

## B. (Non-)manual marker annotation guideline

The non-manual behaviour of the participants in the corpus videos is examined in order to determine whether some non-manual markers are used when (specific forms of) polar questions in NGT are asked. The following markers are focused on: eyebrows, eye shape, shoulders, body position, lip corners, head, nose, and eye gaze. Another feature that is also investigated is whether the manual sign PALMS-UP is used. Each non-manual marker can take different shapes. Eyebrows, for example, can be identified as being raised, low, or neutral. The table below presents the different states the (non-)manual markers can be characterized as.

marker		categories						
1	eyebrows	neutral	raised	low				
2	eye shape	neutral	wide	squeezed				
3	shoulder	neutral	up					
4	body position	neutral	leaning forward	leaning backwards	tilted	sideways		
5	lip corners	neutral	up	down				
6	head	neutral	chin in	chin out	shaking	nodding	shake	nod
7	nose	neutral	wrinkled					
8	eye gaze	other participant	experimenter	space				
9	PALMS-UP	yes	no					

Table 29. (Non-)manual markers and their characterizing categories

This appendix provides the guideline that stipulates which criteria should be fulfilled for a marker to be characterized as being in one of its states. After most of the marker descriptions below, some pictures illustrate the different marker's states.<sup>1</sup>

If it is unclear in which state the marker is, then this marker is annotated as 'uncertain', one could add in the comment section why it is not clear. **In order to determine the participant's natural/neutral state of the different markers it might be helpful to watch some seconds before and after the fragment that needs annotation.** It could be the case that in a fragment the participant combines different *non-neutral* states of a marker, then *this combination* is annotated. For example, in the course of the fragment the participant's eyes are both wide and squeezed, this is annotated as 'wide, squeezed'. In case a neutral and a non-neutral state of the marker are combined, only the non-neutral state is annotated: e.g., the situation in which participant's body position first moves in a tilted state and then back to a neutral position, is annotated as 'tilted'.

### B.1 Eyebrows

Following de Vos' characterization (Vos, Kooij, and Crasborn (2009, p. 318)) of the possible eyebrow shapes, the distinguished forms are inner brow raised, outer brow raised, and eyebrows low. The inner brow is the part of the eyebrow that begins around the nose and ends at the middle of the eyebrow. The outer brow starts at the other end of the eyebrow

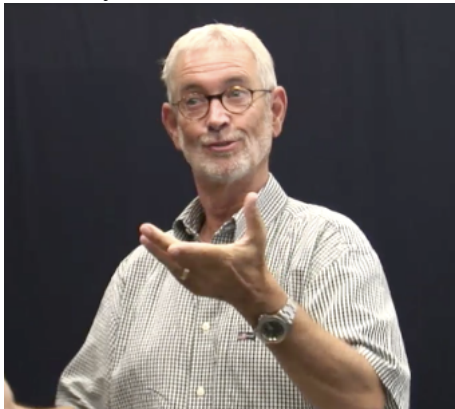
<sup>1</sup>These pictures are screenshots of some video fragments in the NGT corpus (Crasborn, Zwitserlood, and Ros (2008) and Crasborn and Zwitserlood (2008)).

and also ends around the middle of the eyebrow. The eyebrows are annotated as ‘raised’ if both the inner and the outer brow are raised. When the eyebrows are low they are annotated as ‘low’. It could be the case that the eyebrows are low but the inner or outer brow is raised, since the lowness of the eyebrow is more dominant this combination is annotated as ‘low’.<sup>2</sup> In case the eyebrows are in a relaxed position the eyebrows are annotated with ‘neutral’. Also, when the eyebrows move down or up only for a short moment within the given fragment, it is annotated: respectively, as ‘low’ or ‘raised’.

The eyebrows could seem *neutral* in situations in which the eyebrows are in a *non-neutral* state before the fragment starts<sup>3</sup> and they do not change during the fragment. However, compared to the actual neutral state they are non-neutral and although they do not change within the course of the fragment, they are a change compared to this actual neutral state and should therefore be annotated as the particular non-neutral state they are in.<sup>4</sup> It is therefore advised to watch some seconds before the fragment, to determine whether the eyebrows’ state is neutral or not.

