American Sign Language and the Universal Model of the Syllable

Hanan Hussein
## Contents

1 Introduction 2
2 Segmentation 3
3 Syllabification 4
4 Sonority 5
5 Current Syllable Models 6
  5.1 Liddell's Model 6
  5.2 Perlmutter's Model 7
  5.3 Brentari and Goldsmith's Model 9
6 The Model 11
  6.1 Nucleus 13
  6.2 Onset 14
  6.3 Coda 15
  6.4 Discussion 16
7 Conclusions 20

Appendix 21

Bibliography 27
1. Introduction

In spoken language, speech is divided into syllables. There are certain segments which are believed to be part of the universal syllable, and traits which go along with each of these segments. Is it possible that these universals hold for signed language as well?

In this paper, I will propose a model of the ASL syllable which follows this universal requirement of the syllable. There are existing models of the ASL syllable which either do not strictly follow the universal model of the syllable, or they ignore some of the distinguishing features of signing. For example, a model will be discussed later in which the behavior of the nondominant hand is not included in the syllable model. Is the nondominant hand not considered to be part of the ASL syllable even though it sometimes licenses distinguishing information of the sign? I will show not only how the nondominant hand’s behavior is part of the syllable, but also, how the nondominant hand’s behavior can be considered to be the coda of the signed syllable.

This paper is divided and organized in the following way. Section 2 describes what the distinguishing features of ASL are. Section 3 discusses further the universal requirements of syllabification and traits of syllable structure. Section 4 briefly discusses sonority of signed language as compared to spoken language because sonority plays an important role in syllabification. Section 5 describes some current models of the ASL syllable and discusses the inconsistencies I find with the other models. Section 6 presents and discusses the model of the ASL syllable in which I propose there are parts corresponding to the onset, nucleus, and coda of spoken language, and I conclude with section 7.
2. Segmentation

In spoken language, the segments which make up words are sounds known as phonemes. In signed language, however, there are no sounds so the segments which make up words are generally manual and thus perceived visually. There quite a few features of sign which when combined make up distinctive words.

There are four types of distinguishing parts of an ASL sign. These features are handshape, palm orientation, movement, and location (Baker-Shenk and Cokely, p.79). A single sign will be specified for each of these four parts which are known as the parameters of the sign (Baker-Shenk and Cokely, p.79).

The members of each of these four parameters are called primes. Each parameter has its own specified group of primes. According to the Dictionary of American Sign Language by Stokoe, Casterline, and Croneberg, there are 18 or 19 hand shape primes, 24 movement primes, and 12 location primes (Baker-Shenk and Cokely, p.79). When discussing the syllable structure of ASL, we will keep in mind these distinguishing features of ASL and decide how they fit together to form a syllable in ASL.
3. Syllabification

In order to construct a model of the syllable in ASL, we first need to understand what is considered to be the universal construction of a syllable. The syllable is thought to be the "...natural domain for the statement of many phonotactic constraints," (Kenstowicz, 1994:250) which is composed of phonological segments of a language.

Traditionally, the syllable has been broken down into three parts. These parts are the onset, the nucleus, and the coda. The onset and coda are generally optional while it is mandatory for the nucleus to appear in a syllable. So we would like to create a model of the syllable in ASL which has these three parts.

The nucleus of the syllable is the most sonorous, so, in spoken languages, the nucleus most often consists of a vowel. In the absence of a vowel, however, a consonant can become the nucleus of the syllable, or a schwa is added to create a vowel nucleus where one did not previously exist. An example in English where there is no vowel nucleus in a syllable is in the word rhythm which is disyllabic. The m in rhythm becomes the nucleus of its own syllable because there is a constraint in English which does not allow the consonant combination [ðm] in the coda of a syllable(Kenstowicz, 1994: 252).

This constraint is formally known as the *Sonority Sequencing Principle* (SSP) which restricts the creation of complex onsets and codas. SSP requires that the nucleus be of highest sonority in the syllable while the onset rises in sonority to the nucleus and the coda falls in sonority away from the nucleus (Kenstowicz, 1994:254).

It seems that in order to create a model for the syllable in ASL we need to keep in mind these universal traits of syllable structure. I will show that we can create a model of the ASL syllable in which there are three parts which correlate to the onset, the nucleus, and the coda of spoken language syllables.
4. Sonority in ASL

Since sonority is what defines the nucleus of the syllable in spoken language, we should establish some sort of sonority hierarchy for signed language also. According to Peter Ladefoged, noted phonetician, "The sonority of a sound is its loudness relative to that of other sounds with the same length, and pitch" (Ladefoged, 1993: 245).

