




Colasanti, Valentina. 2023. Functional gestures as morphemes: Some evidence from the languages of Southern Italy. *Glossa: a journal of general linguistics* 8(1). pp. 1–45. DOI: <https://doi.org/10.16995/glossa.743>



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Functional gestures as morphemes: Some evidence from the languages of Southern Italy

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Recently, gestures have been a topic of much interest in formal linguistics, especially with respect to their semantic contribution (Ebert & Ebert 2014; Schlenker 2018a; Esipova 2019a; *i.a.*). A consistent observation within this literature is that the semantic content of gestures can be integrated into the meaning of spoken utterances. One way to explain the semantic contribution of gestures is to treat them as part of the grammar: namely, if gesture can participate in semantic relations, it is because they appear in syntactic representations (Jouitteau 2004; 2007; Sailor & Colasanti 2020; Colasanti 2021a; b; to appear). Following this previous literature, I present some preliminary data on the conventionalised co-speech gesture *Mano a Borsa* (MAB; i.e., ) 'pursed hand' in Neapolitan, a southern Italo-Romance language. Based on original fieldwork with 96 speakers in Naples, I argue that MAB is the realisation of a particular flavour of interrogative C, consistent with its preference for aligning with the beginning of the clause in *wh*-interrogatives, even in *wh*-in-situ contexts. In other words, I argue that MAB exhibits behaviour typical of a *wh*-question morpheme, albeit one whose PF realisation happens to be gestural rather than spoken.

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1 Introduction

Recently, gestures have been a topic of much interest in formal linguistics especially with respect to their semantic contribution (Lascarides & Stone 2009; Ebert & Ebert 2014; Tieu et al. 2017; 2018; Schlenker 2018a; Schlenker & Chemla 2018; Esipova 2019a; *i.a.*). A consistent observation within this literature is that the semantic content of gestures can be integrated into the meaning of spoken utterances, and one way to explain this semantic integration is to treat them as part of the sentence grammar—i.e., part of the syntactic representation that provides the input to LF (Jouitteau 2004; 2007; Sailor & Colasanti 2020; Colasanti 2021a; b; to appear). In particular, since gestures are performed with the same articulators as sign languages (e.g. hands, eyebrows), this could mean that at least some gestures are just normal lexical items or morphemes (*qua* bundles of features projected in the syntax) that just happen to be externalised at PF in the visual-gestural modality, rather than in the auditory modality. According to this hypothesis, gestures *can* be integrated in the grammar.¹ Specifically, languages can have both spoken and gestural (functional) morphemes, which can both be involved in syntactic representations alike (Jouitteau 2004; 2007; Sailor & Colasanti 2020; Colasanti 2021a; b; to appear). The existence of this sort of gestural morphemes is reported by Jouitteau (2007) for Atlantic French, which exhibits gestural Q-morphemes. In (1b) and (1c) the presence of a RAISED HEAD or RAISED EYEBROWS gestures respectively, makes the sentences interpreted as yes-no questions. The Q-morpheme *esk* (1a) is the spoken counterpart of the gestures in (1b)–(1c). This contrasts with (1d), in which the absence of one of the gestures results in a sentence that cannot be interpreted as a question.²

- (1) *Atlantic French* (adapted from Jouitteau 2007)
- a. *Esk* *peux finir mon thé?*
Q can finish my tea
 - b. RAISED HEAD *peux finir mon thé?*
Q can finish my tea
 - c. RAISED EYEBROWS *peux finir mon thé?*
Q can finish my tea
 - d. **peux finir mon thé?*
can finish my tea
'Can I finish my tea?'

¹ A note on terminology: I assume a generative architecture of grammar. Thus, in this paper “grammatical integration” is taken to mean that gestures are externalisation of formal abstract features in a syntactic derivation (see Colasanti to appear). Specifically, “grammatical integration” in this paper does not just refer to the idea that gestures are simply aligned with the spoken utterance in a systematic way, as already noted in the literature (see, e.g. Slama-Cazacu 1976).

² Jouitteau (2007) does not report the alignment for the gestures in (1).

Additional evidence in support of the hypothesis that functional gestures *can* be integrated in the grammar is provided by the possible recovery of co-speech gestures under ellipsis. Sailor & Colasanti (2020) demonstrate that gestures, which contribute to the core meaning of an English sentence (i.e. at-issue content), are obligatorily recovered as part of the interpretation of ellipsis. For instance, in (2) Speaker B's utterance involves ellipsis of a predicate (indicated with "[–]") whose interpretation is provided by Speaker A's utterance. Specifically, Speaker B's ellipsis is interpreted not only as the predicate [bring our cooler], but also necessarily includes the interpretation of the size depicted by Speaker A's gesture (i.e. LARGE). (The temporal alignment of gestures with the spoken utterance is indicated throughout the paper with underlining.)

(2) *English* (Sailor & Colasanti 2020: 7)

Context: we are packing for a trip. We own two coolers, one small and one large, and we both know this fact.

Speaker A: I just had an idea: let's bring our cooler  LARGE.

Speaker B: If we do [–], we could pack all our booze! (It won't all fit in the small one).

Examples like the one in (2) demonstrate that co-speech gestures, like the spoken component, cannot be ignored by the ellipsis recovery procedure.

Supporting evidence is also provided by Esipova's (2019a) study, which highlights that gestures can be interpreted as at-issue content under contrastive focus. For instance, (3) implies a contrast between the at-issue restrictive gestural modifiers SMALL and LARGE under contrastive focus:


(3) *English* (adapted from Esipova 2019a: 2)

John might order a **beer** SMALL  or a **beer** LARGE .

→ If John orders a beer, it will be {small, large}.

≈ John might order a small beer or a large beer.

The evidence presented above strongly suggests that gestures can be grammatically integrated. Specifically, the RAISED HEAD or RAISED EYEBROWS gestures in Atlantic French (1), the LARGE gesture under ellipsis (2) and the LARGE and SMALL gestures under contrastive focus (3) behave as their spoken counterparts (i.e. *esk* Q-morpheme in Atlantic French, restricting spoken modifiers *large* and *small* under contrastive focus in English). Therefore, if we take the latter to be lexical items and to be able to participate in syntactic representations, then it follows that also their gestural counterparts should be considered in the same way. Hence, within a generative approach gesturehood can be just considered as being just a PF property of lexical items. This claim is also consistent with the proposal put forward by Esipova (2019a; 2019b; see also Rieber 1983; Chomsky 2010: 56), namely that syntax cannot see the modality of the morphemes that externalise morphosyntactic features (see Sailor & Colasanti 2020 on gesture as evidence that syntax is modality-blind).

Following these previous formal studies on the grammatical integration of gesture, this paper is concerned with the conventional co-speech gesture *Mano a Borsa* (henceforth, MAB; i.e., ³) in Italo-Romance. This gesture is reported to arise frequently in interrogative contexts (Poggi 1983; Kendon 1995; 2004); however, its precise syntactic, semantic, and lexical properties remain unclear. In order to understand the clause-type distribution of co-speech MAB and how it aligns with the spoken utterance an experimental approach was necessary. In particular, we needed to fix a context in which the targeted utterance and gesture would arise and we needed to have consistent stimuli to be judged by native speakers (i.e. consistent temporal alignment of the gesture and consistent movement of the gesture). Moreover, given the huge variation found in Italo-Romance, a replicable experiment was only possible targeting a single language. Based on original fieldwork data from the southern Italo-Romance language Neapolitan (Campania region), I present syntactic evidence that MAB is the realisation of a particular flavour of interrogative C.⁴ This claim is consistent with its preference for interrogative environments and its apparent ability to align with the beginning of the clause, even in *wh*-in-situ contexts. In other words, I argue that MAB exhibits behaviour typical of a *wh*-question particle, albeit one whose PF realisation happens to be gestural rather than spoken.

This paper is organised as follows. In Section 2, I highlight some methodological issues that must be considered while investigating language and gesture in Italo-Romance and I situate this study within the previous literature on MAB. In Section 3, I describe the design of our experiments in Neapolitan. In Section 4, I present the results of the experiments, focusing on the clause-type distribution of MAB (§4.1.2) and its temporal alignment (§4.2.2). In Section 5, I offer some tentative analytical remarks to capture these findings. In particular, I suggest that the clausal distribution and behaviour of MAB is consistent with that of a Q-particle, with its temporal alignment reflecting its scope domain. As such, MAB in Neapolitan reflects the gestural realisation of a functional head—i.e., it is a gestural morpheme stored within the lexicon of what is otherwise a spoken (rather than signed) language. In Section 6, I provide some conclusions.

³ The term *mano a borsa* ‘pursed hand’ comes from one of the earliest linguistic descriptions of this gesture, namely that of De Jorio (1832). However, this gesture goes by many names in the literature, including *mano a tulipano* ‘tulip hand’ and *mano a grappolo* ‘finger bunch’. Its articulation (especially its handshape) is similar to the to that of Q_{ARTICHOKE} ‘artichoke’, a *wh*-phrase in *Lingua Italiana dei Segni* ‘Italian Sign Language’ (LIS; Branchini et al. 2013).

⁴ Following the conventions in Dayal (2016: 5), Farkas & Roelofsen (2017), and others, I use the term *question* as a composite cover-term for sentences with interrogative syntax and/or information-seeking semantics, and only use more precise terminology (e.g. *interrogative* to refer specifically to syntactic clause-type) where a finer distinction is necessary. See the previous references for discussion of non-canonical questions, which require such finer distinctions to be made.

2 Background

The investigation of gesture⁵ within any Italo-Romance language faces methodological challenges from two different sources: the difficulty of working with gestural data on the one hand, and the difficulty of working with Italo-Romance on the other. I will treat the second of these first, by briefly describing the complex linguistic situation in Italy. Finally, I situate this study within the previous literature on MAB.

2.1 The linguistic landscape in Italy

Broadly speaking, most Italians have some access to at least three grammars: Standard Italian, one or more local Italo-Romance languages (i.e. *dialetti*), and *Italiano Regionale* ‘Regional Italian’ (see Pellegrini 1960; Berruto 1987 [2021]: ch. 1; Colasanti 2022). They are formally distinct from one another, and none is aptly described as simply “Italian”. I briefly describe each of them in turn.

Standard Italian is the standardised official language of Italy. Historically, Standard Italian originated as essentially a constructed language. It was based on Medieval Florentine, a local language that acquired high prestige through its literature and maintained this status for several centuries. Following the Unification of Italy in 1861, Standard Italian was imposed across the whole country, mostly through the educational system (Lepschy & Lepschy 1979: ch. 2; Maiden 1995: 3–10), where it continues to be taught presently. As a prescriptive language of education, it is mostly used in formal, high-register, and primarily written contexts. Importantly, as Berruto (2003) argues at length, Standard Italian has no native speakers: because most Italians’ first extended exposure to it is at school, it is a language that is learned rather than acquired (see also Berruto 1987 [2021]: 26).