In case it is hard to determine in which state the eyebrows are in, the eyebrows are annotated as ‘uncertain’.

raised eyebrows



(slightly) raised eyebrows



low eyebrows



neutral eyebrows



<sup>2</sup>In Vos, Kooij, and Crasborn (2009) this is marked as AU 1+2+4 or AU 1+4.

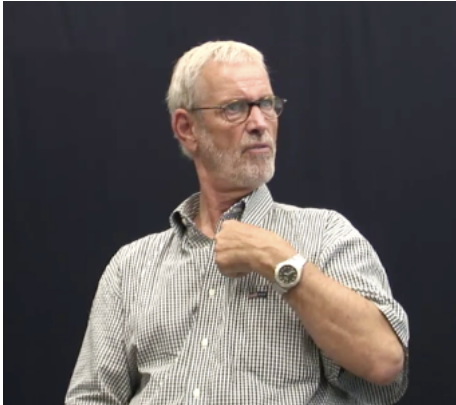
<sup>3</sup>For example because the question in the fragment is following another question.

<sup>4</sup>This is because they could be a particular question marker.

## B.2 Eye shape

The eyes could be in a neutral, squeezed, and wide shape. The eyes are in a squeezed state if the under eyelids are pressed up, the eye shape is then annotated as ‘squeezed’. When the eyes are in such squeezed shape, the upper eyelids could additionally be pressed down. The eyes’ shape is annotated with ‘wide’ when both eyelids are pressed away from each other (i.e., upper eyelid up and under eyelid down). If the eyes are in a natural shape, then the eye shape is annotated as ‘neutral’. Please note that the eyes’ shape could seem squeezed when the eyebrows are low or wide when the eyebrows are raised, while *actually* the eyes are in a neutral state. In these cases, the eye shape should be annotated as ‘neutral’. If the eye shape is hard to determine due to these eyebrow positions, one could add a note about the eyebrows in the comment section. In general, if it is not clear in which state the eyes are, it is annotated with ‘uncertain’.

neutral eye shape (low eyebrows)



squeezed eye shape (low eyebrows)



wide eye shape (raised eyebrows)



wide eye shape (uncertain eyebrows)



squeezed eye shape (raised eyebrows)



neutral eye shape (neutral eyebrows)



### B.3 Shoulders

The participant could raise the shoulders (one or both) or hold them in a neutral position. When the shoulders are relaxed it is annotated with ‘neutral’ and when one or both shoulders are raised with ‘up’. *It could be the case that the body is slightly leaning to the side without tightening the shoulders, in doing so one shoulder is higher than the other without really lifting any of the shoulders.* The shoulders are then annotated with ‘neutral’, and the tilted position is possibly annotated in the body position tier (see section B.4). If it is unclear whether the shoulders are in a neutral or an up state it is annotated with ‘uncertain’.

shoulders up



shoulders neutral



shoulders neutral



shoulders neutral



## B.4 Body position

The body can be in several positions: neutral, leaning forward, leaning backwards, sideways and tilted. If the top of the body is moving forward, then the body position is annotated with ‘leaning forward’. If the top of the body is moving backwards, then it is annotated as ‘leaning backwards’. Both these movements could involve moving shoulders as well. In case such shoulder movements are due to the movement of the body they are not annotated as such in the shoulder tier: this movement is only described in the body position tier.

The body position is annotated as ‘tilted’ if the top of the body is facing forward and the body *moves* in a tilted shape (leaning sideways *movement*). If the body is in a (slightly) tilted position, but there is *no movement* towards that position involved the body position is annotated as ‘neutral’ instead. If the upper body (with or without head movement) is turned sideways then the body position is annotated with ‘sideways’, this could – for example – happen when the participant communicates with the experimenter.