Loudness in spoken language obviously pertains to sound and hearing, but in a signed language which is not based on sound, ‘loudness’ must pertain to something visually perceived instead. Therefore, we can define the sonority of a sign segment to be its ability to be seen or felt (in the case of blind signers) relative to other segments with the same length and force. If someone were to try to get the attention of someone else on the other side of a crowded room by waving at them, he or she would be more likely to use whole arm wave rather than a finger wiggling wave. This is because of the sonority of these movements. A movement made with the whole arm would be more sonorous than a movement made only with the fingers. Now that we have an understanding of sonority we should mention the hierarchy of sonority of segments of signed language. The following is an ASL sonority scale as shown by Juliette Blevins with example signs to show their relative sonority in ASL:

ASL Sonority Scale (Blevins, 1993)

Most Sonorous ----------------------------------------------- > Least Sonorous
path movement > nonstatic articulator > static articulator > location hold
FLY > UNDERSTAND > EAR > 1sg

In creating a model of the ASL syllable, sonority is very important since the Sonority Sequencing Principle governs the spoken language syllable, it should also govern the signed language syllable. In section 6 I will show that the signed language syllable does, in fact, follow this principle.

---

1 All signs which are mentioned in this paper appear in section 8, the appendix.
5. Syllable Models

There are a few different models of the ASL syllable which I would like to discuss. There are a few which are similar in that they break down the parts of the syllable into some sort of position segment and a movement segment.

5.1 Liddell’s Model

One such model is Liddell’s Movement Hold model of ASL syllabification. In this model, the movement (M) and hold (H) segments of the sign are what defines a syllable. In this model, a movement is defined to be "...a segment during which some aspect of the articulation is in transition" (Liddell, 1993: 193), and a hold is "... a segment during which all aspects of the articulation are in a steady state" (Liddell, 1993:193). This definition of hold is a bit problematic because the idea of “steady state” would imply that there is a measurable period of time in which this “steady state” occurs. It seems, however, that in ASL, this period of time does not exist, and because of this inconsistency, holds are often allowed to be deleted. Since the hold segments are where handshape is attached and can spread to neighboring movement segments, when a hold is deleted, the handshape specified on that hold would not be lost. An example of this deletion is the sequence of words GOOD IDEA. GOOD would have the structure HMH, and IDEA would also have the structure HMH, but in sequence the signs would undergo a few transformations, namely M-epenthesis which inserts a M between “...two dissimilar feature bundles not already connected to an M” (Liddell, 1993: 193) and H-deletion which deletes an H segment when it occurs between two M’s). So the underlying form of GOOD IDEA would be HMHHMH. After undergoing M-epenthesis, it would become HMMHMHMH, and after undergoing H-deletion, it would become HMMMMH (Liddell, 1993: 193).

It seems to me, however, that measurable holds occur so infrequently in signed speech, that H is not a distinctive enough feature to make it worthwhile to reassign to surrounding segments all of the features associated with H.
5.2 Perlmutter’s Model

Another model is that of David Perlmutter (1993). Perlmutter, instead of using holds, assumes that the parts of the ASL syllable are position of articulation (P) and path movement (M). The nucleus of Perlmutter’s syllable is the movement since the movement segment is more sonorous than the position segment.

Perlmutter’s syllable model is attempting to create a way in which the P and M segments of ASL can directly correspond to the consonant and vowel segments of spoken language syllables. P would be analogous to C and M would be analogous to V. “This follows from their relative sonority - from the fact that they play analogous roles in the organization of the phonological string into syllables” (Perlmutter, 1993: 229). Thus, the possible ASL syllables under this analysis would be PMP, MP, PM, M, and P just as the possible syllables in spoken language are CVC, VC, CV, V, and C.

Examples of each of these syllable types are (Perlmutter, 1993:228):

(1) PMP: IMPROVE
(2) MP: SICK
(3) PM: TAKE-OFF
(4) M: FLY
(5) P: GERMANY

In Perlmutter’s argument, secondary movement such as finger wiggling and circling can occur on both P and M segments. But finger secondary movement is restricted as to when it can occur on a P segment and not restricted on M segments; secondary movement cannot occur on a P segment if the P is adjacent to an M.

