

Parts of speech in Russian Sign Language

The role of iconicity and economy

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In this paper, we present data that shed light on the parts of speech system of Russian Sign Language (RSL), in particular, the noun-verb distinction. An experimental study revealed that in RSL, specific phonological differences distinguish between nouns and verbs; these include differences in movement, handshape, orientation, location, and mouthing. The attested differences, which are subject to variation among the signers, can co-occur with each other. The patterns we found cannot be accounted for by models that have previously been proposed for other sign languages (e.g. American Sign Language and Australian Sign Language). We argue that these differences may result from the higher iconicity of verbs and the higher economy of nouns.

Keywords: parts of speech, Russian Sign Language, nouns, verbs, phonology, iconicity

1. Introduction

Russian Sign Language (RSL) is the language of the Deaf in Russia and some other countries of the former Soviet Union. To date, only few studies are available that investigate aspects of the linguistic structure of RSL (Zajtseva & Frumkina 1981; Grenoble 1992; Zajtseva 2006; Prozorova 2007; Kimmelman 2009). During the last few years, some research has also been conducted by several undergraduate students of Moscow State University and Russian State University for the Humanities.

In the area of morphological typology, one of the most important questions concerns the identification and typology of word classes in the world's languages (e.g. Evans 2000; Haspelmath 2001). Across languages, two main word classes or parts of speech are verbs and nouns, but there are some languages which appear not to distinguish between those two classes, for example, Mundari, Salish, and others (Evans 2000).

In early studies, sign languages (e.g. American Sign Language, henceforth: ASL) were reported to lack the noun-verb distinction (Stokoe et al. 1965). Results from later research, however, suggest that at least some sign languages make a formal distinction between nouns and verbs (see Section 2).

In this paper, we describe an experiment which we conducted to identify a possible distinction between nouns and verbs in Russian Sign Language. In the rest of this section, we provide important background information concerning the phonological building blocks of signs and the universality of a noun-verb distinction. In Section 2, we summarize the results from some previous studies on parts of speech in different sign languages. We then turn to our own experiment. In Section 3, we outline the methodology and in Section 4, we discuss the results of our study. Finally, in Section 5, we speculate about possible explanations for the characteristics of noun-verb pairs in RSL (and probably other sign languages).

1.1 The phonological building blocks of signs

In order to be able to describe the attested formal differences between nouns and verbs in different sign languages (in Sections 2 and 4), we first introduce the phonological components of signs.

Since Stokoe's (1960) seminal work on the phonological structure of ASL, it is generally assumed that signs are not indecomposable, holistic entities. Rather, they have been shown to be made up of four independent manual components, so-called parameters. Stokoe (1960) identified handshape, movement, and location; Battison (1978) added orientation as a fourth parameter.

These four components are commonly compared to phonemes in spoken languages, because each of them has a finite number of meaningless variants, which in turn can be meaningfully contrasted with each other.¹ The RSL signs GRANDMOTHER and MOSCOW, for example, differ only in the movement component, while the handshape, orientation, and location coincide (Figure 1).

Another component of signs that will turn out to be relevant for our investigation is mouthing, a non-manual parameter. A mouthing is a silent articulation of (a part of) the corresponding spoken language word simultaneously with a given sign (Boyes Braem & Sutton-Spence 2001). For example, an ASL signer may articulate the English word [u:l] while simultaneously producing the sign SCHOOL (Nadolske & Rosenstock 2007), or a RSL signer may produce the RSL sign CHAIR together with the Russian word [stul] ('chair').

1. This is an oversimplification, as will become obvious in later sections.

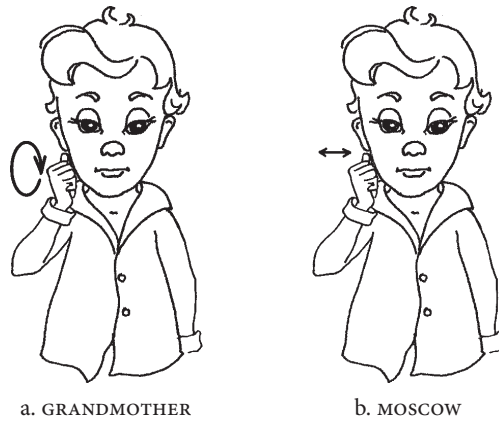


Figure 1. A minimal pair (movement) in Russian Sign Language

1.2 On the universality of a noun-verb distinction

The question whether basic word classes (nouns and verbs) are present in all languages is both theoretical and empirical, and the discussion of it is enduring and complex. In order to provide the reader with a basic idea about how word classes can be determined, we outline the procedure suggested in Himmelmann (to appear).

If there are two languages (L and K), we try to find (at least) two major word classes in each language based on formal criteria, that is syntactic, morphological, and morpho-phonological criteria. Once we found two classes (A and B) for each language, we can compare them in order to check whether the following conditions are met:

- i. Size of $A_K \approx A_L$; $B_K \approx B_L$, where A_K — some formal word class of language K etc.;
- ii. There is (some extent of) semantic integrity of classes;
- iii. Semantics of $A_K \approx A_L$; $B_K \approx B_L$.

These conditions imply that there are semantically similar classes in the two languages under consideration. At the same time, the formal criteria of determining these classes could be completely different. Once we have established the classes, we should observe whether in classes A_K and A_L , for example, words mostly refer to objects or to actions. In the former case, we would call them nouns, in the latter case verbs.

The procedure seems rather straightforward, and in theory allows for the existence of languages both with and without basic word classes. However, as the sign language data will show, in an actual endeavor to establish basic word classes, a linguist may be faced with different kinds of problems.

