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Providing evidence for a well-worn stereotype: Italians and Swedes do gesture differently

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Across cultures and languages spontaneous speech is often accompanied by gestures. It is a popular belief that people in Italy gesture more than people in Northern Europe, such as in Sweden. Despite this general assumption few studies empirically investigate cultural differences in gesture frequency and gesture function under similar circumstances. This study compares the spoken and gestural behaviours of Italian and Swedish speakers, assumed to represent gesture-rich vs. gesture-sparse cultures. We examine the groups' gestural behaviour for frequency, and in terms of possible differences in rhetorical style probing the distribution of gestural functions (referential vs. pragmatic) across narrative levels (narrative, metanarrative, and paranarrative). The results show that (1) Italians overall do gesture more than Swedes; (2) Italians produce more pragmatic gestures than Swedes who produce more referential gestures; (3) both groups show sensitivity to narrative level: referential gestures mainly occur with narrative clauses, and pragmatic gestures with meta- and paranarrative clauses. However, the overall group preferences for different functions still lead to different styles. These findings indicate that the two groups differ in gesture rate and, more interestingly, in rhetorical styles, one focused on events and actions in speech and gesture (Swedish), the other alternating between events in speech and gesture, and the highlighting of the presentation of new pieces of information in gesture only (Italian). We propose that the findings suggest that the two groups conceptualise narrative production in different ways reflected in two different rhetorical styles revealed by gesture production more than by speech.

KEYWORDS

gesture, speech production, crosscultural/linguistic differences, rhetorical styles, bimodal narrative

1 Introduction

People often gesture when they talk, no matter what language they speak and what culture they belong to. It is frequently assumed that cultural differences exist in the function and the frequency of gestures used to accompany speech. Some cultures, like those in the Mediterranean area, are commonly described as high frequency gesture cultures in contrast to Northern European countries, known as low frequency gesture cultures. Yet, this popular belief is mainly based on anecdotal observations.

The current study presents empirical data to test crosscultural differences in gestural behaviour of two language/cultural populations with different cultural practises and assumed differences in gestural behaviour: Italy and Sweden. Italian speakers are

proverbially known for not being able to talk without moving their hands. In contrast, Northern European speakers, such as Swedes, are generally described as being reserved, thus less prone to the use of bodily movements. However, to date there is scarce empirical data to support this folk intuition, especially for Swedish speakers (but see Gullberg, 1998; Andrén, 2010). Moreover, previous studies have generally not considered the specific speech context when addressing issues of frequency differences in gesture. In this study, we explore whether crosscultural differences in rhetorical style may reveal something about crosscultural differences in gesture behaviour. We test this in a narrative discourse, a type of speech production frequent in everyday talk and that is often used in gesture studies for its likelihood to elicit spontaneous gesture production (McNeill, 1992).

2 Background

2.1 The link between speech and gesture

Speech-associated gestures, mainly the hand and arm movements speakers perform while they speak, have been documented in a variety of cultures and a range of different languages (e.g., Efron, 1941/1972; Morris et al., 1979; Kendon, 1981, 1990, 1992, 2004b; Calbris, 1990; McNeill, 1992; Brookes, 2004 inter multa alia; see Kita, 2009 for an overview and chapters 73–90 in Müller et al., 2014). There are no reports of a culture where gesture is absent, and this strongly suggests that gesture is a universal feature of human communication. As such, gesture production and its relation with speech has been the object of extensive scrutiny in contemporary psycholinguistic and cognitive research, and considerable insights have been achieved in the understanding of the link between the two systems. For instance, it has been shown that gesture and speech are temporally aligned such that the most meaningful part of a gesture, the stroke, tends to be coordinated with the co-expressive part of speech, in monolingual and bilingual speakers (Kendon, 1972; McNeill, 1992; Loehr, 2007; Graziano et al., 2020). It has also been shown that gestures mainly occur with fluent speech and not with silence or speech disfluencies, independently of the language spoken and the degree of linguistic competence (Gullberg, 1998; Graziano and Gullberg, 2018). Moreover, it has been demonstrated that gestures are co-expressive with speech and can integrate its content either referentially or pragmatically (McNeill, 1992; Kendon, 2004a). That is, they can indicate concrete or abstract entities (deictic, pointing gestures), show the size or the shape of an object, or enact an action (representational, also called iconic gestures in the literature), or represent an abstract concept, such as time (also labelled as metaphoric gestures). Gestures can also communicate pragmatic content, emphasising relevant parts of the speaker's discourse (often called beats), expressing speech acts (e.g., a denial, an offer, etc.), indicating how to interpret the speaker's discourse or stance towards it, and so on.

