondary articulators mirror each other's handshape, location, and movement, are always symmetrical about the midsagittal plane. The articulators cannot laterally exceed the edges of the body. An example of a midsagittal noun is BOOK (Fig. 6).

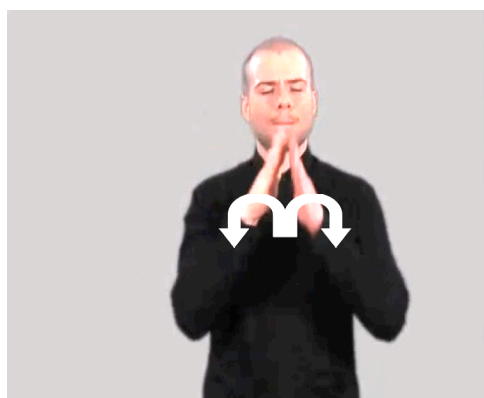


Figure 6a. BOOK, initial position

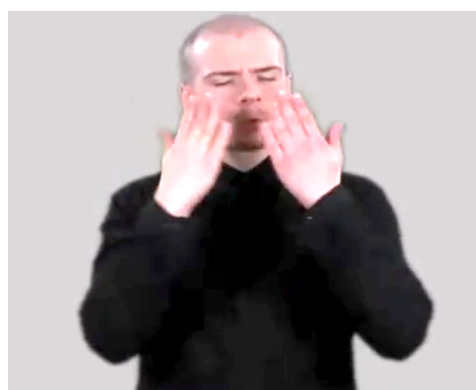


Figure 6b. BOOK, final position

To articulate BOOK, the signer begins with two flat hands, fingers extended and closed. They begin the movement pressed against each other, palms touching, on the midsagittal plane. Then the signer rotates each wrist outwards so that the palms draw away from each other, so that at the end of the movement there is a right angle between the surfaces of the two palms (Fig. 6b).

Note here that, though there is contact between the primary and secondary articulator, this sign is not considered to be body-anchored because the secondary articulator is serving as a coarticulator, not a place of articulation for the primary articulator. It provides redundant information, copying the phonological properties of the primary articulator. The point of articulation for BOOK is the midsagittal plane at chest height.

The class of midsagittal nouns is relatively small; it only encompasses nouns that are articulated on or about the midsagittal plane within the neutral signing space. An example of a sign that is articulated on the midsagittal plane rather than about it is the midsagittal noun TOWER (Fig. 7).



Figure 7a. TOWER, initial position



Figure 7b. TOWER, final position

To articulate TOWER, the signer begins with both hands shaped in loose fists, as if they were holding cylindrical objects, like rods. The secondary articulator remains stationary at waist level as the primary articulator moves upwards, coming to rest at face level. Both maintain the same handshape and orientation throughout the articulation of the sign. Here the secondary articulator is not a coarticulator because it is not moving with the primary articulator; it is being ‘articulated on’ by the primary articulator. However, since the primary articulator does not make contact with the secondary articulator, this sign is not considered a body-anchored sign.

The description of body anchored-ness given in section 2.1 poses problems for the categorization of TOWER (Fig. 7), since it seems to share several phonological properties with body-anchored nouns. Indeed, at first glance, TOWER appears very phonologically similar to MAN (Fig. 5), which patterns with the body-anchored class. MAN does not make contact with its place of articulation on the body, the forehead, and neither does TOWER. One must bear in mind that two-handed signs articulated on the midsagittal plane cannot be body-anchored, for

these signs must be specified either for the midsagittal plane or for a particular place of articulation on the body (i.e. the secondary articulator), not both. Thus, signs that are articulated on the midsagittal plane and do not make contact with the body, such as TOWER, are considered to be specified for the midsagittal plane, whereas signs that are articulated on the midsagittal plane and make bodily contact are considered to be specified for that area of the body and therefore body-anchored. This accounts for the fact that BANDAID (Fig. 8), in which the primary articulator makes contact with the secondary articulator, patterns with the class of body-anchored nouns, but TOWER does not.



Figure 8. BANDAID

To articulate BANDAID, the primary and secondary articulators maintain different handshapes. The primary articulator forms a loose fist with the pad of the thumb sticking out, while the secondary articulator has all fingers outstretched in a relaxed position. The thumb pad of the primary articulator makes contact with the back of the wrist of the secondary articulator at the beginning of the sign. The thumb maintains contact with the secondary articulator as the signer drags the primary articulator down the back of the hand of the secondary articulator, coming to rest at midway down the back of the hand. In this way, the iconic roots of BANDAID are somewhat transparently apparent, for this sign seems to mimic the action of applying a bandaid

to the back of the hand.

### 2.3 Class 3: Lateral Nouns

Lateral nouns are characterized by the location of articulation that is licensed to them, namely the area of the signing space on either side of the signer's body. In other words, these nouns are all signed either at the far right or far left extreme of the signing space—they must be signed on or outside the periphery of the body, outside the neutral signing space. It is important to note that only one lateral extreme of the signing space is licensed for a particular signer; lateral signs must be articulated on the same side of the body as the signer's primary articulator. This space located on either side of the signer's body will from now on be referred to as the 'lateral signing space'. An example of a lateral noun is CHILD, which can be seen in Figure 9:



Figure 9. CHILD

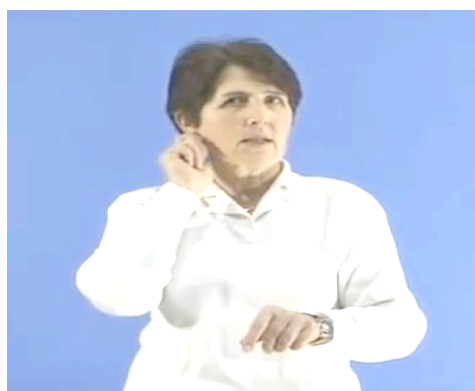


Figure 10. WOMAN

To articulate CHILD, the signer moves her dominant hand, with all fingers extended and closed, from about chest height down to waist level, where this configuration is held. The dominant hand remains in the lateral signing space throughout this motion. Lateral nouns are necessarily non-body anchored, which means they cannot be articulated on a certain point of the body, like the arm or face, nor on the secondary articulator. Nouns like WOMAN are classified as body-anchored nouns, though they are signed in the lateral signing space (Fig. 10). In WOMAN, the primary articulator assumes a handshape in which the thumb and index finger are extended. She

grasps her earlobe between the thumb and index finger to complete the sign. This illustrates the strong phonological primacy of the body-anchored characteristic; wherever the two noun classes lateral noun and body-anchored noun overlap, i.e. whenever there is a sign that is both body-anchored and signed in the lateral signing space, the sign always patterns with the body-anchored noun class. Lateral nouns may have simple path movement incorporated within the sign. Simple path movement occurs when a signer moves her hand from one location to another with a straight or slightly arced trajectory through the signing space. This kind of movement is in contrast to complex movement, and lateral nouns may not incorporate complex movement. Finally, these signs can be articulated at any spatial level along the periphery of the body. For example, the lateral noun CHILD (Fig. 9) is articulated at waist level, but the lateral noun CHAIR, is articulated at shoulder level (Fig. 11).



