

## CHAPTER 39

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# NEGATION, PROSODY, AND GESTURE

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PILAR PRIETO AND M.TERESA ESPINAL

### 39.1. INTRODUCTION

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NEGATION as a basic concept of human cognition can be communicated linguistically and encoded by means of lexical and syntactic strategies (e.g. negative markers, isolated negative words, a combination of negative expressions within a sentential domain), prosodic strategies (e.g. specific tones and intonational tunes, pitch accentuation, phrasing patterns), and even gesturally (e.g. through the use of a variety of movements of the head, face, arms, hands, fingers, or shoulders). As such, negative meanings can be used to convey a variety of functions (Dimroth 2010), among which we will focus on the act of denying an entire utterance or proposition (Horn 1989), the act of rejecting what someone else has asserted (Krifka 2017), and the act of correcting a misguided assumption (Givón 1979).

Beyond the notion of negation as a truth-functional operator, in this chapter we will therefore use the term negation to refer to three distinct types of speech acts, namely *denial*, *rejection*, and *metalinguistic negation*. Denial is understood as an informative speech act of asserting the negation of some content, or ‘how things aren’t’ (see Ripley in this volume). Thus, in (1) the speaker utters a declarative negative sentence in Catalan by means of which the content of someone coming is denied. That is, the speaker asserts its negation in such a way that the negation is true whenever the affirmation is false, and the affirmation is true whenever the negation is false. Pretheoretically, there is equivalence between denying a sentence and asserting its negation. The production of this utterance is commonly expressed with a broad focus intonation, accompanied optionally by a head shake, a palm-down hand gesture, and/or an index finger shake.

- (1) No vindrà.  
not come  
‘(S)he will not come.’

If the hearer of (1) wants to reject the content of this utterance, because (s)he disagrees with the interlocutor, (s)he may follow up the discourse by uttering the sentence in (2a) and conveying the meaning that the person being referred to will certainly come.

On the other hand, examples (2a,b) correspond to a rejection speech act, by means of which the new speaker reacts to the assertion in (1) by rejecting its content. This can be done by means of a specific intonation, a contradiction pitch contour (represented by the symbol  $\checkmark$  in (2a); Espinal and Prieto 2011; Prieto et al. 2013; see section 39.2.1.2 below) or the polar particle *no* ‘not’ that expresses rejection of the negative proposition in (1). In (2b) this rejection speech act combines in discourse with an assertion speech act, introduced by *sí* ‘yes’, by means of which the speaker asserts a commitment to the truth of a positive proposition (Krifka 2017; Espinal and Tubau 2019). Both utterances can be optionally produced with co-speech gestures such as shoulder shrugging, head nods or shakes, and hands/arms moving outwards (e.g. Kendon 2002, 2004; Harrison 2009, 2010; see section 39.3 below).

- (2) a.  $\checkmark$ Sí.  
yes  
‘(S)he will certainly come.’  
b. No, sí que vindrà.  
not yes that come  
‘(S)he will certainly come.’

The hearer of the sentence in (1) *No vindrà* ‘(S)he will not come’ may also react to this utterance by means of a corrective speech act that ranges over discourse old information, like the sentence in (3) below (Larrivée 2018). Metalinguistic negation is a device for objecting to a previous utterance and focuses not on the truth or falsity of a proposition, but on the assertability of an utterance (see Martins in this volume). Metalinguistic negation, therefore, expresses a speaker’s attitude of disapproval that can be emphasized by means of specific lexical items (e.g. *like hell* in English; *ca, i ara* lit. ‘and now’ in Catalan, Espinal 2011), together with a specific gesture: such as upwards movements of the hand or arm, and abrupt or sharp backwards movements of the head.

- (3) Ca! És clar que vindrà.  
PRTL is clear that come  
‘Like hell! Obviously, (s)he will come.’

Traditionally, negation has been studied across languages quite intensively from the syntactic, semantic, or pragmatic point of view while less attention has been paid to the prosodic and gestural patterns associated with it. However, it is well known that prosody, and specifically intonational patterns, strongly influence pragmatic interpretation related to speech act information (assertion, question, etc.), information status (focus, given vs. new information), and belief status (epistemic position of the speaker with respect to the information exchange), among other things (see Pierrehumbert and Hirschberg 1990; Prieto 2015 for a review). Thus in the context of negation, it is important to assess the role of prosody as a source of information about the speaker’s intention and positioning in

discourse, and also, more specifically, explore the role of not only prosody but also gesture in the expression of denial, rejection, and metalinguistic negation across languages.

The purpose of this chapter is to summarize the current state of the art on the contribution of prosody and gesture to the expression and interpretation of negation across languages. In recent decades, a number of studies (some of them experimental in nature) have highlighted the role of prosody in the interpretation of negation. The results of these studies have shown that prosodic properties like morphemic tones, pitch accentuation, prosodic phrasing, and intonation are frequently used by speakers in the expression of the three speech acts under study in this chapter. Section 39.2.1 focuses on the prosodic features used to express negation (specifically denial, rejection, and corrective speech acts) across tonal and intonational languages, in both statements and questions. Pitch accentuation and prosodic phrasing are used to disambiguate structures showing interactions between negation and quantification, negation and sentence modality, affecting the negative scope interpretation of the negative marker. Section 39.2.2 assesses the interaction between prosody and scope disambiguation. Prosodic cues (pitch accentuation, prosodic phrasing and prominence, as well as intonation) may contribute to the propositional form expressed by an utterance, and the implicatures inferred from it, by triggering a negative shift from double negation to single negation readings, and vice versa, as well as a shift in the interpretation of the polar particle *yes*. Section 39.2.3 focuses on the role of prosodic and gestural factors as triggers of semantic shifts in negation. Finally, section 39.3 deals with the interaction between negation, prosody, and gesture and specifically the gestural patterns used in the expression of negation in both adult and child multimodal productions.

