

“Progetto e-LIS@”

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"Progetto e-LIS@" is the presentation of a work-in-progress, which was started in November 2000 by two Italian scholars, Paola Laterza (who is a hearing psychologist) and Claudio Baj, a Deaf LIS teacher. Their aim is to find a system of cataloguing signs in order to create a complete but flexible multimedial dictionary, to be used both by competent Italian Sign Language users and by competent users of Italian. This research presents a new way of ordering signs, different from the usual alphabetical one, and is more congenial to the signing community's linguistic needs, which are clearly oriented to the visual-corporeal channel rather than to the written-oral one. In fact, there are Italian/Sign Language dictionaries based on the alphabetical order, but there is none that goes from Sign Language to the written-oral language (Italian). Special attention has been paid to how signs are systematised: so far the handshape parameter has been explored in detail, but in the near future we plan to associate it with two more parameters, viz. location and orientation. At a later date movement and non-manual signals will also be included among the cataloguing criteria. The objective is not only to put signs in order according to a more flexible and therefore acceptable system for signers (like the alphabetical order satisfies hearing people's phonological needs), but also to allow for the quick search of signs in the multimedial dictionary. The paper describes how, after elaborating different versions in their step-by-step research, the two researchers decided that the present format was more functional, practical and economical from the point of view of the dictionary as an instrument. They will present the results already obtained in their research as well as their intermediate findings to demonstrate their chosen work method but also to receive feedback from other Italian and European realities.

1. HANDSHAPES

1 st version (27th November, 2000)

Figure 1: 1st version

Our first step was to single out a number of so-called “principal” handshapes, chosen from the ones that appeared clearest, best-defined, with extended fingers and in alignment with the hand, easy to remember for either experienced or inexperienced signers. 14 handshapes were chosen: As – A – S – G – I – L – Y – H – V – Ycor – 3 – 4 – B – 5. These were ordered by starting from the closed fist and progressing to the open hand, since we recognized the fist as the origin of all the other handshapes (cf. Volterra 1987). Subsequently one finger at a time appears

from the fist-shape: first the thumb, then the index finger and the numbers from zero to five. The thumb represents the number 1, the index 2, and so on, up to 5 with the open hand. Then there are also two fingers that appear simultaneously, then three, and so on, up to the point of having five extended fingers and an open hand. When there are two handshapes that have the same two extended fingers, preference is given to the one with two joined fingers rather than to the one with open fingers, because the latter looks more open from the visual level (e.g. “H” vs. “V”). In cataloguing the handshapes, reference is made to the dominant hand, even if a sign requires both hands with different handshapes. The handshape symbols have been taken from the dictionary by Radutzky (1992).

2 nd version (15th January, 2001)

Figure 2: 2nd version

In the second version we maintained the same criteria as in the first, but a few slight changes were made in the choice of the principal handshapes. We felt the need for a further criterion which would allow us to flexibly insert as many handshapes as possible by following an order that will not create confusion. Therefore we saw the addition of the subgroup criterion as a useful innovation. The principal handshapes are still 14, but with some variations. The sequence of the handshapes were changed vis à vis the previous version. However, the number of principal handshapes remained unchanged. The new order of principal handshapes was as follows: A – S – G – I – L – Y – H – V – Ycor – 3 – 4 – 3/5 – B – 5. Over and above the 14 principal handshapes, we started to include other “subordinate” handshapes, putting them in subgroups dependent on the principal ones. The subgroups were catalogued according to the position of the fingers in the principal handshapes, from which, with progressive curving, bending or closing movements, one finally reached the subordinate subgroups. After singling out the subgroup criterion we chose to add a further criterion to order the handshapes within the subgroups themselves. According to this criterion, the subordinate handshapes follow a contrasting closing-opening movement, followed by the principal handshapes: starting from the maximum opening of the principal handshape, the subgroup is shaped by the progressive closing of the fingers (e.g. L, cc, Lp, Lq, Lch, T). In this version 37 handshapes were catalogued.

3 rd version A (12th March, 2001)

