

# The temporal coordination of negation gestures in relation to speech

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## Abstract

This paper examines the temporal coordination of a subset of gestures in relation to speech containing negation. Based on qualitative observations of ‘palm down’ gestures in naturalistic data, I show that the gestures tend to occur either with or after the verbal negative particle, but not before. Analysing 10 utterances, I identify the different synchronization points and relate them to grammatical, discursive, and conceptual factors involved in the expression of negation in English.

**Keywords:** Negation; Negative Polarity Items; Scope; Gesture coordination; Conceptual affiliate

## 1. Introduction

Since Schegloff (1984), studies of the temporal coordination of gesture with speech have focused on representational gestures in relation to their ‘lexical affiliate’ (e.g., Nobe, 2000; Chui, 2005; Ferré, 2010; Bergmann, Aksu, & Kopp, 2011).

However, McNeill (2005) emphasizes that “a co-expressive linguistic segment might be a lexical affiliate, but there is no necessity for it to be” (p. 37). In McNeill (1998), he writes that “synchrony arises in the form of the thought itself”, which leads to a ‘conceptual affiliation’ between speech and gesture that goes beyond individual linguistic segments (de Ruiter, 2000; Kirchhof, 2011).

Studying a subset of gestures with different organizational properties to representational gestures may shed light on these issues. In the case of gestural forms associated with the expression of negation, gestures link to speech in terms of semantic (Calbris, 1990), pragmatic (Kendon, 2004), and grammatical aspects (Harrison, 2009).

This paper presents a study of the temporal coordination of negation gestures in relation to speech in English. Analyzing examples from a corpus transcribed in ELAN, I identify the factors that impose positional constraints on the distribution of gestures with speech and formulate a preliminary heuristics to capture the different synchronization points.

### Gestural forms associated with negation

Harrison (2009) identified nine gestural forms that speakers in his corpus produced in association with utterances containing negation. These gestures were all categorized as exhibiting an Open Hand Prone formation and could be interpreted as expressing a ‘semantic theme’ associated with negation (following Kendon, 2004: 248-264).

The gestures reported in the current paper belong to this Open Hand Prone (OHP) family. The examples contain three variations performed with the palm(s) facing down

and moved horizontally through space, either along the lateral axis or diagonally downward (Fig.1).

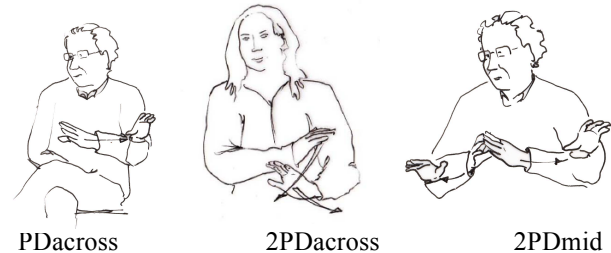


Figure 1: 3 Palm Down gestures (Harrison, 2009).

In previous work on speech-gesture coordination, Harrison (2010) demonstrated that with sentential negatives (like “I don’t have to pay” where a negative node NOT negates a proposition ‘have to pay’), speakers tended to “prepare the gesture in advance of the node, synchronize the gesture stroke with the node, and perform a post-stroke hold through the scope” (p. 31).

### Present study

In the present study, I extend the observation that gesture aligns with a negative construct in speech to a broader range of utterances containing negation. In all cases, the gestures tend to occur either with or after the negative particle in speech, but not before. Gestures placed after the verbal particle of negation are still affiliated with the negation conceptually but align grammatically with the particle’s scope projections. They coordinate with respect to focused elements further down the syntax, such as elements to which the negation applies and elements serving to emphasise the negation, like Negative Polarity Items (e. g. *any*, *ever*). Furthermore, the gestures may occur during a pause in speech at the end of utterance, when they appear to be related to a broader description of a negative state of affairs evoked by the dialogue.

