

Why are you raising your eyebrows?

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Abstract

It is widely known that sign languages make an extensive use of non-manual markers (NMM) to transmit linguistic information. Some NMMs are specific to particular constructions (in several Sign Languages, furrowed eyebrows is mostly used to mark wh-questions, while headshake is used to mark negation), others may occur in several unrelated constructions (see eyebrow raising in American sign language). This study presents preliminary results of a quantitative investigation of the distribution of raised eyebrows (re-NMM) in Italian Sign Language (LIS). Re-NMM frequently occurs in spontaneous signing and is used to mark a variety of constructions; therefore re-NMM qualifies as a good candidate for a VARBRUL analysis. In particular, re-NMM may mark 8 different constructions in LIS: yes/no-questions, topics, if-clauses, correlative clauses, focus, contrastive focus, subordinate clauses, and the signer's attitude. Data come from a corpus of LIS and have been analyzed with the ELAN software. Results show an even distribution across the sample for most of the uses of re-NMM. Only two functions turned out to be significantly different: the use of re-NMM as a focus marker and the use of re-NMM as an attitude marker, which are sensitive to age.

1. Introduction

One of the most interesting properties of sign languages (SLs) is the use of non-manual components to transmit linguistic information. At a first glance, non-manual markers (NMMs) can be thought to have a similar role to that played by prosody in spoken languages. While this is certainly true (see for instance Nespor and Sandler 1999), it is also clear that NMMs are much more than that. Indeed, they represent a pervasive aspect of SLs. All levels of linguistic analysis are affected by the presence of NMMs: they are productively used to mark specific lexical items, and in some cases they also mark phonological contrast (see Franchi, 2004, for some examples from Italian Sign Language, LIS). They are used as adverbial markers (see Neidle et al. 2000, for some examples from American sign language, ASL). They can also be used as markers of discourse features like the signer's attitude and more generally as affective markers. NMMs have an impact also in the domain of semantics. For instance, in some varieties of LIS, the position of the shoulder is used to mark the event time (Zucchi, 2009). However, the most intriguing use of NMMs is in the domain of syntax, where NMMs play a crucial role in determining several syntactic functions and constructions such as overt agreement (Neidle et al. 2000), negation (Neidle et al. 2000, Geraci, 2006 and Pfau & Quer, 2007 among others), wh-questions (Cecchetto, Geraci & Zucchi 2009), etc.

Several independent articulators can be used to produce NMMs and, most importantly, they can act simultaneously so that a certain degree of overlapping is generally allowed. For instance, (raised or lowered) eyebrow positioning may co-occur with head-tilt, eye gaze, and some specific body postures. As discussed in Wilbur (2000), the main function of NMMs is to single out specific linguistic domains. Depending on the

articulator(s), this can be done either by signalling domain boundaries (as in the case of eye blinking or head nods), or by spreading the marker over the whole domain (as in the case of headshake or eyebrow positioning). In the former case, NMMs are used as edge-makers, while in the latter case they are used as scope markers. Within the class of scope markers, raised eyebrows pose a particular challenge. Indeed, while headshake and, to a certain extent, furrowed eyebrows can be argued to mark specific constructions (negation and wh-questions, respectively), raised eyebrows are found to occur with several and apparently unrelated constructions (for ASL, see Wilbur 2000). The aim of this study is twofold: on the one hand, we analyze the distribution of the raised eyebrow NMM (re-NMM) in LIS; on the other hand, we investigate whether non-linguistic factors may have a role in such distribution. In particular, it is likely that social factors may affect the use of re-NMM and the variety of constructions in which it occurs. This is accomplished by presenting preliminary results of a quantitative analysis of the distribution of re-NMM in a corpus of LIS data (Geraci et al. 2010).