## 39.2. THE ROLE OF PROSODY IN THE EXPRESSION OF NEGATION

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### 39.2.1. The prosodic realization of negation

#### 39.2.1.1. *The expression of denial*

Denying is an informative speech act by which the speaker rules out some information (see Ripley in this volume). In this respect a legitimate question to be addressed is whether there are any languages in the world that mark negation prosodically, without additional linguistic encoding. The traditional view is that while languages tend to mark speech act type differences (e.g. interrogation, imperativity) exclusively by means of prosody (i.e. in the absence of morphological or syntactic encoding), this is not the case with negation (Horn 1989: 472–3; Horn and Wansig 2015). However, this view must not be taken too categorically, as various tonal languages have been shown to use exclusively tonal means to mark negation. Hence, while negation in standard Igbo is marked by the negative suffix *ghi*, some dialects such as Nnewi and Onicha display suffixless negative constructions. In these constructions, a high tone over the verbal element has been described as being the only indicator of negation (Obiamalu 2013). In Ndyuka, a creole language of Suriname, the contrast between positive and negative sentences is indicated by a low vs. high tone respectively on the copula *na*, with no other segmental differences (*Mi na gaanman*

‘I am chief’—low tone on *na*—vs. *Mi na gaanman* ‘I am not chief’—high tone on *na*) (Huttar and Huttar 1994: 134).

While the above-mentioned examples clearly show morphological tone being used alone to mark negation, no conclusive evidence has been found that negation can be marked solely through intonation in the case of intonational (i.e. non-lexical tone) languages. In these languages, prosodic prominence regularly accompanies specific negative lexical markers. Thus, it has been shown that negative expressions themselves, like other modality operators like sentential adverbs, modals, and quantifiers, belong to a set of contrastive lexical items that introduce new information in discourse and thus are generally produced with prosodic prominence. Yaeger-Dror (2002) proposed the “Cognitive Prominence Principle” by which it would be reasonable to expect some kind of prosodic highlighting in linguistic morphemes that are crucial to sentential interpretation (see also Pierrehumbert and Hirschberg 1990). In an experimental investigation, O’Shaughnessy and Allen (1983) analyzed the fundamental frequency patterns of modality operators in English being read aloud and found that negative items and other contrastive elements were prosodically emphasized and tended to be marked intonationally with rises or sharp falls in pitch. For their part, Hedberg and Sosa (2003) analyzed a spontaneous interactive speech corpus and found that negative morphemes were systematically produced with a rising pitch accent, except in cases of contracted negation with the auxiliary *do*. They also found a trend in the data for more rising or level final tunes in negative than in positive declarative utterances.

In sum, while tonal languages can mark negation exclusively through tonal morphemes, in intonational languages the prosodic expression of the difference between negative and positive sentences tends to rely on the use of prosodically prominent negative expressions. Thus in general, languages assign prosodic prominence to the negative expressions of negative sentences, by means of a high tone in tonal languages, and by means of pitch accentuation in intonational languages. Interestingly, the tendency for negative elements to be produced with prominent prosodic patterns backs up the claim that prosodic highlighting serves to single out the linguistic morphemes that are central for discourse interpretation. This phenomenon can be understood as a general strengthening strategy which coincides with a more general conspiracy in natural language to signal negation as early as possible within a sentence. Additional effects of this negation strengthening principle range from diachronic shifts in the expression of sentential negation to fronting and negative inversion phenomena (Horn 1989: 293; after Jespersen 1917: 5; see also Chapters 12 and 32 in this volume).

### 39.2.1.2. *The expression of rejection*

Rejection (or denegation of an assertion, Krifka 2017) is here understood as the speech act by which someone expresses an attitude of rejection or disagreement towards either a contextual stimulus or a previous speech act of the interlocutor. In this regard an important question to be addressed is whether intonational languages use specific pitch contours to mark rejection. While no evidence has been found so far of specific tunes expressing denial (see section 39.2.1.1), a specific type of intonational contour (the so-called *contradiction contour*) has been documented in the production of negative sentences conveying the speaker’s rejection or disagreement with the previous turn (Jackendoff 1972; Hedgberg and Sosa 2003; Goodhue and Wagner 2018 for English; Espinal and Prieto 2011;

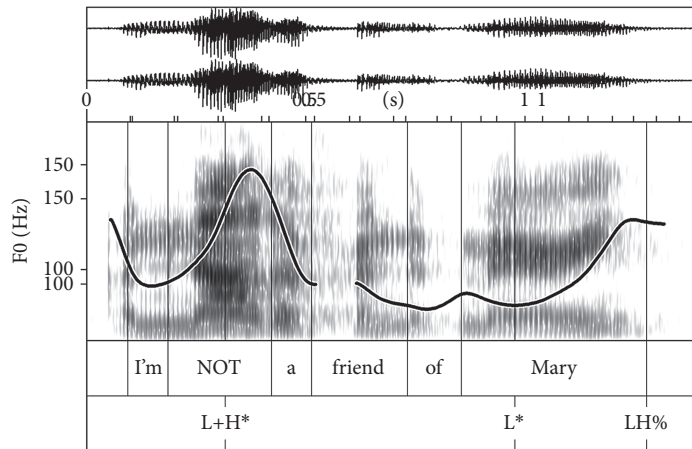


FIGURE 39.1. Pitch contour, waveform, and spectrogram of an example of the classical contradiction contour in English