By contrast, local Italo-Romance languages – commonly referred to as *dialetti*, and in English often confusingly called “Italian dialects” – are mostly spoken at the level of the home, the town, or larger local community, among family and some close friends from the same community. These languages – examples of which include Neapolitan (Naples), Barese (Bari), etc., among thousands more – are related to Standard Italian, but did not descend from it (Pellegrini 1960; 1970; Rohlfs 1968–69; Maiden 1995: 3). With the exception of certain urban languages, these languages are mostly endangered: they are no longer being actively acquired by children, and are spoken regularly only by the oldest members of the population (Tamburelli 2012).⁶ As such, these languages have low prestige; in fact, given the influence and prestige of Standard Italian,

⁵ Gestures have been studied extensively within non-formal linguistic frameworks, including the investigation of aspects of their production, perception, processing, and development (Holler & Beattie 2003; Kita & Özyürek 2003; Dick et al. 2012; Özyürek 2014; Cooperrider et al. 2018; Gullberg 2022; *i.a.*; see Abner et al. 2015 for an overview).

⁶ According to the most recent census (Istat 2014), only 9% of Italians identify as speakers of their local languages.

many local languages suffer stigmatisation, perceived even by their own speakers as ‘bad talking’ (Lepschy & Lepschy 1979: 18). Collectively, these local languages constitute the Italo-Romance linguistic subfamily, of which (Standard) Italian is just another member. Thus, these are ‘Italian’ languages exclusively in the sense that they are native to the Italian peninsula, but there is no sense in which they are dialects of “(Standard) Italian”; see Maiden (1995: 3).

We are now faced with a striking question: if there are no native speakers of Standard Italian, and the local languages are also seriously endangered (in that their native speakers are few and dwindling in number), then what exactly do Italians speak?

For most of the population, the answer is *Italiano Regionale* (‘Regional Italian’), a cover term which refers to an unknown number of contact varieties that have arisen due to the mixing of Standard Italian with the local languages (Sobrero 1988). The adjective *regionale* ‘regional’ should not be taken to refer to the different administrative regions of Italy; in fact, a particular variety of *Italiano Regionale* might be spoken across one or more such administrative regions. Rather, the ‘regions’ this adjective refers to are at least partly defined by the major isoglosses that distinguish groups of local Italo-Romance languages (Pellegrini 1970; Sobrero 1988). In both social and professional settings, these Regional Italian varieties are the most commonly used languages in Italy—simply put, *Italiano Regionale* is what Italians actually speak nowadays, and is almost uniformly what both linguists and laypeople mean when they refer to “Italian”.

With this background on the language situation in Italy, I hope to have clarified the nature and scope of the present study, while also emphasising a more general need for precision regarding the object of study in the Italo-Romance context. With this background now in place regarding the languages of Italy, we can turn presently to some background regarding the gestures of Italy.

2.2 The gestural landscape in Italy

Not all Italo-Romance varieties are equivalent in their gestural inventory. In particular, the grammar of Standard Italian clearly lacks gestures.⁷ Due to stigmatisation, Italians tend not to gesture in formal interactions—namely, the only occasions when Standard Italian might be used. If the grammar of Standard Italian did include gestures, then we ought to find chapters covering their use and meaning in the Standard Italian textbooks and grammars used to teach schoolchildren and L2 learners. Of course, no such chapters exist. The obvious reason is that gestures in Italy are exclusively found in spoken *non-standard* Italo-Romance varieties (i.e. local languages and *Italiani Regionali*; Colasanti 2021a; b). As such, gesture, as other structural phenomena which are characteristic of non-standard varieties hold a negative stigma (Henry 2005). This is why Italo-Romance gestures such as MAB must be investigated in a local language (e.g. Neapolitan) or in a specific variety of *Italiano Regionale*, and not in “Italian”.

⁷ I am only referring to conventionalised gestures such as MAB, and not to *gesticulation*: see McNeill (2010: 3) on this distinction.

Non-standard Italo-Romance varieties provide fertile ground for investigating the grammatical properties of gestures, owing to significant syntactic (micro)variation across these varieties. Since gestures like MAB are conventionalised (grammaticalised) functional items (see below), we also expect them to be subject to the usual cross-linguistic variation that characterises such elements in the spoken modality, i.e. in their articulation (e.g. handshape, movement, place of articulation, etc.), their semantic contribution, and their syntactic distribution (if any) across different local languages (Diadori 2013). For instance, what seems to be a single gesture (in terms of its articulation) in two different varieties might nevertheless have very different syntactic distributions; or, what looks like a single gesture with a similar or identical distribution across two varieties might in fact make different semantic contributions in each. An example of lexical variation is provided in (4), where the size gesture ‘small’ has an entirely different surface form in Romano (4a) than in Verbicarese (Calabria) and Cepranese (Southern Lazio).

(4) ‘Small’ gesture



Romano



Verbicarese (Calabria), Cepranese (Southern Lazio)

Thus, the repertoire of gestures should not be assumed to be the same *a priori* across Italo-Romance.

2.3 *Mano a Borsa* and its ‘interrogative component’

MAB is a linguistically-meaningful hand gesture found in several Italo-Romance languages in which it is both conventionalised (Efron 1941; McNeill 1992) and highly recognisable.⁸ Making use of the parameters for describing signs in sign languages (Sandler & Lillo-Martin 2006), we can describe MAB as having the following properties. First, MAB is articulated with all the fingers of the hand fully extended and in contact with one another at their tips, and the palm of the hand faces upwards or towards the speaker’s torso:

⁸ MAB is stereotypically Italian: it holds pop-culture status both within and outside of Italy (Donadio 2013), and is identifiable by people from all over the world (having recently been included as an emoji in extremely popular messaging apps and social media, for instance). However, given the scope and degree of linguistic diversity in Italy, there is every reason to expect that MAB is subject to cross-linguistic variation, just like any other functional element in closely-related languages might be (to anticipate the coming analysis). As such, I restrict my claims about the status of MAB strictly to the language under investigation here, Neapolitan. On the question of whether MAB is found in “Italian”, see Section 2.2.

- (5) *Mano a borsa* ‘pursed hand’ handshape (De Jorio 1832)



Its place of articulation is within the torso/body mid-line in front of the speaker. The arm and hand are both active articulators; the forearm is moved vertically up and down at the elbow (or, alternatively, the hand is moved up and down at the wrist). Movements can have a large or short amplitude, and can also vary in tempo. MAB can also be articulated simultaneously with both hands.

Distributionally, MAB can be either a pro-speech gesture (i.e., seemingly standing in place of a spoken word: Schlenker 2018b; 2020) or a co-speech gesture (i.e., co-occurring with, and temporally aligned to, spoken linguistic material: Esipova 2019a: 1). For instance, in Romano (an Italo-Romance variety spoken in present-day Rome) and other varieties, MAB can be articulated on its own, without accompanying speech; in this context, it is a pro-speech gesture (6), and its interpretation is entirely recoverable from the conversational context.

- (6) *Romano* (adapted from Poggi 1983: 222)

Context: While she is going to the university, Maria gets offered a weird flyer on the street. Before taking it she wonders what the flyer is about and gestures:



MAB

‘What (kind of flyer) is this?’

In addition to the above usage, MAB in Neapolitan can also be used as a co-speech gesture: it can be produced simultaneously with speech, temporally aligned with part or all of the spoken utterance. This is illustrated in the rhetorical question below:

- (7) *Neapolitan* (adapted from Kendon 2004: 233)

Context: Sandro is puzzled because the robbers stole a telephone. Because it was a phone rented through the telephone company, it could not be re-sold. Sandro says:



Ma a chi servə chillu telefəno
but to who needs that telephone
‘Who would want such a telephone?’

In this paper, I focus exclusively on co-speech MAB.

MAB has been reported as having an ‘interrogative component’ (Neapolitan: De Jorio 1832, Kendon 1995; Romano: Poggi 1983; 2007). Poggi (1983: 224–228) highlights that, in Romano, pro-speech MAB can be used in ‘true questioning’ (8) and ‘negative pseudo-questioning’ (9).⁹ The disambiguation of the meaning is related not only to the context, but also to the facial expression of the speaker and the speed and amplitude of the movement involved in MAB’s articulation: in true questioning (i.e. information-seeking wh-questions), the movement is short and rapid; in pseudo-questioning, the movement is long and slow. These differences in the production of MAB lead Poggi (1983) to conclude that there are two different pro-speech MABS.

- (8) *Romano* (adapted from Poggi 1983: 231)

Context: The speaker learns that his friend Giovanni, who was in town for a visit, has suddenly left town early.



MAB

‘What gives? (i.e., what’s the reason for the current situation?)’

- (9) *Romano* (adapted from Poggi 1983: 225)

Context: The speaker bumps into a friend on the street who seems unusually well-dressed.



MAB

‘What gives?’

For Neapolitan, Kendon (1995: 250) agrees with Poggi (1983) that MAB “indicates that the gesturer is asking a question”. As in Romano, MAB in Neapolitan can be used in both true questioning and pseudo-questioning (7).

From a more formal perspective, recent papers by both Giorgi & Dal Farra (2019) and Ippolito (2020; 2021) discuss interrogative uses of MAB in “Italian”.¹⁰ On the one hand, Giorgi & Dal Farra argue that MAB is a component of counter-expectational questions and surprise/disapproval questions, both of which are optionally introduced by the adversative particle *ma* ‘but’; on the basis of experimental evidence, they conclude that gesture generally seems to be a ‘necessary

⁹ In Poggi (1983: 225), the term ‘negative pseudo-questions’ refers to a non-canonical question uttered ironically and intended to mock the addressee.

¹⁰ As a standardised and primarily written language, (Standard) Italian lacks conventionalised gestures of any kind, and thus is unlikely to have been the language under investigation in these works. (Indeed, the use of gestures is heavily stigmatised, and thus proscribed in contexts where Standard Italian would be used and/or taught; see above.) Rather, I assume that these authors were working on assorted varieties of *Italiano Regionale*, though it is not specified which varieties in particular. See Section 2.2 on the problem of gesture in “Italian”.

component of the grammar’, as it is ‘triggered by the syntax’. On the other hand, Ippolito argues that MAB marks a *wh*-operator in a constituent question, characterising non-canonical questions (i.e. biased questions and rhetorical questions) in particular.