The findings confirm that the notion of lexical affiliate does not generalize to all instances of gesture production and they support both conceptual and grammatical relations determining the speech-gesture coordination. Moreover, while a verbal negation particle casts or ‘imposes’ a range of possible synchronization points for these gestures across the utterance, linguistic material alone emerges as insufficient to evaluate their exact placement. Previous discourse, dialogic context, and the speaker’s emphasis play essential roles in speech-gesture coordination for each individual utterance.

## 2. Corpus

I filmed conversational partners either seated in my apartment or interacting on a campsite (over 30 speakers in total). In my apartment, I used a board game called ‘Get to know one another’ as a stimulus for conversation.

Out of approximately 12 hours of conversation, I selected utterances that contained a verbal form of negation and then focused on instances where the speakers also performed a gestural form previously observed to be associated with negation (Calbris, 1990) i.e. in the Open Hand Prone family (Kendon, 2004). I examined the organization of gestures in relation to speech in ELAN for 49 such utterances (Harrison, 2009), creating temporally aligned annotations in analytical tiers for speech and gesture phrase structure. For speech, I made annotations for each word; for gesture, I annotated the preparation, stroke, and retraction phrases, as well as holds (cf. Kita et al, 1998).

Out of the 49 utterances, the selection criteria for the 10 utterances studied below include a particular subset of gestures within the Open Hand Prone family, fluency of speech, clarity of gesture phrase structure and minimal interference from both other gestures and the interlocutor.

Examples are transposed from ELAN into orthography and stressed syllables are indicated with SMALL CAPS. Abbreviations e.g. ‘PDacross’ refer to gesture form variations (cf. Figure 1). Alignment of phases of gestural action are annotated in the line underneath speech with symbols to represent where the phases occur (Kendon, 2004):