Prieto et al. 2013; Tubau et al. 2015 for Catalan). In their study of a corpus of American English spontaneous speech, Hedberg and Sosa (2003) documented the classical contradiction contour, the low-rise  $L^* LH\%$  in negative sentences expressing contradiction. However, they also pointed out that not all contradictions are marked by this tune. They found that the locus of negation is almost always marked with a high pitch accent, except in cases with contracted negation. Regarding the nuclear pitch contour, a large number of  $L^* LH\%$  final tunes were found. An example of such a tune is illustrated in Figure 39.1<sup>1</sup> showing the intonational contour of the utterance *No, I am NOT a friend of Mary* as the potential response to the question *You are a friend of Mary, aren't you?* (for a discussion of the intonational transcription of this contradiction contour, see Goodhue and Wagner 2018: section 3.1).

While the above-mentioned results revealed that negative expressions conveying denial and rejection tend to be pitch-accented (e.g. tend to receive phrasal prominence), other quantitative investigations using spontaneous oral corpora in English have not offered such clear results (Yaeger-Dror 1985 for American English, Kaufmann 2002 for British English). Yaeger-Dror (1985) argued that American English speakers may de-emphasize and contract negative items “if they express disagreement with a previous speaker’s turn and thus threaten the face of the conversational partner.” Thus, under certain social conditions speakers might tend to deaccent negative expressions to minimize possible sources of disagreement. Kaufmann (2002) confirmed these findings and documented a strong tendency for negative items to be realized without prosodic prominence. However, she argued that potential conversational discord cannot be claimed to be the only explanation

<sup>1</sup> We thank Patrick Rohrer (Universitat Pompeu Fabra) for providing us with the audio recording of this example.

for the low rate of prominent negative items, since disagreements were infrequent in her data. Rather, she suggested, prominence on negatives may also be register-dependent.

Disagreement in questions can also be expressed through a variety of intonational contours across languages. Research has documented specific intonational contours for what are known as incredulity questions, which are intended to express rejection or disbelief. For example, in Puerto Rican Spanish, such questions are characterized by a specific fall-rise-fall tune L\*HL% (Armstrong 2017). Similarly, Crespo-Sendra et al. (2013) documented a specific intonational pitch contour for incredulity questions in Dutch and Catalan. While in the latter, the main difference between an information-seeking question and an incredulity question lies in the pitch range difference in the whole contour, in Dutch the main difference lies in the nuclear configuration (L\*H% for information-seeking questions vs. L + H\*LH% for incredulity questions).

In sum, specific pitch contours expressing rejection or disagreement can be found in statements and questions across languages. Moreover, as we will see below (see section 39.2.3), these intonational contours (together with other prosodic strategies) are commonly used across languages to shift negative interpretations under certain semantic and pragmatic conditions.

### 39.2.1.3. *The expression of metalinguistic negation*

A third speech act involved in the expression of negation consists of a corrective speech act, which usually consists of a first proposition that contains discourse-old information followed by a corrected second proposition that is conceived as discourse-new information by virtue of being in focus (Larrivée 2018; Moeschler 2018; Martins in this volume).

Metalinguistic negation is considered a case in which the use of focal or contrastive pitch accents affects the scope of negation. By way of illustration, consider the examples in (4) (from Horn and Wansing 2015: (19a,b,d)), which show several uses of metalinguistic negation and their instantiations through the use of contrastive pitch accents.

- (4) a. Around here we don't LIKE coffee—we LOVE it.  
b. She doesn't sell INSurance—she sells inSURance.  
c. I'm not HIS brother—he's MY brother!

Horn (1989: 402) claimed that “metalinguistic uses of negation tend to occur in contrastive environments, either across speakers in a given discourse context or within a single speaker's contribution.” More recently, Horn and Wansing (2015) stated that, through metalinguistic negation, “a speaker objects to a previous utterance on a variety of grounds, including its phonetic or grammatical form, register, or associated presuppositions or implicatures.” In all the examples in (4) the item that receives contrastive pitch in the first sentence is understood as being under the scope of negation, and the item that receives contrastive pitch in the second sentence introduces the correction. From a prosodic point of view, the corrective speech acts expressed in the examples in (4) are typically produced with prosodic prominence (realized through pitch accentuation) associated with the target contrastive words (marked in capitals in (4)). Optionally, speakers can produce these target words together with beat gestures, the rhythmic head nods or hand movements which are typically associated with prosodically prominent positions in speech.

### 39.2.2. Prosody and scope

In this section we present several studies that show the important role played by prosodic factors (typically pitch accentuation and phrasing) in the disambiguation of linguistic expressions that involve negative markers, and their interaction with quantifiers, indefinite NPs, and polarity items, in both statements and questions.

#### 39.2.2.1. *Scope disambiguation in statements*

Perhaps one of the most thoroughly analyzed interactions between negation and quantification is the case of universal quantification. At a sentential level it has been argued that sentences with universal quantifiers and negation are ambiguous, as illustrated in (5) (from Giannakidou and Etxeberria 2018: 28).