In summary, previous studies on MAB agree that both its distribution and meaning have an interrogative character; however, these works disagree about the type(s) of interrogatives MAB is found in, and whether it makes a purely pragmatic contribution. Additionally, some of these works fail to specify precisely which language(s) MAB is being described in (see below), making it difficult or impossible to replicate the relevant claims. A primary goal of this paper is therefore to clarify the empirical picture of MAB for one particular southern Italo-Romance language, namely Neapolitan (as spoken in Naples, Italy). Before presenting this novel Neapolitan data, I first describe our experiments in detail.

3 MAB in Neapolitan: an experimental approach

3.1 Why an experimental approach was necessary

The precise syntactic, semantic, and lexical properties of MAB remain mostly unexplored. Although MAB is reported to be found in ‘interrogative contexts’, whether MAB accompanies also other clause types (e.g. declaratives, exclamatives, etc.) or in which specific interrogatives MAB can be found (e.g. yes-no, *wh*-interrogatives, etc.) is unknown. Moreover, the parameters of its temporal alignment in its co-speech use remain unclear. To be precise, neither of these questions has been investigated previously. Although experiments are not very frequent in studies on Italo-Romance syntax, an experimental approach was necessary in this case because of the nature of our research questions (see below). For instance, in order to collect reliable data, we needed to fix a context in which the targeted utterance and MAB would arise, and to have consistent stimuli to be judged by native speakers (e.g. with consistent temporal alignment or gesture movement).

3.2 Why Neapolitan?

Given the peculiar linguistic situation of Italy (see §2.1), it was necessary to focus on one specific local language (i.e. Neapolitan) so to avoid confounding the data with data from multiple different languages spoken within Italy. By ensuring that our data come from participants with the same language background – specifically, from native speakers of a specific local Italo-Romance language (unlike other recent studies into MAB) – we can ensure that our experiments are replicable.

There are additional reasons for choosing Neapolitan as the subject of our study. First, Neapolitan is a healthy urban language spoken in the South, where gesture is especially prominent (Kendon 1995), and it has many hundreds of thousands of speakers. This contrasts with most other Southern languages spoken at the level of the town, e.g. Cepranese, Lancianese, etc., which

have significantly fewer fluent speakers. The relative health of Neapolitan makes it easier to recruit speakers (especially during the COVID19 pandemic)—in particular, fluent speakers of different ages. There is also an existing literature on Neapolitan gesture, mostly (but not only) by Adam Kendon (1995, *et seq.*).

3.3 Research questions and predictions

This study has two main research questions: examining the clause-type distribution of MAB and investigating MAB's temporal alignment with the spoken utterance. I elaborate on both in the next sections.

3.3.1 Question 1: the clause-type distribution of MAB

In order to test the clause-type distribution of MAB, the target configuration of Experiment 1 is presented in (10): we contrast two alternative constructions, namely a construction which exhibits no MAB alignment with the spoken utterance (10a) vs one that exhibits the presence of a co-speech MAB aligned throughout the spoken utterance (10b). I refer to the former construction as *Construction MABless* and to the latter as *Construction MAB*. Constructions belonging to different clause types were selected (see Section 3.4.2). I refer to non-wh-interrogatives (e.g. declaratives, exclamatives, and yes-no interrogatives) as *Clause-type A* and to wh-interrogatives as *Clause-type B*.

(10) Experiment 1 target configuration

Context: At the supermarket, Antonia bumps into Teresa, Alda's wife. Antonia has just bought a new car and wants to show it to Alda, his best friend. He asks Teresa:

- a. Addò sta Alda ↓
where stands Alda



- b. Addò sta Alda ↓
where stands Alda
'Where is Alda?'

In terms of hypothesis-testing, for Experiment 1 I formulated the following hypotheses, together with their predictions:

(11) **Null hypothesis:** no association between MAB and clause type.

- a. **Claim:** presence/absence of MAB not related to clause type.
- b. **Prediction:** there should be no difference in preference for Construction MAB over Construction MABless (or vice versa) for Clause-type A vs Clause-type B examples.




- (12) **Alternative hypothesis:** association between MAB and clause type.
- Claim:** presence/absence of MAB related to clause type.
 - Prediction:** there should be difference in preference for Construction MAB over Construction MABless (or vice versa) for Clause-type A vs Clause-type B examples.

3.3.2 Question 2: the temporal alignment of MAB

In order to test MAB's temporal alignment with the spoken utterance, the target configuration of this study is presented in (13). We contrast 4 (or 5) identical utterances with the following patterns: MAB is aligned entirely after (13a), entirely before (13b), and entirely throughout the utterance (13d); articulation of MAB just (a subpart of) the VP (13c); and articulation of MAB over just the in-situ wh-item (only in the wh-in-situ test items; see Section 5). I refer to constructions like in (13d) – in which MAB's spreading mirrors its c-command/scope domain – as *Constructions R(ight Alignment)*, and all the other constructions – in which MAB's spreading does not mirror its c-command/scope domain – as *Constructions M(isalignment)*. I selected constructions belonging to different question types (see Section 3.4.2).

- (13) Experiment 2 target configuration

Context: At the supermarket, Antonia bumps into Teresa, Aldə's wife. Antonia has just bought a new car and wants to show it to Aldə, his best friend. He asks Teresa:

- | | | | | | |
|----|-------|--------|------|---|---|
| a. | Addò | sta | Aldə |  | ↓ |
| | where | stands | Aldə | MAB | |
- | | | | | | |
|----|---|-------|--------|------|---|
| b. |  | addò | sta | Aldə | ↓ |
| | MAB | where | stands | Aldə | |
- | | | | | |
|----|-------|--------|---|---|
| c. | Addò | sta |  | ↓ |
| | where | stands | Aldə | |
- | | | | | |
|----|------------------|--------|------|---|
| d. | Addò | sta | Aldə | ↓ |
| | where | stands | Aldə | |
| | ‘Where is Aldə?’ | | | |

In terms of hypothesis-testing, I formulated the following hypotheses, together with their predictions:

- (14) **Null hypothesis:** no correlation between MAB's spreading and its c-command/scope domain.
- Claim:** MAB's spreading does not mirror its c-command/scope domain.
 - Prediction:** Constructions R examples should not be significantly more acceptable than Construction M examples.

- (15) **Alternative hypothesis:** correlation between MAB's spreading and its c-command/scope domain.
- a. **Claim:** MAB's spreading mirrors its c-command/scope domain.
 - b. **Prediction:** Constructions R examples should be significantly more acceptable than Construction M examples.

To test our research hypotheses laid out above, I conducted two experiments, whose designs I report and discuss in the following section.

3.4 Experimental design

Two experiments were designed: one comprised binary forced-choice tasks (Experiment 1) and one consisted of acceptability judgement rating tasks (Experiment 2), two experimental methodologies with a sizeable existing literature on both spoken and sign languages. Generally, in generative studies on both spoken and sign languages, data comes mainly from the intuitions of native speakers; i.e., from formal and informal acceptability judgements by native speakers and signers. The reliability of this method has been experimentally confirmed for both spoken languages (Schütze & Sprouse 2014; Sprouse et al. 2018; Sprouse 2018) and sign languages (Kimmelman 2021). The experiments were designed in order to answer our research questions: Experiment 1 was designed to understand the clause-type distribution of MAB and Experiment 2 tested how MAB aligns with the spoken utterance. I describe the methods used in Experiment 1 and 2 in the following sections.

3.4.1 Participants

We collected data from 96 native speakers of Neapolitan (with ages ranging from 20 to 80 years old), recruited from different neighbourhoods of Naples through the friend-of-a-friend approach (Milroy 1987) by two fieldworkers. Before administering the experiments, we briefly interviewed each participant to verify their proficiency in Neapolitan. This is to make sure that our sample comprised only native speakers of Neapolitan.

3.4.2 Materials

3.4.2.1 Experiment 1

Experiment 1 was designed to test the clause-type distribution of MAB: specifically, the acceptability of MAB in non-wh-interrogatives and wh-interrogatives. The following 4 non-wh-interrogatives have been included in Experiment 1: 2 yes-no questions, a declarative, and an exclamative. Concerning wh-interrogatives, the following 12 clause types have been tested in Experiment 1: canonical information-seeking wh-interrogatives (i.e., subject, object, adjunct), non-canonical wh-interrogatives (i.e., declarative biased question, rhetorical, surprise-disapproval, counter-expectational, can't-find-the-value-of-x, disapproval echo ex-situ, 2 disapproval echo in-situ, and

unheard echo in-situ). The clause-type distribution of MAB was tested using binary forced-choice tasks. The trial design for Experiment 1 can be seen in (16):

(16) Trials design for binary forced-choice tasks

a. **Utterance context (audio):** At the supermarket, Antonia bumps into Teresa, Aldə's wife. Antonia has just bought a new car and wants to show it to Aldə, his best friend. He asks Teresa:

b. **Target sentence with or without MAB gesture (videos):**



Addò sta Aldə ↓
where stands Aldə
'Where is Aldə?'

Addò sta Aldə ↓
where stands Aldə
'Where is Aldə?'

c. **Evaluation (binary):** Which of the two utterances sounds more natural to you?

d. **Evaluation (comment):** Please tell us the rationale behind your choice.

Each of the 16 trials involved a single audio recording of a detailed utterance context (16a) paired with two different video recordings of two identical utterances (16b). Specifically, each pair of video stimuli contained an audio of a single utterance produced by a native Neapolitan speaker from the Sanità neighbourhood of Naples. In one video of each pair, this utterance was produced with an accompanying MAB gesture (produced across the entire utterance; *Construction MAB*); in the other video, the utterance was produced with no gesture at all (i.e., the speaker in the video simply sat still during production of the utterance; *Construction MABless*; see Section 3.3.1). These correspond to the two conditions of the experiment. The observations were in total 3,072. For each pair of test items, the evaluation was binary – i.e., which video was the most natural in the given utterance context (16c). In addition, there was the possibility to add a comment on the binary evaluation (16d).

3.4.2.2 Experiment 2

Experiment 2 was designed to test the hypothesis that the onset and duration of a co-speech gesture reflects its c-command/scope domain, following work on Non-Manual Markers (NMMs) within sign language linguistics (Aarons 1994; Wilbur & Patschke 1999; Neidle et al. 2000; Liddell 2003; Sandler & Lillo-Martin 2006; Branchini et al. 2013; Dachkovsky 2022; see Wilbur 2021 for

an overview and references therein). NMMs are markers produced with articulators other than the hands, including head position, body position, brow raising, eye gaze, lip movement, etc., which a signer can produce while simultaneously signing with the hands.¹¹ With this in mind, the temporal alignment of MAB interrogatives (canonical and non-canonical questions) was tested using acceptability judgement rating tasks. Specifically, the trials included constructions in which MAB's temporal alignment mirrors its c-command/scope domain (*Constructions R*) and constructions in which MAB's spreading does not mirror its c-command/scope domain (*Constructions M*; see Section 3.3.2). These are the two conditions of Experiment 2.