Perlmutter’s analysis of syllable structure takes into account this restriction of secondary movement. So the possible syllables are:
So, in reality, secondary movement is only possible on a P segment when P makes up the whole syllable. To account for this phenomenon, Perlmutter posits the following rules (Perlmutter, 1993: 235-6):

(11) Secondary movement features can only occur on the nucleus of a syllable.

(12) a. An M is always a syllable nucleus.

     b. A P can be the nucleus of a syllable only if it is not adjacent to an M.

This analysis actually correlates very nicely to spoken language syllabification. The P with a secondary movement is analogous to a syllabified consonant in a spoken language which functions as the nucleus of a syllable. “The fact that a P can be a syllable nucleus only if not adjacent to an M is then explained in exactly the same way as the fact that in oral languages a consonant can be a syllable nucleus only if not adjacent to a vowel.” (Perlmutter, 1993:237).

Perlmutter’s analysis accounts for handshape changes with the same reasoning it used to account for secondary movement in ASL syllables. Handshape changes only occur on P segments when P is not adjacent to an M in the syllable, therefore handshape changes also only occur on the nucleus of the syllable.

Perlmutter’s analysis seems to be very neat and concise, but it seems to only account for the dominant hand’s behavior throughout a sign. How does Perlmutter’s analysis account for the nondominant hand? Is the nondominant hand not considered to be
part of the ASL syllable? In my analysis of the ASL syllable, I will account for the presence of the nondominant hand in many ASL signs and incorporate its behavior into the structure of the syllable.

5.3 Brentari and Goldsmith’s Model

The third syllable model which I would like to discuss is that of Diane Brentari and John Goldsmith (1993). In this model Brentari and Goldsmith attempt to correlate the function of the nondominant hand in ASL to the function of the coda in spoken language, but their model of the syllable does not follow the structure of the universal model of the syllable in that their syllable does not consist of an onset, a nucleus, and a coda like spoken language syllables.

There are two main constraints which govern Brentari and Goldsmith’s model of the syllable. They are Selected Finger Restriction and Path Restriction. Selected Finger Restriction allows only one set of selected fingers to occur in a syllable and Path Restriction allows only one path movement to occur in a single syllable (Brentari and Goldsmith, 1993). Therefore, the model of the syllable which results when these constraints are followed consists mainly of a single path movement and a single handshape, but I think a single handshape may include an opening or closing of the original handshape.

Some important points made by Brentari and Goldsmith show that features licensed by the nondominant hand are severely restricted. The nondominant hand cannot specify an independent path movement and place of articulation; these features are specified by the dominant hand. Also, the handshapes which can be licensed by the nondominant hand are restricted to B, A, S, C, O, 1, and 5 (Brentari and Goldsmith, 1993: 28).

Brentari and Goldsmith divide their syllable into three feature categories. These three categories are place, secondary movement, and armshape, and they point out that “All (or virtually all) of these features are realized on H1 [dominant hand].” (Brentari and Goldsmith, 1993: 32). They divide their syllable into two tiers: the dominant tier, and the
non-dominant tier. If something is present on the nondominant tier its handshape will be one of the seven handshapes allowed by the nondominant hand, or it will be a copy of the handshape of the dominant hand. As far as other features, such as place or secondary movement, are concerned, Brentari and Goldsmith claim that those features exist on the dominant hand tier and may be linked to the non-dominant hand.

Brentari and Goldsmith would like to call the nondominant hand a secondary licenser, but they shy away from allowing the nondominant hand to be considered the coda of the ASL syllable. They go so far as to say “On the one hand, if H2 [nondominant hand] is in some ways like a syllable coda, as we have suggested, we might expect that each syllable would bring with it the possibility of an independently specified H2 handshape, chosen from the seven possible handshapes of H2. This, as we have said, is empirically not correct.” (Brentari and Goldsmith, 1993: 34)

I disagree with this assertion. Brentari and Goldsmith seem to feel that the nondominant hand does not specify its own handshape. The nondominant hand does, in fact, bring its own information into the sign. In section 6 we will explore examples and the implications of signs in which the nondominant hand does bring independent information into the sign.
6. The Model

The model I propose for the ASL syllable incorporates into the structure movement, both path and secondary, handshape, the nondominant hand, and the universal model of the syllable consisting of an onset, a nucleus, and a coda.

First, let’s consider how the nondominant hand plays a role in previous ASL syllable models. In order to look at this role, we should examine the ROCKET where “The downturned right “R” hand is place so that its index and middle fingers rest on the back of the downturned left “S” hand. The right hand moves quickly forward off the left hand. The “R” hand may also point up and move off the left hand from this position” (Sternberg, 1981:459).