Figure 3: 3rd version A

Here we followed up our previous findings and tried to add more and more handshapes, but at the same time maintaining clarity and linearity. To facilitate our research for the multimedial dictionary, we decided to subdivide the subgroups further, creating branches of the principal handshapes. In the previous version each subgroup was linear and the handshapes (both curved and flat) were collocated within it and ordered according to a very arbitrary criterion of closure based on the impression of more or less filling of the visual space. Here, on the other hand, some branches were drawn up from those handshapes which, starting from the principal one, follow a movement of flat closure while other branches follow a movement of curved closure. This version includes 53 handshapes, of which 20 are principal, and represents an attempt to list and order all the handshapes existing, in our opinion, in Italian Sign Language. The principal handshapes are: As – A – S – G – I – L – Y – H – V – Ycor – Hs – 3 – Ys – W – 4str – 4 – 3/5 – B – Bs – 5. In this version we started to systematize the criteria; some remained unchanged while other new ones were created from the previous versions. First criterion: the order of the principal handshapes proceeds from the closed fist to the progressive extension of one finger at a time, from the thumb to the little finger, and subsequently of two, three, four and five fingers extended at the same time. In the first five handshapes, each finger is withdrawn to leave space to the following one, following the numerical order from the thumb to the little finger. The same principle guides the order of the handshapes formed either by pairs of fingers, by threes, fours or fives. Second criterion: among the principal handshapes, according to the principle of progressive opening of the hand, those with joined fingers precede those with the same but separate fingers. Third criterion: having chosen to consider all handshapes as independent/separate from each other, we decided that a linear, sequential list of 53 handshapes would be difficult to implement. To overcome the difficulties that a very long list would cause in cataloguing, in learning, memorizing and use, already during the second version we opted for the creation of subgroups. As “principal” handshapes we chose handshapes which were clearly contrasting with each other and easy to perform from the motorial point of view. The subgroups consisted of those “subordinate” handshapes that present limited distinctive features and are more difficult to perform. Fourth criterion: since the principal handshapes, chosen from the clearest and most distinct, are performed with the fingers in an extended position and in alignment with the hand, it is obvious that the movement necessary to order the subgroups follows the progressive closure of the fingers, contrary to the movement of progressive opening of the principal handshapes. Fifth criterion: since an enormous variety of subordinate handshapes exist within the subgroups, we have tried an ulterior subdivision to create more order. Different branches originate from a principal handshape,

depending on the typology of the closure movement (i.e. flat or circular). The flat handshapes moving towards progressive closure with extended fingers precede the handshapes with curved fingers, since the latter enclose a more limited area of the palm, while the former leave a wider opening. Sixth criterion: in signs where both hands are used, handshapes are sometimes different. In cataloguing these cases, reference is made to the dominant hand (i.e. for right-handed people, the right hand, and for the left-handed, the left hand).

3 rd version B (6th February, 2002)

Figure 4: 3rd version B

In the following version the previously elaborated criteria have undergone some more changes; moreover, five new handshapes have been added to reach a total of 58. Some movements have also been carried out, to better satisfy the recognized criteria. We thus have 20 principal handshapes: S – G – Yi – I – L – Y – H – V – Ycor – Hs – 3 – Ys – Wstr – W – 4str – 4 – 3/5 – B – Bs – 5. The new handshapes are those that are used very little but are present in LIS and have never been catalogued officially. First criterion: The principal handshapes have fingers extending from the fist at a right angle and are not bent, while the other fingers are closed, i.e. they have contact with the palm of the hand. They have been singled out among those handshapes which correspond to the numbers “1” to “5” in one hand, starting from the thumb and ending at the little finger. Second criterion: The principal handshapes follow the movement of progressive extension of the hand from a closed to an open position, from “1” to “5”, from the thumb to the little finger, following the intermediate passages. Third criterion: In the subordinate handshapes the fingers are in a bent position, and, if they have contact with parts of the hand, it is not with the palm (like in the closed handshapes), but almost exclusively with the fleshy tip of the thumb. Other contacts between fingers are only considered as part of movement of large closure. Subordinate handshapes are grouped together in subgroups. Fourth criterion: Since the fingers are straight and not bent in the principal handshapes, it is selfevident that the subordinate handshapes follow a movement of progressive closure within the subgroups, in contrast with the movement of progressive opening in the principal handshapes. Fifth criterion: Different branches originate within a subgroup from a principal handshape, depending on the typology of closure movement applied, i.e. flat or circular. Flat handshapes closing progressively with extended fingers precede the ones where the fingers are curved, since the latter occupy a more limited area of the palm, while the former allow for a larger opening. Sixth criterion: In signs where both hands are used (Volterra, 52), the handshapes are sometimes different. For purposes of cataloguing, in these cases reference is made to the dominant hand (i.e. the right hand for right-handed people and vice versa for the left-handed). For the purposes of this research, the latter version is presently considered the most functional, the clearest and simplest for ordering signs. The criteria

that have been emphasized are definitive, in the present state-of-the-art.

2. COUNTERCHECKS

During the work-in-progress, when the criteria for cataloguing the signs had been established, we looked for counterarguments and confutations which could show which of these were fundamental, superfluous or arbitrary, but keeping version 3B as the reference point. In this way we started to build up new versions.

1 st countercheck (3rd July, 2002)

Inversion of criterion 2 Main handshapes Figure 5: 1st countercheck

The 21 principal handshapes have been put into a particular order by inverting criterion 2, i.e. from the maximum to the minimum opening of the fist closure, to see if this criterion is fundamental or arbitrary. Building up the scheme, this criterion proved to be arbitrary, since exclusion or confusion of handshapes does not result from the inversion of the order. This countercheck did not include subgroups. In the next counterchecks we shall see if the order remains functional when subgroups and other criteria are added.