The following clause types have been included in Experiment 2 materials: 4 canonical information-seeking wh-interrogatives (i.e., subject, object, adjunct, adjunct with wh-topicalization (37)), 2 canonical yes-no questions, 9 non-canonical wh-interrogatives (i.e., declarative biased, rhetorical, surprise-disapproval, counter-expectational, can't-find-the-value-of-x, disapproval echo ex-situ, 2 disapproval echo in-situ, and unheard echo in-situ). Exclamatives and non-biased declaratives (already tested in Experiment 1) have not been included in Experiment 2 materials. The reasons behind this choice are two. First, an informal small-scale pilot study comprising a questionnaire administered to 20 native speakers of Neapolitan (conducted before the present experiment) already revealed a very low acceptability of these clause types while paired with MAB. This is additionally confirmed by the results of Experiment 1; see Section 4. Second, there was the need to reduce the overall duration of the experiment, which was already too long for many participants.

Each of the 15 trials involved a single audio recording of a detailed utterance context (17a) paired with four or five pre-recorded videos of four or five identical utterances (17b). Specifically, each video contained audio of a single utterance produced by a native speaker of Neapolitan paired with MAB aligned in different ways to the utterance. Specifically, the videos involved each of the following MAB alignments with the spoken utterance: articulation of MAB entirely after, entirely before, and entirely throughout the utterance; articulation of MAB over just (a subpart of) the VP; and, articulation of MAB over just the in-situ wh-item (only in the wh-in-situ test items).¹² Specifically, 12 of the 15 trials involved 4 pre-recorded video items and 3 of the 15 trials (i.e., 2 disapproval echo in-situ and 1 unheard echo in-situ) involved 5 pre-recorded video items (testing the wh-in-situ). The observations were in total 6,039.¹³ Each of the videos

¹¹ I will come back to this point in more detail below in Section 5.2.3.

¹² During the pilot study preceding the experiment, examples where MAB is aligned only with the ex-situ wh-item appeared difficult to test. This is probably due to the fact that the phonetic realisation of wh-items in Neapolitan is shorter than MAB's articulation.

¹³ The total number of observations should have been 6,048. However, 9 observations involving the info-seeking wh-interrogative clause (adjunct with wh-topicalization) are missing from our dataset. Also, as noticed by an anonymous reviewer, the conditions in both experiments are unbalanced. In particular, the lack of balance occurs in both the number of items per condition and between the two conditions. These are limitations of the experimental design. I leave to future studies the design of more balanced and comparable conditions.


was accompanied by text instructions suggesting the participants to drag the slider to a position within a scale from 0 (= unnatural) to 10 (= natural), see (17c). In addition, there was the possibility to add a comment on the evaluation (17d).

(17) Trials design for acceptability judgement rating tasks


a. **Utterance context (audio):** At the supermarket, Antoniā bumps into Teresa, Aldə's wife. Antoniā has just bought a new car and wants to show it to Aldə, his best friend. He asks Teresa:

b. **Target sentence with different MAB alignments (videos):**




Addò sta Aldə  ↓
 where stands Aldə MAB
 'Where is Aldə?'




 addò sta Aldə ↓
 MAB where stands Aldə
 'Where is Aldə?'




 Addò sta Aldə ↓
 where stands Aldə
 'Where is Aldə?'




 Addò sta Aldə ↓
 where stands Aldə
 'Where is Aldə?'

- c. **Evaluation (Likert scale/slider):** Indicate the degree of naturalness of each (0 = unnatural, 10 = natural).
- d. **Evaluation (comment):** Please tell us the rationale behind your choice.

In both Experiment 1 and 2, the intonational contour was kept constant for each trial (but predictably varied across minimal trials, according to clause type). The speed of the movement during the articulation of MAB was also kept constant in all the test items. In all the video recordings the face of the speaker was not visible in order to control for the possible interference of face gestures and focus exclusively on the use of MAB.

3.4.3 Procedure

Our experiments were administered in a hybrid fashion (i.e., with both an in-person and an online component) by two fieldworkers who are native speakers of a Campanian language closely related to Neapolitan. The online component hosted by Gorilla (<https://gorilla.sc/>) was administered in-person to each participant.

After having signed the consent form, participants were then given a brief set of instructions, including explicit clarification about the language of interest in our study (i.e. the local language spoken in Naples, and not the *Italiano Regionale* spoken in Naples; again see Section 2.1). Participants were then directed to the binary-forced task in Experiment 1. For each trial in Experiment 1, participants listened to an audio containing the relevant detailed utterance context in Neapolitan played by a fieldworker. Participants were then shown two different pre-recorded videos for each context (see Section 3.4.2). Participants were then asked to choose between the two videos, and finally they were asked for a brief rationale for their choice in each context. The decision was recorded by a fieldworker for each of the trials.

After completing Experiment 1, participants were directed to the acceptability rating task in Experiment 2. For each trial in Experiment 2, participants listened to an audio containing the relevant detailed utterance context in Neapolitan played by a fieldworker. For a given context, participants were then presented with four to five pre-recorded videos containing the recording of a single utterance (see Section 3.4.2). The order of the videos was randomised for each of the trials. Participants were asked to rate the degree of naturalness of each audio-video pairing (i.e., 0 = unnatural, 10 = natural) and to comment on their choices. The decision was recorded by a fieldworker for each of the trials. All participants did both experiments.

4 Results

In what follows, I present the quantitative results of our experiment. First, I report the results of the binary-choice tasks (Experiment 1) in Section 4.1.1. In Section 4.1.2, I show in which clause types MAB is accepted by our participants in Experiment 1. Second, I report the results of the acceptability judgement tasks (Experiment 2) in Section 4.2.1. In Section 4.2.1, I present data from Experiment 2 involving temporal alignment of MAB.

4.1 Experiment 1

4.1.1 Statistical analysis

For both Experiment 1 and 2, all statistical tests and plots were done using R (R Development Core Team 2009). Following current practices in experimental syntax (Schütze & Sprouse 2014; Schütze 2016), using lme4 (Bates et al. 2015), I ran a logistic mixed effects model (Baayen 2008; Baayen et al. 2008) predicting Response (i.e., Construction MAB vs. Construction MABless) as

a function of Clause-type (treatment-coded, with Clause-type A as 0 and Clause-type B as 1). The model included random effects (both intercepts and slopes) for Participant and Item. The statistics are summarised in **Table 1** (p -values were obtained using a Wald z -distribution).

	Coefficient	z-value	SE	p-value
Intercept	-4.36	-4.84	0.90	
Clause-type B	8.03	7.54	1.07	<0.001

Table 1: The logistic regression model’s coefficient estimates in log-odds space.

Overall, a logistic mixed effect regression model shows that there is a significant association between the presence or absence of MAB and the clause type. The model estimates that the probability of choosing Construction MAB with Clause-type A is 1% (95% CI: [0%, 7%]) and with Clause-type B 98% ([95% CI: [93%, 99%]). The model coefficients reflects that participants are more likely to choose Construction MAB for Clause-type B than for Clause-type A examples.

Figure 1 shows the distribution of Construction MAB across Clause-type A and Clause-type B examples in terms of proportion. In particular, the proportion of Construction MAB is overwhelmingly higher in Clause-type B examples than in Clause-type A examples.

On the basis of the statistical analysis above, we can reject the null hypothesis (i.e., there is no association between presence/absence of MAB and clause type) stated in Section 3.3.1.

4.1.2 What is the clause-type distribution of MAB?

The results for Experiment 1 above show that MAB cannot be paired with declaratives (18),¹⁴ exclamatives (19), or yes-no questions (20).¹⁵ For declaratives, the strong majority of our participants preferred the test items without MAB (18a) over the those with MAB (18b).¹⁶

¹⁴ While MAB cannot be paired with neutral falling declaratives (i.e. canonical assertions), it is highly acceptable in declarative questions or rising declaratives (Gunlogson 2001). I leave discussion of non-canonical questions of this sort (i.e. questions with declarative syntax; see Dayal 2006; Farkas & Roelofsen 2017) to future work.

¹⁵ In broad descriptive terms, sentence-final intonational contour is indicated as follows: ↓ = falling contour; ↑ = rising contour; ↗ = plateau contour. Following previous research (Lieberman & Sag 1974; Pierrehumbert & Hirschberg 1990; Gunlogson 2001), I take the intonational contour as one of the components of questionhood. However, with the exception of work by Maturi (1988, *et seq.*); D’imperio (2001, *et seq.*), the intonation of Neapolitan has only been “approximatively” described (Ledgeway 2009: 31), like most other local languages and varieties of *Italiano Regionale*. Therefore, I rely (where possible) on the description of the variety of *Italiano Regionale* spoken in Naples by D’imperio (2001; see also Grice et al. 2005)—though it is a different language than Neapolitan, their intonational phonology seems broadly comparable. Finally, while it is possible that participants interpreted the yes-no question below as a biased (non-canonical) question, the fact that it is still unacceptable with MAB is telling (cf. discussion of non-canonical wh-questions below).