If we use Perlmutter’s analysis of the syllable, the S shape of the nondominant hand would not even be considered, and Brentari and Goldsmith’s model claims that the nondominant hand cannot independently specify a handshape. In ROCKET, we can see that the handshape of the nondominant hand is not determined by the handshape of the dominant hand.

In the following table there are more examples of signs in which the nondominant hand specifies its own handshape. The table indicates the handshape of both the dominant and the nondominant hands. These examples further prove that the nondominant hand can specify a handshape independent of the handshape of the dominant hand.
Now let us examine how secondary movement plays in a role in syllable construction, and how the previous models account for secondary movement. There are a couple of types of secondary movement to be considered. They are general finger motion such as wiggling or circling and opening or closing of the fingers.

I support Perlmutter’s analysis that secondary movement such as finger wiggling allows a sign with no path movement to be a syllable because it allows a lone position or handshape to become syllabified (GERMANY), but how does finger wiggling fit into the syllable when there is a path movement and thus a viable syllable without the secondary motion (SNOW)? This too will be discussed later in this section.

Finally I would like to discuss how the ASL syllable can follow the universal model of the syllable. Seeing that the nondominant hand’s participation in the formation of a sign can be independent in some ways from the dominant hand’s participation, I would like to propose that the nondominant hand functions here like a coda of spoken language syllables. There will be a more detailed discussion later in this section of why the nondominant hand’s behavior can be considered to be the coda of the ASL syllable, but if we consider the nondominant hand’s function as the coda of the syllable, the segments included in our

<table>
<thead>
<tr>
<th>Sign</th>
<th>Dominant</th>
<th>Nondominant</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABUNDANCE</td>
<td>5</td>
<td>S</td>
</tr>
<tr>
<td>WEEK</td>
<td>D</td>
<td>B/5</td>
</tr>
<tr>
<td>AROUND</td>
<td>G</td>
<td>O (flattened)</td>
</tr>
<tr>
<td>HERMIT CRAB</td>
<td>5</td>
<td>V</td>
</tr>
<tr>
<td>INK</td>
<td>I</td>
<td>O</td>
</tr>
<tr>
<td>LEAF</td>
<td>Q</td>
<td>5</td>
</tr>
<tr>
<td>BULLSHIT</td>
<td>O \to S</td>
<td>Y</td>
</tr>
<tr>
<td>SWEAR</td>
<td>Y</td>
<td>G</td>
</tr>
<tr>
<td>WORLD</td>
<td>W</td>
<td>S</td>
</tr>
<tr>
<td>INSULT</td>
<td>G</td>
<td>V</td>
</tr>
</tbody>
</table>
model of the syllable would be the same segments required in the syllable by the universal model of the syllable.

We know following the universal model for the syllable would require that the syllable consist of an onset, a nucleus, and a coda. In spoken languages, these three parts of the syllable occur linearly, but signed language is not linear like spoken languages, so the model I propose, does follow the universal model in that the syllable is made up of an onset, a nucleus, and a coda, but it does not follow the universal model in that they do not occur in a strictly linear manner. So I am proposing that although the ASL syllable does not follow the model in linearity, it follows the model because it contains corresponding parts.

Another aspect of the universal syllable model is the Sonority Sequencing Principle which requires that the nucleus of the syllable is the most sonorous part, with the onset rising in sonority towards the nucleus and the coda falling in sonority from the nucleus (Kenstowicz, 1994: 252). So we need to keep this principle in mind when discussing the model of the ASL syllable.

Next, we should establish what information in a sign is crucial to the definition of the syllable. Like the models discussed previously, I would like to include path movement and handshape. This model of the ASL syllable should include both movement of the dominant and nondominant hands, and handshape of both the dominant and the nondominant hands. Also, this model of the ASL syllable will include secondary movement such as wiggling, circling, opening, or closing, as a feature which can help define a syllable.

6.1 The Nucleus

This model is not unlike that of Brentari and Goldsmith (1993) in that the skeleton of a basic single syllable consists of one handshape accompanied by one path movement. Since the path movement segment of the syllable is the most sonorous part of this skeleton,
I support Perlmutter's claim that movement forms the nucleus of the syllable. I would like to expand on that claim in that I would like to include secondary movement in the nucleus of a syllable. So the nucleus of an ASL syllable would be composed of one distinct path movement and possibly a secondary movement. An example of a sign in which the nucleus is simply a path movement is FLY, and an example where the nucleus is composed of both a path movement and a secondary movement is SNOW.