|      Gesture phrase boundaries (i.e. onset/offset)  
 ~~~ Preparation; \*\*\* Stroke; -.- Retraction  
 ——— Holds in action; / Different phases of stroke action

## 3. Examples

### 3.1. Sentential negatives

When the utterance contains a sentential negative, the gesture stroke synchronizes with the negative particle. The gesture may be held after the stroke, with the length of the post-stroke hold corresponding to the material within scope (cf. Harrison, 2010).

In (1), the speaker is explaining a privileged relationship he has with the owners of the campground. Unlike other clients, the speaker can occupy a pitch without having to pay unless he actually sleeps there.

1. If I don’t STay here, I DON’t have to pay  
 |~~~~~\*\*\*\*\*~|  
 PDacross

When there is no linguistic material following the negative node, the gesture occurs abruptly without a hold. In (2), the speaker expresses an unattainable wish to go climbing twice on Tuesdays. Her gesture accompanies the negative “don’t” which refers back to the proposition ‘have the time’.

2. I wish I HAD the time on TUESDAYS to go TWICE  
 but I DON’t.....uuuuhm.  
 |~~~~\*~-.~| (2PDmid)

In (3) the speaker expresses her disapproval about a question that has been asked but chooses to leave the object of her negation implicit. The gesture synchronizes with the negated modal “can’t”.

3. Because, like, I don’t know,  
 You CAN’t, eww, hate that question!  
 |~~~~\*~-.~|  
 2PDacross

In (1) through (3), the speaker prepares the gestures to synchronize with the negative particle, which is the part of speech it relates to semantically (cf. Calbris, 1990). In addition to examples discussed in Harrison (2010), example (1) indicates that speakers may maintain a post-stroke hold of the gesture as they utter the elements over which the negative particle has scope, highlighting further conceptual and grammatical relations between elements within the utterance.

### 3.2. Negative pronouns and adjectives

Gestural forms associated with negation also occur in utterances containing negative pronouns like NO-ONE (4), and negative adjectives like NO-GO (5). These particles also attract the stroke of the gesture associated with negation. In (4), the speaker describes the joy of being alone in winter, coordinating his gesture with the expression ‘no-one around’.

4. Snowboarding... or when it’s Pissing down and really cold outside, and you’re just CHilling in...  
 and NO-one AROUND, you’re just by yourself.  
 |~~~~\*\*\*\*\*~-.~-.~| (2PDmid)

In (5), the speaker describes how his plan to break up with his girlfriend in order to date her friends backfired. He coordinates the stroke of his gesture with ‘no-go’ and maintains a hold as he utters ‘territory’.

5. I was like..... I was like NO-go territory.  
 |~~~~~\*\*\*\*\*~|  
 PDacross

The early preparation and pre-stroke hold of the gesture here function to coordinate the stroke precisely with the verbal negation. They may also forewarn the interlocutor that a negation is forthcoming.

### 3.3. Negative Polarity Items

Negative Polarity Items (NPIs) are expressions like *any*, *ever*, and *a single* that are grammatically restricted in the sense they “can only occur felicitously within the scope of

negation” (Horn, 1989: 49). In (6, 7), the function of NPIs is to reinforce a negation, either to emphasize a contrast with a background of expectations (6) or endorse an argument that involves a negative state of affairs (7). Rather than occurring with the utterance’s negative particle, the same gestures as above now occur with the NPIs.

In (6), the speaker is responding to the question “Do you have a television?”. She affirms that she owns ‘the physical box’ but negates receiving channels. She emphasizes this contrast with the NPI *a single*. Although she stresses the word ‘channel’, the gesture stroke begins with the second syllable of ‘single’.

6. I own the physical box...  
but I don’t... get a single CHANNEL.....uhmm  
|~\*\*\*\*\*\_-.|  
2PDacross

In (7), a teacher uses the NPI *at all* after a negation to emphasize the fact that at no single point does she have to work in the week and endorse her claim that she enjoys the weekends. The first stroke of her palm down gesture coordinates with the word ‘all’ while the second (identical) stroke occurs with ‘Monday’.

7. Yes, I like the weekends. And they’re long too, like yours... Because  
I DON’t work FRIday at ALL or MONday at ALL.  
|~\*\*\*\*\*\_-.|  
2PDMid

In both these examples, the focus of the negation is not the negation itself, but a point of contrast or emphasis that occurs later in the utterance. Marked verbally and structured grammatically by an NPI, and indicated by a point of stress in speech, these contrasts are ‘newsworthy’ items (cf. McNeill, 1998). Although the gesture relates conceptually to the negative particle, the gesture occurs in the region of the NPIs, reflecting the speakers’ discursive goals but also maintaining conceptual relations between grammatically associated elements within the utterance.

### 3.4. Focused elements lying in scope

Examples of speakers rejecting multiple discourse ‘objects’ further demonstrate this link and indicate that a) gesture strokes may be coordinated with objects being negated that lie in scope of a verbal negator and that b) the number of objects may correspond to the number of strokes.

Consider (8), in which the speaker structures an utterance with the negator NONE OF. He follows this negator with a list of attributes of television soaps that he dislikes and coordinates a palm down gesture stroke with each attribute.

8. None of these HEAVY, where everybody Dies, and  
|~\*\*\*\*\*\_-.|  
PDacross

they’re probably FIGHTing and hate each other  