¹⁶ Consequent on the statistical analysis in Section 4.1.1, I take the lower proportions of Construction MAB (vs. Construction MABless) found in our dataset for Clause-type A (i.e., declaratives (18b), exclamatives (19b), and yes-no

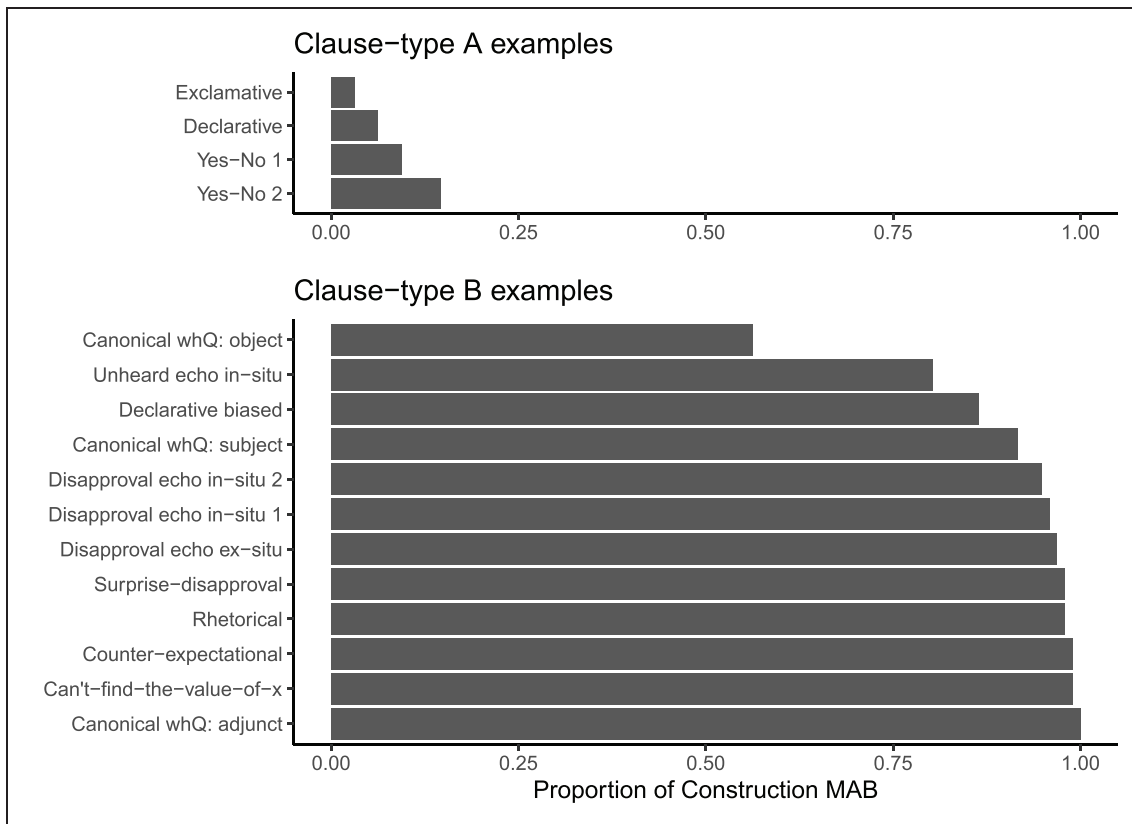


Figure 1: Proportion of Construction MAB across Clause-type A and Clause-type B examples.

(18) Declarative

Context: Antonio and Teresa are at home when suddenly it starts raining. Antonio asserts with certainty:

- a. Sta chiuennə ↓
it.stands raining



- b. *Sta chiuennə ↓
it.stands raining
'It's raining.'

questions (20b)) to mean that these are less acceptable than Construction MABless and, thus mark them with '*'. Concerning Clause-type B examples (i.e., the wh-questions in (21), (22), and (23)), I take the higher proportions of Constructions MAB (vs. Construction MABless) found in our dataset to mean that these are more acceptable than Construction MABless. The majority of participants has highlighted that, although MAB is not obligatory, the (b) examples represent the preferred choice in natural informal conversations. I take this to mean that the (a) examples cannot be marked as unacceptable.

Similarly, exclamatives (19) and yes-no questions (20) articulated without MAB ((a) examples) were strongly preferred over the ones articulated with MAB ((b) examples):

(19) Exclamative

Context: Francesco and Anna go to pay a visit to their neighbours who have just returned home with their newborn baby girl. Francesco looks at the baby girl and says:

- a. Chə bellizza ↓
what beautiful.F.DIM



- b. *Chə bellizza ↓
what beautiful.F.DIM
'How beautiful!'

(20) Yes-No question

Context: Antonio and Mario just meet each other at a bar in Posillipo when while chatting Mario asks Antonio:

- a. Tu tienə a casa a Posillipə ↓
you keep a house at Posillipo



- b. *Tu tienə a casa a Posillipə ↓
you keep a house at Posillipo
'Do you live in Posillipo?'

The opposite pattern arises with wh-questions, both canonical (21) and non-canonical (22)–(23). Following Dayal (2016), Farkas & Roelofsen (2017) and Farkas (2022), canonical questions are interrogatives which are asked from a position of ignorance by a speaker requesting information from an addressee presumed to be competent to answer the question. Thus, these are information-seeking, and the speaker assumes that the addressee can provide a knowledgeable answer to that question. By contrast, non-canonical questions *can* solicit information, but they can also convey a bias on the part of the speaker about what this information is likely to be. Often, these do not have a standard interrogative form (or intonational contour), and in some cases may function more like an assertion than a request for information (see Dayal 2016, Farkas & Roelofsen 2017 and Farkas 2022). Unlike canonical questions, the speaker is often not speaking from a position of ignorance (and thus is not necessarily soliciting a response).

The overwhelming majority of speakers preferred both canonical and non-canonical wh-questions with MAB (as in the (b) examples) than without it (as in the (a) examples); I

present a selection of such examples from our study below. First, consider a canonical neutral information-seeking question:

(21) Canonical information-seeking wh-question¹⁷

Context: At the supermarket, Antonia bumps into Teresa, Alda's wife. Antonia has just bought a new car and wants to show it to Alda, his best friend. He asks Teresa:

- a. Addò sta Alda ↓
where stands Alda



- b. Addò sta Alda ↓
where stands Alda
'Where is Alda?'

In this context, the speaker, Antonia, is ignorant regarding the whereabouts of Alda. He assumes that Teresa, Alda's wife, knows the answer to his question, and that she is likely to provide him with that information. In this context, participants find the sentence more natural with MAB than without it (see fn. 16).

Similarly, with both rhetorical questions (22) and so-called can't-find-the-value-of-x questions (23) (see Obenauer 2004a; b on this distinction), speakers preferred the test items that included MAB ((b) examples) to those involving just the utterance alone ((a) examples):¹⁸

(22) Rhetorical question

Context: Maria asks her brother if he can introduce her to Giuseppa because she thinks he is handsome. Maria's brother says:

- a. (Ma) pəcché è purə bellə Giuseppə ↓
but why is also beautiful Giuseppə



- b. (Ma) pəcché è purə bellə Giuseppə ↓
but why is also beautiful Giuseppə
'How can you possibly think Giuseppa is handsome?'

Here, Maria's brother disagrees with her about whether Giuseppa is handsome, expressing this in the form of a non-information-seeking question. This type of clause is a non-canonical

¹⁷ As reported for other southern Italo-Romance languages, both Neapolitan and the Regional Italian variety spoken in Naples exhibit a falling sentence-final intonational contour in canonical information-seeking wh-questions, rather than a rising contour like that found in e.g. Standard Italian (see D'Imperio (2001, *et seq.*); see also Grice et al. 2005).

¹⁸ The rounded brackets around *ma* 'but' in examples (22) and (23) indicate that *ma* is optional. The reason behind this optionality is beyond the scope of this paper.

‘question’ in the sense that it is not a request, but rather an assertion of its own polar opposite. The function of this kind of question is not to solicit new information, but rather to point to the obviousness of the answer; indeed, such questions can naturally remain unanswered (Farkas 2022). Nevertheless, participants showed a preference for such sentences to be paired with MAB (22b). The same is true for can’t-find-the-value-of-x questions (of the kind investigated by Obenauer 2004a; b):

(23) Can’t-find-the-value-of-x question

Context: Teresa tells Antonia that the neighbour’s dog ran away after managing to open the gate. Antonia says:

- a. (Ma) comə cazzə a fattə ↓
but how fuck has done



- b. (Ma) comə cazzə a fattə ↓
but how fuck has done
‘How the fuck did he do that?’

Here, the speaker cannot understand how the dog was able to open the neighbour’s gate (i.e., can’t find a value for the variable bound by the wh-item: see Obenauer 2004a: 367). This kind of question can also remain unanswered, as these are not necessarily genuine requests for information by the speaker. Once again, participants preferred such items when they included MAB (23b) compared to their MABless counterparts (23a).

To sum up, MAB is strongly preferred in wh-questions (both canonical and non-canonical), and strongly *dispreferred* in declaratives, exclamatives, and yes-no questions. Experiment 1 provides experimental support for previous intuitions about MAB’s ‘interrogative component’, but only for wh-interrogatives.

We turn now to Experiment 2, investigating speakers’ preferences regarding the temporal alignment of MAB relative to the utterance it is paired with.

4.2 Experiment 2

4.2.1 Statistical analysis

Construction M(isalignment) examples (i.e., in which MAB’s spreading does not mirror its c-command/scope domain; $M_o = 0$) were significantly less acceptable than Construction R(ight Alignment) examples (i.e., in which MAB’s spreading mirrors its c-command/scope domain; $M_o = 10$). **Figure 2** shows the counts for each of the ratings (Likert scale: 1–10) for both Construction M and Construction R examples.

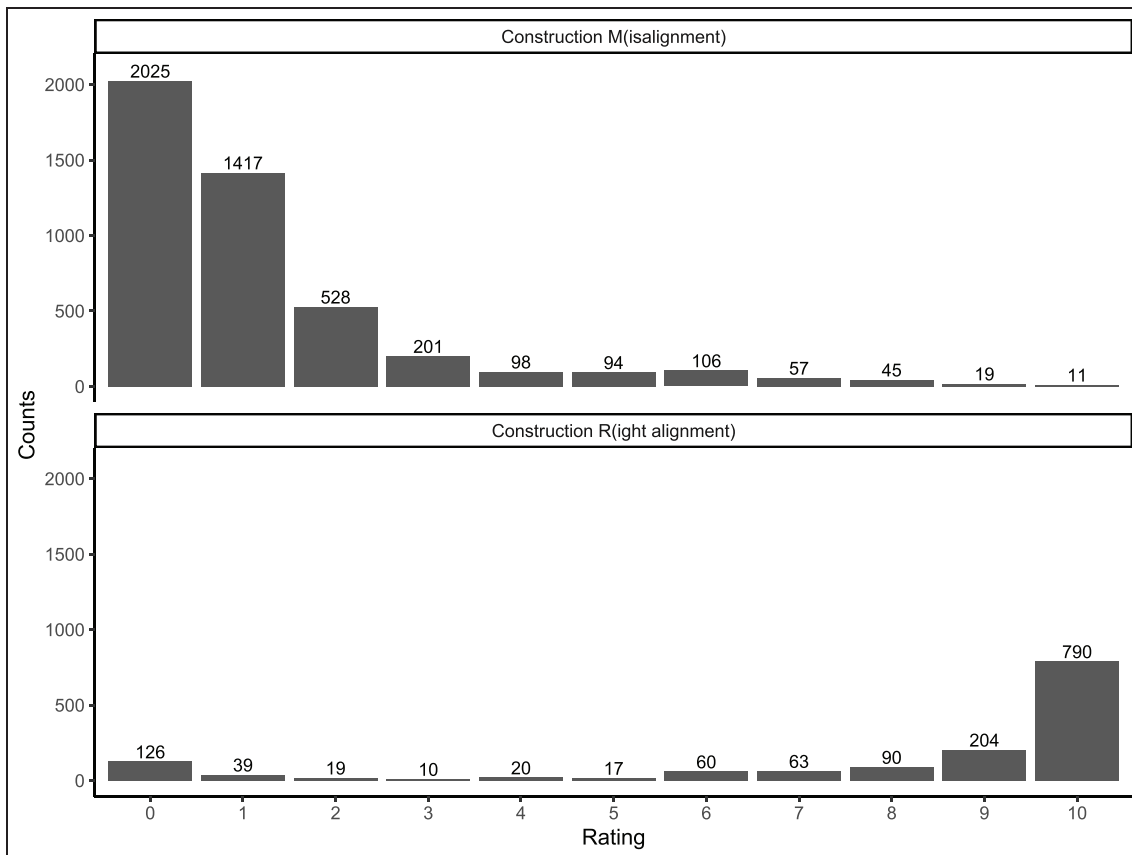


Figure 2: Rating counts for Construction M and Construction R.