Furthermore, gestures are also involved in the process of structuring interaction, as when they are used to regulate turn taking, to claim the role of speaker or to provide feedback (e.g., Goodwin, 1981; Bavelas et al., 1992; Kendon, 2004a).

2.2 Variation in gesture frequency

Its universal character notwithstanding, gesture production varies both at individual and cultural/linguistic level. This has often led to some stereotypical views regarding in particular gesture frequency, often attributed to unspecified crosscultural differences. Indeed, such claims have been mainly based on anecdotal remarks, drawing on a (folk) notion of high vs. low gesture frequency cultures. For example, portraying features of the Italian character, Barzini (1964) wrote: "Italian gestures are justly famous. Indeed Italians use them more abundantly, efficiently, and imaginatively than other people" (p. 65). Gesturing is even described as part of the Italian identity (Nardotto Peltier and McCafferty, 2010); a characteristic that, supposedly, suggests that Italians are more communicative. The only empirical findings in support of this claim is provided by Graham and Argyle (1975), who showed that Italians benefit more from the presence of gestures in discourse to solve certain tasks than English speakers.

Lay people also share stereotypical views of gesture frequency as well as of other aspects of gestural behaviour, such as gesture size. Sekine et al. (2015) asked people in France, Italy, Japan, the Netherlands and USA about their views on the gestural production of 13 languages/cultures (Western and Asian). They found that people tended to believe that speakers of "Western languages" gesture more and with bigger movements than speakers of "Asian languages". Again, Italians were those to whom these characteristics were attributed the most, followed by Spanish and American English speakers. Interestingly, in addition to some common opinions (e.g., people gesture more when they speak a foreign language; pointing at others with the index finger is impolite; the size of gestures depends on the language spoken), people tended to attribute different weight to different aspects of gestures (e.g., Americans believe that people produce more gestures when they speak in public; the Japanese believe that gesturing is linked to personality and that it should be avoided in logical discourse).

Strikingly, studies assuming differences in gesture frequency have produced surprisingly little evidence in support of crosscultural variation in this respect. Frequency differences are often assumed in studies of bilingual speakers to test whether non-verbal behaviour of one language/culture becomes visible in the other language; that is, whether gestural "transfer" can be found in bilinguals speaking one supposedly high gesture frequency language (typically, Italian, French, Spanish, American English) and one low gesture frequency language (generally, British English, Chinese, Japanese and, depending on the comparison, American English). Results from these studies diverge. For example, Nicoladis et al. (2009) reported that English-Spanish and French-English bilinguals gestured more when speaking English than English monolinguals. This result was interpreted as evidence of gestural transfer from the (presupposed) high gesture frequency culture (French, Spanish) into the (presupposed) low gesture frequency culture (English) as a function of exposure to the second language cultural norm for gesture (France and Spain, in this case), and in particular for iconic gestures, in the authors' terms. Similarly, So (2010) claimed a transfer effect from American culture for English-Chinese bilinguals in Singapore. The author found that American English monolinguals gestured more than Chinese

monolinguals, and subsequently showed that bilinguals gestured as frequently as American English monolinguals when speaking English, and more than Chinese monolinguals when speaking Chinese. Transfer seemed to happen only for representational gestures (which in the author's classification included abstract deictic and iconic gestures). However, it is important to note that these Chinese-English bilinguals were raised and lived in Singapore where, as the author admits, people could potentially be influenced by other cultures as well and not directly by the American one to which they are compared.

In contrast, other studies have found no evidence for posited transfer. For example, despite finding that Italians gestured more than speakers of British English, Cavicchio and Kita (2013) did not find transfer for gesture rate or for the use of gesture space (referred to as gesture salience) in Italian-English bilinguals. The authors concluded that when bilinguals switch language, they switch gestural parameters as well. Similarly, Nicoladis et al. (2009) found no evidence in support of a hypothesised frequency transfer effect from French into English. Although English-French bilingual children used more gestures than monolinguals when speaking both languages, French monolingual children did not gesture more than their English counterparts.