2. Previous studies on the noun-verb distinction in sign languages

2.1 American Sign Language (ASL)

The study of Supalla & Newport (1978) is the first in-depth study on parts of speech in a sign language. The authors show that ASL has a noun-verb distinction. Based on the analysis of 100 formally similar noun-verb pairs, they propose that the nouns and the verbs differ in their movement component. Obviously, a movement always contains a trajectory, that is, a direction of movement. To describe the formal differences between the nouns and verbs, Supalla & Newport introduce three additional movement categories:

1. Directionality — the movement of a sign can be bidirectional or unidirectional;
2. Manner — the movement can be continuous, hold or restrained;
3. Frequency — the movement can be single or repeated.

Continuous manner means that the hand (or hands) in a sign moves without a stop, smoothly and without tension. In a sign with hold manner, the hand moves smoothly, but the movement ends in an abrupt stop. Restrained manner means that the hand moves with tension, the movement is short and not smooth. A sign with continuous or hold manner can use more than one joint at the same time, but a sign with restrained manner can use only one joint at a time.

Both unidirectional and bidirectional signs can be repeated: if a unidirectional sign is repeated, a so-called transitional movement appears: the hand moves in one direction and then it returns to the starting point in a continuous manner.

Supalla & Newport (1978) made the following interesting observation: nouns are always restrained in manner and repeated while verbs can be either continuous or hold in manner, and their movement can be single or repeated. For example, the verbal sign *SIT* (ASL) is single and hold in manner, while the corresponding nominal sign *CHAIR* (ASL) is repeated and restrained in manner, as is shown in Figure 2.

Supalla & Newport also proposed a derivational scheme according to which both the verb and the noun in a pair are derived from a common underlying form. This underlying form contains the handshape, orientation, location, and trajectory of the movement. To create the noun, restrained manner and repetition have to be added. In contrast, a hold or continuous manner (depending on the verb class) and repeated or single movement (depending on aspect and verb class) have to be added to create a verb from the underlying form.

The authors argued for this analysis on the basis of the fact that different inflectional processes such as slow repetition and dual repetition, which apply both

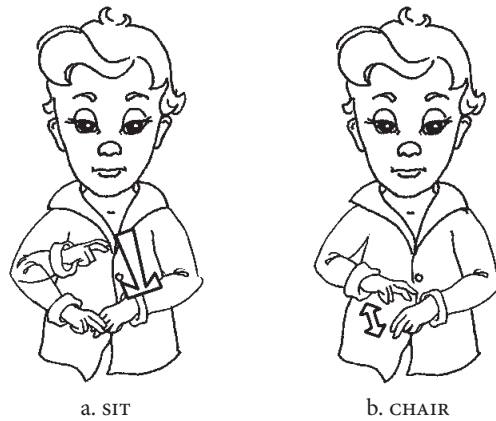


Figure 2. A noun-verb pair in ASL

to nouns and verbs, preserve the manner of movement, but do not preserve the frequency.

It is important to keep in mind that although the distinction is systematic according to Supalla & Newport, only 100 concrete noun-verb pairs (objects and manipulations involving these objects) were observed. Crucially, Supalla & Newport point out that this distinction is not present in abstract noun-verb pairs. Another fact worth mentioning is that they did not observe the presence/absence of this distinction in natural discourse.

2.2 Australian Sign Language (Auslan)

For Australian Sign Language (Auslan), Johnston (1989) first argued that a phonological distinction between nouns and verbs exists, and that Auslan uses the same mechanisms as ASL although in a less regular way.

Later, however, Johnston (2001) argued that the noun-verb distinction in Auslan is not as robust as in ASL. He proposed that this distinction exists only in a subclass of pairs in which the verb is a so-called reversible verb. This implies that the action which the verb represents is reversible in the real world, and so is the movement in the verb. For example, the action “to open the door” is reversible (one can open or close the door), and consequently, the corresponding sign of Auslan is reversible: the verbs *OPEN-DOOR* and *CLOSE-DOOR* differ only in the direction of movement. Johnston suggested that when a verb is reversible, it has a potential to create a formally distinct noun in a straightforward way: by adding the repetition. Hence, if one repeats the sequence of the two signs *OPEN-DOOR* and *CLOSE-DOOR*, one will get the corresponding noun *DOOR*. It seems rather natural to express the nominal meaning ‘door’ by using the repeated action of opening and closing the

door because a door is obviously a thing which is opened and closed. Johnston showed that in Auslan, non-reversible verbs cannot use this mechanism of creating nouns and therefore nouns and verbs in these pairs are formally identical.

Johnston also mentioned that most nouns and verbs are only formally (“phonetically”) identical. There exist syntactical and pragmatic means to distinguish nouns from verbs. Furthermore, he observed that mouthing is used with nouns only.

2.3 Quebec Sign Language (LSQ)

Voghel (2005) studied noun-verb pairs in Quebec Sign Language (LSQ). Her research is important because natural discourse was analyzed.

Before the experiment, she hypothesized that there could be several phonological and syntactic mechanisms for distinguishing nouns from verbs: repetition (nouns — repeated, verbs — single); mouthing, which accompanies nouns, not verbs; differences in the use of space: nouns may localize a referent in the signing space, while verbs can only use previously established locations (for agreement); possessives, which are used only with nouns; negation, which is used only with verbs.

In reality, however, her research showed that noun-verb pairs are formally and syntactically identical. According to her results, the only (reliable) way to distinguish nouns from verbs in LSQ is mouthing; just as in Auslan, mouthing mostly accompanies nouns.

2.4 Austrian Sign Language (ÖGS)

Hunger (2006) analyzed data from Austrian Sign Language (ÖGS). She studied noun-verb pairs both in isolation and in context. Counting the frames of videotaped signs, she found that verbs were longer than the corresponding nouns. She calculated the ratio between the average duration of verbs versus nouns. The ratio turned out to be 2.2:1, that is, the average time to produce a verb was 2.2 times longer than the average time needed to produce the corresponding formally related noun (Hunger 2006:82). These differences in duration result from several formal differences, namely that movement in verbs is often repeated, slower, and extended (i.e. the amplitude was greater than in the corresponding nouns).