It could be the case that the body is moving in several directions, the combination of movements is then annotated (e.g., forward to side movement is annotated as ‘leaning forward, sideways’). The body is in a neutral position if it is relaxed and not heavily moving, this is annotated with ‘neutral’. If it is unclear in which body position the participant is, then this is annotated as ‘uncertain’.

neutral body position



neutral body position



leaning forward body position



leaning forward body position



leaning backwards body position



sideways body position



## B.5 Lip corners

The lip corners could be curled up, pushed down, or in a relaxed state. This is respectively annotated as ‘up’, ‘down’, or ‘neutral’. Some participants already have their lip corners curled up/down when in a relaxed state, annotators should therefore view some seconds before and/or after the fragment in order to first get a better view of the participant’s neutral lip corners’ state. Besides signing, the participants also use mouth gestures and mouthing, therewith their mouths including their lip corners move, it could therefore be hard to determine in which state the lip corners are. To minimize the influence of this factor, **only the state of the lip corners at the end of the fragment is annotated**. Also, the lip corners are only annotated as non-neutral if they *move* into some non-neutral state at the end of the fragment. Thus, if there is no lip corner movement involved at the end of the fragment, the lip corners are annotated as ‘neutral’. If the lip corners’ state is unclear it is annotated as ‘uncertain’.

lip corners down



lip corners neutral<sup>5</sup>



## B.6 Head

The head could be in several states: neutral, chin out, chin in, shaking, shake, nodding, and nod. If the **chin** is pulled backwards or pushed down, it is annotated as ‘chin in’. In case the chin is pushed forward or up it is annotated as ‘chin out’. A combination is also possible if for example the participant moves the chin forward and down it is annotated as: ‘chin out, chin in’.

The head is annotated as ‘shaking’ when the head is moving from side to side more than once. If it just moves *once* it is annotated as ‘shake’. If the head moves several times vertically, it is

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<sup>5</sup>despite the lip corners being slightly down, it is the participant’s neutral state, therefore the lipcorners are annotated with ‘neutral’.

annotated with ‘nodding’. If the head makes *one* nod, which means that the chin moves from an up position to a down position (and possibly back), then the head is annotated as ‘nod’. Both ‘nod’ and ‘shake’ can occur more than once within the fragment. The difference between for example two nods (which is annotated as ‘nod’) and nodding is that nodding is a continuous vertical movement whereas in case of two nods there is one up-to-down movement followed by a pause in which no nodding takes place followed by another up-to-down movement. The same distinction applies to shake and shaking, but in this case a horizontal movement is involved.

In case the head/chin is in a relaxed and non-moving position, the head is annotated as ‘neutral’. If it is uncertain which state the head is in, this column is annotated with ‘uncertain’.

chin in



chin in



chin out



chin out



chin out



chin out



## B.7 Nose

The participant's nose could be in a neutral or in a wrinkled state. In the wrinkled state the nose is pulled up such that wrinkles arise at its top (just below the eyes) and the tip of the nostrils are pulled up as well. If the nose is in this wrinkled state it is annotated with 'wrinkled'. The nose is not only annotated as 'wrinkled' if the nose is wrinkled during the entire fragment, but also when it is only wrinkled for a short moment. If the nose is in a relaxed state it is annotated as 'neutral'. If it is uncertain whether the nose is in one of these states it is annotated as 'uncertain'.

nose wrinkled



nose wrinkled



## B.8 Eye gaze

The participant could look in three different directions. The most common direction is towards the other participant which is annotated as 'other participant'. If the participant is looking in the direction of the experimenter, the participant is in some way turned sideways and it is annotated as 'experimenter'. The eye gaze is also annotated as 'experimenter' if the participant looks at multiple experimenters during the fragment. If the participant does not look towards the other participant or the experimenter then the participant is looking into space, this last direction is annotated as 'space'. Also, within the scope of asking the question the participant could look in multiple directions, in this case the combination is annotated: e.g., looking at both the other participant and the experimenter is annotated as 'other participant, experimenter'. If it is uncertain in which direction the participant is looking this tier should be annotated with 'uncertain'.

space



space



## **B.9 PALMS-UP**

If the participant signs PALMS-UP then this manual marker is annotated with ‘yes’ and in the case that no PALMS-UP is signed the annotation is ‘no’. PALMS-UP could be signed with one or with both hands. The borderline case in which a PALMS-UP sign seems to be made when the hand returns from a manual sign to a neutral position (e.g., to the lap) could be annotated with ‘uncertain’, as in such case the sign is so subtle that it is uncertain whether it should really be interpreted as PALMS-UP.