The monolingual child language literature also reveals mixed results. Iverson et al. (2008) found that very young Italian children produced gestures more frequently than American children of the same age. Capirci et al. (2010) and Colletta et al. (2015) also reported that Italian children make more use of gestural resources than French children, and both groups more than American children. Similarly, in naming tasks studies, Marentette et al. (2016) found that Italian children produced more representational gestures than Canadian English-speaking children. An analogous result was reported by Cattani et al. (2019) who compared Italian, Australian and British children. However, while the production of representational gestures was higher in Italian in comparison to the Australian and British children; the same was not true for pointing gestures whose production did not differ between Italian and Australian children who in turn produced more of such gestures than British children. These studies ascribe this difference to the nature of the adult gesture models to which children are exposed (but see Goldin-Meadow and Saltzman, 2000, who examine Chinese and American mothers' gestures to hearing or deaf children). Yet, no systematic comparison of the adults' gestural behaviour of the same cultures is available. The explanations, thus, rely mainly on anecdotal reports. Moreover, considering studies in which gesture production is actually compared between cultures, there is already some evidence that this might not be a suitable or at least the only explanation. For instance, Pettenati et al. (2012) found no differences in the gesture frequency of Italian and Japanese toddlers performing a naming task. Similarly, Gullberg (1998) found that the gesture frequency of French and Swedish adult speakers engaged in the same narrative task did not differ and Müller (1994) reported the same result comparing Spanish and German adult speakers.

In sum, the evidence for high vs. low gesture frequency cultures, and of gesture transfer from high to low gesture frequency cultures are mixed.

2.3 Variation in gesture forms and functions

Differences in gesture use across cultures have long been recognised (see Kita, 2009 for a review). It is well known, for example, that in every culture there is a repertoire of conventional gestural forms (e.g., Morris et al., 1979; Kendon, 1981; Calbris, 1990; Payrató and Clemente, 2020) often used in place of spoken expressions. Such gestures, called "emblematic" (Efron, 1941/1972), "emblems" (Ekman and Friesen, 1969) or "quotable gestures" (Kendon, 1992), are characterised by a set form/meaning association. That is, a particular hand shape is associated with a more or less stable meaning that is shared among the individuals of the same social or cultural group. Examples of such gestures include the "thumbs-up" gesture or the "ring" gesture commonly used to express OK, "all good" (Morris et al., 1979) in several cultures/countries, like Sweden or Italy, but which assumes different values in other countries or even in some regions within the same country. For example, the "thumbs-up" gesture is an offensive gesture in Sardinia (Italy) and some parts of Greece, and the "ring" gesture is an insult in Greece and in Turkey, while it represents both "excellent" and "zero" in France (Morris et al., 1979).

In addition to culture-specific form/meaning associations, gesture production is also affected by language-specific features, such as lexical and syntactic patterns for encoding motion or spatial information. For instance, Gullberg (2011) showed that French and Dutch speakers gesture differently when they talk about caused motion or placement as a reflection of the different ways in which placement events are lexicalised in these two languages. Hence, while French speakers use the generic placement verb mettre ("put") and typically gesture only about the direction of the placement movement, Dutch speakers must choose between zetten ("set") and leggen ("lay"), depending on the properties of the object being placed, and this is paralleled in gestures that also tend to incorporate the object in the hand shape. Similarly, Kita and Özyürek (2003) and Özyürek et al. (2005) provided evidence that Japanese, Turkish and English speakers gesture differently when describing motion events as an effect of the syntactic packaging of motion information specific to each language. They found that English speakers typically express the manner and the path of a motion event in one single spoken clause (such as he rolls down) and can also depict both pieces of information in a single gesture. In contrast, Turkish and Japanese speakers generally express manner and path in two separate clauses (e.g., it descends rolling) and this is reflected in two gestures, one gesture indicating the direction (descends) and another representing the manner of motion (rolling).

Crosscultural differences in gesture use can also be found at the level of discourse structuring. For instance, in narrative retellings Dutch, Swedish, and French speakers usually gesture more about referents' actions than Japanese speakers, who are instead more likely to gesture about locations and entities that form the narrative setting. This difference can be traced to the information organisational principles typical of these languages: in speech, Dutch, Swedish, and French treat actions as focused information, while Japanese assigns this status to scene settings (Yoshioka, 2005; Gullberg, 2006).