Hunger also observed that 92% of nouns but only 50% of verbs were accompanied by mouthings. Other potential differences (such as eye-gaze and syntactic environment) were not reliable in distinguishing nouns and verbs.

2.5 Parts of speech in sign languages: New perspective

Schwager & Zeshan (2008) propose a new perspective on the word class issue related to sign languages. They propose the following two-step procedure for conducting research on this question. First, universal semantic criteria should be determined for identifying probable word classes in all languages. Second, syntactic and morphologic criteria should be determined language-specifically.² They show how this methodology can be successfully applied to data from two very different sign languages: German Sign Language, a typical urban European sign language, and Kata Kolok, a village sign language used in a village in Bali (Marsaja 2008). They show that these two languages show strikingly different characteristics concerning the syntax and morphology of different word classes. For example, verbs in German Sign Language (as well as in other urban sign languages) can be spatially modulated to show agreement, while a comparable mechanism is not attested for verbs in Kata Kolok.

Schwager & Zeshan used syntactic and morphological criteria for identifying word classes in specific sign languages, while other authors argued that the most reliable criteria are phonological in nature: nouns and verbs are often formally similar but different in their movement. Another criterion that has been found to be (relatively) reliable is mouthing, which — at least in some sign languages — accompanies mostly nouns. Ideally, of course, all the available criteria should be used in an effort to provide a comprehensive description of word classes in a sign language. Due to time limitations, however, our experiment was devoted only to phonological distinctions between nouns and verbs in RSL.

3. Methodology

To uncover a possible noun-verb distinction in RSL, we set up an experiment. First, we selected 60 potential noun-verb pairs. It is important to note that the pairs were chosen neither arbitrarily nor on purely semantic grounds: all pairs belong to the concrete lexicon and were assumed to be formally related. As we found out during the experiment, some of the pairs were not suitable either because the corresponding nouns and verbs were formally unrelated or because some unforeseen complexity occurred during the experiment (e.g. most informants did not

2. Recall the procedure outlined in Section 1.2, which resembles the procedure sketched here in that semantic and formal criteria are teased apart. In the procedure discussed above, however, formal factors were primary and semantics were only considered afterwards, while in Zeshan & Schwager's (2008) procedure, semantic classification precedes formal analysis.

know a certain sign). In the end, we collected 43 noun-verb pairs referring to concrete objects and actions involving these objects (manipulation and movement); all pairs (i.e. English translations) are listed in Appendix 1.

3.1 Participants

Our informants were 35 RSL signers with varying RSL competence. 17 RSL signers were from Omsk, aged 15–60. The most reliable subgroup among them included five students of the 7th School for the Deaf (Omsk) with a very high competence in RSL. The other group of signers (18) included students of the Russian State Social Institute (Moscow), aged 18–30. Table 1 provides an overview of the informants' characteristics.

Table 1. Informants' characteristics

Place	n	Age	Participated in ³
Omsk	17	15–60	stage 1: 15; stage 2: 2
Moscow	18	18–30	stage 2

3.2 Experiment

The experiment was conducted in two stages, a production part and a comprehension part. In the first stage, short videotaped scenes were shown to 15 informants from Omsk who had been asked to produce the corresponding RSL signs or sentences. For example, there was a short scene involving matches which was expected to elicit the nominal sign *MATCH* or *MATCHES*. Another scene which showed a boy striking a match was expected to yield the verbal sign *STRIKE-MATCH* or a sentence with the meaning 'a boy strikes a match'. The experiment was designed this way in order to prevent influence from the spoken language. The stimuli were presented in a randomized order. In the quantificational analysis, we used the data from 11 informants.

In the second stage, the videotaped signs, which supposedly reflect nominal or verbal meanings, were shown to another 20 informants (2 from Omsk and 18 from Moscow) in mixed order to find out whether the phonological differences which had been identified following stage 1 were meaningful for the observer, that is, whether they would help the RSL signers to distinguish nouns from verbs. Every informant was given an answer-sheet with questions in mixed order. The

3. Concerning the two stages of the experiment, see Section 3.2.

questions addressed the issue of whether a given sign would better be translated by a verb or a noun.

4. Results

The data we collected allowed us to make the following generalizations. First, a noun and a verb in a pair can be distinguished by various means. The attested differences will be described in Section 4.1. Second, the differences are observed not only with so-called reversible verbs and their corresponding nouns. Third, the attested differences do not occur regularly: only 60% of all usages were different. Figure 3 details to what extent the pairs differ from each other with respect to the percentage of usages in which the verb and the noun were formally distinguished (note that mouthing is not counted as a difference in this table). For example, the pair CAMERA — TAKE-PICTURES was distinguished by all 15 informants, while the pair CAR — DRIVE-CAR was not formally distinguished by any of the informants. Fourth, formal differences frequently combine with one another (Section 4.2). Fifth, there appeared to be considerable variation among the informants (Section 4.3). Sixth, the differences that we found help the informants to distinguish nouns from verbs during comprehension (Section 4.4). Also, there are some methodological complications which we will discuss in Section 4.5.