- (5) All the men didn't go.  
a.  $\forall > \neg$  : no man went  
b.  $\neg > \forall$  : some men went

For English, it has long been claimed that each interpretation corresponds to a different prosodic structure (Jackendoff 1972; Büring 1997b; Krifka 1998). In particular, if the sentence in (5) is uttered with a falling contour (Jackendoff's A accent), it is the universal quantifier that takes scope over the sentential negation, and the interpretation is that none of the men went. By contrast, if it is uttered with a contrastive pitch accent on *all* and a final fall-rise contour (Jackendoff's B accent), the negation takes scope over the universal quantifier and the interpretation is that some of the men went.

In the linguistics literature it has also been argued that some sentences show scope ambiguity between a negative marker and an indefinite NP, which is resolved with the presence of a contrastive pitch accent on the indefinite NP. In such situations "part of what is in the semantic scope of negation is outside the pragmatic scope of negation" (de Swart 2000a: 355). Thus, a sentence such as (6a) is not used to deny that any killing took place, but to deny that it happened with a hammer. The inference of the implicature is shown in (6b).

- (6) a. He didn't kill the judge with a HAMMER.  
b. He killed the judge, but not with a hammer.

As discussed in de Swart (2000a), a contrastive interpretation activated by pitch accentuation on an indefinite NP is compatible with inverse scope of negation because the implicature allows the utterance to convey positive information. This requires that, when a sentence such as (6a) is uttered, a distinction must be made between what is asserted (a negative sentence with a focused NP that triggers the existence of alternatives) and what is implicated (a positive proposition that the judge was killed, and a presuppositional denial that the member of the set of instrument alternatives with which the action took place is a hammer).<sup>2</sup> This distinction is triggered by the presence of focus, instantiated by means of pitch

<sup>2</sup> See Geurts (1998) for the notion of presupposition denial, in contrast to proposition denial.

accentuation. Pitch accents themselves indicate the existence of a contextually salient set of alternatives (Bolinger 1961; Rooth 1992), and the contrastive marking on a focus constituent  $\alpha$  expresses the speaker's assumption that the hearer will not consider the content of  $\alpha$  (i.e. that the instrument of the killing action was a hammer) likely to be(come) common ground (Zimmermann 2008: 354).

Other types of scope of negation ambiguities involving coordination structures and subordinate clauses have also been shown to be resolved through the use of prosodic phrasing strategies (Repp 2006 for English, Hirschberg and Avesani 2000 for English and Italian). For example, the English sentence *William isn't drinking because he is unhappy* has two potential interpretations: the reading in which William drinks, but not because he is unhappy, and the reading in which William does not drink, because of his unhappiness. In the former reading, the so-called wide scope condition, phrase boundaries are rarely exhibited, while the latter reading, the so-called narrow scope condition, has typically a phrase boundary before the subordinate clause (and a final rise at the end of the utterance) (Hirschberg and Avesani 2000: 90).

The overall conclusion of this section is that prosodic patterns (and specifically intonation, pitch accentuation, and phrasing patterns) are used across languages for the disambiguation of the scope of negation in statements in which negation interacts with universal quantifiers, indefinite NPs, and subordinate sentences.<sup>3</sup>

#### 39.2.2.2. *Scope disambiguation in questions*

As mentioned earlier, prosodic patterns strongly interact with sentence interpretation not only in assertions, but also in questions. In English, adding prosodic prominence (e.g. pitch accentuation) to negative items in questions has the effect of adding a negative bias. Asher and Reese (2005) showed that prosodic emphasis can help to convey negative bias in English polar questions. When a weak negative polarity item such as *anything* or *ever* in a polar interrogative is emphatically stressed, as illustrated in (7b) and (8b), the question is negatively biased. By contrast, when the negative polarity item is unstressed, as in (7a) and (8a), the interpretation is that of a neutral question.

- (7) a. Did Fred contribute anything to the campaign?  
b. Did Fred contribute ANYthing to the campaign?
- (8) a. Has John ever voted for a democrat?  
b. Has John EVER voted for a democrat?

Negative questions constitute a challenge for semantic interpretation because they are systematically ambiguous as to whether the speaker of such a question is asking for

<sup>3</sup> We acknowledge the existence of additional phenomena that show the interaction between prosodic factors and negative expressions at the level of lexical semantics. See e.g. Giannakidou (1998) and Chatzikonstantinou (2016) on the effects of pitch on the scalarity of negative polarity items in Greek. Other studies focus on the interaction between prosody and negative expressions at the level of information structure. See Armstrong and Schwenter (2008) on the prosodic correlates of canonical and non-canonical negation in Brazilian Portuguese.



confirmation of  $p$  or  $\neg p$  (Ladd 1981; Krifka 2017). While positive polar questions (or positive *yes-no* questions) tend to ask for new information in a non-biased way, negative questions are generally biased, which means that they are produced when speakers have compelling evidence against some proposition (Büring and Gunlogson 2000; Romero and Han 2004; Reese 2006; and others). Ladd (1981: 164, ex. (1)) argues that the two different interpretations of the question in (9) hinge on whether the scope of the negative marker *not* extends beyond or is contained within the proposition under question, an ambiguity which can be resolved through prosody.

- (9) Isn't there a vegetarian restaurant around here?  
a. Speaker wants confirmation that there is a vegetarian restaurant here.  
b. Speaker wants confirmation that there is no vegetarian restaurant here.

The use of polarity particles (*too, either*), as well as tag questions with different intonation patterns, has been argued by Ladd (1981) to constrain the interpretation into one or the other direction.