Following Veríssimo (2021), I used an ordinal regression model for the analysis of acceptability judgement data from a Likert scale. Specifically, using the ‘polr()’ function from the R package MASS (Venables & Ripley 2002), I ran an ordinal regression model predicting Rating (Likert scale: 0–10) as a function of Construction (i.e., Construction M, coded as 0, vs. Construction R, coded as 1). Random intercepts were included for Participant. I predicted that participant’s rating depends on the construction type. The model’s estimates, shown in **Table 2**, support this prediction. Transformed back into probabilities, the model suggests that the average probability of participants giving an increased rating in ‘Construction R’ compared to the baseline, ‘Construction M’, is 98.7% (95% CI: 98.5%, 98.9%). Because the assumption of proportional odds was not met, as determined by a Brant-Wald test (Schlegel & Steenbergen 2020), this probability must be understood as an approximation of the average effect across all levels (Harrell Jr 2015: 313). The model’s maximum likelihood pseudo-R-squared is 44.5%.

Coef. type	Coefficient	Estimate	<i>t</i> -value	<i>p</i> -value
Slope	Construction R	4.34	49.33	< 0.001
Intercept	0 1	-0.19		
	1 2	1.06		
	2 3	1.71		
	3 4	2.04		
	4 5	2.27		
	5 6	2.51		
	6 7	2.92		
	7 8	3.24		
	8 9	3.62		
	9 10	4.22		

Table 2: The ordinal regression model’s coefficient estimates in log-odds space. The slope indicates the average effect of moving from the baseline (Construction M) to Construction R across all levels. Intercepts represent threshold values for the rating scale for Construction M.

On the basis of these statistical results, we can reject the null hypothesis (i.e., there is no correlation between MAB’s spreading and its c-command/scope domain) stated in Section 3.3.2.

4.2.2 The temporal alignment of MAB

The results of Experiment 2 above show that participants clearly reject¹⁹ items in which MAB is produced entirely after the sentence it is paired with (as in the (a) examples below), as well as those in which it is produced entirely before the sentence it is paired with (as in the (b) examples). Moreover, participants also reject items in which MAB is aligned strictly with the DP subject alone (as in the (c) examples).

On the other hand, they clearly accept items where MAB is produced across the entire wh-clause (as in the (d) examples).²⁰


Some representative examples are given below, showing that these general patterns of (un)acceptability hold both for both canonical information-seeking wh-questions (24) and non-canonical rhetorical wh-questions (25):


¹⁹ Consequent on the statistical analysis in Section 4.2.1, the low acceptability ratings of Construction M examples is indicated with “*”.


²⁰ Whether MAB is also accepted in embedded contexts is a matter under investigation. See Colasanti (in progress a).


(24) Canonical information-seeking wh-question

Context: At the supermarket, Antonia bumps into Teresa, Alda's wife. Antonia has just bought a new car and wants to show it to Alda, his best friend. He asks Teresa:

a. *Addò sta Aldà  ↓
 where stands Aldà MAB


b. * addò sta Aldà ↓
 MAB where stands Aldà


c. *Addò sta  Aldà ↓
 where stands Aldà


d. 
 Addò sta Aldà ↓
 where stands Aldà
 'Where is Aldà?'


(25) Rhetorical question

Context: Maria asks her brother if he can introduce her to Giuseppa because she thinks he is handsome. Maria's brother says:

a. *(Ma) pəcché è purə bellə Giuseppə  ↓
 but why is also good-looking Giuseppə MAB

b.  (Ma) pəcché è purə bellə Giuseppə ↓
 MAB but why is also good-looking Giuseppə

c. *(Ma) pəcché è purə bellə  Giuseppə ↓
 but why is also good-looking Giuseppə

d. 
 (Ma) pəcché è purə bellə Giuseppə ↓
 but why is also good-looking Giuseppə
 'How can you possibly think that Giuseppə is handsome?'

Though I omit the examples here for reasons of space, note that similar results were also found for non-canonical surprise-disapproval questions (Obenauer 2004b), declarative questions

(Gunlogson 2001), disapproval echo questions, and unheard echo questions, both ex-situ and in-situ (Bartels 1997; Fiengo 2007; Chernova 2014): participants accepted only those examples where MAB was aligned to the entire utterance.

To sum up, participants have clear judgements with respect to MAB's temporal alignment with the spoken utterance. In particular, they gave high ratings to examples where MAB is articulated throughout the whole utterance, but not when MAB is aligned with only part of it, or when it is articulated entirely before or entirely after the utterance.

In what follows, I argue that the data presented above provide evidence for the hypothesis that the onset and duration of co-speech MAB reflects its c-command/scope domain, directly parallel to the behaviour of NMMs in sign languages.²¹

5 Discussion

On the basis of the Neapolitan facts above, we could entertain two similar-looking initial hypotheses about the status of MAB. The first hypothesis is that when it is present, MAB necessarily aligns with the left edge of a *wh*-phrase (perhaps as some kind of modifier, either of the *wh*-phrase or of the entire *wh*-question). An alternative hypothesis is that MAB is a gestural exponent of a [+Q, +WH] C head. In either case, the articulation of MAB spreads rightward to the end of the sentence. In order to choose between these hypotheses, I discuss additional data from Neapolitan in the next sections, where I comment on the status of MAB and its role in interrogative syntax in Neapolitan.

5.1 MAB is not a *wh*-modifier

It can be shown empirically that MAB does not mark the left edge of the *wh*-phrase. Although Neapolitan is a *wh*-movement language, it also allows *wh*-in-situ *only* in echo questions (and certain other non-canonical question types).²² Such clauses were included in our experiment, and they provide important evidence on this point. Consider the in-situ disapproval echo-question below, comparable to Bartels's (1997) 'amazement' echo-questions. Such questions involve an in-situ *wh*-phrase (and marked intonation) to signal the speaker's disapproval or disbelief of a preceding assertion:

²¹ An anonymous reviewer asked whether the spread of MAB is influenced by intonation. Although this paper is not concerned with intonation, this experimental study provides indirect evidence that MAB's spreading is not prosodic. In particular, the spoken examples possibly paired with MAB exhibit different intonational contours depending on the clause type. If we were to entertain the possibility that MAB's spreading is due to intonation, it would be difficult to explain why the same gesture aligns with different intonational contours in an identical way. This is left for future research.

²² With the exception of the discussion of Neapolitan in Ledgeway (2009: ch. 22) and central Sicilian languages in Bianchi & Cruschina (2022), I am unaware of any detailed studies on the syntax of interrogatives in southern Italo-Romance.


(26) In-situ disapproval echo-question


Context: Antonia and Teresa are talking about the last Christmas dinner they spent together.


Teresa says:


- a. Mamma-ma a cuotto bbuonə.
 mum-my has cooked well
 ‘My mum cooked well.’


Antonia replies:

- b. *A cuotto bbuonə CHE  ↓
 she.has cooked well what MAB

- c. * a cuotto bbuonə CHE ↓
 MAB she.has cooked well what

- d. *A cuotto bbuonə  CHE ↓
 she.has cooked well what

- e. *A cuotto  CHE ↓
 she.has cooked well what

- f.  A cuotto bbuonə CHE ↓
 she.has cooked well what
 ‘No she didn’t!’ (*lit.*: ‘She cooked WHAT well?’)

Participants strongly rejected in-situ disapproval echo-questions in which MAB entirely follows (26b) or precedes (26c) the utterance, or is aligned to some subpart of the clause (e.g. with the adverb *bbuonə* plus the in-situ wh-phrase) in (26e)—this is similar to what we saw previously in examples with wh-movement. However, example (26d) shows that participants also strongly rejected items in which the onset of MAB is aligned with the left edge of the in-situ wh-item *che*. This provides crucial evidence that MAB is not associated with the wh-phrase specifically, but rather with some other component of the wh-question more generally. The fact that the onset of the two happens to align temporally in most cases of wh-movement is therefore likely just a by-product of their close proximity to one other in the left periphery of the clause, each spelling out a position within CP. Completing the picture, we see in (26f) that the onset of MAB in in-situ disapproval echo-questions is still preferentially aligned with the left edge of the clause, consistent with the hypothesis that it realises an interrogative C. Thus, we can exclude

the hypothesis by which MAB is a gestural modifier of a wh-phrase, otherwise these patterns are left unexplained.

5.2 MAB is a Q-particle

Mainstream generative approaches to questions assume that wh-questionhood comprises at least three distinct but related components: a wh-phrase, a Q-morpheme/particle, and an interrogative C head (Katz & Postal 1964; Baker 1970; Bresnan 1970; Watanabe 1992; Hagstrom 1998; Cable 2010; see Cheng 2003a; b for an overview and references therein). Under standard assumptions, the interrogative C bears a [+WH] feature that attracts the wh-phrase to its specifier (either overtly or covertly). This C head (or a dedicated interrogative head within the split-CP; Rizzi 1997; 2001) may additionally host a Q-morpheme, e.g. *ka* in Japanese. With this in mind, we return to our original pair of hypotheses concerning the status of MAB: since MAB is not a modifier of the wh-phrase (or the wh-clause entirely), is it a realisation of the [+Q, +WH] feature bundle in the left periphery of wh-interrogative clauses?

I argue that this empirical evidence supports the claim that MAB is a Q-particle. To support this claim, I will begin by showing MAB's close parallels with other Q-particles realised in the spoken-auditory and in the visual-gestural modality, namely those from spoken and sign languages respectively.