When I refer to path movement, this includes the path movement of the nondominant hand in addition to the dominant hand, so a two handed sign such as CONTRIBUTE would have only one path movement since both the dominant and nondominant hand have the same path movement. We should also discuss the path movement on signs such as JUDGE where the dominant and the nondominant hands do not have identical path movements but have opposite or mirrored movement. I would like to posit that when the path movement of the nondominant hands is a reflection of the movement of the dominant hand, there is still considered to be only one path movement. Therefore, JUDGE would have only one path movement.

6.2 The Onset

Now that we have established what makes up the nucleus of an ASL syllable, we need to decide what the onset and the coda are made up of. Since we have already accounted for the path movement and secondary movement in an ASL syllable, we have handshape and the features of the nondominant hand to account for.

I would like to posit that the onset of the ASL syllable is composed of the handshape of the dominant hand. If we consider the handshape of the dominant hand to be the onset of the syllable, this is consistent with the idea that the independent handshape of the nondominant hand could form the coda of an ASL syllable. So in this model both the onset and the coda would be formed with the same type of segment much in the way that spoken languages have the onset and the coda as the same type of segment.
In SNOW, the onset would be a 5 handshape. We should take note of the fact that the dominant hand and the nondominant hand both perform the same handshape. In the same way that identical path movement of the nondominant hand was not counted as a separate path movement, I would like to posit that identical handshape of the nondominant hand to the dominant hand is not considered to be an independent handshape.

We can see that with this interpretation, the onset and the nucleus are certainly not linearly associated like in spoken language. The handshape is often held throughout the path movement, so the onset actually co-occurs with the nucleus and the coda.

Since we have accounted for handshape, path movement, and secondary movement, we have accounted for all the parts of SNOW, so, we can see that SNOW would be composed of only one syllable, a syllable with only an onset and a nucleus like a CV syllable in spoken language.

So we have accounted for handshape of the dominant hand and handshape of the nondominant hand when it is identical to that of the dominant hand. We will account for the handshape of the nondominant hand when it is independent from the dominant hand in the coda of our syllable, but first I would like to give examples of more signed syllables which are composed of an onset and a nucleus.

Signed syllables composed of an onset and a nucleus:

<table>
<thead>
<tr>
<th>One handed examples</th>
<th>Two handed examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. FLY</td>
<td>aa. PERSON</td>
</tr>
<tr>
<td>b. PLEASE</td>
<td>bb. PERMISSION</td>
</tr>
<tr>
<td>c. UNDERSTAND</td>
<td>cc. FAT</td>
</tr>
</tbody>
</table>

6.3 The Coda

Now, let's consider the behavior of the nondominant hand. The nondominant hand, as we have seen, often copies the path movement of the dominant hand or copies the handshape of the dominant hand (Brentari & Goldsmith, p. 30), but in some instances, it
can have its own handshape. The handshapes possible for the nondominant hand to take on are limited. The possible handshapes for the nondominant hand are B, A, S, C, O, 1, 5 (Brentari & Goldsmith, p. 30), but there are a few examples (HERMIT CRAB, INSULT) in which the handshape of the nondominant hand is V, so perhaps there are a few more possibilities for the handshape of the nondominant hand. Since the phonemes allowed in the coda of spoken languages are often limited, the restriction of the nondominant hand's handshape is not problematic if we would like to consider the nondominant hand responsible for the coda in an ASL syllable. So I would like to go ahead and claim that the handshape of the nondominant hand forms the coda of an ASL syllable.

Brentari and Goldsmith claim that the nondominant hand cannot be like a coda in spoken language because it cannot license its own independent handshape (Brentari & Goldsmith, p. 34). This, however, is not correct as we have seen in ROCKET and other examples where the nondominant hand and the dominant each had a distinct handshape. So the nondominant hand’s handshape can form the coda of the ASL syllable.

6.4 Discussion

Now let's look at some examples of signs to see how they would be syllabified. First let's examine SODA POP. The first syllable of SODA POP is composed of one downward path movement, a dominant handshape (F), and a nondominant handshape (O). So the F handshape would be the onset, the path movement would be the nucleus, and the O handshape would be the coda of this syllable. But this sign has another part with a new dominant handshape and another path movement. The new dominant handshape is 5 which came about by opening the original F handshape. This opening movement should be considered as a secondary movement, but is it a secondary movement in the first syllable or the second?