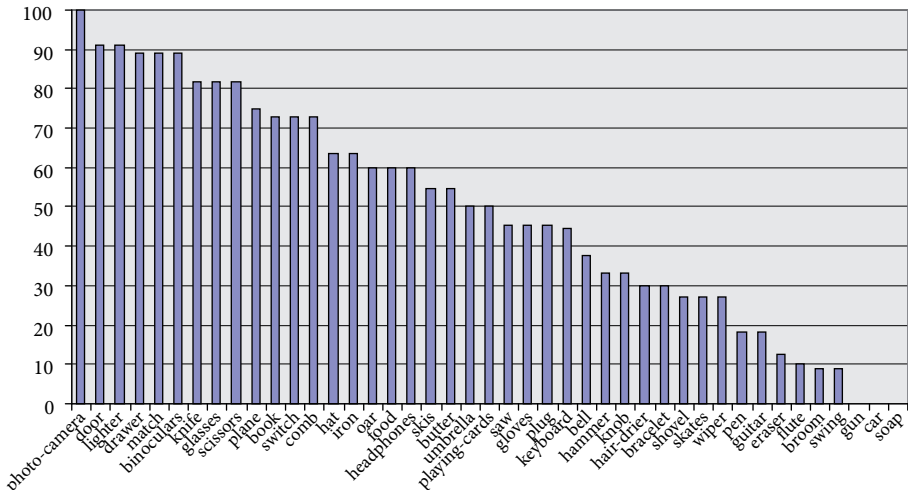


Figure 3. Percentage of usages in which a noun and a verb were formally distinguished (only nouns are listed; see Appendix 1 for the corresponding verbs).

4.1 Experiment: Stage 1

The first stage of the experiment, the sign elicitation part, revealed the following eight phonological differences.

I. Repeated vs. single movement

A noun is repeated while the corresponding verb contains single movement. This difference is present in the pairs DOOR — CLOSE-DOOR, SCISSORS — CUT-WITH-SCISSORS, MATCH — STRIKE-MATCH, and many others. For example, the sign in Figure 4 is a noun when repeated but a verb when articulated with a single movement (note that in the following figures, the left photo shows the begin position of the (dominant) hand while the right one pictures the end position).

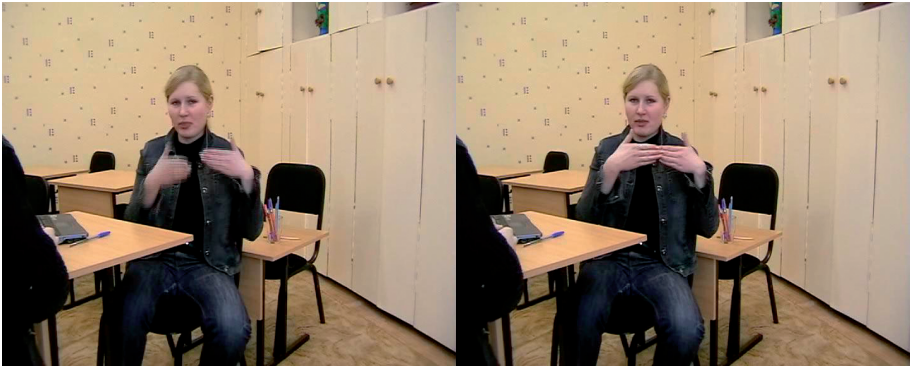


Figure 4. DOOR (if repeated) or DOOR-CLOSE (if single)

This difference has been shown to be common in different sign languages, for example, it has been described for ASL (Supalla & Newport 1978) and Auslan (Johnston 2001).

II. Movement vs. lack of movement

A noun may lack movement while the corresponding verb contains a path movement (as in WATCH-WITH-BINOCULARS) or a hand-internal movement (e.g. orientation change in TURN-KNOB). This difference, which is present in the pairs DOOR — CLOSE-DOOR, KNOB — TURN-KNOB, BINOCULARS — WATCH-WITH-BINOCULARS, appears to be unique to RSL; at least, it has not been previously described for other sign languages.

III. Amplitude differences

A verb contains a wider movement amplitude than the corresponding noun. This difference can be found in almost every noun-verb pair, for example, BUTTER — SPREAD-BUTTER, HAMMER_N — HAMMER_V (compare Figure 5 with Figure 6).

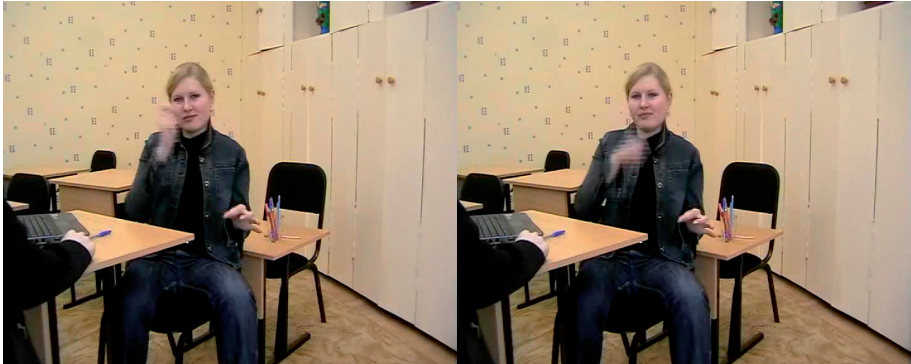


Figure 5. HAMMER_N



Figure 6. HAMMER_V

This difference is also not unique to RSL; it is attested in ASL (Supalla & Newport 1978), Auslan (Johnston 2001), and ÖGS (Hunger 2006).

IIIa. Contact vs. lack of contact

If a noun sign contains continuous contact between the two hands, the contact is broken in the corresponding verb. Actually, this difference can be considered a sub-type of amplitude differences. It is observed in the pair BOOK — OPEN-BOOK illustrated in Figures 7 and 8.