5.2.1 Q-particles in spoken languages

Q-particles in wh-questions are widely attested in spoken languages (e.g. Tlingit: Cable 2010; Lele: Frajzyngier 2001; Nweh: Aboh et al. 2005: 104). As with Neapolitan MAB, these languages' Q-morphemes co-occur with both moved and in-situ wh-phrases (e.g. Tlingit *daa_{wh}* + *sá_Q* (27); Lele *wéy_{wh}* + *gà_Q* (28); Japanese *nani_{wh}* + *ka_Q* (30)):²³

- (27) *Tlingit* (Cable 2010: 7)
Daa **sá** i éesh al'oon.
 what Q your father he.hunts.it
 'What is your father hunting?'
- (28) *Lele* (Frajzyngier 2001: 282)
Wéy ba é gâ.
 who FOC fo Q
 'Who went away?'

²³ Q-particles are also found in yes-no questions in many of spoken and sign languages. I am not discussing them here as these are beyond the scope of the present paper.

- (29) *Japanese* (Hagstrom 1998: 15, 16)
 John-ga **nani**-o kaimasita **ka**.
 John.NOM what.ACC bought.polite Q
 ‘What did John buy?’

As with Neapolitan MAB, in many languages Q-particles are optional. For instance, in Japanese wh-questions a wh-item can either co-occur with a Q-particle and rising intonation (e.g. *ndai*_Q; (30a)) or with rising intonation only (30b). Similarly, wh-questions in Neapolitan are usually marked with a wh-item together with MAB and falling intonation (31a) or with falling intonation only (31b).

- (30) *Japanese* (adapted from Hagstrom 1998: 15, 16)
 a. **Dare**-ga kuru **ndai** ↑
 who.NOM come Q
 b. **Dare**-ga kuru ↑
 who.NOM come
 ‘Who will come?’

- (31) *Neapolitan*



- a. **Addò** sta Aldə ↓
 where stands Aldə
 b. **Addò** sta Aldə ↓
 where stands Aldə
 ‘Where is Aldə?’

On the basis of this cross-linguistic evidence, I argue that MAB is a Q-particle of exactly the sort we see above in Tlingit, Lele, and Japanese, albeit realised in the gestural modality. In support of this claim, I show MAB’s close parallels with other Q-particles realised in sign languages.

5.2.2 Q-particles in sign languages

Several sign languages are reported to have a NMM arising specifically in wh-questions, including ASL (Neidle et al. 2000; Petronio & Lillo-Martin 1997), LIS (Cecchetto et al. 2009), Indo-Pakistani Sign Language (Aboh et al. 2005), and Sign Language of the Netherlands (Coerts 1992).²⁴ These NMMs typically exhibit spreading throughout the wh-clause, leading scholars to argue that

²⁴ The discussion here cannot do justice to the debate on content interrogatives in sign language linguistics but can just point to certain observations and claims that are relevant to the topic of this paper. See Kelepir (2021) for a review and Zeshan (2004; 2013) for a crosslinguistic perspective.

these NMMs are marking the scope of some component of the wh-question which (granted the differences in specific analyses) can be identified as the [+Q, +WH] C that characterises the sentence periphery of wh-questions (see Wilbur 2021; Kelepir 2021 for discussion). For instance, in ASL a wh-sign (i.e. WHAT) can occur with the NMM BROW FURROW ‘[wh]’ in wh-questions. Notice that the onset of the articulation of BROW FURROW coincides with the left edge of the wh-clause and it can optionally spread throughout the clause. Similarly, in Sign Language of the Netherlands, wh-questions are marked with a wh-sign (e.g. WHAT), which can co-occur with the Q-sign PALM UP (PU) and the intonational wh-NMM ‘[wh]’ (33).²⁵

(32) *American Sign Language* (Neidle et al. 2000: 110)

_____ ^{wh}
WHO LOVE JOHN
‘Who loves John?’

(33) *Sign Language of the Netherlands* (Coerts 1992)

_____ ^{wh}
INDEX₃ SAY WHAT PU
‘What did s/he say?’

As reported by Cecchetto et al. (2009; see also Branchini et al. 2013; Cecchetto et al. 2022), LIS presents a composite wh-question formation strategy involving (i) a context-specific wh-sign, e.g. WHO, (ii) a generic/underspecified wh-sign $Q_{\text{ARTICHOKE}}$ (i.e. “a lexical variant for any interrogative sign”; Cecchetto et al. 2022: 4), and (iii) a NMM FURROWED EYEBROWS (FE). FE can be combined with both $Q_{\text{ARTICHOKE}}$ and a specific wh-sign, and it spreads across both the specific wh-sign and the $Q_{\text{ARTICHOKE}}$ (34a). However, when the specific wh-sign is absent, FE only spreads over the $Q_{\text{ARTICHOKE}}$ (34b) or may spread on a bigger portion of the clause (34c):

(34) *Lingua Italiana dei Segni* (adapted from Cecchetto et al. 2022: 4)

- a. ARRIVE WHO $Q_{\text{ARTICHOKE}}$ _____ ^{fe}
- b. ARRIVE $Q_{\text{ARTICHOKE}}$ _____ ^{fe}
- c. ARRIVE $Q_{\text{ARTICHOKE}}$ _____ ^{fe}
‘Who arrives?’

Cecchetto et al. (2022) take this to show that FE can spread over the syntactic c-command domain of the functional head expressing the wh-feature. Specifically, the NMM FE lexicalises

²⁵ There are particularly striking similarities between the question formation strategies of Neapolitan and those of Sign Language of the Netherlands, but the details must be left aside here. See Colasanti (in progress b).

a [+WH] feature, and $Q_{\text{ARTICHOKE}}$ expresses a [+Q] associated with wh-questions. In LIS, the [+WH] and the [+Q] are externalised as two different morphemes (Checchetto et al. 2022: 6).

In the next section, I will pursue the following hypothesis: MAB is to Neapolitan what the NMMs BROW FURROW '[wh]' is to ASL and FURROWED EYEBROWS is to LIS (and other [wh] NMMs are to other sign languages). I argue that, like the wh-NMMs in ASL and LIS, MAB's temporal alignment can reflect the high left-edge position of the [+Q, +WH] C that MAB spells out. More generally, what unites all of these phenomena is that they are Q-morphemes, comparable to various markers in spoken languages (see Section 5.2.1).

5.2.3 MAB is to Neapolitan as wh-NMMs are to ASL and LIS

Before drawing parallels between the behaviour of MAB and other wh-NMMs found in sign languages, I am going to briefly discuss first the rationale behind looking at co-speech gestures through the lens of sign language linguistics.

A common intuition found in work on the temporal alignment of co-speech gestures (see Loehr 2004; Schlenker (2014; *et seq.*); Esipova 2019b) is that there are close parallels to be drawn with the property of simultaneity that characterises sign languages. In particular, certain co-speech gestures are increasingly thought of as comparable to NMMs, meaning they are linguistic objects realised in the visual-gestural modality within languages that otherwise make exclusive use of the auditory-spoken modality. In other words, this implies that comparisons can be made between components of NMMs in sign languages and co-speech gestures in spoken languages, for example in the grammatical contribution conveyed by their temporal alignment with other morphosyntactic objects. The alignment of some NMMs in sign languages is frequently said to be sensitive to c-command (Liddell 1977; 1978; 1980; Padden 1983; Aarons 1994; Wilbur & Patschke 1999; Neidle et al. 2000; see also Checchetto et al. 2009; Aboh & Pfau 2010; Branchini et al. 2013; Herrmann 2014; see Wilbur 2021 for an overview and references therein).²⁶ By comparison, it has been noted for spoken languages that gestures and intonation align in a meaningful way (Swerts & Kraemer 2008), for example in signalling the scope of negation in some circumstances (Prieto & Espinal 2020). What the two scenarios share is the property of simultaneity: both NMMs and co-speech gestures (and intonational contours) are articulated simultaneously with the realisation of other morphosyntactic objects (whether signed or spoken). To the extent that NMMs and co-speech gestures (and intonational contours) can be shown to be morphosyntactic objects in their own right, then simultaneity obtains.

For example, in American Sign Language (ASL), the polar interrogative NMM '[q]' (i.e. RAISED EYEBROWS) in (35) spreads across the whole question, reflecting the high scopal position

²⁶ The discussion on NMMs in this paper does not intend to be comprehensive but it only covers points relevant to the present paper. I refer the reader to Wilbur (2021) for a more detailed overview.

of the interrogative feature within the left edge of the clause (Wilbur 2021; Kelepir 2021). On the other hand, the negative NMM '[neg]' (i.e. HEAD SHAKING) in the same example spreads only over the scope domain of the negative sign ('NOT'), i.e. the VP, excluding the surface subject position (see Wilbur 2021 for arguments that NegP in ASL hosts a [neg] feature which can be realised as either the negative NMM [neg], the negative sign 'NOT', or both; see also (Wilbur & Patschke 1999; Neidle et al. 2000; Wilbur 2017):²⁷

(35) *American Sign Language* (Bahan 1996: 55)

$$\frac{\text{q}}{\text{neg}}$$
 JOHN NOT LIKE MARY
 'Doesn't John like Mary?'

The differential behaviour of these two NMM markers [q] and [neg] follows straightforwardly from the different structural height of the features they realise, consistent with the hypothesis that the temporal alignment of NMMs *can* reflect the c-command/scope domain of the features they spell out (Wilbur 2021).

With this in mind, returning now to Neapolitan, we crucially observe that the contexts in which MAB is licensed are broadly similar to those in which particular NMMs in sign languages are licensed. The similarity with Neapolitan MAB (36) is clear when we compare it with, for example, BROW FURROW '[wh]' in ASL (in the repeated example (32) below): both mark wh-questions, the onset of their articulation coincides with that of the left edge of the wh-clause, and both can be spread throughout that clause.

(36) *Neapolitan*



Addò sta Aldə ↓
 where stands Aldə
 'Where is Aldə?'

(32) *American Sign Language* (Neidle et al. 2000: 110)

$$\text{wh}$$
 WHO LOVE JOHN
 'Who loves John?'

²⁷ The spreading of the negative NMM [neg] is apparently optional in ASL: when the negative sign NOT is present, the NMM can either be aligned with just that sign, or it can spread across the domain over which negation takes scope. When NOT is absent, however, then [neg] obligatorily spreads over everything within the scope of negation (Neidle et al. 2000: 44–45). See Wilbur (2021) for discussion.

Additional evidence consistent with our claim that MAB is the realisation of C [+Q, +WH] comes from wh-question formation in LIS (see Section 5.2.2). This is shown in the Neapolitan example above (36) and the repeated LIS example (34c):

(34c) *Lingua Italiana dei Segni* (adapted from Checchetto et al. 2022: 4)

$\overline{\text{ARRIVE } Q_{\text{ARTICHOKE}}}$ ^{fe}
 ‘Who arrives?’