2 nd countercheck (2nd October, 2002)

Confutation of criteria 1 and 3 Linear sequence

Figure 6: 2nd countercheck

The 58 handshapes have been ordered according to the progressive opening of the hand without creating subgroups (criterion 3), and therefore in a linear sequence. We saw that, in this way, groupings of handshapes according to finger positions did not take place if no distinction between principal and subordinate handshapes (criterion 1) was effected. The sequence of resulting handshapes was therefore determined randomly and exclusively through the perception of the hand more or less filling the visual space. Moreover, in a similar sequence, it was impossible to single out a simple logic to understand and memorize: remembering 58 elements without any clear, precise reference points proved to be difficult. Thus we concluded that it was necessary to single out principal handshapes and subgroups in order to produce an applicable order. Therefore criteria 1 and 3 proved to be fundamental. The order in which fingers open up could be inverted, from the open hand to a fist, but there were no structural changes and no handshapes were excluded. In this way the arbitrariness of criterion 2 was confirmed.

3 rd countercheck (9th April, 2004)

Inversion of criterion 2 With subgroups Figure 7: 3rd countercheck

Inverting the order of the principal handshapes and going against criterion 2, i.e. from the open hand to the closed fist, and following the creation of subgroups according to criteria 3, 4, 5 and 6, leads to the reproduction of a "version 3b" in reverse, but without making it less clear or

organized. In this way the arbitrariness of criterion 2 is proved.

4 th countercheck (13th November, 2002) **Confutation of criterion 5**

Subdivision according to order in finger movement

Figure 8: 4th countercheck version A and Figure 9: 4th countercheck version B

When this countercheck was started, 15 principal handshapes and 7 subgroups were selected. The principal handshapes were singled out according to criterion 2 (i.e. moving from the fist to the open hand, followed by the sequential appearance of fingers from 0 to 5), but considering handshapes with joined fingers as subordinate. Within the subgroups criterion 4 (i.e. progressive closure of the fingers but without distinguishing straight and curved finger positions) was followed in contrast with criterion 5. It was therefore proved that, without criterion 5, especially in the "5th finger" subgroup, the attempt to create a sequence is confused since it is difficult to clearly identify "more open" or "more closed" handshapes. Criterion 5 is therefore fundamental. (This countercheck proved to be similar to version 3b in many respects, but it was useful in verifying the importance of criterion 5). In the version following this countercheck, criterion 2 was mainly followed, thereby distinguishing as principal handshapes both the ones with united fingers and the ones with open fingers (e.g. "U" vs. "V") as a movement of maximum opening. Therefore 20 principal handshapes were singled out. Moreover criterion 5 was also taken into consideration. In fact, this countercheck produced subgroups which were very similar to the "3b" version, with a few minor changes. What makes it different from version "3b" are the principal handshape families, created according to the appearance of fingers: "fist" family, "1st finger" family, "2nd finger" family, "3rd finger" family, "4th finger" family, "5th finger" family, which could prove useful for better categorizing and memorizing handshapes. But the negative consequence lies in the additional passages that must be carried out to reach the desired handshape, which could be a further source of confusion. In the present state-of-the-art we have proved that criteria 1, 3 and 5 are fundamental, while criterion 2 is arbitrary.

3. Bibliographical References

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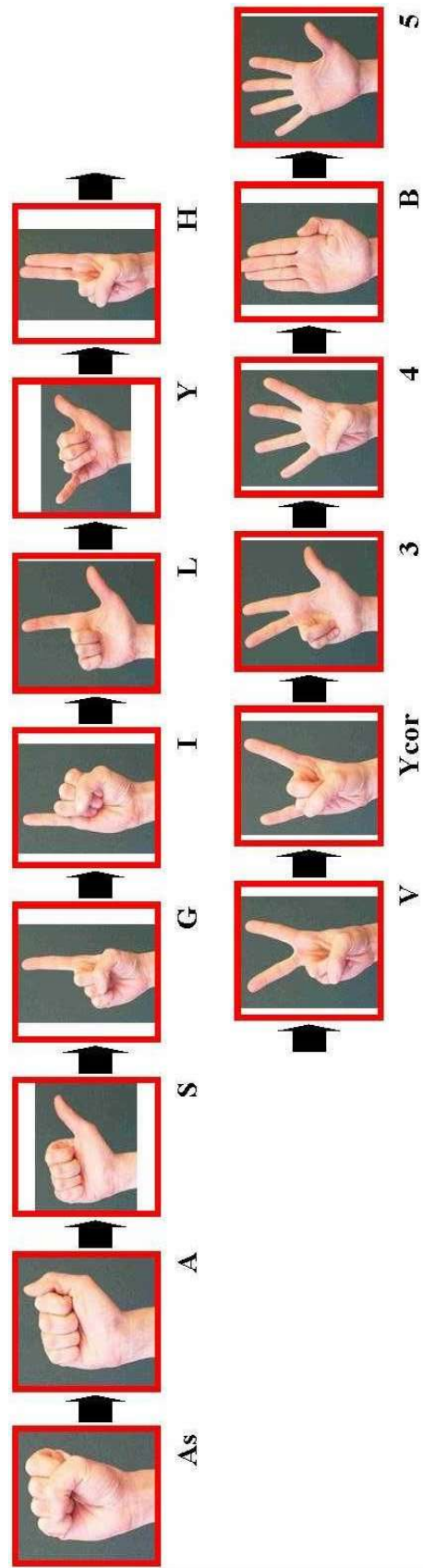