Figure 11. CHAIR

To articulate CHAIR, the signer begins the movement at cheek level, with the index and middle finger extended but slightly bent. The signer then moves her hand quickly downwards, coming to a rest at approximately chin/neck level.

## 2.4 Class 4: Nouns with Complex Movement

Complex movement is a special type of movement within the phonological category of movement. Unlike simple path movement, it involves movements that are more complex than



travelling from one position to another in a straight or arced path. Complex movement is seen in signs where the path movement is repeated and/or alternating, like in the one-handed sign DREAM (Fig. 12). To articulate DREAM, the signer moves the primary articulator with all fingers selected and slightly bent around his right-hand temple in a forward-down rotation. He repeats this motion, for a total of two circular rotations. Here, both circular and repeated path movement are displayed, which is a common pairing of movement features in DGS.



Figure 12. DREAM

Complex movement can also involve alternating motion, in which the primary and secondary articulator are both articulating the same motion, but in an alternating pattern, such as in the sign BATTLE (Fig. 13).

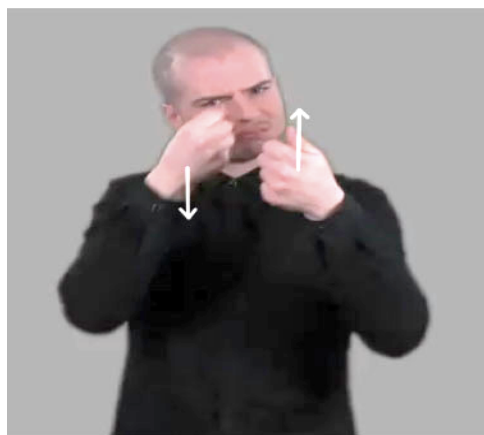


Figure 13a. BATTLE, initial hold

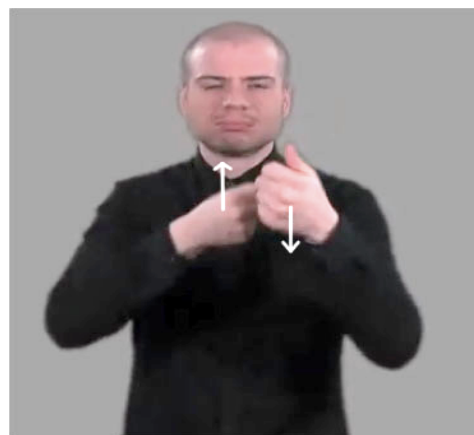


Figure 13b. BATTLE, final hold

In BATTLE, the signer moves the primary and secondary articulator in loose fists up and down

parallel to the line of his body. The primary and secondary articulator move in opposite directions; when the primary articulator is located at the uppermost point of its motion, the secondary articulator is located at the bottommost point of its motion. This up and down motion is usually completed two times to articulate the sign, so this sign also involves repetition.

These three movement patterns described here, repetitive, circular, and alternating motion, are not in complementary distribution. That is to say that all three features can be present in a single sign, such as in BICYCLE (Fig. 14).



Figure 14. BICYCLE

In BICYCLE, the articulators, both in fists, are moving in circular trajectories parallel to the midsagittal plane. Each articulator completes two revolutions of counterclockwise motion in this sign, but in an alternating pattern; when the primary articulator is at the top of its revolution, the secondary articulator is at the bottom of its revolution.

This class of nouns therefore allows for a broad range of signs because the class is defined by complex movement, allowing signs with any of the other the other three phonological categories (location, orientation, and handshape) to be included.

Lateral nouns and midsagittal nouns tend to be described as less phonologically complex as the other three classes: nouns with complex movement, body-anchored nouns, and compound

nouns. Interestingly, signs that have a characteristic of one of the first two classes of nouns and also a characteristic of one of the other three classes of nouns are almost always subsumed under the classification of the latter. This indicates that body-anchoredness, complex movement, and compounding are more phonologically salient and take primacy over both the lateral and midsagittal characteristic. It is difficult to categorize signs that display characteristics of both body-anchored nouns and nouns with complex movement, but according to Brentari's feature hierarchy, complex movement usually outranks body-anchoring in sign languages, meaning nouns with both features would be categorized in the nouns with complex movement class (Brentari 1998).

## **2.5 Compound Signs: A Proposed Fifth Noun Class**

While the four noun classes presented above seem to accurately describe the commonalities of the signs that are included in them, there is a set of signs in DGS for which these four classes do not accurately account: compound signs. Therefore, I propose to add a fifth class of compound signs to the other four. Like compound nouns in English (*playground* and *lighthouse*, for example), compound signs in DGS are comprised of two component signs that could and do often appear on their own. In combination, the two signs assume a semantic meaning that transcends a merely compositional meaning of the two component signs.

Since the component signs belong to the DGS lexicon, they necessarily belong to one of the original four noun classes; however, in combination, the total compound sign may not fit into any one of the previous four noun classes. Therefore, compound signs must belong to their own class. For example, the DGS sign STEEPLE (Fig. 15) is comprised of the signs CHURCH and TOWER, which can be notated as CHURCH^TOWER. The notation SIGN^SIGN represents a compound sign by connecting the two component signs with a caret mark.



Figure 15a. Part 1 of STEEPLE: CHURCH



Figure 15b. Part 2 of STEEPLE: TOWER

To articulate the first part of STEEPLE, the signer signs CHURCH. To sign CHURCH, the signer begins the sign with open, flat hands with closed fingers at chest level. The hands are oriented diagonally towards the midsagittal plane. Then, he moves his hands in diagonal, straight path movement towards each other, and the fingertips of each hand meet at the final hold position, as if he were articulating the shape of the diagonal legs of an isosceles triangle.

Since the secondary articulator is mirroring the location, orientation, and movement of the primary articulator about the midsagittal plane, CHURCH is a midsagittal noun, and as we saw in section 2.2, TOWER is also a midsagittal noun; however, the combined compound sign, STEEPLE, is still not a midsagittal noun. STEEPLE is specified for two types of midsagittal locations: in neutral signing space about the midsagittal plane, as in CHURCH, and on the midsagittal plane, as in TOWER. It is specified for different path movements, diagonal straight path movement (CHURCH) and vertical straight path movement (TOWER). STEEPLE is also specified for two handshapes that remain consistent throughout the articulation of each constituent sign: the open palm with closed and outstretched fingers of CHURCH and the loose fists of TOWER.

The simple signs that compose the four other noun classes can be specified for maximally two places of articulation and one type of movement (Sandler and Lillo-Martin 2006). As discussed above, STEEPLE violates both of these criteria. With respect to handshapes, a simple sign may start in a hold position with one handshape, undergo some sort of movement, and end in the final hold position with a different handshape. STEEPLE violates this constraint because the two handshapes of the constituent signs remain consistent throughout their respective articulation patterns. STEEPLE violates not one but three requirements of the other noun classes, so it cannot belong to any of them. Thus, it seems that noun-noun compounds that are composed of two signs from the same class belong to a different class of nouns, compound nouns, and according to the data analyzed for this work, compound nouns of this sort do not pattern with the noun class of their component signs.