|~\*\*\*\*\*\_-.|  
(Palm Vertical)

Here, the gesture is affiliated to its accompanying words not through semantic features, but by virtue of those words being the words to which the negation stemming from the negator ‘none’ applies. In (9) the utterance is similar in that the speaker is rejecting items—two household chores she dislikes—and she also performs a palm down gesture with a corresponding number of strokes. However, she begins the strokes of her gesture only at the end of her verbal utterance.

9. J: Ironing?  
A: NO ironing *unh uh*  
and vacuuming *unh uh* .....  
|~\*\*\*\*\*\_-.| (PDacross)

The effect of this post-verbal organization is to indicate ‘not only ironing and vacuuming, but also all other such unpleasant household chores’. In a similar example (10), the utterance contains a sentential negative and a negative polarity item, yet the palm down gesture occurs after the verbal utterance, just before the speaker makes a *cluck!*, one of several oral gestures related to ‘nothingness’ (Calbris, 1990).

10. A: I hate working at home... S: Really?  
A: Yeah...  
I just DON’t get anything done..... *cluck!*  
|~\*\*\*\*\*\_-.|  
2PDMid

The common organizational feature of (9) and (10) is that the speaker performs her gesture towards the end of the utterance with the effect of emphasising an expression of ‘absolute negation’. In (9) this means ‘neither ironing nor vacuuming and *no other such things*’, while in (10) this means ‘doing *absolutely nothing*’. These examples highlight the conceptual relation between gesture, the utterance, and a broader description of a negative state of affairs. They also show that in addition to being synchronised, gestures with conventionalised meanings may be sequenced with speech.

## 4. Preliminary ordering principle

Based on the above examples, we may formulate a preliminary ordering principle: gestures associated with negation in English tend to occur either with or after the verbal negation, but not before. Possible synchronisation points emerge by virtue of the negative structures underpinning the utterance and may be identified by analyzing a) the position of the main verbal negator and b) the linguistic material in the utterance under scope from the negation. Discursive processes and speakers’ emphasis (often indicated by stress) are essential to understanding the specific placement of a negation gesture with a given utterance in context.

A working heuristics for gestures associated with negation in English grammar may be sketched, where square brackets indicate the linguistic segment in which the gesture is likely to occur and bold type predicts approximate location of the stroke based on the presence of other elements in the utterance; underlining indicates a hold (Figure 2).

- (i) I [don't].
- (ii) I [don't have to pay]
- (iii) I [don't have to pay **a single dollar**].
- (iv) I [don't have to pay a dollar to **Vito** or to **Suki**].
- (v) I [don't have to pay at all **.....**]
- (vi) \*I [don't have to pay]

Figure 2: A working heuristics for the timing of gestures associated with negation in English.

If there is a negative node only, the gesture associated with negation will occur with it (i). Where a negative node projects scope over a clause the gesture will synchronise with the node and be maintained in space through the scope (ii). The presence of an NPI will indicate the speaker's emphasis and attract the gesture stroke accordingly (iii). Discourse elements receiving the focus of negation will also attract the gesture stroke, in which case number of focused elements may determine number of gesture strokes (iv). A gesture performed as part of a description of negative state of affairs to emphasize the categorical or absolute nature of negation may be performed after the verbal utterance, as a kind of summative expression of negation (v). Note that in (iii, iv, and v), the stroke does not need to synchronise with the onset of its main conceptual affiliate (the negative particle), but can be associated with grammatically related elements that occur later in the utterance. In (vi), where the gesture would occur with the subject "I", the asterisk indicates that a gesture associated with negation will not usually precede the main verbal negation.

## 5. Discussion

Because a verbal form of negation imposes syntactic constraints on linguistic elements in the utterance, possible synchronisation points for a gesture associated with negation will also be constrained. Since the negative form is restricted to one syntactic slot yet the elements to which it applies must be distributed linearly across the utterance, gesture may either be placed with the negative form or be organized to reflect the structures that also organize verbal elements associated with negation (negative focus, NPIs). In addition, which structures are used and where the gesture synchronises depend on the dialogic context of the utterance and the speaker's communicative aims.

A larger data set with inter-rater reliability for coding and finer-grained analyses of both intonation and linguistic properties of negation would help to test the heuristics outlined above. Since speech-gesture organization reflects grammatical relations, studying languages with different morpho-syntactic expressions of negation should reveal

different temporal coordination than English, but nevertheless be based on similar principles (position of negative particle, projection of scope, presence of NPIs).

## Acknowledgments

I wish to thank a host of people for comments on an earlier manuscript as well as the SeSyLiA research team (Univ. Paris 3) for discussion of the examples.

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