Figure 1: 1st version

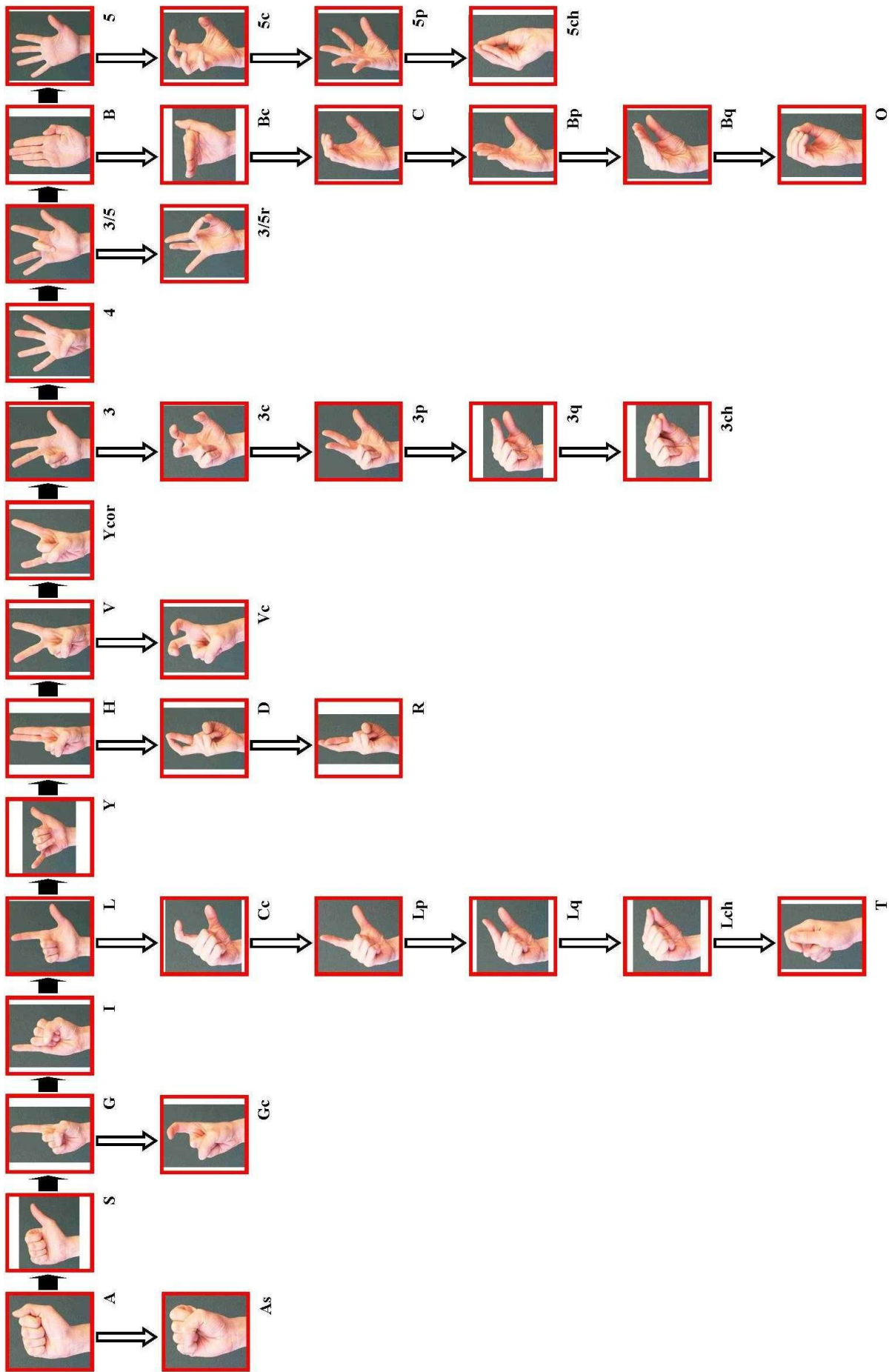


Figure 2: 2nd version

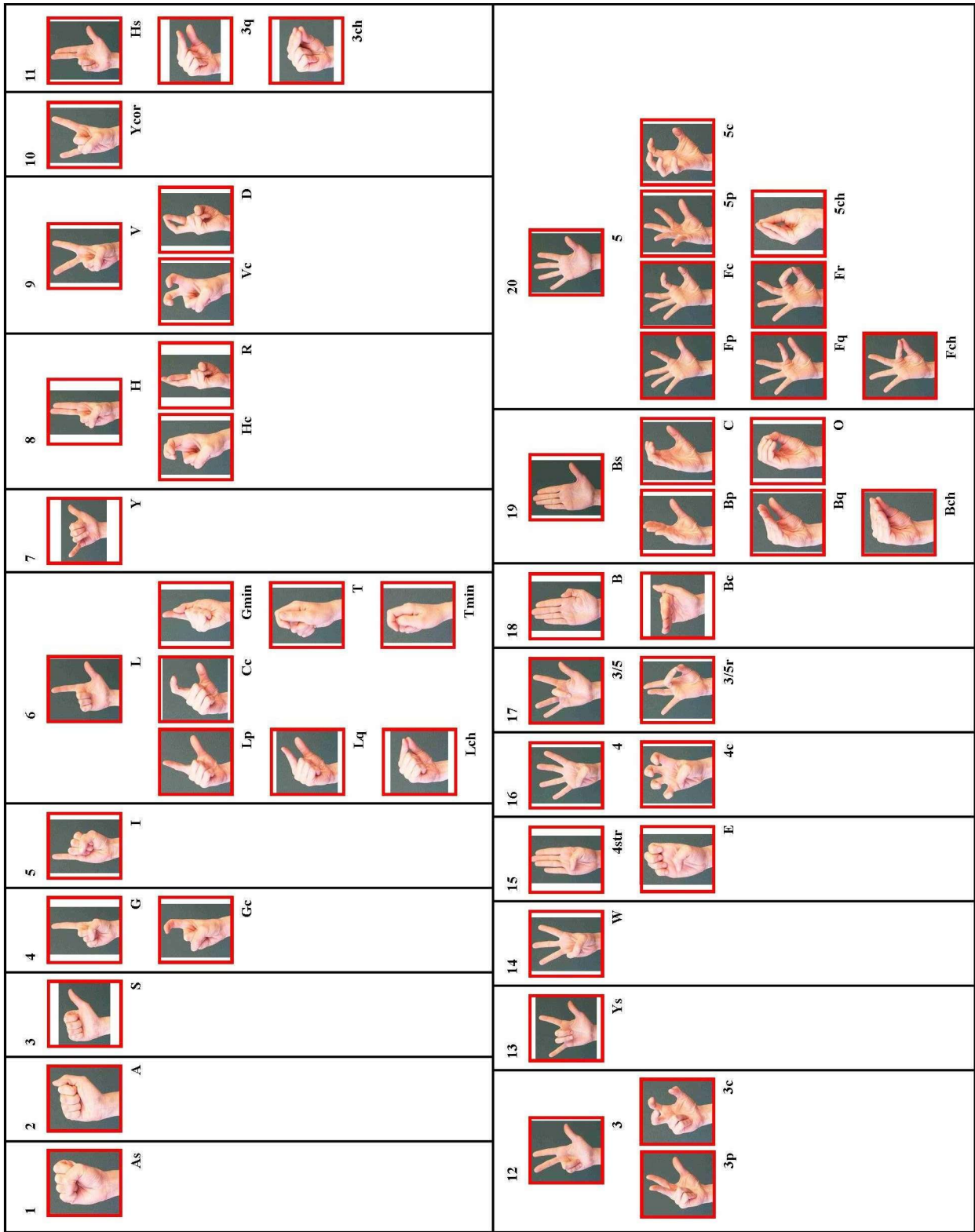


Figure 3: 3rd version A

1		2	 G		3		4		5	 L Lp Cc Cr Lq Lch Gmin T Tmin	6		7	 H Hc R	8	 V Vc D	9		10	 Hs Hp Hq Hch
11	 3 3p 3c 3r	12		13		14		15	 4str E	16	 4 4c	17	 3/5 3/5r	18	 B Bc	19	 Bs Bp Bq Bch C O	20	 5 Fp Fc Fq Fch 5p 5sch Fr A As	