Holmberg (2013: 91) suggests that the presence of stress on the negative marker in the question might favor the answer *yes* as a confirmation of the negative meaning, as illustrated in (10).

- (10) Q: Is John NOT coming?  
A: Yes. [Preferred reading: 'He is not coming.']

For more information about biased questions, and the interaction of prosody and syntax in the promotion of biased interpretations, see Asher and Reese (2007) and Krifka (2017).

### 39.2.3. Negative shifts

In this section we focus on two sorts of phenomena triggered by prosodic factors that involve semantic shifts in interpretation between single negation (SN) and double negation (DN) readings, and vice versa, as well as between positive and negative interpretations of bare polar particle responses.

Before we move into these issues, let us clarify the use of the term DN as it is found in the literature. On the one hand, DN has been used to refer to the compositional reading obtained in some languages within the boundaries of a single clause when two negative items, each one of which encodes a negative operator, cancel each other out (Law of DN, Horn 1989:  $\neg\neg p \rightarrow p$ ), yielding an affirmative interpretation. This situation can be exemplified by the standard English sentence *She didn't call nobody*, interpreted as 'She called everybody'. On the other hand, the term DN has been also used to refer to the non-compositional positive reading inferred from a single negative expression after an operation of rejection is activated by a particular contradictory contour or some specific rejection gesture.

In this section we focus on two sorts of semantic shifting phenomena triggered by prosodic factors and gestural strategies: (i) the meaning shift exemplified by sentences that have the semantic ingredients to compose a DN reading (e.g. multiple sets of negative markers or quantifiers) but end up being interpreted as conveying an SN reading; and

(ii) the meaning shift exemplified by sentences that have the semantic ingredients to yield an SN reading (perhaps after a syntactic operation of negative concord, see Labov 1972b; or a semantic process of negative spread, see den Besten 1986) but end up conveying a DN interpretation.<sup>4</sup>

### 39.2.3.1. *From double negation to single negation readings*

We first review some studies that document the semantic shifting effects of prosody when it comes to interpreting a sentence with multiple negative quantifiers (perhaps even in combination with a negative marker), which are initially expected to yield a DN reading but ultimately convey an SN reading.

Let us consider modern standard Dutch. This is a paradigmatic example of a language where the combination of two negative expressions yields a DN reading, because each morpho-syntactically negative expression corresponds to an independent semantic negation with the result that they cancel each other out when the meaning of the full sentence is composed. Interestingly, it has been pointed out in the literature (Neeleman and van de Koot 2006; Zeijlstra 2010a; de Swart and Fonville 2014) that prosodic factors (namely pitch accent) may lead to a SN interpretation. Zeijlstra (2010a:45, ex. (20)) claimed that emphasis (identified as stress) must occur on the first negative element to obtain an SN interpretation, whereas if the second element is the one that carries stress only DN is conveyed.

- (11) a. Hij heft NIKS niet gezegd.  
he has nothing not said  
'He didn't say anything (at all).'
- b. Hij heft niks NIET gezegd.  
he has nothing not said  
\*'He didn't say anything (at all).'
- √ 'There is nothing he didn't say.'

This was borne out in a production experiment with Dutch native speakers in which both DN and SN readings were obtained from sequences with a high pitch accent (H\*) on the first negative expression (de Swart and Fonville 2014). The authors further showed that the speakers used an H\*H\* contour pattern for both DN and SN readings, and H\*L\* exclusively for DN readings.

Mandarin Chinese is another language for which the combination of two negative expressions within the boundaries of a single clause is expected to compose a DN reading. Li, Borràs-Comes, and Espinal (2018) investigated whether SN readings are ever possible in sentences with multiple negative expressions in examples like those in (12).

<sup>4</sup> Note that we avoid referring to a macroparametric division between DN languages and Negative Concord (NC) languages, as has been postulated in the linguistics literature (Giannakidou 2000a; Van der Wouden 1997; Zeijlstra 2004a; and others). See Déprez (2011) and Longobardi (2014) for a criticism of this macroparametric division. See de Swart (this volume) and Giannakidou (this volume) for DN readings and NC readings, respectively.

- (12) a. Méi(yǒu)rén méi(yǒu) qù guò Měiguó.  
not.have.people not.have go PART America  
'No one hasn't been to America.'
- b. Wǒ cóngláibù bù cānjiā xiàlingyíng.  
I ever.not not attend summer camp  
'I don't never attend summer camp.'

After identifying the acoustic correlates of stress in this tone language,<sup>5</sup> the results of a perception experiment showed that (a) SN readings are possible, though they occur at a low—albeit statistically significant—rate, (b) SN readings are obtained only when the second negative expression (which in all cases was the negative marker *méi(yǒu) /bù* 'not') received stress, and (iii) SN readings are more likely when the first negative expression is an adjunct (*cóngláibù* 'never') rather than an argument (*méi(yǒu)rén* 'nobody').

Recently, Blanchette and Nadeu (2018) have shown that standard American English, which is expected to license DN readings, can generate both SN and DN interpretations for negative indefinite fragment answers to negative questions. Positive readings of negative fragment answers (corresponding to the expression of rejection) are yielded when the answer is pronounced with higher pitch. In their study these authors adapted the experimental paradigm applied in Espinal and Prieto (2011) to investigate whether DN and SN readings in standard American English behave similarly to what is seen in Spanish and Catalan, using question–answer pairs of the sort exemplified in (13).