Another example of a compound noun is STOPPING-TIME (WORK^END) (Fig. 16).



Figure 16a. WORK

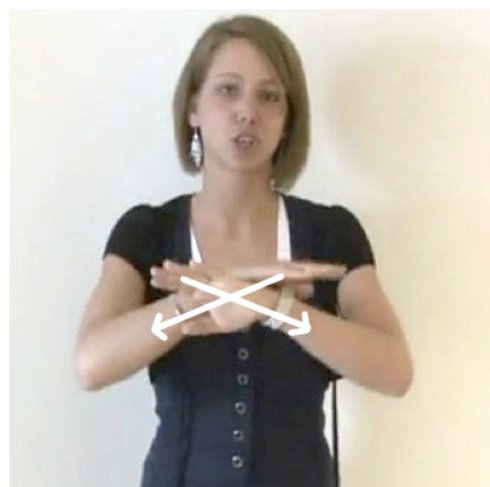


Figure 16b. END, initial hold



Figure 16c. END, final hold

To articulate STOPPING-TIME, the signer begins with the component sign WORK (Fig. 16a). In this sign, both hands form fist handshapes oriented parallel to the midsagittal plane. The primary articulator brushes across the wrist of the secondary articulator, moving from the part of the wrist that is closest to the midsagittal plane outwards. Then, the primary articulator reverses this motion, brushing across the wrist of the secondary articulator back to its starting position. The primary articulator undergoes this articulation motion a second time to complete the sign. Next, the signer articulates the other component sign END (Fig. 16b). In this sign, the primary and secondary articulator assume a handshape with a flat palm and extended fingers that are closed and touching one another. The sign begins with the arms crossed in front of the chest (Fig. 16b). The signer moves both articulators in a straight path movement simultaneously away from the midsagittal plane, bringing them to rest at chest level in the lateral signing space with the palms oriented downwards (Fig. 16c).

It is ambiguous whether this compound sign constitutes a verb-noun compound or a noun-noun compound, for the verb WORK and the noun WORK in DGS are articulated almost identically. What is clear is that this is a case of two component signs belonging to different noun classes, in this case, nouns with complex movement and midsagittal nouns, respectively, combining to form a noun that belongs to the class of compound nouns. Since the sign WORK

involves a repetition of motion, it belongs to the class of nouns with complex movement, while END involves simple path movement about the midsagittal plane, so it belongs to the midsagittal noun class.

A third example of a compound noun in DGS is TELEPHONE-NUMBER (TELEPHONE^NUMBER) (Fig. 17).

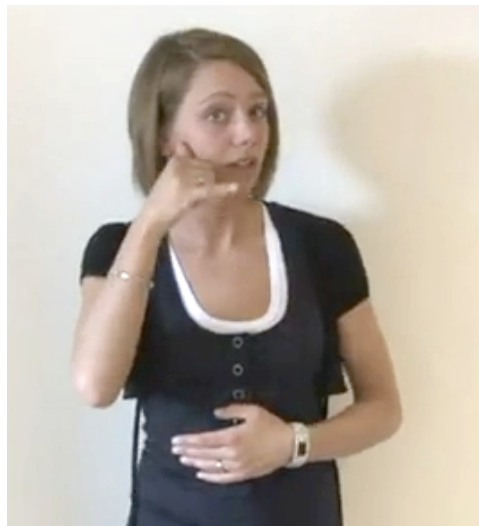


Figure 17a. TELEPHONE

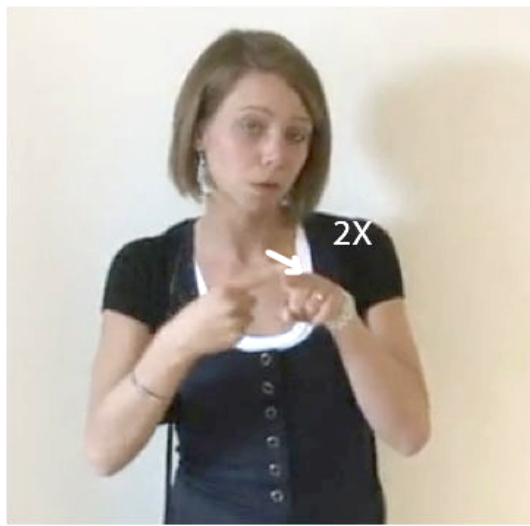


Figure 17b. NUMBER

To articulate this sign, the signer begins with the component sign TELEPHONE. In this sign, the primary articulator forms a handshape with the thumb and pinky finger selected and fully extended, while the remaining fingers are folded touching the palm. The signer articulates this sign by touching her thumb to the cheek on the dominant hand's side (in this case, the right-hand side) with the pinky oriented in the direction of the mouth (Fig. 17a). Next, the signer articulates NUMBER (Fig. 17b). In this sign, both hands form a handshape with the index finger selected and fully extended while the remaining fingers are folded. The signer brushes the secondary articulator's index finger with the index finger of the primary articulator, moving from the tip of the secondary articulator's index finger down to about middle of the finger. The primary articulator then returns to its starting position, and then the signer rearticulates this motion a

second time to complete the sign.

The compound sign TELEPHONE-NUMBER represents another case of two signs of different noun classes, in this case, body-anchored nouns and nouns with complex movement, combining to form a compound sign that does not belong to either of those classes.

## **2.6 Summary**

The compound noun class is a ‘strong’ class because nouns that display the characteristic of compounding almost always belong to this class. Nouns that belong to this class may display characteristics of the other four classes, but as long as they are composed of two component signs, they should belong to the compound noun class. Body-anchored nouns and nouns with complex movement are also strong classes because signs that display either body-anchoredness or complex movement must belong to these two classes. Even if a sign displays the characteristics of lateral nouns or midsagittal nouns in conjunction with either body-anchoredness or complex movement, it would still belong to either the class of body-anchored nouns or nouns with complex movement. Accordingly, lateral nouns and midsagittal nouns are ‘weak’ classes because nouns only belong to these classes if they display none of the characteristics of the other three classes.

## **3. Plural Marking**

According to Pfau and Steinbach (2005), evidence for this classification model can be drawn from the three pluralization strategies that are available in DGS: sideward reduplication, simple reduplication, and zero-marking. Multiple pluralization strategies are common to the world’s languages, both signed and spoken. In some languages, like English, the morphological allomorphy is entirely triggered by the phonological make-up of the base noun. For example, in English, the plural suffix sometimes assimilates characteristics of the final sound of the noun to



which it is attached, as seen in the example below.

(18)	<i>singular</i>	<i>plural</i>	<i>gloss</i>
a.	[bʌ:z]	[bʌ:zɪz]	‘buzz’
b.	[bʌ:d]	[bʌ:dz]	‘bud’
c.	[bʌ:t]	[bʌ:ts]	‘butt’

The plural suffix assimilates the [voice] feature of the sound it follows, becoming voiced when it follows voiced sounds (18a-b) and voiceless when it follows voiceless sounds (18c).