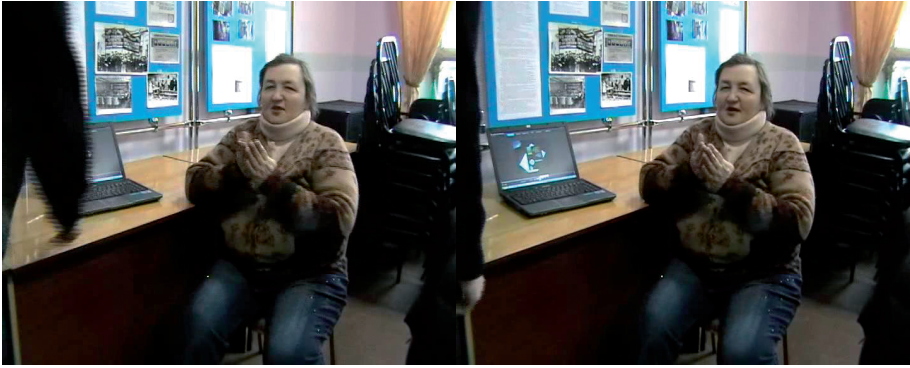


Figure 7. BOOK



Figure 8. OPEN-BOOK

IV. Number of joints involved

In verbs, more distinct joints participate in the articulation of the movement than in the corresponding nouns. This difference is present in the pairs LIGHTER



Figure 9. LIGHTER (single movement): only the thumb (interphalangeal joint) is used

— LIGHT-LIGHTER (see Figures 9 and 10), MATCH — STRIKE-MATCH, COMB_N — COMB_V among others.



Figure 10. LIGHT-LIGHTER (repeated movement): at least the thumb and the elbow joint are used

This difference has also been described for ASL (Supalla & Newport 1978) and Auslan (Johnston 2001).

V. Differences in handshape

A noun and the corresponding verb can contain different handshapes. This difference is present in the pairs KNIFE — CUT-WITH-KNIFE, SAW_N — SAW_V, IRON_N — IRON_V among others.

The RSL nominal sign KNIFE, for instance, is made with the **K**-handshape (from the Russian Manual Alphabet) while the corresponding verb CUT-WITH-KNIFE is made with the **B**-handshape (see Figure 11 for illustrations).



Figure 11. Letters K and B of the Russian Manual Alphabet

This difference has not been previously described for other sign languages (but see Section 4.4 for a possible reason).

VI. Orientation differences

A noun and the corresponding verb can have different palm orientations. This difference is present in the pairs WIPER — WIPE (see Figure 13), PLUG — INSERT-PLUG, UMBRELLA — OPEN-UMBRELLA. This difference, too, has not been previously described for any other sign language.

VII. Location differences

A noun and the corresponding verb can be articulated at different locations. This difference is present in the pairs HAT — PUT-ON-HAT (see Figures 14 and 15), BRACELET — PUT-ON-BRACELET, HEADPHONES — LISTEN-WITH-HEADPHONES. Again, no data are available concerning this difference in other sign languages.

VIII. Mouthing

Until now, we only considered manual differences. However, another important fact is that *mouthing* in RSL, just as in Auslan and LSQ, accompanies nouns much more often than verbs: in total, 233 productions of nouns and 162 productions of verbs were accompanied by mouthing, the ratio being 1.43:1). The difference is even more remarkable when we compare the number of productions of pairs in which mouthing is only observed with nouns (80 productions) to the number of productions of pairs in which mouthing is only observed with verbs (14 cases): in this case, the ratio is approximately 6.6:1. Johnston (2001) mentioned that even when a verb is accompanied by mouthing, the speaker usually utters the corresponding noun of a spoken language, for example, the word ‘door’ accompanies the verbal sign DOOR-OPEN. We cannot say whether this observation also holds for RSL because of the small amount of relevant usages.

Besides these eight differences, we found some additional subtle differences, which we will come back to in Section 5.

As we can see, the first four differences could also be captured in Supalla & Newport’s model (since differences I and II concern the frequency and differences III and IV the manner of movement), while the same does not hold for differences V to VIII. Additionally, we observe that the differences do not only occur with reversible noun-verb pairs. Hence, the analysis Johnston (2001) proposed for Auslan cannot be applied to RSL either.

Table 2. Phonological differences across pairs

Difference	Pairs (only nouns are listed)	Percentage
I	All except BRACELET, GLASSES, GLOVES, BINOCULARS, CARDS, FLUTE, KEYBOARD, HAIRDRYER, WIPER, CAR, SOAP, GUN	72%
II	DOOR, KNOB, BINOCULARS, HEADPHONES, PLANE	12%
III	All except CAR, SOAP, GUN	93%
IV	LIGHTER, MATCH, COMB, SCISSORS, KEYBOARD, GLOVES, IRON, HAMMER, HAT, DOOR, BOOK, KNOB, PHOTO-CAMERA,	32%
V	KNIFE, SAW, IRON, BELL, FOOD, HAIRDRYER, SWITCH	16%
VI	WIPER, PLUG, UMBRELLA, SCISSORS	9%
VII	HAT, BRACELET, HEADPHONES, WIPER, BINOCULARS	12%

Table 2 summarizes how the differences are distributed across pairs (only nouns are listed in the table). Mouthing is not included because, according to our data, it can be used with any noun. Note that the percentages do not add up to 100% because frequently, more than one formal difference distinguishes a noun and a verb in a pair, as will be further explained in the next section.

4.2 Combined effects

It is important to note that the differences described above do not only occur in isolation in a given pair. Rather, we often observe several differences between a noun and the corresponding verb at the same time. Consider the noun-verb pairs illustrated in Figure 12. The verbal sign CLOSE-DOOR has a single movement with wide amplitude. The nominal sign DOOR-1 is repeated and has shorter movement (differences I and III). The nominal sign DOOR-2, which is an alternative realization of the same nominal meaning ‘door’, contains no movement at all (difference II).