2. The re-NMM variable

To our knowledge, there is no systematic investigation of re-NMM in LIS. However, the presence of this marker is observed in many studies, and it is associated with a variety of constructions. In particular, re-NMM is associated with:

- Yes/no questions (Cecchetto, Geraci & Zucchi 2006),
- If clauses (Barattieri, 2006),
- (Cor-)relative clauses (Cecchetto, Geraci & Zucchi 2006, Geraci, 2007, Branchini & Donati, 2009),

- Topicalized elements (Geraci, 2006 and Geraci, Cecchetto & Zucchi, 2008 and Bertone, 2009),
- Subordinate and complement clauses (Geraci, 2007, and Geraci, Cecchetto & Zucchi 2008).

Other previously unnoticed uses of re-NMM emerged in this study are:

- Broad focus,
- Contrastive focus,
- Emphatic discourse attitude.

Of course, as it happens with other NMMs, re-NMM is not the exclusive marker for the above-mentioned constructions. Other non-manual components may co-occur with it, or it can also be the case that re-NMM is only one of the possible means to mark the construction. Be as it is, such variation of uses is likely to be influenced not only by purely linguistic factors, but also by non-linguistic factors (such as age and gender). Furthermore, given its highly frequent distribution, re-NMM nicely qualifies as a candidate for a variation analysis with standard sociolinguistic techniques (Bayley 2002).

3. Data collection

The data from this study comes from a corpus of LIS which is under construction as part of a national research project on sociolinguistic variation in LIS (see Geraci et al. 2010). The corpus includes data from signers of three age groups (18-30, 31-54, over 55) recruited in 10 cities distributed across the country and consists of various kinds of texts, namely free conversation (45 minutes), elicited conversation (about 5-10 minutes), individual narration (10 minutes), and a picture-naming task (42 items). For this study, we analyzed the narrative production of 16 signers from the city of Torino. Six signers were in the group of old signers, while the middle and young groups consisted in five signers each. All participants agreed in being recorded. In order to avoid the situation of a signer sitting right in front of the camera and to reduce the potential negative effects of recording, signers were asked to sign to a Deaf addressee from the same local Deaf community. The camera was placed right behind the addressee, so that a frontal view of the narrator was provided. Signers were asked to tell stories about their life experience, nevertheless they were free to change topic at their pleasure.

4. Methodology

Data were analyzed by using the ELAN software (Johnston & Crasborn, 2006). The annotations were made by a LIS interpreter, enrolled as a second year MA student at the Università Ca' Foscari-Venezia, and were crosschecked by two native signers of LIS. For this study four tiers were employed, as shown in figure 1.

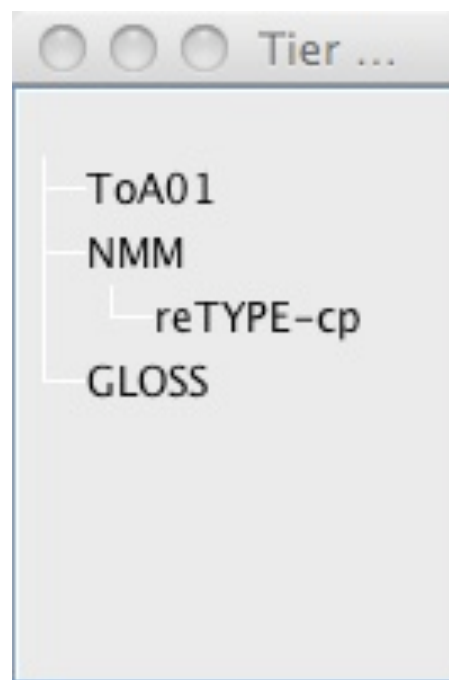


Figure 1: Tiers used for the re-NMM study

The main tier (ToA01, namely, old signer from Torino) includes the annotations of the utterance in which a re-NMM occurred. The GLOSS tier includes the sign-by-sign annotation of the utterance, while the NMM tier marks the spreading of eyebrows raising. Finally, the re-Type tier specifies which function is associated to that raising. Since the number of functions is limited, a controlled vocabulary has been created with 8 possible functions for the re-NMM: y/n question, if-clauses, (cor-)relatives, topic, subordination, focus, contrastive focus, and attitude. The procedure adopted for the annotation involved four steps: First, every occurrence of eyebrow raising was simply marked (NMM tier). Second, the annotations for the utterance were inserted (main tier). Third, the function of the re-NMM was selected (re-Type tier). Fourth, the gloss for each sign included in the utterance was provided (GLOSS tier). Figure 2 illustrates the ELAN workspace for this study.