The second syllable is therefore made up of a path movement, a dominant handshape (5), and a nondominant handshape (O). So SODA POP consists of two ASL
syllables each containing an onset, a nucleus, and a coda. The syllabification of SODA POP is similar to that of carpet in English in that they both are disyllabic with two onsets, two nuclei, and two codas.

Now, let's examine LAWYER which is composed of the LAW and PERSON in the ending form. LAW itself is a two handed sign in which the handshape of the dominant hand is an L, the handshape of the nondominant hand is a 5, and the dominant hand follows a path movement along the surface of the nondominant hand. So LAW, which forms the first syllable in LAWYER is composed of all three possible parts of the syllable. The L handshape of the dominant hand is the onset, the path movement is the nucleus, and the 5 handshape of the nondominant hand is the coda. The second syllable which is made up of the PERSON ending consists of a B handshape on both hands and a downward path movement. Thus the PERSON ending consists of an onset and a nucleus. So LAWYER which is disyllabic is, in syllable structure, much like the word party in English.

So I have established a model of the ASL syllable which follows the universal model of the syllable in that the ASL syllable is in fact composed of an onset, a nucleus, and a coda. The onset and the coda are both the same type of feature just as the onset and the coda in spoken language syllables are the same type of segment, and the nucleus of the syllable is the most sonorous part of the syllable just like the nucleus of the spoken language syllable.

We should note, however, that the syllables possible in ASL are slightly more restricted than those in English. In English, we can have a syllable consisting only of a nucleus, but in ASL we are required to have some sort of handshape, so a nucleus-only syllable is not possible in ASL. This is not problematic for our universal syllable structure, since spoken languages vary as to which syllables, of the universally accepted syllables, are acceptable to the individual language.

So far, we have a working model of the ASL syllable. We have not, however, discussed the Sonority Sequencing Principle and whether or not our model follows this
principle. I would have to say that the Sonority Sequencing Principle does, in fact, hold for this model. The nucleus where all movement is considered to take place is certainly the most sonorous part of the syllable, and the onset and coda which are only comprised of a handshape are not as sonorous. So our model strictly follows the implications of this principle.

The main difference between our model of the ASL syllable and the universal model of the syllable is in linearity. Our model, unlike the spoken language syllable, is not linearly constructed. When dealing with signed language, however, we need to take into account how the crucial information in speech is being received by the listener and how it is being created by the speaker. The listener in signed language is visually absorbing the information contained in the signs, while the listener in spoken language receives the crucial information in speech from hearing and the speaker obviously creates the sounds in his or her mouth.

If we consider the simple mechanics involved for the speaker of each of these languages, we will see why there is a difference in how language in each of the two types of language is articulated. It is possible for the speaker to hold the handshape of the onset into the nucleus of the syllable, but it is not physically possible for the speaker of a spoken language to articulate two unique segments simultaneously. Similarly, it is possible for the listener of signed language to see these overlapping segments and be able to absorb all the information given by these segments. On the other hand, it would not be possible for the listener of spoken language to discern the elements of the spoken syllable if they all co-occurred.

In spoken language, however, the listener can hear and understand some features which do occur simultaneously, such as nasalization of a vowel. The nasal feature, and the features of the vowel occur simultaneously, and are both received by the listener. Signed languages benefit from the fact that it is the eyes perceiving the simultaneous movements
because the eyes are able to take in more than one thing at a time, and the signer is able to articulate simultaneous segments.

Given the fact that signed and spoken languages have this inherent difference, it makes sense that the model of the ASL syllable does not follow the universal model of the syllable as far as linearity is concerned. ASL has the added ability to have more than one segment articulated simultaneously, so the ASL syllable should take this into account, so my model does not follow the universal syllable model’s linearity specifications.
7. Conclusion

I have established a new model of the ASL syllable, but what is it about this model which is better than previous ones? It strikes me as odd that we spend so much time trying to fit ASL into the same framework in which spoken languages fit, and, yet, then when it is time to discuss syllable structure, the universal model is immediately disregarded because one aspect of ASL, the fact that sign formation is non-linear, does not fit into the universal model.