Figure 4: 3rd version B

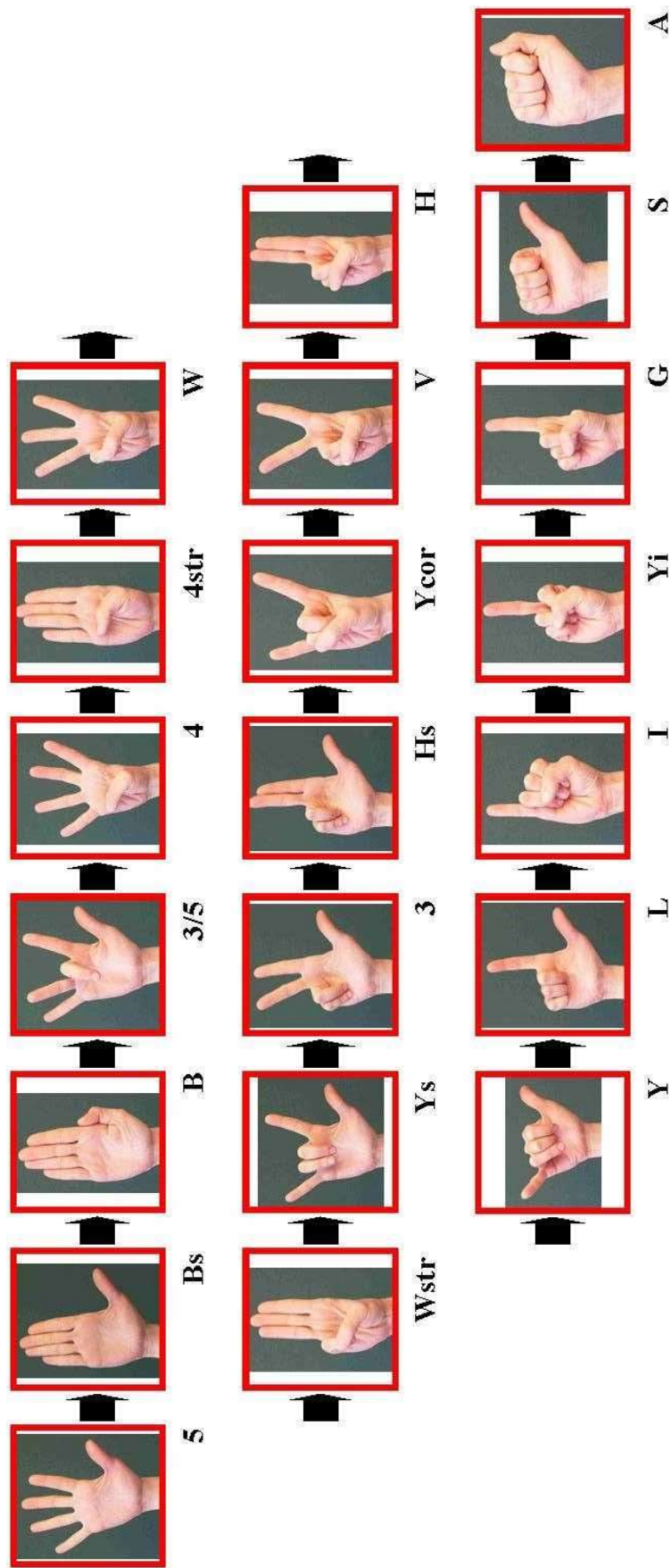


Figure 5: 1st countercheck

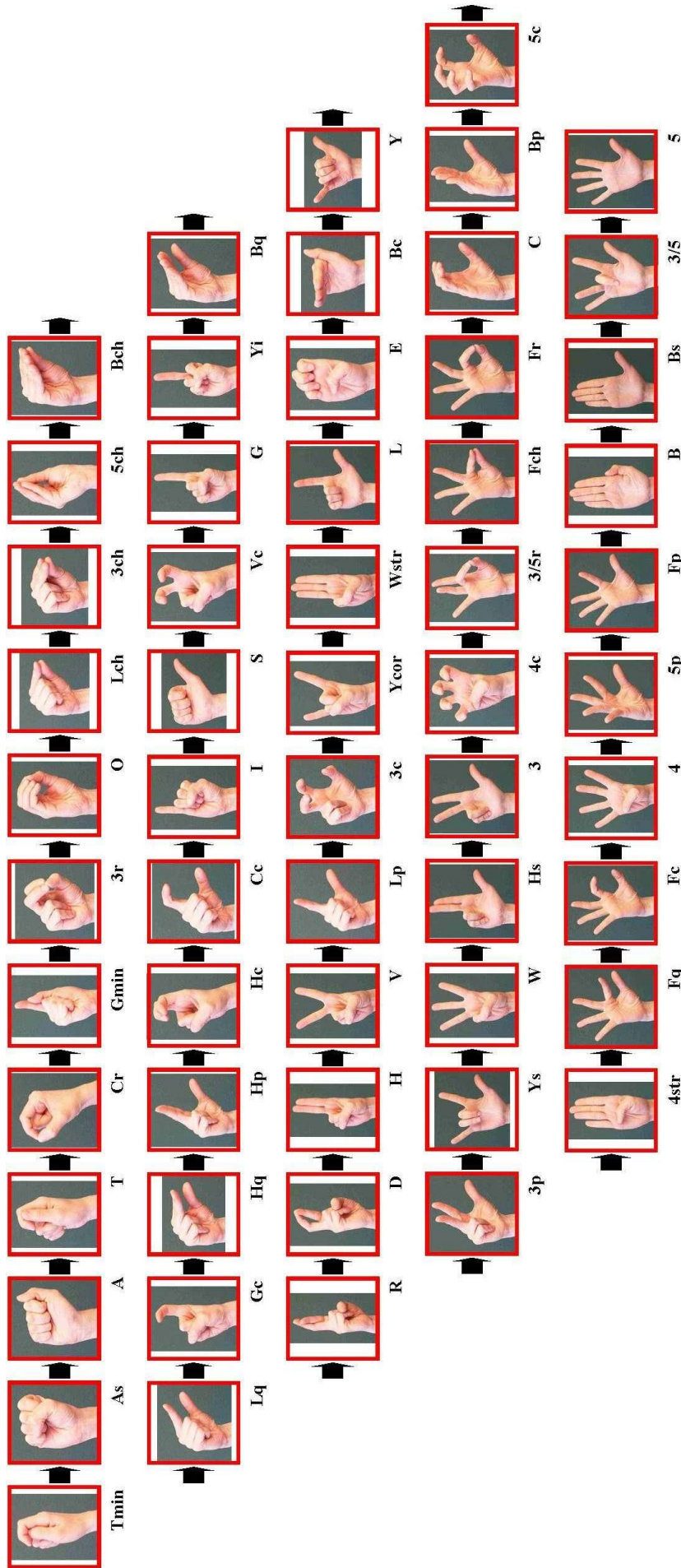


Figure 6: 2nd countercheck




1	 S  Fp  Fr  Fq  Fch	 Bs  Bp  Bq  Bch	 B  Bc	 3/5  3/Sr	 4  4c	 4str  E	 7  W	 8  Wstr	 9  Ys	 10  3  3p  3c  3r
11	 Hs  Hp  Hq  Hch	 Ycor	 V  Vc  D	 H  Hc  R	 Y	 L  Lp  Cc  Gmin  Cr  T  Tmin  Le	 17  I	 18  Yi	 19  G  Gc	 20  S