5. Results

A total of 410 instances of re-NMM have been coded. The overall distribution for each function of re-NMM is given in table 1. Independently from the linguistic functions, old signers tend to use re-NMM (44.1 %) more than signers of the middle (30%) and young (25.1%) groups, and male signers (57.6%) tend to use re-NMM more than female signers (42.4%). Furthermore re-NMM is mostly used to mark broad focus (34.4%) and topic (26.8%). Apart from broad focus and attitude, the remaining functions of re-NMM are equally distributed across the factors in both factor groups (Age and Gender), as can be seen from the percentages reported in table 1.

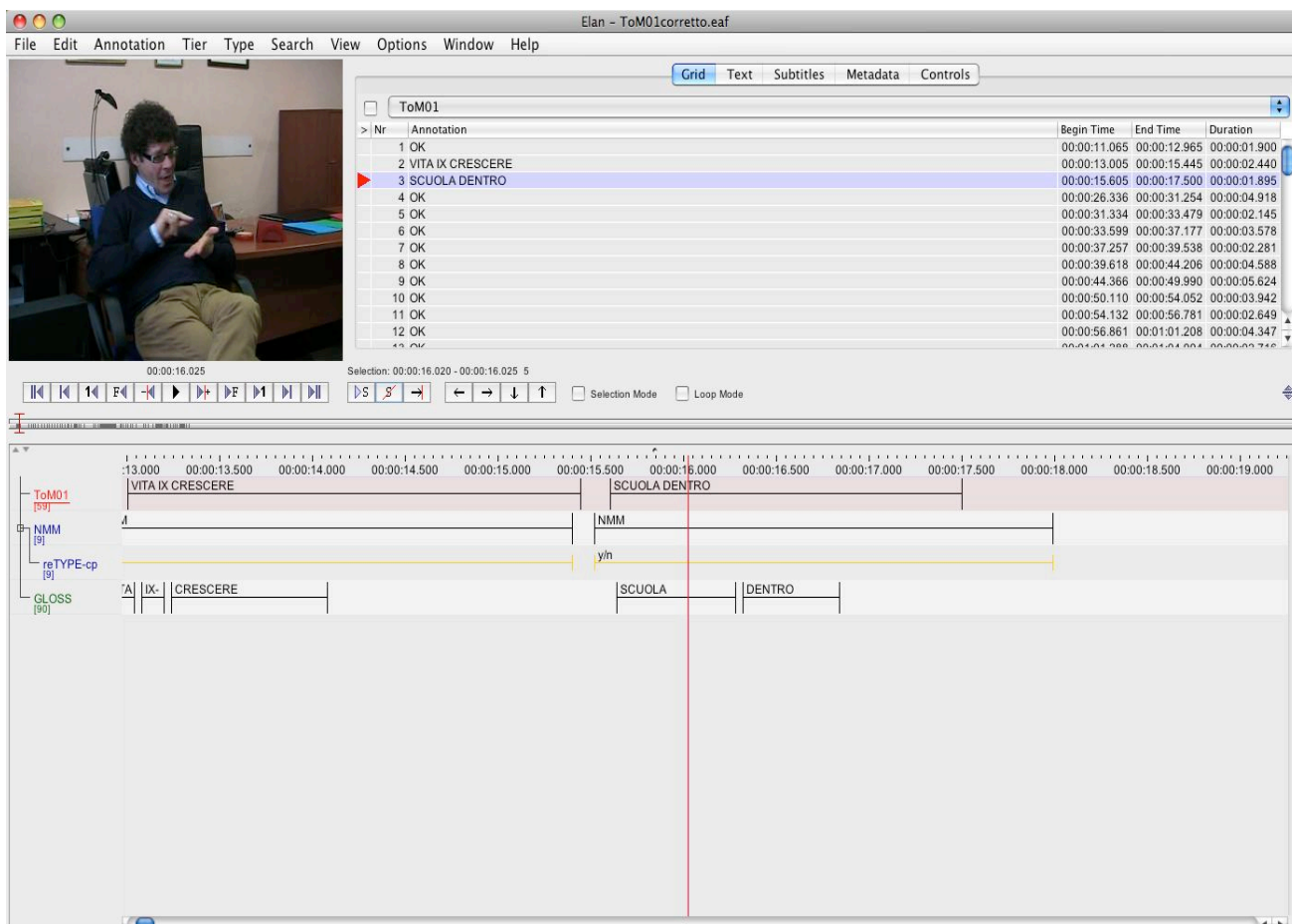


Figure 2: Workspace for the re-NMM study.

	Function	t	f	c	i	s	a	y	r	Total	%
Age	o	46	63	7	7	7	38	9	4	181	44.1
	%	25.4	34.8	3.9	3.9	3.9	21.0	5.0	2.2		
	m	36	34	9	6	12	12	13	4	126	30.7
	%	28.6	27.0	7.1	4.8	9.5	9.5	10.3	3.2		
	y	28	44	7	4	4	9	5	2	103	25.1
	%	27.2	42.7	6.8	3.9	3.9	8.7	4.9	1.9		
Gender	M	60	76	14	9	11	43	15	8	236	57.6
	%	25.4	32.2	5.9	3.8	4.7	18.2	6.4	3.4		
	F	50	65	9	8	12	16	12	2	174	42.4
	%	28.7	37.4	5.2	4.6	6.9	9.2	6.9	1.1		
	Total	110	141	23	17	23	59	27	10	410	
	%	26.8	34.4	5.6	4.1	5.6	14.4	6.6	2.4		

Table 1: Distribution of re-NMM functions by Factor Group. Functions: t = topic, f = broad focus, c = contrastive focus, i = if-clause, s = subordinate, a = attitude marker, y = y/n question, r = relative clause. Age: o = old signers' group, m = middle signers' group, y = young signers' group; Gender: M = male signers, F = female signers.

Indeed, only Age showed a significant effect in two of the eight VARBRUL analyses, performed with broad focus and attitude defined as the application value. Results for this factor group are shown in table 2. We have included the input value for each run, an overall measure of the tendency of signers to choose the application value and the chi-square per cell, a measure of the goodness of fit.