### 3.1 Internal Pluralization Strategies in DGS

Like in English, DGS displays three different allomorphic plural forms. In DGS, as posited by Pfau and Steinbach (2006), sideward reduplication is the underlying plural form. The more reduced form of this plural, simple reduplication, is the second. The final realization of the plural marker is no realization, or zero marking; the plural form is identical to the singular form of the noun.

#### 3.1.1 Sideward Reduplication

To complete sideward reduplication, a signer must first articulate the sign as it would appear in the singular form. Next, the sign is rearticulated at a location slightly further out laterally in the signing space; the signer moves the articulator away from the body. The sign is then rearticulated at a location laterally even further away from the body to complete the articulation of the plural form. Thus, the sign is articulated three times total.

Lateral nouns undergo this type of reduplication, as in CHILDREN, which is articulated as CHILD>+>+ (Fig.19). The notation SIGN>+>+ represents the fact that the sign is rearticulated twice as the articulator moves away from the body.



Figure 19. CHILDREN (CHILD>+>)

In the plural sign CHILDREN, the citation form of the singular noun is first given. Then the primary articulator moves in an arc-like motion to a location laterally further away from the body and slightly downwards from its original position. This move is then repeated; the primary articulator moves in an arc-like motion from its second position to a third position that is laterally further away from the body and slightly lower than position 2.

This movement pattern is particular, in that it is executed without internal pauses. The signer transitions from one articulation of the sign to the next, forming one fluid movement. Furthermore, the path of the movement between the articulations of CHILD is highly arced, such that the primary articulator appears to ‘bounce’ between the articulations of CHILD. This is in contrast to how a signer would articulate three separate instances of the singular form of the sign CHILD in a row. To accomplish this, the signer would have to pause at the bottom-most point of each articulation of CHILD before moving on to the proceeding articulation. Also, the movement between each articulation displays a straighter path than in the plural sign CHILDREN. This kind of articulation implies a spatial relationship among the referents that the plural sign CHILDREN does not have, and the number of articulations of the singular sign CHILD directly corresponds to the number of referents to which the signer is referring. By contrast, the plural sign CHILDREN refers to an indefinite plurality of children. Thus, the repetition in the plural sign CHILDREN is not iconic because the sign can be used to represent any number of children, not

just three.

### **3.1.2 Simple Reduplication**

To complete simple reduplication, a signer articulates the sign as she would in the singular form of the sign. Then she articulates this form twice more in the same location, for a total of three articulations of the sign. Midsagittal nouns are a more phonologically restrictive class than lateral nouns—sideward reduplication is not available to this class. Instead, midsagittal nouns adopt the reduced form of reduplication, i.e. simple reduplication. In simple reduplication, no additional motion is implied to the articulation of this plural, as it is with sideward reduplication. It can be conceptualized as three articulations of the same sign in quick succession.

For example, the midsagittal noun BOOK follows this pluralization pattern (see Fig. 5 for the singular). In the plural sign BOOK, the signer's hands remain at chest level throughout the articulation. The signer produces the sign three times by opening and closing his palms three times. This articulation often takes on a reduced form, in which the palms do not rotate quite as far out as they would in the singular form. Normally, when the hands are both at the most outward extreme of their rotational trajectories, the palms are at right angles with respect to one other. In the reduced form of the plural, the angle formed by the two palms can be as much as half that.

### **3.1.3 Zero-Marking**

The final plural marking strategy available in DGS is exhibited by two of the four original classes of nouns: body-anchored nouns and nouns with complex movement. Note the two classes that restrict the realization of underlying reduplication in the plural form are also the two most phonologically complex noun classes of the original four. For these two classes of

nouns, both sideward and simple reduplication are ungrammatical. The singular and plural forms of nouns belonging to these classes are produced identically. The patterning of reduplication among the four noun classes suggests that certain phonological characteristics block the realization of the plural form, namely, body-anchoredness and complex movement (repeating, circular, and alternating path movement).

The fifth class of nouns that I propose, compound signs, also displays zero marking in the plural form. Compound signs, as nouns made up of two component signs, are inherently more phonologically complex than either lateral or midsagittal nouns. Therefore, it is not surprising that they display zero marking in the plural. Whether these nouns are equally complex or more complex than body-anchored nouns and nouns with complex movement is not so clear.

Compound signs like STEEPLE, for example, which are made up of two phonologically less complex nouns to form, as a whole, a phonologically complex sign might be at a similar level of complexity as body-anchored nouns and nouns with complex movement, but compound signs that involve at least one constitutive sign that is phonologically complex, i.e. a body-anchored sign or a sign with complex movement, might not be. Either way, compound nouns tend to display zero-marking in the plural, regardless of the phonological characteristics of the nouns that compose it.

### **3.1.4 Summary**

The following is a chart of the pluralization patterns of all five noun classes.

Noun class	Internal plural
Lateral	Sideward reduplication
Midsagittal	Simple reduplication
Body-anchored	Zero marking
Complex movement	Zero marking
Compound noun	Zero marking

Figure 20. Noun classes and their pluralization

The three realizations of the plural marker, sideward reduplication, simple reduplication, and zero-marking are phonological allomorphs for several reasons. First, they pattern consistently with the phonological noun classes outlined in section 2, suggesting that these realizations are triggered phonologically. Second, sideward reduplication and simple reduplication express the same semantic information, suggesting that they are variant forms of the same morpheme. Though the same cannot be said for zero-marking since it does not display any overt realization of the plural marker, the patterning of one alternative pluralization strategy, classifier constructions, which are discussed in section 3.2.1, provides further evidence for the hypothesis that zero-marking is also an allomorph of the same morpheme as sideward reduplication and simple reduplication.

### 3.2 Alternative Strategies for Expressing Plurality in DGS

Although direct realization of the plural marker in body-anchored signs, signs with complex movement, and compound signs is not licensed in DGS, alternative strategies for expressing plurality in reference to these kinds of nouns are available. According to Pfau and Steinbach (2005), the two most prevalent strategies are classifier constructions and spatial

localization.

### 3.2.1 Classifier Constructions

Many if not all sign languages make use of classifier constructions. In sign languages, classifiers are handshapes that can be used to represent a noun in the signing space (Sandler and Lillo-Martin 2006). According to Sandler and Lillo-Martin, they display characteristics of the sign or the referent that the sign represents. Once a signer has articulated a particular sign, he or she can then use a classifier construction to represent how that person or thing moves, what he, she, or it looks like, and/or where the referent is located in space. A classifier cannot represent a sign that has not already been introduced into the discourse (Keller 1998). The morphological composition of classifier constructions is not arbitrary but meaning-bearing; the form and function of the classifier varies according to what object or action it is meant to represent (Supalla 1994).

Classifier constructions tend to represent the most visually salient characteristics of the objects they are meant to represent, like flatness or roundness, orientation in space, and characteristic movements or actions of that object (Hong 2008). Accordingly, no one classifier can represent all referents in DGS. Each type of classifier has a group of nouns that it could potentially represent, while all other nouns are excluded from representation by that classifier.

In DGS, classifier constructions are unlike numeral classifiers for several reasons. Numeral classification is the marking of a number of entities by combining a number or quantifier with a noun that is countable (Pfau and Steinbach 2006). For example, two numeral classifier constructions can be seen in (21).