Strikingly, crosscultural differences in gestural styles are seldom discussed in a broader perspective. To date the only exception is Efron's (1941/1972) pioneering study where he compared the gestural behaviour of Eastern European Jews and Southern Italian immigrants in New York City still speaking Yiddish and Italian, respectively. Interestingly, Efron reported that the two groups differed very little in gesture frequency, but more in the kinesic structure of the gesture and in the range of space used, as well as in the type of gestures produced in association with speech. He observed that Italian immigrants' gestures involved not only the hand but also the entire arm from the shoulder, which was moved in a wide space including the lateral plane. Gestures produced by Jewish immigrants, in contrast, involved mainly the elbow and the wrist, and were produced mostly in the vertical and frontal planes. Moreover, whereas Italians made more use of gestures to illustrate the content of their speech (that is, they produced more referential gestures), Yiddish speakers tended to use gestures to mark the logical structure of the talk (that is, they used more pragmatic gestures). In addition, Italians also seemed to have a wider repertoire of emblematic gestures. Efron's observations of Italians' gesture features were later supported by Kendon (2004b) who compared gestures produced by a Neapolitan (Southern Italy) and an English speaker. He found that the Neapolitan speaker produced gestures in a wider space and in a more visible area (in the centre of the visual field of the interlocutor) than the English speaker, who instead moved the arm at the level of the waist. Additionally, the Neapolitan speaker produced a wide range of hand shapes that were much better defined and specialised in their usage than those produced by the English speaker. Müller (1994) also remarked on differences between Spanish and Germans in terms of gesture space, with Spanish speakers producing more gestures above the shoulder at the height of the face. Gullberg (1998) similarly found that French speakers were more likely to produce small beat-like gestures whereas Swedish speakers instead preferred representational gestures depicting content.

2.4 Variation in gesture use and rhetorical style

Taken together the studies summarised above suggest that patterns of spatial and kinesic organsation in gesture production might be culture-specific, and, on the other hand, that the preponderance for a particular gesture function might be the expression of culture-specific rhetorical styles. Several authors used the notion of rhetorical styles, but defined them somewhat differently. Slobin's (1996, 2004) well-known notion of thinking-for-speaking, which suggests that speakers of different languages select different elements of events and reality to talk about as a function of the linguistic units at their disposal, has also led to the notion of language-specific rhetorical styles (Slobin, 2004). That is, speakers of different languages will construct discourse patterns that differ slightly as a consequence of the linguistic (lexical and morphosyntatic) options at hand. For example, if you speak a language that offers grammaticised verbal aspect, this will lead to discourse with a focus on ongoingness of events. If instead you speak a language without grammaticised aspect, your discourse will be characterised by a focus on boundedness and spatial endpoints (e.g., Von Stutterheim and Nüse, 2003). Studies of gestural reflections of motion events and such different rhetorical styles have already been reviewed above (e.g., Özyürek, 2017 for an overview).

Rhetorical styles also considered to result from other alternations. For example, in story tellings or narratives, there may be different patterns of alternations between clauses that convey different types of information (Labov and Waletzky, 1967; Labov, 1972). For example, Cassell and McNeill (1991) and McNeill (1992) analyse a narrative in terms of "narrative levels" distinguishing between narrative clauses, which push the story line forward, metanarrative clauses, which provide comments on the story line, and paranarrative clauses, which highlight the narrative situation itself. They showed that in English different narrative levels typically come with different gestural patterns. For example, narrative clauses are often accompanied by representational gestures that depict actions and events; transitions to other narrative levels may be punctuated by beat-like gestures; metanarrative clauses are often accompanied by what they called abstract deictic and metaphorical gestures, and paranarrative ones are generally accompanied by fewer gestures overall.

Building on this work, Nicoladis et al. (2018) have suggested that there may be a link between gesture production, specifically frequency, and story-telling style. Assuming that different cultures have different narrative styles, the authors focused on the distinction between chronicle style—what happened and how—and evaluative style—what happened and why—and hypothesised that speakers adopting a chronicle style would produce more gestures than speakers who adopt an evaluative style. They also hypothesised that the chronicle style would be a characteristic of high gesture frequency cultures. Their study compared the spoken and gestural production of four groups of bilinguals all having English as L2 and Mandarin, Hindi, French or Spanish as L1 while telling narratives. They found that the Chinese-English bilinguals (supposedly low gesture frequency cultures) and Hindi-English bilinguals (a group for which they had made no frequency prediction) gestured less than the French-English and Spanish-English bilinguals (both supposedly high gesture frequency cultures), and that the first two groups tended to use an evaluative style, while the second two groups tended to use a chronicle style. They concluded that a chronicle style is associated with more gestures than the evaluative one. These results are intriguing, but raise many questions. For example, the study did not have any monolingual comparison groups making it difficult to assess whether differences were really due to style or to some other underlying factor. Also, the study only considered representational gestures, capturing only a part of the gestural activity.