- (13) Q. So, what didn't you read?  
A. Nothing.

Their conclusion is that "DN [ . . . ] is marked by a higher fundamental frequency than its single negative counterparts, even if it is frequently produced with the same intonational contour that we find in the other two conditions" (Blanchette and Nadeu 2018: 137), which are a negative reply to a positive question in a control condition and a negative reply to a negative question in a negative condition.

Summarizing, the examples reviewed in this section show that, in both tonal and intonational languages, prosodic patterns interact with syntactic patterns in triggering meaning shifts from expected DN interpretations to SN readings.

### 39.2.3.2. *From single negation to double negation readings*

To our knowledge, Corblin (1994, 1995) was the first to call attention to the fact that a French sentence like *Personne n'aime personne* (lit. 'Nobody NEG loves nobody') is notoriously ambiguous, since it can be read as describing a kind of no-love world or instead a world in which everybody loves at least one person. If *personne* is considered to be a negative concord item (like in other Romance languages such as Italian or Spanish) the preferred SN interpretation is straightforwardly explained, while the marked DN reading is not. By contrast, if

<sup>5</sup> The acoustic correlates of stress documented for this variety are higher mean pitch, higher pitch range, longer duration, and higher intensity.

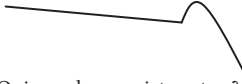


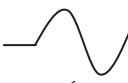
*personne* is considered to be a negative quantifier, the DN interpretation seems fully compositional. Interestingly, Corblin observes that if one of the negative quantifiers is stressed, the DN reading is highly favored. This author approaches the syntax–prosody interface by focusing on the role of stress (i.e. pitch accentuation) and prosodic phrasing, and claims that the answer to the question in the French example in (14) can only have a DN interpretation. He relates this phenomenon to the interpretation of (15), with strong stress on the first negative quantifier. What is common to (14) and (15) (from Corblin 1994, 1995: ex. 81), with a stressed quantifier, is that the SN interpretation is excluded.

- (14) Q. Qui n' a rien fait?  
 who NEG has nothing done  
 'Who didn't do anything?'  
 A. PERSONNE.  
 nobody (= Everybody did something)

- (15) PERSONNE // ne dit rien à personne.  
 nobody NEG say nothing to nobody  
 'Everybody said something to somebody.'

Corblin's account is based on the assumption that stress triggers a focus–topic partition in (15), and this divides the utterance in two parts at the time of processing. 'If this is so, in each part there is one negative to process, and as a consequence, the representation of the whole construction will have one negation per negative, hence cannot be mono-negative' (Corblin 1995: 33). The same applies to fragment answers under an ellipsis account that composes the meaning of the reply with the meaning of the elided negative question. In both cases, one negation cancels the other, and the inferred interpretation is DN.

Recently, a set of empirical studies have shown the important role played by intonation rather than pitch accentuation in the interpretation of isolated negative words used as answers to negative questions in Catalan. Consider the data in (16) (from Espinal and Prieto 2011: 2397, ex. (11); see also Prieto et al. 2013).

- (16) (a)    
 Q. Qui no ha menjat postres?  
 who not has eaten dessert  
 'Who did not eat dessert?'  
 A. Ningú  
 nobody  
 'Nobody' (= Nobody ate dessert.)
- (b)    
 Q. QUI no ha menjat postres?  
 who not has eaten dessert  
 'Who didn't eat dessert?'  
 A. NINGÚ  
 nobody  
 'Nobody' (= Nobody did not eat  
 dessert: everybody did eat dessert.)

A negative word pronounced with a statement tune, which corresponds to the answer given in (17a), triggers a SN reading, whereas a negative word produced with a contradictory tune,

namely the one encoded in (16b), triggers a DN reading and expresses rejection. In (16a) a rising pitch accent is associated with the accented syllable, and it is followed by a low boundary tone, as represented in (17a). In (16b) a rising pitch accent appears too, but in this case it is followed by a complex fall-rise boundary tone, as represented in (17b).

- (17) a. L + H\* L%  
b. L + H\* L!H%

In Espinal and Prieto (2011) it is argued that the rise-fall-rise intonation contour encoding rejection in (17b) imposes an interpretation constraint not only on the attitude of the speaker but also on the communicated proposition. Similarly, Espinal et al. (2016) investigated the interaction between prosody and syntax in the interpretation of different syntactic structures involving negation in Catalan and Spanish, namely isolated negative concord items (NCIs), preverbal NCIs followed by a negative marker, and preverbal NCIs with no negative marker. These patterns are illustrated in (18).

- (18) Q. Qui no ha menjat postres?  
who not has eaten dessert  
‘Who has not eaten dessert?’  
A. Ningú ((no) ha menjat postres).  
nobody not has eaten dessert  
‘Nobody (ate dessert).’

The results showed that the presence of the intonation pattern L + H\* L!H% clearly led to the activation of positive interpretations in all conditions. Yet, it was also clear that this effect was stronger in some syntactic conditions than in others. Specifically, the fragment answer condition favored the DN as opposed to a full negative sentence. Overall, this study showed that Catalan and Spanish hearers manifest form-meaning preferences between syntactic forms and prosodic contours.

In section 39.2.3.3 we examine the meaning shifts induced by intonation in polar particles used as responses to negative questions.