Figure 7: 3rd countercheck

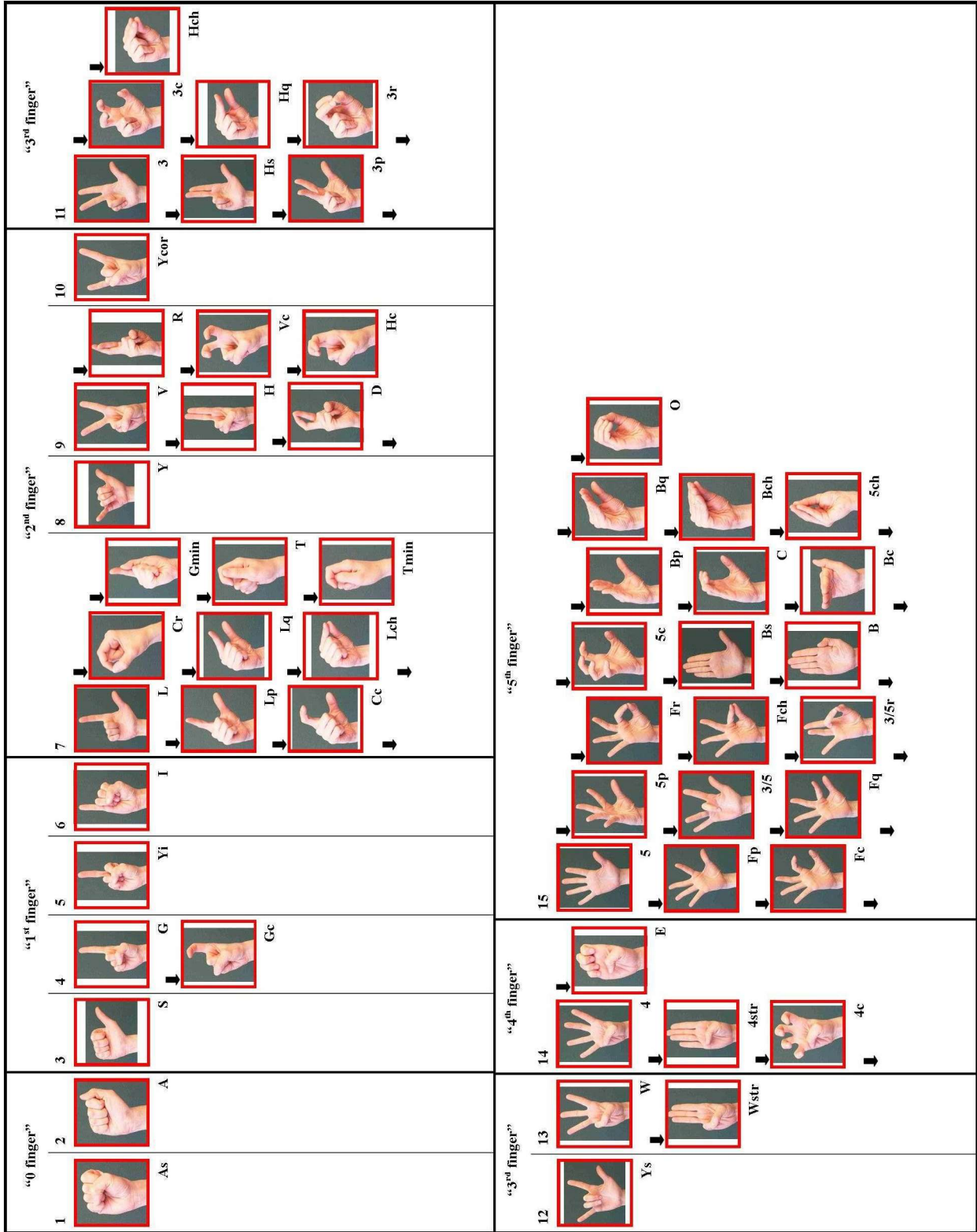


Figure 8: 4th countercheck