- (21) a. TWELVE BOOK  
 b. MANY BOOK  
 c. THREE BOOK CL<sub>flat</sub>>+>+  
 d. BOOKS CL<sub>flat</sub>>+>+

As 21a and 21b illustrate and Pfau and Steinbach assert, DGS does not have NP-internal number agreement. The introduction of a numeral or a quantifier blocks the realization of the plural marker on the midsagittal noun BOOK; however, as these authors also note, numerals do not affect the reduplication of the classifier, as seen in 21c. In 21c, the notation  $CL_{flat}>+>+$  is used to represent the reduplicated plural classifier that represents flat referents. Since the reduplication of the classifier is not blocked, it seems that the classifier is not part of the NP. Furthermore, as shown in 21d, classifiers are not only external to the NP of the nominal sign to which they attach, they also do not form a NumP with nominal signs, for in 21d, the realization of the internal plural on BOOKS is not blocked by the reduplicated classifier  $CL_{flat}>+>+$ . Thus, classifier constructions clearly fulfill a syntactic function that is different from that of numeral classifiers.

With this discussion, it is important to note that the classifier construction can be used in combination with any of the five noun classes. It is not confined to the set of nouns for which overt realization of the plural marker is blocked, and therefore it is not used for the sole purpose of expressing plurality where the overt realization of plurality is blocked. Example 21 shows that the midsagittal noun BOOK can be used in conjunction with classifier constructions even though it already displays the internal plural marker.

Supalla divides the set of classifiers in American Sign Language (ASL) into two categories: size-and-shape specifiers (SASSes) and “semantic” classifiers. SASS constructions represent a referent by mimicking its physically most salient characteristics. SASSes represent the physical dimensions of their referents in two ways: by moving the articulators to trace the outline of an object or by arranging the hand into a configuration that is physically reminiscent of the referent. Semantic classifiers represent the whole entity of the referent they are meant to represent, rather than just parts of it (Supalla 1982). For this reason, semantic classifiers are

sometimes referred to as ‘whole entity classifiers’. I have adapted his classification system for DGS because it seems to describe the data I have seen well.

An example of a semantic classifier is the classifier for human or person arguments, the Personal Agreement Marker (PAM). PAM in sign languages is a morpheme that can be used to represent the whole category of lexical referents that denote human entities (Herrmann 2010). In DGS, this marker appears to have been grammaticalized from the noun PERSON (Fig. 22).

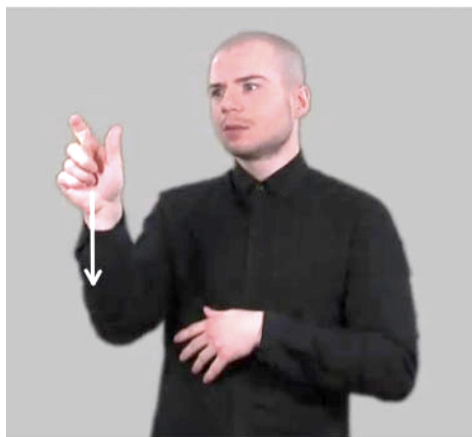


Figure 22. Personal Agreement Marker (PAM)

It also patterns similarly to the other whole entity classifiers, and the patterns emphasized within the paradigm of the PAM construction can be applied to the remaining whole entity classifiers in DGS. PAM is articulated with a handshape in which the index finger and thumb are selected and slightly bent. This handshape is moved vertically downwards to the upper abdomen level to complete the sign. To use PAM in a plural construction, a signer first articulates the base noun. Then, he articulates PAM a certain number of times, according to how many referents are being represented. For example, to articulate *three men* using a PAM construction, a signer would first articulate the citation form for the singular sign MAN then follow this sign with three articulations of PAM.

In the case above, PAM is referring to three definite entities, so internal pauses



occur between each successive articulation of PAM. At the bottom-most point of the motion that defines each singular articulation of PAM, the signer pauses slightly before continuing on to the next repetition of PAM. Accordingly, the path movement between each articulation is not arced like the path movement internal to the articulation of the laterally reduplicated plural marker (see section 3.1.1). In this instance, the path movement between articulations of PAM is more or less straight (Fig. 23).



Figure 23. PAM, disjoint reduplication

In the example above, each articulation of PAM refers to a particular man in the phrase *three men*, so in this respect, the classifier construction behaves like a conjunctive phrase. While the articulation of the internal plural marker (i.e. sideward reduplication or simple reduplication) represents the plurality of referents as a group, one individual in this construction is represented by each successive articulation of PAM. In turn, each PAM morpheme is connected to the same base nominal sign, so the three individuals are connected to one another conjunctively.

However, I assert that PAM can also be used to express an indefinite plurality of referents. PAM has the lateral characteristic; it is similar to the class of lateral nouns in that it is articulated in the lateral signing space, so it can undergo sideward reduplication. For example, to articulate *men* using PAM, a signer would articulate the singular sign MAN, followed by the laterally reduplicated form of PAM. In this instance, the reduplicated PAM is articulated in one fluid motion. There are no internal pauses between each successive articulation of the singular sign PAM, and the path movements between each articulation are arced, similar to the path movement

internal to the articulation of the laterally reduplicated plural marker (Fig. 24).



Figure 24. Laterally Reduplicated PAM

At the same time, this reduplicated PAM morpheme is not as restrained in its pluralization as nominal signs because it can reduplicate a greater or lesser number of times than the prescribed triplication of nominal signs. In fact, the number of times PAM is articulated within this paradigm is used productively. If a signer wishes to emphasize the fact that the number of referents being represented is large, she might articulate PAM four or five times (Fig. 25).

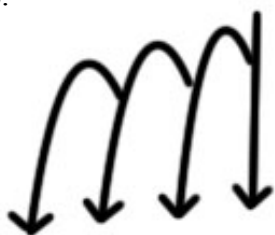


Figure 25. Large plurality of referents represented by PAM

Therefore, one might argue that this PAM can reduplicate freely, since it does not seem to be constrained by the same kind of phonological constraints that govern the internal plural marker.

Classifier constructions add another semantic component to the meaning of a nominal plural (Pfau and Steinbach 2005). According to Pfau and Steinbach, classifier constructions necessarily imply a spatial relationship among the referents they represent. For example, if a signer reduplicates PAM in a motion similar to sideward reduplication, signing each articulation of PAM next to the previous one by moving laterally away from the body, this implies that the signer is referring to three people who are standing next to one another. Accordingly, if a signer

signs two articulations of PAM in close proximity to each other, while a third is signed further away from the first two, the signer is referring to two people who are standing close together and one person who is standing across the room.

Pfau and Steinbach assert that classifier constructions necessarily imply this spatial relationship among their referents. I maintain that classifiers can alternatively assert a propositional relationship among referents. In the example above, in which the signer articulates PAM twice in close proximity to each other and once further away from the first two, the signer might be establishing a spatial relationship among his referents. He also might be setting up a situation in which the two referents who have been assigned spatial proximity will be referred to as a pair or group within the forthcoming discourse, whereas the third referent will be referred to as an individual. In both cases, the classifier construction provides additional semantic information that is not present in an internal plural.