### 39.2.3.3. *Bare polar particle responses*

In many languages, bare polar particle responses are ambiguous when they are used to respond to negative declaratives and interrogatives (Holmberg 2013, 2016; Tubau et al. 2015; Krifka 2017; Espinal and Tubau 2019). Although languages differ as to how they confirm or oppose the content of negative questions, in so-called polarity-based languages (Jones 1999) a *yes*-answer can be ambiguous between a rejecting and a confirmation reading, as illustrated in (19) (Ladd 1981; Romero and Han 2004; Holmberg 2013).

- (19) a. Q. Isn’t John coming?  
A. Yes. [Ambiguous. Rejection reading: ‘John is coming’ vs. confirmation reading: ‘John is not coming’]  
b. Q. Isn’t John coming?  
A. No. [‘John is not coming’]

Experimental research has shown that the prosodic and intonational properties of the answer play an important role in the meaning resolution of these bare polar responses to negative questions in languages belonging to typologically distinct answering systems, namely Catalan and English (polarity-based), Mandarin Chinese (truth-based), and Russian (a mixed system using polarity-based, truth-based, and echoic strategies) (see, among others, Goodhue and Wagner 2018 for English; Tubau et al. 2015 for Catalan; González-Fuente et al. 2015 for Russian; Li et al. 2016 for Mandarin).<sup>6</sup> Tubau et al. (2015) conducted two rating experiments with Catalan participants which showed that (a) *yes*-answers to negative *yes/no*-questions are perceived as ambiguous by Catalan speakers when prosody is not available, and (b) the interpretation of *sí* ‘yes’ as an answer to a negative *yes/no*-question is dependent on the prosodic (and gestural) properties of the answer. González-Fuente et al. (2015) carried out a production experiment to assess the strategies used by Catalan and Russian speakers when confirming and rejecting responses to negative assertions and negative polar questions. The results showed that speakers of both languages resort to strikingly similar strategies at the time of expressing rejecting answers to negative propositions. Li et al. (2016) showed that Mandarin Chinese speakers convey a rejecting response to a negative question by relying on a combination of lexico-syntactic strategies (e.g. negative markers such as *bù* or *méi(yǒu)*, and positive sentences) together with prosodic (e.g. higher mean pitch) and gestural strategies (mainly the use of head nods). Overall, the above-mentioned studies show that a speech act of rejection can be instantiated in some languages through the integrated use of lexical, syntactic, prosodic, and gestural strategies.

### 39.3. MULTIMODAL NEGATION: INTEGRATION BETWEEN PROSODY AND GESTURE IN THE EXPRESSION OF NEGATION. ACQUISITION PATTERNS

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In face-to-face interaction, prosodic and gestural patterns may be used in combination with negative expressions (*no*, *not*, *nothing*, etc.) to express denial, rejection, and related notions like correction, disapproval, stop, prohibition, failure, refusal, etc. (see Guidetti 2005; Harrison 2010, 2018). In his recent book, Harrison (2018) argues that grammatical concepts such as negation are fundamentally multimodal and that the analysis of natural speech interactions leads to recurrent bindings between grammar and gesture. In oral languages, the expression of negation can be encoded either solely through verbal means or gestural means, or through a combination of the two. Equally, in sign languages, depending on the language, negation can be expressed either solely with manual negation elements (*not*, *nothing*, etc.), solely with non-manual prosodic features (such as headshake or facial

<sup>6</sup> Servidio, Bocci, and Bianchi (2018) for Italian showed that a fronted focus in the question is what induces a shift from a positive–negative interpretation of *si/no* answers to an agreement–disagreement answering pattern.

expression), or by means of combining manual and non-manual elements (see Pfau 2008; Quer 2012; Quer this volume).

Several studies have pointed out that co-speech gestures display a parallel situation to that of prosody, that is, distinct gestures and facial expressions are used to express distinct types of speech acts (see Brown and Prieto in press for a review). In relation to the expression of negation, many languages show a contrast between the types of conventional co-speech gestures used to express affirmation (e.g. head nods), and those used to express denial (e.g. side-to-side shaking of head or finger), rejection (head shakes), and metalinguistic negation (raising of an arm with sharp backwards head movement). Several authors highlight the presence of “kinesic ensembles” associated with negation, and involving negative lexical items, palm down hand gestures and head shakes (see Kendon 2002, 2004; Harrison 2009, 2010). Interestingly, Harrison’s work reveals the interaction between the span and timing of the negative gesture at the utterance level and the semantic scope of negation. A distinctive set of gestures and facial expressions has been described as being involved in the expression of rejection or disagreement. A recent study by Benitez-Quiroz, Wilburb, and Martinez (2016) has documented a common facial expression of disagreement across four languages—Spanish, English, Mandarin Chinese, and American Sign Language—suggesting a universal pattern. Participants in all these languages reacted by slightly furrowing their eyebrows, pursing their lips, and raising their chins in response to statements they disagreed with (e.g. a reaction to a prompt like *A study shows that university tuition should increase by 30 percent. What do you think?*).