Since ASL is considered to be a language in the same way that English is considered to be a language, it should also follow the universal constraints for languages. My model of the ASL syllable has shown that the syllable in signed language can follow the universal model for syllable structure even though ASL is not a spoken language. I have shown that, although, the signed language syllable is not linear in the way the spoken language is, it can still be considered to follow the universal model's constraints on syllable structure, and, thus, it demonstrates the existence of language universals which are not restricted to spoken languages, but ones which hold for all types of languages.
8. Appendix


**ABUNDANCE** (o bùn' dans), n. (A full cup.) The left hand, in the "S" position, is held palm facing right. The right "5" hand, palm down, is brushed outward several times over the top of the left, indicating a wiping off of the top of a cup. *Cf. ABUNDANT, ADEQUATE, AMPLE, ENOUGH, PLENTY, SUBSTANTIAL, SUFFICIENT.*

**AROUND** 1 (a round'), adv. (Circling around.) The left hand, all fingers pointed up and touching, is encircled by the right index finger, pointing down and moving clockwise.

**BULLSHIT** 2, n., expletive. (The horns of a bull; the animal defecating.) The left downturned "Y" hand is held near the right shoulder. The closed left hand, positioned under the left elbow, opens suddenly into the "5" position. The movement may be repeated.

**CONTRIBUTE** (kon trīb' ĕt), v., -UTED, -UTING. (A giving of something.) Both "A" hands, with index fingers somewhat draped over the tips of the thumbs, are held palms facing in front of the chest. They are pivoted forward and down, in unison, from the wrists. *Cf. AWARD, GIFT, PRESENT 2.*

**EAR** (êr), n. (The natural sign.) The right index finger touches the right ear.

**FAT** 1 (fât), adj. (The swollen cheeks.) The cheeks are puffed out and the open "C" hands, positioned at either cheek, move away to their respective sides. *Cf. STOUT.*
FLY 1 (v.i.), FLEW, FLOWN, FLYING. (The wings of the airplane.) The "Y" hand, palm down and drawn up near the shoulder, moves forward, up and away from the body. Either hand may be used. Cf. AIRPLANE, PLANE 1.

FLY 2, v., n. (The wings and fuselage of the airplane.) The hand assumes the same position as in FLY 1, but the index finger is also extended, to represent the fuselage of the airplane. Either hand may be used, and the movement is the same as in FLY 1. Cf. PLANE 2.

Germany¹ n. (alternate sign) Related form: German n., adj.
[Represents the eagle on the German insignia] With the little-finger side of the right hand at the base of the thumb and index finger of the left hand, both palms angled in, wiggle the fingers of both hands with a repeated movement.

Germany² n. (alternate sign) Related form: German n., adj.
[Represents the eagle on the German insignia] Beginning with right hand holding the thumb of the left hand in front of the chest, both palms facing in, quickly flick the fingers of both hands outward, ending with hands.

GOOD ¹ (good), adj. (Tasting something, approving it, and offering it forward.) The fingertips of the right "S" hand are placed at the lips. The right hand then moves out and into a palm-up position on the upturned left palm. Cf. WELL 1.

HERMIT CRAB n. (The shape and function.) The downturned bent left "V" fingers creep forward as they pull the right hand, the shell, along.

11 (I), pron. (The letter "I," held to the chest.) The right "I" hand is held with its thumb edge to the chest and little finger pointing up.
idea n. A thought, conception, or notion occurring in the mind: Having this party was a good idea.

[Initialized sign similar to sign for invent] Move the extended right little finger from near the right temple, palm facing down, upward in a double arc.

Improve v. To make or become better: Try to improve your handwriting. The students' reading has improved. Related form: improvement n.

Hands seems to measure out an amount of improvement] Touch the little-finger side of the right open hand, palm facing back, first to the wrist and then near the crook of the extended left arm.

INK 1 (īŋk), n. (The letter "T"; dipping the pen and shaking off the excess ink.) The little finger of the right "T" hand is dipped into the hole formed by the left "O" hand, held thumb side up. The right hand then emerges and shakes off the imaginary ink from the little finger.

INSULT 1 (īn' sūlt; v. ĭn sūlt') -SULTED, SULTING. (A puncturing.) The right index finger is thrust quickly and deliberately between the index and middle fingers of the left "V" hand, which is held palm facing right.

JUDGE 1 (jūd), n., v. JUDGED, JUDGING. (The scales move up and down.) The two "F" hands, palms facing each other, move alternately up and down. Cf. CONSIDER 3, COURT, EVALUATE 1, IF, JUDGMENT, JUSTICE.