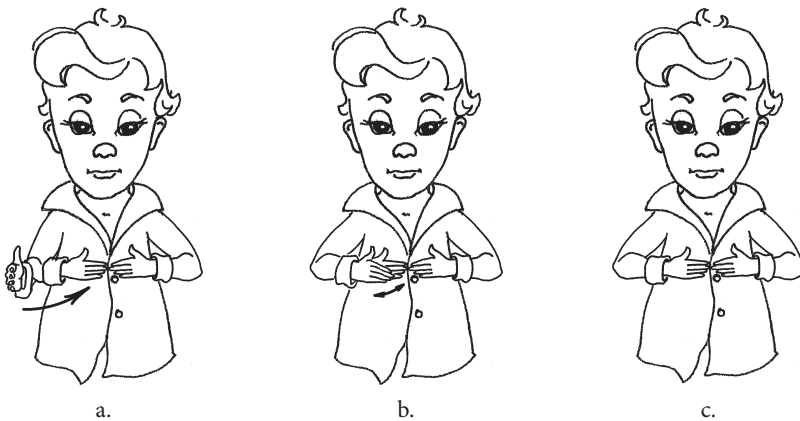


Figure 12. (a) CLOSE-DOOR; (b) DOOR-1; (c) DOOR-2

Figure 13 illustrates that the nominal sign WIPER differs from the verbal sign WIPE in palm orientation, location, and amplitude of movement (differences III, VI, and VII).

Overall, only 4 noun-verb pairs (9%) could be distinguished by one difference only, 3 pairs (7%) were not distinguished at all in our database, and 36 pairs (84%) could be distinguished by at least 2 differences.

The most frequent combinations are I+III (27 instances in our database), I+IV (12 instances), and III+IV (7 instances). It is possible to stipulate the existence of a special combination of differences I+III+IV (4 instances) that may be partially realized as I+II, I+IV, or III+IV. This seems to be reasonable because

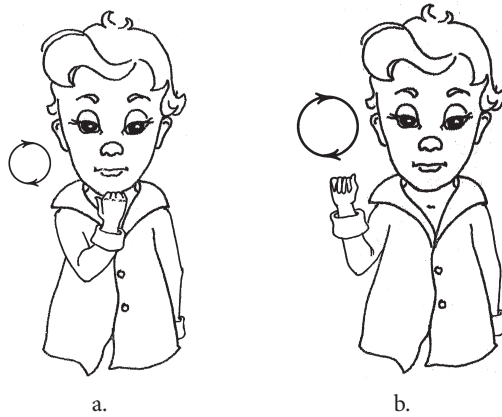


Figure 13. (a) Nominal sign WIPER; (b) Verbal sign WIPE

different realizations of these combinations are often used with the same pairs. For instance, the pair PHOTO-CAMERA — TAKE-PICTURES was realized with the following combinations of differences: I, I+IV, I+III+IV. This situation is reminiscent of the mechanisms proposed for ASL by Supalla & Newport (1978); unlike ASL, however, RSL does not use these combined differences in all pairs collected.

The existence of combined differences creates a problem for the distinction between related and unrelated nouns and verbs, and will be subject to further discussion in Section 4.5.

4.3 Inter-signer variation

In some pairs, a noun and the corresponding verb are distinguished by almost all the informants, while in other pairs only few informants applied one of the differences described above. This is also evident from Figure 3. In other words, some signers tend to distinguish more noun-verb pairs than others.

It is also important to note that once we consider only instances in which a noun and a verb in a pair were distinguished by some of the mechanisms described above, the inter-signer variation is reduced. If we consider all instances of the combined I+III+IV differences as (partial) manifestation of the same phenomenon (Section 4.2), then we get the following results: for 19 pairs out of 40 (48%), all informants produced identical forms; for 13 pairs (33%), the informants produced two distinct forms; for 6 pairs (15%), the informants produced three distinct forms; and for 2 pairs (5%), they produced four different forms. Another important fact is that the variation among informants generally concerns only verbal signs, while the corresponding nominal signs are similar for all informants.

We should mention, however, that there seem to be no obvious consistent differences between signers from different age groups. For example, two persons from the same high-school class in Omsk applied very different formal distinctions to distinguish nouns from verbs.

Although the variation is considerable and the phonological differences between nouns and verbs are not used consistently, the differences appear to help addressees to distinguish nouns from verbs during perception. As the second part of our experiment showed (and as will be detailed in the next section), 75% of signs containing one of the characteristic phonological features of nouns or verbs were correctly identified by the RSL signers.

4.4 Experiment: Stage 2

After having compiled a list of possible formal differences, we decided to check whether these differences are actually significant for the RSL signers, that is, whether they help RSL signers in identifying a noun or a verb (following Johnston (2001), who conducted a similar experiment). Overall, the differences appeared to be significant: approximately 75% of the nouns and verbs were correctly identified. Mouthing was excluded as a factor from this experiment because it makes the identification of parts of speech easy; therefore, only the signs produced without mouthing were presented. In addition, only pairs that differ in one formal aspect were used in the experiment. Unfortunately, differences II (the lack of movement in nouns), VI, and VII also had to be excluded because of the limited amount of relevant examples in the data set. As for the differences VI and VII (differences in orientation and location), we may stipulate that they are easily detected and that they therefore should facilitate the identification of nouns and verbs. Table 3 below shows how useful the different formal distinctions turned out to be for identifying the part of speech of a word.

Table 3. Phonological differences and correct identification

Difference	Verbs correctly identified	Nouns correctly identified
I	68%	93%
III	68%	87%
IV	35%	100%
V	93%	35%

As the table shows, some of the differences, e.g. repetition (I) and amplitude (III) of movement, were highly useful for the identification of verbs and nouns. In contrast, the number of joints involved in the sign (IV) for some reason only

facilitated the identification of nouns, but not verbs, while differences in handshape (V) turned out to be more useful for identifying verbs.

Before trying to propose a possible explanation for the attested patterns, we discuss some complexities with the data, the experiment, and the analysis.

4.5 Methodological considerations

Some conceptual problems complicate the interpretation of many of the observed differences. First, it is well known that reduplication is also used to express plurality in nouns (Pfau & Steinbach 2006) and aspectual modification in verbs (Klima & Bellugi 1979). This is also true for RSL. Therefore, when discussing a noun, we need to determine whether the repetition is inherent or inflectional. In our experiment, we were faced with this problem. Given that, for example, a box of matches was presented as a stimulus for the nominal sign *MATCH*, it could not be excluded that the repetition found in our data did not express plural inflection. In future studies, researchers should be aware of this potential problem. The same is true for repeated movement in verbs. If, for instance, the verb *HAMMER_V* is realized with repeated movement, it may very well be the case that the base form involves lexicalized durative aspect because the depicted action is almost always durative (see, for example, Wilbur 2008). In general, it is extremely difficult to suppress aspectual marking of verbs during elicitation — at least in an experiment with a design similar to ours — because the action presented in the elicitation video is either single or repeated, which can be directly represented in the production of the sign.