At the same time, I assert that the reduplicated PAM morpheme described by Fig. 24 and 24 can refer to a general plurality of referents. As shown by Fig. 23 and 24, this reduplicated PAM morpheme is distinct from the disjointed reduplication of PAM. The reduplicated PAM morpheme displays a more fluid path movement than the disjointed reduplication of PAM. The signer transitions quickly from each articulation of PAM to the next, in a motion that is very similar to the transitions among reduplications of a nominal sign in sideward reduplication. In the data analyzed for this work, whenever the reduplicated PAM morpheme appeared, characterized by this fluid motion, the individuals designated in that phrase were always referred to as a group. Furthermore, the number of articulations of the PAM handshape did not necessarily correspond to the number of referents designated, and no special spatial relationship among these referents seemed to be implied.

I assert that classifier constructions can theoretically be used in conjunction with any of the five noun classes. Classifier constructions are commonly used in conjunction with the noun classes that display zero marking: body-anchored nouns, nouns with complex movement, and compound nouns. This phenomenon would be expected, since these nouns cannot express the internal plural marker and bare nouns are seen very rarely if not never in DGS. Classifier constructions in conjunction with midsagittal nouns were also observed. In this case, the midsagittal noun would appear in its plural form, followed by the classifier construction. Interestingly, the reduplicated classifier morpheme that displays fluid transitions among articulations of the classifier was not observed with midsagittal nouns. Whenever a classifier construction was applied to a midsagittal noun, it was always the disjointed reduplication of that classifier. Finally, no lateral nouns were observed in conjunction with classifier constructions, though it might be possible. My consultants could not agree whether a lateral noun with a classifier would be grammatically acceptable.

### 3.2.2 Summary of Classifiers

The following is a table of all pluralization strategies available to the five noun classes.

Noun class	Internal plural marker	Reduplicated CL morpheme	Disjointed reduplication of CL
Lateral	Sideward reduplication		(√)
Midsagittal	Simple reduplication		√
Body-anchored	Zero marking	√	√
Complex movement	Zero marking	√	√
Compound	Zero marking	√	√

Figure 26. Full table of pluralization strategies

The fact that body-anchored signs, signs with complex movement, and compound signs, the

classes that display zero-marking of the internal plural marker, can be used in conjunction with the reduplicated classifier morpheme suggests that this classifier construction might be serving as a true replacement or alternative to the realization of the internal plural marker. Furthermore, since lateral nouns can rarely be used in conjunction with the disjointed reduplication of a classifier, if at all, whereas midsagittal nouns can be used in conjunction with the disjointed reduplication of a classifier, sideward reduplication might be the underlying form of the internal plural marker. This evidence suggests that where full realization of the plural marker is allowed, in lateral nouns, alternative pluralization strategies are rare. In the instance where this realization is partially blocked, midsagittal nouns, one classifier construction type is available, and where the realization is completely blocked, in the remaining three classes, both types of classifier constructions are available.

### **3.2.3 Spatial Localization**

Spatial localization is another construction that can be used to express plurality for nouns that cannot overtly express the plural marker (Pfau and Steinbach 2005). According to these authors, when a signer spatially localizes nouns, she signs them in different locations within the signing space. The orientation of each sign with respect to the others that have also been spatially localized mimics the orientation of the actual referents with respect to one another that the signer is describing.

A good example of this can be found in a story in which the signer is describing the spire of St. Michael's church in Hamburg. In the spire, there are three tiers of bells, with two bells per tier. The signer describes this spatial relationship of the six bells by using a spatial localization construction, as seen in Fig. 27.



Figure 27a. BELL, position 1



Figure 27b. BELL, position 2



Figure 27c. BELL, position 3

The citation form of the singular noun BELL is a one handed lateral noun. It exhibits a handshape in which all fingers are extended and slightly bent and the wrist is rotated forward, forming a sort of claw-like handshape. It is articulated at approximately chest height and contains a small internal movement: the wrist rotates left and right slightly, making the hand jiggle back and forth slightly. In the spatial localization construction, the primary and secondary articulator both represent a referent. This shows how spatial localization is different from the normal articulation of signs, in which only one articulator (the primary articulator) is licensed to represent the referent. The signer begins with the first tier of bells, which he represents at shoulder height with two articulations of BELL, one performed by the primary articulator, the other by the secondary (Fig. 27a). He then represents the second tier of bells with two articulations of BELL slightly higher up than the first tier at approximately nose level (Fig. 27b). Finally, he represents the third tier of bells with two articulations of BELL even higher up than the second tier at about eyebrow/forehead level (Fig. 27c).

Spatial localization is unique in that the signer is encoding two pieces of grammatical information that are usually presented linearly in a simultaneous manner. For example, in Figure 27a, the signer is referring to two bells simultaneously. When the signer articulates a spatially localized sign, he is not only introducing a referent into the propositional structure of the utterance, he is also assigning that referent a location in the signing space that corresponds to the

location of the actual referent with respect to other referents in proximity to it in reality. In classifier constructions, for example, a signer first introduces a referent into the propositional structure of the utterance by signing the nominal sign that represents it, then she localizes it with the classifier.

#### **4. Discussion**

DGS, like any other natural language, has to balance ease of articulation on the one hand with the clarity of that articulation on the other; on one side, there are representational constraints, and on the other there are computational restraints. This ease of articulation factor will be referred to as the economy constraint because it wants the signer to exert as little effort as possible to articulate any given sign. The clarity of the articulation factor will be referred to as the redundancy constraint because DGS, and other sign languages, sometimes maintain a degree of redundancy in certain constructions in order to make them visually distinguishable (Wilbur 2009).

With respect to nouns with complex movement, the demands for economy seem to have outweighed the need for visual saliency. If lateral reduplication is the underlying form of the plural marker, then nouns with complex are driven to reduplication in the plural, but, because of the phonological property complex movement, this reduplication is blocked. I propose that the reason for this phonological blocking has to do with the heavy load the reduplication of complex movement would place on production. For example, to reduplicate a sign like BICYCLE (Fig. 14), each articulator would have to complete six revolutions of the circular motion that that sign involves. The excessive amount of time it would take to articulate would outweigh the benefits of being visually distinct. Thus, nouns with complex movement are simply too complex to be reduplicated.

Compound nouns behave similarly because they are similarly complex. Since compound nouns are composed of at least two component nouns, reduplication of these signs would entail three articulations of each component sign, for a total of six articulations of these two signs. This is just as taxing on production as the reduplication of nouns with complex movement, so the realization of the reduplication is blocked.

However, body-anchored signs are a special case because they have the unique opportunity of referring to an object that is actually present, namely the body. Within this class, there are metonymic signs, such as WOMAN (Fig. 10), in which the signer represents an entity by referring to a characteristic part or action of that entity (Wilcox 2000). For example, in the sign WOMAN, a signer refers to a characteristic that many women share, earrings, to represent the whole entity 'woman'. To reduplicate WOMAN, a signer could articulate the citation form of the singular base noun, then reduplicate it by pinching the earlobe two more times, but this articulation runs the risk of being interpreted as an articulation of the plural form of the metonymic part. In this case, the reduplicated form of WOMAN is visually reminiscent of a plurality of its metonymic part, earrings (Wilcox 2000). Thus, if signs like WOMAN were reduplicated, their metonymic meaning might get lost.