In the last few decades, several studies have jointly analyzed the use of prosodic and gestural patterns to express rejection in languages such as Catalan, Dutch, Russian, and Chinese, and have demonstrated that such patterns make up multimodal ensembles. Crespo-Sendra et al. (2013) showed that while Catalan and Dutch speakers use very similar facial expressions while uttering an incredulity question (e.g. some degree of eyebrow furrowing and eyelid closure), they produce language-particular incredulity intonation contours. Prieto et al. (2013) showed that prosody and gestures interact and affect the listeners’ interpretation of short negative responses. These authors investigated the preferred interpretation of negative words *ningú* and *nadie* in Catalan and Spanish for an auditory-only condition, a video-only condition, and an audiovisual condition with congruent and incongruent multimodal matches. In the audiovisual condition, DN readings were picked up when prosody and gesture converged on the rejection interpretation, otherwise SN was preferred, with an increase in reaction times. Another set of studies investigated the gestural and prosodic patterns in rejecting responses to negative questions in Catalan (Tubau et al. 2015), Russian (González-Fuente et al. 2015), and Mandarin (Li et al. 2016). Tubau et al.’s (2015) perception results support the claim that both the prosodic and gestural patterns that express rejection (e.g. the contradiction pitch contour together with wide hand/arm movements, as well as shoulder shrugs) play a crucial role in the interpretation of *yes*-answers to *yes/no*-questions in a so-called polarity-based language like Catalan. Li et al. (2016) showed that Mandarin speakers use a combination of gestural strategies (head nods and head shakes) and lexico-syntactic strategies, together with prosody (mean pitch) to express a rejecting response to a negative question.

From the perspective of development, cross-linguistic evidence on the early production of negation reveals that three functions feature prominently in early speech: non-existence, rejection or refusal, and denial (see Dimroth 2010, for a thorough cross-linguistic review;

see Thornton in this volume). By the middle of their second year, children start refusing in response to questions from the caregiver (see Volterra and Antinucci 1979). Also by age 2, children produce conventional gestures such as head shakes conveying ‘no’ prior to the production of their verbal counterparts and progressively combine those shakes with the vocal modality, first with vocalizations and then with words (Guidetti 2000, 2005). An analysis of the gestures used by young French children aged 16 to 36 months when interacting with their mothers in everyday situations revealed that the most frequent types of gestures were pointing and gestures of agreement or refusal (Guidetti 2002). Kettner and Carpendale (2013) conducted an analysis of the gestures used for *no* and *yes* by eight infants and reported that those gestures developed along different trajectories, with shaking the head for *no* emerging between 13 and 15 months, and nodding for *yes* between 16 and 18 months.

Finally, several studies have highlighted the precursor role of gesture in the early development of negation (see Guidetti 2000, 2005; Beaupoil-Hourdel, Boutet, and Morgenstern 2015; Morgenstern et al. 2016; see also Hochmann in this volume for a review of the infant cognition precursors of early meanings of verbal negation). In a longitudinal study with one English monolingual girl starting at 10 months, Beaupoil-Hourdel, Boutet, and Morgenstern (2015) showed how the child’s first negative constructions started with early gestures of rejection and avoidance. In a follow-up of this study, Morgenstern et al. (2016) analyzed all the negative multimodal utterances produced by four children (a hearing French child, a hearing English child, a deaf child of deaf parents learning French sign language, and a hearing child with one hearing parent and one deaf parent) using bimodal bilingual interactions. Though the authors draw four different pathways to illustrate how each child combines categories in the visual and speech modalities in successive steps, a common pattern can be seen that points to the importance of gesture in the four children’s multimodal path into negation. For a proposal on the relationship between gesture and sign in language acquisition, see Franklin, Giannakidou, and Goldin-Meadow (2011) and Guidetti and Morgenstern (2017).

## 39.4. CONCLUSIONS

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This chapter has reviewed the role of prosody and gesture in the expression of negation across languages, and specifically the prosodic encoding of speech acts of denial, rejection, and metalinguistic negation. Regarding the expression of denial, we have shown that tonal languages can convey denial through the exclusive use of prosody through the use of high tones on specific verbs. This prosodic behavior is parallel to that seen in intonational (i.e. non-lexical tone) languages, where negative expressions tend to receive prosodic prominence (e.g. pitch accentuation). While to our knowledge no language has been reported to solely use a productive intonational pitch contour to express denial, this is not the case regarding the expression of rejection. Overall, languages use a variety of means to encode rejection, like specific pitch contours (e.g. the so-called contradiction contours in English and Catalan) or prosodic focus (e.g. English, Mandarin, or Russian).

Importantly, prosodic patterns involving the instantiation of prosodic prominence and prosodic phrasing, as well as specific intonational pitch contours, have been shown to help



disambiguate between alternative readings of a variety of structures involving negative scope disambiguation, and to trigger semantic shifts in negation. More specifically, recent experimental research has shown the crucial effects of prosodic and gestural patterns in the interpretation of bare response particles.

The work reviewed in this chapter has also evidenced the tight interactions between prosody and syntax. Recent experimental research has highlighted the close links between certain prosodic features and the interpretation of negative sentences which are manifested in various syntactic patterns, such as when the negative marker interacts with a quantifier or an indefinite expression, when the negative marker interacts with a negative adjunct, or when a negative indefinite expression is an isolated fragment answer.

Overall, the review of the literature contained in this chapter points to the need for more holistic approaches to the understanding and analysis of negation in natural grammars. We have shown how denial, rejection, and metalinguistic negation can be encoded cross-linguistically not only in prosodic terms but also using gestural strategies. Recent studies have offered fresh evidence that both prosodic and gestural markers work together with lexical and syntactic strategies to constrain both the proposition expressed and the inferences drawn from that proposition. Thus in order to understand more fully the expression of negation in language, it is indispensable to integrate both prosodic and gestural analyses within a multimodal interaction model of language design. We hope that the review of the literature provided in this chapter can motivate further research that integrates the various viewpoints from which the study of negation has been approached thus far into a single, overarching perspective that fully captures all the complex interactions involved.

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