The second problematic point concerns the status of handshape, orientation, and location differences. Should we analyze a noun sign and a verb sign as related if these differences occur or, even more problematic, if they are combined (Section 4.2)? We have to conclude that this decision should be made separately for each pair. As discussed above, the RSL signs *KNIFE* and *CUT-WITH-KNIFE* can contain different handshapes (see Figure 11); in addition, the movements have slightly different trajectories. We therefore conclude that these two signs are simply unrelated, in other words, we stipulate a rule saying that if two signs are different in movement and handshape, then they are unrelated. The signs *SAW_N* and *SAW_V* can differ only in handshape — the noun being articulated with a **K**-handshape, the verb with a **B**-handshape. We could therefore conclude that they are related; this difference, however, was only observed in one informant. Other handshape differences were also rare and unsystematic, which suggests that this type of difference should be studied in more detail in future research. But as we will see, two signs of a pair can differ in location and movement (Figures 14 and 15) and still be clearly related. In fact, we do not have strict criteria for determining whether a noun and

a verb are related or not and what combinations of differences can be present in related signs. Possibly, the consultation of informants (by means of direct questions) could help in clarifying the matter, but clearly, this is not a very reliable strategy.

The above problems notwithstanding, other attested differences (such as, for example, joints used, amplitude, loss of contact) do not seem to be connected to inflection or to be problematic for some other reason in RSL and can therefore be considered more reliable indicators of word class distinctions.

5. Discussion

5.1 Iconicity vs. economy

In the preceding section, we presented our observations concerning the formal differences between nouns and verbs in RSL. However, so far no attempt has been made to explain why these differences occur, in other words, whether they are motivated by some more general factors. In this section, we try to answer this question.

We propose that all the observed differences between nouns and verbs in RSL (except for the handshape differences,⁴ which will not be considered further) are connected to the higher iconicity of verbs and the higher economy of nouns. Let us illustrate these two terms by means of an example, the noun-verb pair HAT — PUT-ON-HAT depicted in Figures 13 and 14.

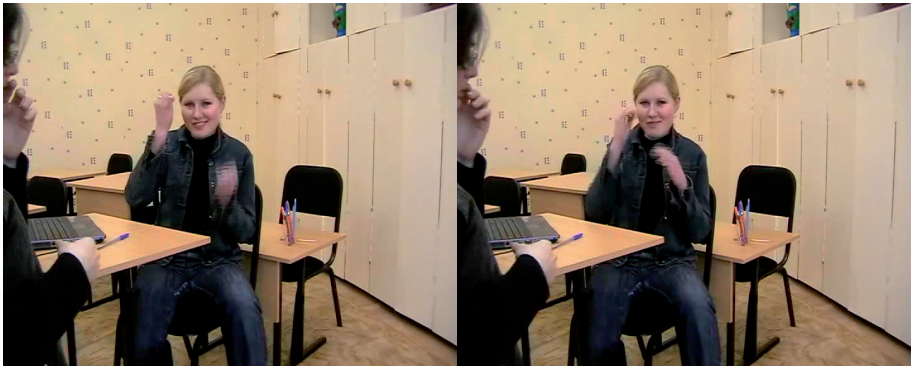


Figure 14. HAT

4. As pointed out by an anonymous reviewer, this type of difference might result from the use of different classifiers. For example, a noun can be signed with an Entity Classifier, the corresponding verb with a Handling Classifier (see for instance, Engberg-Pedersen 1993). If this is the case, then these two signs should be analyzed as unrelated.

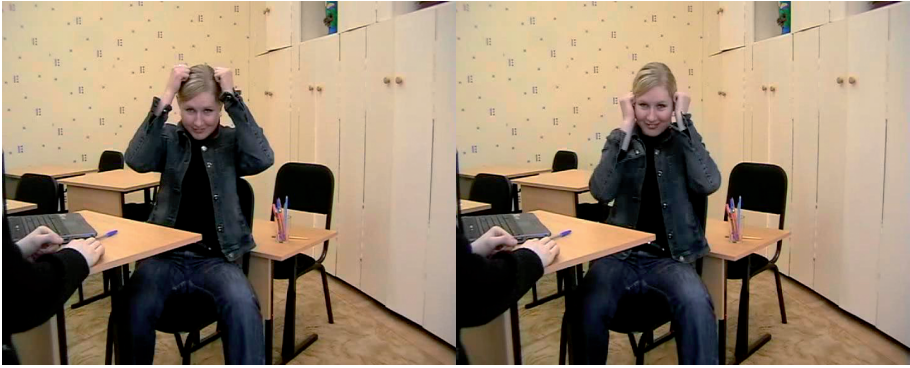


Figure 15. PUT-ON-HAT

When comparing these two signs, we observe that the verbal sign PUT-ON-HAT is more iconic because

- it is articulated on the head (with contact);
- the movement is more precise in that the hands follow the form of the head.

Articulation of the noun sign HAT, on the other hand, is more “economic” because

- it is articulated in the neutral signing space (in front of the chest) (difference VII);
- the movement is short and unmarked: the trajectory is straight (difference III);
- it uses only the wrist joint (difference IV).