However, even if the case of metonymic signs is put to one side, the visual salience of the body plays a big role in blocking the realization of the plural marker in body-anchored signs. If a body-anchored sign were reduplicated, the repetition of the sign on the body would emphasize this place of articulation (Wilcox 2000). Thus, the reduplication of the a body-anchored sign on the body does not serve to visually distinguish it. The visual saliency of the body trumps the linguistic arbitrariness of that place of articulation.

In DGS, when a person or object to which a signer wishes to refer is actually present, the



signer will refer to that entity by means of indexical pointing (Keller 1998); instead of using a sign or proper name to introduce the entity into the discourse, the signer will point to the physically present referent. This example shows the saliency of physical presence in sign language. Thus, body-anchored signs are intimately tied to their place of articulation, the body, and if that place of articulation is emphasized through reduplication of the sign, the meaning of the sign might lose salience next to the physically present body part that is being emphasized by this articulation.

With respect to classifier constructions, it has been demonstrated that the classifier handshape can be used in a variety of productive ways. It can be used to represent a definite number of referents, in which case the path movement between articulations of the classifier is disjoined by pauses, or it can be used to represent a more ambiguous number of referents, in which case the articulation of the reduplicated classifier is one continuous motion. Thus, nouns that display zero-marking in the plural have an alternative construction to the morphological plural marker that seems semantically almost identical to it.

With respect to lateral nouns and midsagittal nouns, something unexpected occurs. While the classifier can be used to represent a definite number of referents, it also can and is used to represent an indefinite plurality of referents. This is surprising because the overt realization of the morphological plural marker is not blocked to these nouns, so they already have a strategy available to them that allows them to pluralize in this kind of way. Furthermore, when this type of laterally reduplicated classifier is used in conjunction with a lateral noun or midsagittal noun, it blocks the realization of the morphological plural marker on that noun. Thus, in this instance, it seems that the classifier is replacing the function of the plural marker that is licensed to these nouns.

## 5. Conclusion

Classifier constructions serve not only as a replacement for underspecified nouns, like compound nouns, nouns with complex movement, and body-anchored nouns, but also can be used in conjunction with nouns that are already specified for the realization of the morphological plural marker in surprising ways. This analysis of how the classifier construction can be used to alternatively construct the plural has shed new light on the phonological properties of the nouns with which it is associated. It has revealed the flexibility of lateral nouns and midsagittal nouns to express indefinite plurality by means of the morphological plural marker or the laterally reduplicated classifier; however, further investigation on this subject still is needed to fully illuminate the matter.

## Appendix A: Terminology

**Agreement Verbs** are verbs in sign language that must agree with both their subject and object. To do so, a signer must assign both subject and object a location within the signing space. Then the verb uses motion to link the two together. In articulating the verb, the primary articulator (H1) either begins its motion at the location representing the subject and then moves to the location representing the object, or vice versa, in an agreement strategy known as **backwards agreement**.

**Classifiers** are difficult to define. In the classifier system, phonological properties (handshape, location, and movement) are not arbitrary but meaning-bearing. For example, the shape of **SASSes** describes the shape of the referent that they represent: round objects are represented by a classifier handshape with outstretched fingers that are slightly bent, cylindrical objects by a loose fist that looks like it is grasping a rod-like object, etc. **Whole entity classifiers** represent an entire referent. A construction built off of classifiers can span several intonational phrases and give rise to a sequence of predicates. In classifier constructions, the two hands are not subject to the H2 constraint, which means that both articulators may function independently of one another. Classifier constructions are both iconic, in that they spatially represent physical characteristics of their referents, and conventionalized, in that they are used systematically to represent objects in this way.

The **coarticulator** is the non-dominant hand (H2) when it is used to support the articulation of the dominant hand (H1). The coarticulator can mirror the movement of H1, or it can act as the place of articulation for H1. In the latter case, the coarticulator is the body-anchor for H1.

**Complex Movement** consists of circulating and/or repeated and/or alternating path movement of the dominant and non-dominant hands. Circulating movement implies one or both hands moving in a circular trajectory. Usually, the articulator(s) undergoes more than one revolution of circular movement. Repeated movement implies any type of path movement that is reduplicated at least once. Alternating movement occurs when H1 and H2 are undergoing the same motion, but unsynchronized. When H1 is at one extreme of the path movement, H2 is at the opposite extreme. Both single-handed and double-handed signs can exhibit complex movement.

**Internal Movement** is movement of the fingers of one hand during the articulation of a sign. The articulator might change handshapes, causing internal movement, or it can flutter the fingers slightly while maintaining the basic handshape. The wrist can also move within a sign, causing the orientation of the handshape to shift, which is also characterized as internal movement.

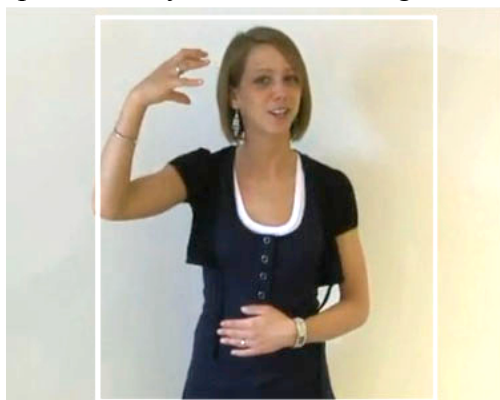
**Handshape** refers the way the fingers and palm are configured in relation to one another. Fingers can be outstretched, bent, or curled flush to the palm. **Hand orientation** refers to how the handshape is oriented in space. Due to the wrist's and elbow's rotational flexibility, a particular handshape can be oriented at all sorts of angles. To take a simple example, with the handshape where all fingers are outstretched and the palm is flat, the palm can be facing up or down, left or right, etc.

**Location** is the point within the signing space where a particular sign is articulated. If the

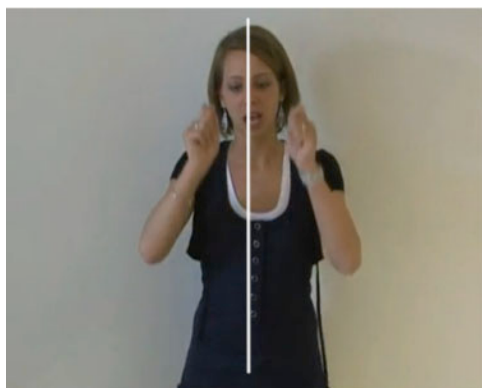
signing space were visualized as a 3-dimensional coordinate plane, the location would be the  $x$ ,  $y$ ,  $z$  coordinates where a particular sign is usually signed.

### Signing Space

The signing space is represented by a three-dimensional rectangle that starts at the top of a signer's head and extends down to mid-pelvis level. The lateral extremes extend either way about a foot away from the edge of the signer's body. It extends out away from the body into the space directly in front of the signer.