In sum, despite widespread interest in crosscultural differences in gestural behaviour, the overall empirical evidence remains somewhat patchy and often contradictory, especially regarding gesture frequency. Moreover, most studies looking at frequency have often focused exclusively on representational gestures, leaving other gestural functions aside. This means that we have a poor understanding of the ways in which frequency may interact with differences in gestural functions more generally. And finally, very

few studies have considered the potential role of spoken context defined as rhetorical style for differences across cultures.

3 Current study

This study aims to examine the gestural production of Italians and Swedes, supposedly a high frequency vs. a low frequency gesture culture. Keeping the context and content of speech constant across Italian and Swedish, we ask whether any differences in gesture rate and distribution of gesture functions in narrative data across the two cultures may be linked to crosslinguistic differences in rhetorical style, operationalised as differences in the use of different gestural functions (Kendon, 2004a) across narrative levels (McNeill, 1992). Different structural analyses for narratives have been proposed (e.g., Labov, 1972; Stein and Glenn, 1979), but we follow McNeill's (Cassell and McNeill, 1991; McNeill, 1992) framework given its previous application to gesture studies. McNeill suggests that gestures are functionally distributed over the narrative levels the speaker is operating on at any time. Moreover, Cassell and McNeill (1991) suggest that iconic gestures (representing objects or actions) tend to occur on the narrative level; metaphoric gestures (representing abstract concepts) and deictic gestures tend to mark the metanarrative level; while the paranarrative level is rarely marked by gestures at all.

We first chart overall gesture rate and distribution of gestural functions (referential vs. pragmatic) in narratives produced by Italian and Swedish speakers. We then examine the distribution of clauses at different narrative levels (narrative, meta- and paranarrative levels). Finally, we ask whether there is a difference in the distribution of gesture function across narrative levels in Italian vs. Swedish narratives.

4 Method

4.1 Participants

We recruited 12 Italian (8 female, age range 19–31, M^{age} = 22), and 12 Swedish (8 female, age range 20–48, M^{age} = 28) native speakers to act as narrators in a narrative task. They were asked to bring a friend to act as the listener. All participants were university students recruited by word of mouth in Naples at the Università degli Studi di Napoli "L'Orientale" and in Lund at Lund University, respectively. Italian participants volunteered without compensation, Swedish participants were offered a lunch voucher. All participants provided signed consent before data collection.

4.2 Materials and procedure

Participants were invited to participate in the study with a friend. In Naples the narratives were collected in a quiet room at the university, in Lund in one of the studios of Lund University Humanities lab. The setting was the same in both locations: the participants sat on a chair side-by-side, and a camera was placed on a tripod at a distance from the pair suitable for catching the entire body of both of them.

The participants who had the role of narrators were asked to watch an episode of the series Pingu lasting 90 seconds (Pingu's Family Celebrates Christmas, 1992) on a laptop which was then removed after viewing, while the listener waited in another room. The cartoon featured a family of penguins getting ready for Christmas celebrations. The narrators were then asked to retell from memory what happened in the cartoon to their friend (who had not seen the video). The listeners were instructed not to interrupt the speaker but were allowed to give feedback signals (such as mh, I see).

Since some participants did not arrive with a friend for the recording session, seven Italian narrators spoke to the same listener (known to all of them). Similarly, two Swedish narrators spoke to the same listener (again, also known to the second speaker). In all these cases, speakers did not know that their listener had already listened to the story. It was important that the interlocutor was presented as naïve to the content since this increases the communicative pressure on the speaker which in turn promotes gesture production. The narratives were video recorded for later analysis.