We propose that all of the attested differences can be captured by these two mechanisms. First, in verbs, single or repeated movement reflects a single or repeated action, while in nouns simple repetition does not necessarily imply plurality. For instance, the noun HAMMER_N is repeated even if it is meant to refer to a single hammer, while the verb HAMMER_V is repeated if the action is multiple, but single if the action is single.⁵ Second, the lack of movement and the smaller amplitude observed in nouns are more economic. Third, using more joints contributes to the iconicity of verbs, while using fewer joints (and joints which are more distal to the body) makes nouns more economic. For example, as shown in Figure 15, the articulation of the sign involves more joints to depict more realistically the action of putting on the hat. Finally, verbs make iconic use of contact, palm orientation, and location, while nouns do not. Nouns tend to involve neutral and hence

5. This is not due to the fact that verbs can be marked for aspect, while nouns cannot: nouns could undergo reduplication to express nominal plurality.

more economic orientations and locations. For example, the verbal sign WATCH-WITH-BINOCULARS can only be made in front of the eyes, because this action is performed there in the real world, while the corresponding noun BINOCULARS is sometimes performed in the neutral space in front of the signer. Similarly, the verbal sign WIPE is oriented from the signer towards the imaginary surface which is being wiped,⁶ while the orientation towards the signer in the nominal sign WIPER is not motivated by iconicity.

This analysis also provides an explanation for the fact that mouthing is much more common with nouns than with verbs. The more economic articulation of nouns makes them *less perceptually salient*. Mouthing can therefore be considered a supportive system which obviously facilitates the interpretation of a sign.

It is possible to stipulate that the higher iconicity of verbs and the higher economy of nouns follows from the fact that in RSL, nouns (concerning only concrete objects) are so-called frozen signs or lexemes, while verbs (concerning only actions using concrete objects) are non-frozen, productive signs (Johnston & Schembri 1999). While in nouns, handshape, orientation, location, and movement are potentially meaningless phonological elements, in verbs they are meaningful parts that contribute to the meaning of the verb (for a different account see Zwitserlood 2003).

Consider again the signs HAT and PUT-ON-HAT (Figures 14 and 15). In the verb, the handshape depicts holding a flat object; the movement depicts the process of putting on a hat; the location depicts the location of the action, i.e. the fact that the hat is put on the head. Therefore, the whole constitutes a classifier construction (or polycomponential sign). In contrast, in the corresponding noun, the movement does not depict anything related to the meaning described by the nominal sign HAT; the location also does not mean anything directly, in particular, it does not imply that the hat is in front of the chest. In fact, only the sign as a whole has a meaning, and this meaning is not computable from its parts; therefore, it is a frozen sign.

It has to be pointed out, however, that our hypothesis concerning the different lexical status of nouns and verbs cannot be proven on the basis of our data. Possibly, this hypothesis could be tested in an experiment which investigates whether verbs are indeed more flexible than nouns in all phonological parameters. For instance, the native signers could be presented with many instances of an object and many different activities with this object and asked to tell in RSL about these objects and

6. The orientation in the verbal sign could be analyzed as locative agreement. This possibility, however, does not directly influence our hypothesis: even if the difference results from the application of some grammatical mechanism (like locative agreement or aspectual reduplication), the verb is still more iconic than the noun.

actions. If nouns are indeed frozen signs unlike verbs, then all instances of objects should be described with the same nominal signs, while different actions might be described with different verbal signs. We conclude that our hypothesis awaits further experimental verification (or falsification).

5.2 On the universality of word classes

In general, it should be pointed out that if our hypothesis concerning the different lexical status of verbal and nominal signs in RSL is correct, RSL does not have verbs and nouns in the traditional sense, because we are comparing lexical signs (nouns) to polycomponental signs (verbs), which are a very different class of objects in many respects. However, it is possible to conclude that a more general notion of word classes, as developed for spoken languages by Himmelmann (to appear), is in a broad sense applicable to sign languages. RSL has a class of signs referring to objects and a class of signs referring to actions, and the signs belonging to these two classes are formally different. If these two classes are even *more different* than nouns and verbs in spoken languages — the former including lexical signs, the latter morphologically complex classifier constructions — they are still separate, and the universal tendency of languages to distinguish word classes is fulfilled.

6. Conclusion

In this paper, we presented the first analysis of a noun-verb distinction in Russian Sign Language. We found out that in the lexical domain of concrete object and actions performed with these objects, nouns and verbs that are formally related can be distinguished by several phonological means. While some of these means have previously been described for other sign languages, other phonological changes we identified appear to be attested in RSL only. We also claimed that all formal differences between nouns and verbs can be attributed to the higher iconicity of verbs and the higher economy of nouns.

Still, some questions concerning the analysis of word classes in RSL remain open. What is required is a systematic description of differences between nouns and verbs based on a larger amount of entities as well as an observation of formal differences in natural discourse. Furthermore, a more fine-grained analysis of the pairs is necessary.

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Appendix 1. List of noun-verb pairs

Nominal meaning	Verbal meaning
door	to open a door, to close a door
book	to open a book, to close a book
drawer	to open a drawer, to close a drawer
knob	to turn a knob
plug	to plug in
umbrella	to open a umbrella
photo-camera	to take pictures
bell	to ring a bell
gun	to shoot with a gun
lighter	to light a lighter

Nominal meaning	Verbal meaning
plane	to fly by plane
car	to drive a car
bracelet	to put on a bracelet
hat	to put on a hat
glasses	to put on glasses
match	to strike a match
scissors	to cut with scissors
switch	to switch
gloves	to put on gloves
broom	to sweep with a broom
food	to eat
comb	to comb
shovel	to dig
swing	to swing
iron	to iron
skates	to skate
saw	to saw
eraser	to erase
wiper	to wipe
hammer	to hammer
playing-cards	to shuffle cards, to deal cards
keyboard	to type
headphones	to put on headphones
pen	to write
guitar	to play guitar
flute	to play flute
binoculars	to look through binoculars
butter	to spread butter
soap	to soap
hairdryer	to dry the hair
oar	to row
skis	to ski
knife	to cut with knife

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