MAB can be combined with different wh-items (like FE in LIS) and it spreads over the c-command domain of the interrogative C (like FE in LIS). However, unlike FE (associated with a [+WH] feature) and $Q_{\text{ARTICHOKE}}$ (associated with a [+Q] feature),²⁸ the temporal alignment of MAB suggests that it belongs to the category of Q-particles realising both [+WH] and [+Q] simultaneously, as in many of the sign languages described above.²⁹

If our proposal is on the right track – namely, that MAB realises C [+Q, +WH], and spreads throughout the material within its scope – then a clear prediction arises: MAB should obviously fail to spread across any material outside the scope of this C head. This prediction is directly confirmed in examples involving high topics in the context of MAB. Compare the examples in (37) involving a topicalised subject occupying a clause-initial position above the wh-phrase’s position in the specifier of the [+Q, +WH] C head: in such cases, MAB cannot be realised across the entire clause including the topic outside the scope of C; rather, the onset of its articulation coincides with that of the wh-phrase in post-topic position:³⁰

²⁸ Interestingly, MAB in Neapolitan and the wh-sign $Q_{\text{ARTICHOKE}}$ in LIS share the same handshape articulation. Whether the association of both of them with a [+Q] feature is just a coincidence or it is related to an hypothetical historical relation between the two remains to be understood. However, since co-speech gestures are commonly grammaticalised in sign languages (van Loon et al. 2014), we might speculate that MAB underwent this process as well. More work on this question is obviously required.

²⁹ A prediction highlighted by Checchetto et al. (2022) is that since $Q_{\text{ARTICHOKE}}$ in LIS is associated with a [+Q] feature, it should not be found in exclamatives (viz. these should only present wh-morphology but not Q features; see also Zanuttini & Portner 2003). This prediction is borne out in LIS, and MAB in Neapolitan too: like $Q_{\text{ARTICHOKE}}$, MAB is not found in exclamatives either.

³⁰ Concretely, I assume that the wh-item in [Spec, CP] falls within the scope of the [+Q, +WH] features that MAB realises. This can be formalised in various ways – for instance, we might appeal to the notion of m-command, such that C scopes over its own specifier; or, perhaps more promisingly, this might involve a split-CP configuration in which the landing site for the wh-phrase is actually below the surface position of the [+Q, +WH]-bearing head (possibly following head movement past the wh-phrase of the sort argued for on independent grounds in Rizzi 2001) – however, I will not explore these analytical details in depth here. I thank Craig Sailor for helpful discussion on this point.

(37) *Neapolitan*

Context: At the supermarket, Antonia bumps into Teresa, Alda's wife. Antonia has just bought a new car and wants to show it to Alda, his best friend. He asks Teresa:



- a. Addò, addò sta ↓
 Aldà where stands
 'As for Aldà, where is he?'



- b. *Aldà, addò sta ↓
 Aldà where stands
 'As for Aldà, where is he?'

Note that this is not an example of Clitic Left Dislocation (the topic is not doubled by a clitic and is not case-marked with a preposition; see Ledgeway 2009: 790). More importantly, this example also does not involve a hanging topic: as Ledgeway (2009: 790) observes, hanging topics in Neapolitan are obligatorily doubled by a clitic or a strong pronoun (and are never case-marked with a preposition), which is absent here. Thus, this appears to be an instance of topicalisation movement, which Rizzi (2001) and others have shown independently to target a position above the surface position of *wh*-phrases, but below ForceP (unlike the position of hanging topics: see Benincà & Poletto 2004). Thus, the fact that this dislocated topic apparently falls outside the scope of MAB provides additional evidence that the latter realises a left-peripheral head associated with interrogatives (below both Force and the higher Top positions). This behaviour of MAB is reminiscent of some of the properties of the head Int(errogative) discussed in (Rizzi 2001): Int is endowed with a [+WH] feature and found below (at least) one Topic position. Thus, MAB's temporal alignment is consistent with the placement of Q-particles realising Int in other languages: see e.g. Gungbe (Aboh 1998) and Japanese (Saito 2012).³¹

To sum up, from our preliminary results, MAB seems to mark a left-peripheral C head endowed with [+Q, +WH] features.³² This would immediately explain the preliminary results of our

³¹ An anonymous reviewer asks whether it could be in principle possible for a single bundle of morphosyntactic features, e.g. [+Q, +WH], to be realised in both the visual-gestural and the spoken-auditory modalities simultaneously within a given utterance. Restated in a framework like Distributed Morphology, the question asks whether a single exponent might consist of phonological features which are realised in different modalities. I am unaware of any previous work addressing this question. Possible candidates for this kind of trans-modality exponence might be found, for example, in languages whose [+Q, +WH] C head is realised simultaneously as a marked intonational contour as well as a segmental morpheme. I leave these interesting questions aside.

³² The fact that MAB is a functional lexical item does not imply that all co-speech gestures hold the same linguistic status. Another example similar to MAB seems to be the co-speech gestural focus marker RING, found in the Italo-Romance language Lancianese (see Colasanti & Cuonzo 2022; Colasanti to appear). More generally, we expect the set of gestural functional lexical items in natural languages to be quite slim.

empirical study. First, this would account for the temporal alignment of MAB in both in-situ and ex-situ wh-questions: MAB spreads across the c-command domain of the head it lexicalises, consistent with the behaviour of wh-NMMs reported in the literature on sign languages.³³ Second, this would provide an explanation for the presence of MAB in both canonical and non-canonical questions, as well as its absence in yes-no questions, exclamatives, and declaratives: only the former, but not the latter, bear the relevant ‘flavour’ of interrogative C (see Cheng 1991; Aboh & Pfau 2010, *i.a.*).³⁴

6 Conclusion

The behaviour of MAB in Neapolitan presented in this paper provides strong evidence that at least some gestures are grammatically integrated. Our preliminary experimental results support the hypothesis that MAB is a Q-particle, realising a C head endowed with [+WH, +Q] features. In other words, we have evidence that the lexicon of a spoken language can nevertheless contain a functional item that happens to be realised at PF in the visual-gestural modality rather than in the auditory modality. Concretely, this entails that a single language can have both spoken and gestural functional morphemes. This is a striking finding, but note that it is not the first reported instance of a functional morpheme of this sort: Jouitteau (2007) reports for Atlantic French the existence of gestural Q-morphemes (see discussion in Section 1).

MAB behaves in every relevant respect like a typical Q-particle from spoken languages (see Katz & Postal 1964; Baker 1970; Bresnan 1970; Watanabe 1992; Hagstrom 1998; Cable 2010; Cheng 2003a; b). This is consistent with a Late Insertion based view of morphology (Halle & Marantz 1993), whereby the syntax of Neapolitan treats MAB as an ordinary Q-particle because

³³ An anonymous reviewer raises the question of how gestures are linearized with speech. This is a question of considerable breadth that goes beyond the scope of this paper. See Esipova (2019b: §4.3.4) on the complexities involved with considering linearization and gesture. See also Donati (2021) for discussion on linearization in code-blending found in bimodal bilinguals.

³⁴ An anonymous reviewer asks whether sentences such as the following bear further comment:

(i) *Romano* (p.c. anonymous reviewer)



Dice che è il più grande linguista del mondo.
 he.says that he.is the plus big linguist in.the world
 ‘He claims to be the best linguist in the world (, but who believes this?)’

As the translation indicates, this example expresses a kind of disbelief question of the sort we have already seen MAB associated with, albeit here without the form of a wh-question. Although I have not included such examples in the two experiments reported here, my Neapolitan consultants accept such examples in the right context (e.g., as a means of rejecting a prior assertion). I take such cases to be just another type of disbelief question whose C head is expressed with MAB (albeit with the syntax of a yes/no question rather than a wh-question), but this warrants further investigation.

it cannot know how (or indeed, whether) the [+WH, +Q] bundle of features will be realised at PF. In the case of Neapolitan, this bundle happens to be realised gesturally, but otherwise behaves like a typical Q-particle. This is consistent with the proposal put forward by Esipova (2019b) – along the lines of Chomsky’s first intuition in Rieber (1983) – that syntax is blind to the modality of the morphemes that spell out morphosyntactic features (see also discussion of ‘Esipova’s conjecture’ in Sailor & Colasanti 2020). Future work should consider the possibility that other functional items might be expressed gesturally in an otherwise-spoken language (see Jouisseau 2004; 2007).

I close by briefly mentioning some limitations of the present study, which represents only a preliminary first step in uncovering MAB’s morphosyntactic properties in Neapolitan. Forthcoming work (see Colasanti in progress a) builds on these findings by describing the behaviour of MAB in embedded interrogative contexts and, more broadly, describing the ingredients of question-formation (e.g. intonation) in Neapolitan, situating this within a comparative view of southern Italo-Romance languages, e.g. Lancianese (Abruzzo) and Palermitan (Sicily). For instance, similar patterns of (un)acceptability found in the Neapolitan examples (24d) and (24c) also hold for canonical information-seeking wh-questions in the Sicilian language spoken in Palermo:

(38) Canonical information-seeking wh-question (Palermitan)

Context: We are in Palermo in front of the main station. A man has just arrived with the train from Agrigento. He stops you and asks:



-
- a. (R)unn è u mercato ra Vucciria ↓
 where is the market the Vucciria



-
- b. *(R)unn è u mercato ra Vucciria ↓
 where is the market the Vucciria
 ‘Where is the market *Vucciria*?’

Preliminary fieldwork has already established that MAB’s behaviour seems to show similarities and differences across other languages spoken in Southern Italy: this is the expected scenario, as gestural material is not predicted to be immune to the pervasive structural microvariation we see across Italo-Romance.

Ethics and consent

This research has been approved by the Research Ethics Committee of the School of Linguistic, Speech and Communication Sciences, Trinity College Dublin (Applicant Code: TT52 (2020/21)).

Acknowledgements

First, I thank all the Neapolitan speakers that participated in this study and to Mariangela Cerullo for taking care of the data collection *in loco*. A special thanks goes to Craig Sailor for helpful discussions throughout the writing of this paper. For comments and feedback on a previous version of this paper, I would like to thank Donna Jo Napoli. I would also like to thank three anonymous reviewers for their useful comments and suggestions. I thank Elizabeth Pankratz for her unvaluable help with the statistical analysis. Usual disclaimers apply. This research has been funded by the the Trinity Long Room Hub Arts and Humanities Research Institute within the research project *Gestural Grammar: Investigating Gestures in Southern Italy* (GestuGram; PI: Colasanti).

Competing interests

The author has no competing interests to declare.

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