version A

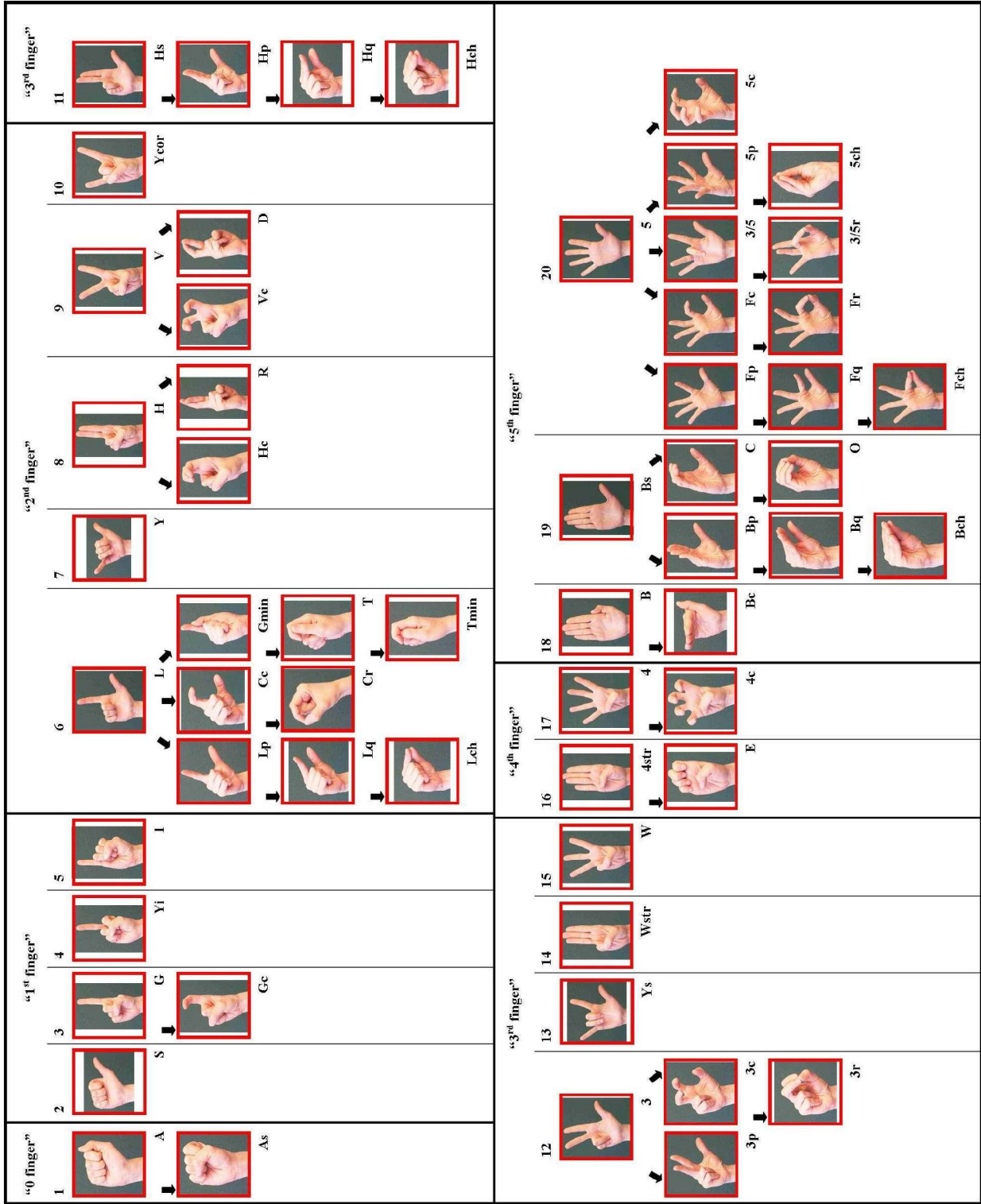


Figure 9: 4th countercheck version B