Factor	Broad Focus		Attitude	
	Weight	%	Weight	%
Old	.507	34.8	.632	21
Middle	.416	27.0	.405	9.5
Young	.590	42.7	.383	8.7
Input	.342	34.4	.134	14.4

Table 2: Functions of re-NMM by Age. Note: Broad Focus, $\chi^2/\text{cell} = 0.0660$; Attitude, $\chi^2/\text{cell} = 0.0764$.

On the one hand, the use of re-NMM to mark broad focus is favored by young signers ($p = .590$) and disfavored by middle signers ($p = .416$), while old signers neither favor nor disfavor the use of re-NMM to mark broad focus. On the other hand, the use of re-NMM as an attitude marker is favored by old signers ($p = .632$) and clearly disfavored both by signers from the middle ($p = .405$) and young ($p = .383$) groups.

6. Discussion

Eyebrows raising is a fundamental component of the grammar of sign languages. In LIS, as in ASL, this non-manual marker is widely used in several constructions. In particular, re-NMM is used to mark eight different linguistic functions. Interestingly, the data reported here show a significant effect of age in the use of re-NMM. In particular, young signers use re-NMM to mark broad focus more often than other age groups, and older signers tend to use re-NMM as an attitude marker while middle and young signers disfavor the use of re-NMM for this function. Both these effects can be interpreted as a diachronic tendency toward the use of re-NMM with a fine-grained linguistic function. Of course, more research and more data from other types of texts and other cities are needed to confirm this hypothesis and to evaluate how consistent our findings are with respect to the varieties of LIS signed in other cities.

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