LAW (lā), n. (A series of LAWS as they appear on the printed page.) The upright right "L" hand, resting palm against palm on the upright left "S" hand, moves down in an arc a short distance, coming to rest on the base of the left palm. Cf. ATTORNEY, LAWYER, LEGAL.
LAWYER (lo' yar), n. The sign for LAW is made. The sign for INDIVIDUAL is then added: both hands, fingers together, are placed at either side of the chest and are moved down to waist level. Cf. ATTORNEY, LAW, LEGAL.

The sign for INDIVIDUAL is then added: both hands, fingers together, are placed at either side of the chest and are moved down to waist level. Cf. ATTORNEY, LAW, LEGAL.

PERMISSION 1 (par mish' an), n. (A permissive upswinging of the hands, as if giving in.) Both hands, palms facing and fingers pointing away from the body, are held at chest level, almost a foot apart. With an upward movement, using their wrists as pivots, the hands sweep up until the fingers point almost straight up. Cf. ALLOW, GRANT 1, LET, LET'S, LET US, MAY 3, PERMIT 1, TOLERATE 1.

PERMISSION 2, n. (The "P" hands are used.) The same sign as in PERMISSION 1 is used, except with the "P" hands. Cf. PERMIT 2.

PERSON (par' son), n. (The letter "P"; an individual is indicated.) The "P" hands, side by side, move straight down a short distance, as if outlining the sides of an unseen individual.

"PERSON" ENDING Both open hands, palms facing each other, move down the sides of the body, tracing its outline to the hips.

LEAF (lěf), n. The left "S" hand, palm out, is the tree. The right thumb and index finger trace the shape of a leaf from one of the outstretched left fingers.
PLEASE (plez), v., PLEASED, PLEASING. (A pleasurable feeling on the heart.) The open right hand is circled on the chest, over the heart. Cf. APPRECIATE, ENJOY, ENJOYMENT; GRATIFY 1, LIKE 3, PLEASURE, WILLING 2.

ROCKET (rŏk' ĭt), n. (A rocket takes off from its pad.) The downturned right “R” hand (for ROCKET) is placed so that its index and middle fingers rest on the back of the downturned left “S” hand. The right hand moves quickly forward off the left hand. The “R” hand may also point up and move off the left hand from this position.

SICK (sĭk), adj., adv. (The sick parts of the anatomy are indicated.) The right middle finger rests on the forehead, and its left counterpart is placed against the stomach. The signer assumes an expression of sadness or physical distress. Cf. DISEASE, ILL, ILLNESS.

SHOW^2 n., v. (alternate sign)

[Shows the movement of snow falling] Beginning with the fingers of both hands in front of each side of the chest, palms facing down, bring the hands slowly down in front of the body, wiggling the fingers as the hands move.

SODA POP n. (Corking a bottle.) The left “O” hand is held with thumb edge up, representing a bottle. The thumb and index finger of the right “S” hand represent a cork, and are inserted into the circle formed by the “O” hand. The palm of the open right hand then strikes down on the upturned edge of the “O” hand, as if forcing the cork into the bottle. Cf. POP 1, SODA WATER.

SWEAR 3, (sl.), v. (Curlicues, as one finds in cartoon-type swear words.) The right “Y” hand, palm down, pivots at the wrist along the left “G” hand, from the wrist to the tip of the finger. Cf. CURSE 3.
**take off** v. phrase. To begin flight: *The plane took off.*

[The hand shape represents an airplane taking off] With the thumb, index finger, and little finger of the right hand extended, move the right hand from resting on the left *open hand* held in front of the body, palm facing up, upward in a large arc, ending with the palm facing forward.

**UNDERSTAND 1** (dən' dər stænd'), v., -STOOD, -STANDING. (An awakening of the mind.) The right "S" hand is placed on the forehead, palm facing the body. The index finger suddenly flicks up into the "D" position.

**UNDERSTAND 2**. v. (See rationale for UNDERSTAND 1.) The curved index finger of the right hand, palm facing the body, is placed with the fingernail resting on the middle of the forehead. It suddenly flicks up into the "D" position. Cf. UNDERSTANDING, UNDERSTOOD.

**WEEK** (wék), n. The upright, right "D" hand is placed palm-to-palm against the left "S" hand, whose palm faces right. The right "D" hand moves along the left palm from base to fingertips.

**WORLD** (wɔːrd), n. (The letter "W" in orbit.) The right "W" hand makes a complete circle around the left "W" hand and comes to rest on the thumb edge of the left "W" hand. The left hand frequently assumes the "S" position instead of the "W," to represent the stationary sun. Cf. GLOBE 2.
Bibliography