**Midsagittal Plane** is a plane of reflection that divides a signers body in half. It starts at the top of the head and extends down through the signer's body. It is also known as the  $z$ -plane.



**Mouthing** refers to the movements and configurations of the mouth of a signer that accompany her signing. Mouthings seem to correspond to the movements and configurations the mouth of a speaker of the corresponding spoken language would be making for the corresponding word for that concept in the spoken language. For example, the sign FRAU (woman) in DGS is accompanied by the mouthed spoken German word 'Frau'. These mouthings can be voiced or unvoiced. Mouthing is optional. Typically, mouthings in DGS are articulated without voice. Most nominal items in DGS have a mouthing element associated to the manual signed element, and when they are manifested, they are usually in a 1:1 relationship with nominal signs in terms of synchronization (Keller 192).

**Mouth Gestures** are mouth actions that accompany some signs, such as puffing of the cheeks, blowing, mouth closure, mouth squeezing. These generally do not correspond to a particular word in the corresponding spoken language; however, phonetic elements from that language may be employed for mouth gestures. For example, in DGS the sign EMPFORT-SEIN (to be angry) is

accompanied by the mouth gesture that looks like the spoken language utterance /ba/. Mouth gestures are restricted to a small subset of signs and they are obligatory to the articulation of these signs. Unlike mouthing, few of these signs have meaning if the mouth gesture element is removed. (Keller 193)

**Neutral Signing Space** is a subset of the signing space. It includes the area directly in front of the signer's body from approximately chest level to down to the lower abdomen. The lateral extremes of the neutral signing space are the edges of the signer's body.

**PAM Marker**, or Personal Agreement Marker, is a type of classifier that represents human referents.

**Primary Articulator (H1)** is (usually) a signer's dominant hand. The primary articulator communicates the primary linguistic information, except in the case of a classifier construction where the primary and secondary articulator (non-dominant hand) are acting independently of one another.

**Path Movement** is the motion an articulator undergoes as it passes from one location to another. **Simple Path Movement** occurs when the trajectory of this motion is either straight or slightly arced.

**Secondary Articulator (H2)** is (usually) a signer's non-dominant hand. It either repeats the information that the primary articulator is communicating, serves as a place of articulation, or plays no role at all in the articulation of the sign.

**Selected Fingers** are the fingers in a handshape that are extended. These fingers may be held straight out or bent. The fingers that are held flush to the palm are **unselected**.

## References

- Boyes Braem, Penny and Rachel Sutton-Spence (eds.). 2001. *The Hands are the Head of the Mouth: The Mouth as Articulator in Sign Languages*. Hamburg: Signum-Verlag.
- Boyes Braem, Penny and Christian Rathmann. 2001. Transmission of Sign Languages in Northern Europe. In: Diane Brentari (ed.): *Sign Languages*. New York: Cambridge University Press.
- Brentari, Diane. 1998. *A Prosodic Model of Sign Language Phonology*. Cambridge, MA: MIT Press.
- Conrad, R. 1977. Lip-Reading by Deaf and Hearing Children. In: *British Journal of Educational Psychology*. Vol. 47: 60-65. <http://onlinelibrary.wiley.com/doi/10.1111/j.2044.8279.1977.tb03001.x>.
- Emmorey, Karen. 2001. *Space on hand: The exploitation of signing space to illustrate abstract thought*. Cambridge, MA: MIT Press.
- Erting, Carol J., Robert C. Johnson, Dorothy L. Smith, Bruce D. Snider, (eds.). 1994. *The Deaf Way: Perspectives from the International Conference on Deaf Culture*. Washington, D.C.: Gallaudet University Press.
- Herrmann, Annika. 2010. The interaction of eye blinks and other prosodic cues in German Sign Language. In: *Sign Language and Linguistics*, Vol. 13, 1: 3-39.
- Hohenberger, Annette and Daniela Happ. 2001. *The linguistic primacy of signs and mouth gestures over mouthings: Evidence from language production in German Sign Language (DGS)*. In Boyes Braem and Sutton-Spence (eds.) 2001.
- Hong, Sung-Eun. 2008. Agreement Verbs in Korean Sign Language (KSL). In: R. M. de Quadros (ed.) *Sign Languages: spinning and unraveling the past, present and future. TISLR9, forty five papers and three posters from the 9th. Theoretical Issues in Sign Language Research Conference*, Florianopolis, Brazil. <http://www.editora-arara-azul.com.br/EstudosSurdos.php>.
- Johnson, Trevor. 2011. *Nouns and Verbs in Australian Sign Language: An Open and Shut Case*. Oxford: Oxford University Press.
- Keller, Jörg. 1998. *Aspekte der Raumnutzung in der Deutschen Gebärdensprache*. Hamburg: Signum-Verlag.
- Keller, Jörg. 2001. *Multimodal representations and the linguistic status of mouthings in German Sign Language (DGS)*. In Boyes Braem and Sutton-Spence (eds.) 2001.
- Klima, Edward S., and Ursula Bellugi. 1979. *The Signs of Language*. Cambridge, MA: Harvard University Press.

List, Gudula. 1994. *Sign Language Research in Germany*. In: Erting, Johnson, Smith, and Snider, (eds.) 1994.

List, Günther. 1994. *The Oralistic Tradition and Written History: Deaf People in German-Speaking Countries*. In: Erting, Johnson, Smith, and Snider (eds.) 1994.

Lewis, M. Paul (ed.) 2009. *Ethnologue: Languages of the World*, Sixteenth edition. Dallas, TX: SIL International.

Padden, Carol. 1990. The Relation between Space and Grammar in ASL Verb Morphology. 118-126. In: Ceil Lucas (ed.). *Sign Language Research: Theoretical Issues*. Washington, D.C.: Gallaudet University Press.

Pfau, Roland and Markus Steinbach. 2005. Plural Formation in German Sign Language: Constraints and Strategies. In Leuninger, Helen and Daniela Happ (eds.). *Gebärdensprachen: Struktur, Erwerb, Verwendung*. Linguistische Berichte Sonderheft 13. Hamburg: Helmut Buske Verlag.

Pfau, Roland and Markus Steinbach. 2006. Pluralization in Sign and Speech: A cross-modal typological study. In *Linguistic Typology*. Vol. 10, 2:135-82.  
<http://www.referenceglobal.com/doi/abs/10.1515/LINGTY.2006.006>

Sandler, Wendy and Diane Lillo-Martin. 2006. *Sign Language and Linguistic Universals*. Cambridge: Cambridge University Press.

Supalla, Ted. 1982. The classifier system in American Sign Language. In: Collette Craig (ed.). *Noun Classes and Categorization*. Philadelphia: John Benjamins. 181-214.

Wilbur, Ronnie B. 2009. Effects of Varying Rate of Signing on ASL Manual Signs and Nonmanual Markers. In *Language and Speech* Vol. 52, 245.

Wilcox, Phyllis Perrin. 2000. *Metaphor in American Sign Language*. Washington D.C.: Gallaudet University Press.

Zeinert, Heiko. 1994. *The Center for German Sign Language in Hamburg: Deaf People Doing Research on their Language with Video and Computers*. In: Erting, Johnson, Smith, and Snider 1994.