4.3 Data treatment and coding

4.3.1 Speech

All narratives were transcribed by two native speakers using, respectively, standard Italian and Swedish orthography (for the Italian data, the speech analysis was conducted by the first author). Disfluency phenomena (such as filled/unfilled pauses, lengthenings, and so on) were noted. The speech was then segmented into clauses, according to Berman and Slobin's definition: "We define a clause as any unit that contains a unified predicate. By unified, we mean a predicate that expresses a single situation (activity, event, state). Predicates include finite and nonfinite verbs, as well as predicate adjectives." (Berman and Slobin, 1994, p. 660). The data set consisted of 1,001 clauses (n = 454 Italian, n = 547 Swedish), of which some were accompanied by more than one gesture (n =192 in Italian, n = 73 in Swedish).

All narratives were analysed for their structural organisation following McNeill's (1992) framework according to which oral narratives based on the viewing of an animated cartoon can be articulated on multiple levels: narrative, metanarrative and paranarrative. Such levels can be identified clause by clause based on a content analysis of each clause. Therefore, each clause was coded for one of the three levels. The narrative level corresponds to the world of the story proper and includes all mentions of characters' actions and sequence of events. The metanarrative level refers explicitly either to the act of watching the cartoon or to the structuring of the story. The paranarrative level contains reference to the speakers themselves or to the interlocutors, and evaluations that the speakers provide of characters and events in the story.

Examples (1)–(3) illustrate the respective levels in Italian (a examples) and Swedish (b examples).

(1) Narrative level
(a) la mamma e il padre fanno l'albero di Natale
"mum and dad decorate the Christmas tree"
(b) så de bakar kakor inne i deras igloo

"so they bake cookies inside their igloo"
(2) Metanarrative level
(a) e alla fine finisce con il suono delle campane
"and in the end it ends with the sound of bells"
(b) jag har sett en film
"I have seen a movie"
(3) Paranarrative level
(a) l"hai visto mai Pingu?
"have you ever seen Pingu?"
(b) så att de inte ska kunna se ut
"so that they will not able to see outside."

4.3.2 Gesture coding

Gesture coding for both Italian and Swedish data was conducted by the first author. All gesture strokes were identified ($n = 1{,}146$; $n = 746$ Italian, $n = 400$ Swedish) independently from the speech, e.i., with audio off. A stroke is the phase of movement in which the hand shapes are most clearly defined and the pattern of movement is distinctive (Kendon, 1980). Based on gestural strokes, we computed each participant's gesture rate per 100 words. Contractions in Italian were counted as one word (e.g., determiner-noun contractions, l'albero "the tree"). We also computed each participant's average number of gestures per clause.

Subsequently, following Kendon's (2004a) functional classification, each gesture was coded as having a referential or pragmatic function. As described above, referential gestures include both deictic/pointing gestures (indicating concrete or abstract referents) and representational gestures (also called iconic and metaphoric). Gestures with a pragmatic function, in contrast, convey part of "an utterance's meaning that [is] not part of its referential meaning or propositional content" (Kendon, 2004a, p. 158). That is, they are used to express a comment on or stance towards the speaker's spoken production, or to punctuate or stress the structural organisation of the discourse. Examples of pragmatic gestures include the following: a gesture produced with hands rotated upwards and moved laterally occurring with a comment such as and "*so it seems to me*"; or a beat-like up and down movement that marks the passage to a new piece of information, such as "*and then* they open the door" (in italics the words that coincide with the gesture). The function of the gesture was established by looking at the gesture in relation to the speech that it accompanied. Gestures for which we could not assign a function were excluded from the analyses ($n = 48$ Ita; $n = 11$ Swe), leaving us with a data set of 1,087 gestures for analysis.

The transcriptions and all speech and gesture coding were performed in the video annotation software ELAN, version 5.1 (Wittenburg et al., 2006).

4.3.3 Interrater reliability coding

4.3.3.1 Speech

Two additional native speakers (one per language) coded 17% of the Italian and 17% of the Swedish data. Clauses identified by first coder were re-coded for narrative levels (i.e., data from 2/12 speakers in each language). In the Italian data agreement reached 96.2%, Cohen's k 0.9 (near perfect agreement); in the Swedish data agreement was 79.3%, Cohen's k 0.63 (substantial agreement). In cases of disagreement, we retained the first rater's coding.

4.3.3.2 Gesture

A second rater coded 17% of the gesture sets in both languages (i.e., data from 2/12 speakers in each language) for gesture identification and gesture function. For gesture identification in the Italian data, agreement reached 87.7%, Cohen's k 0.56 (moderate agreement); in the Swedish data, agreement was 91.1%, Cohen's k 0.79 (substantial agreement). For gesture function in the Italian data, agreement was 91.5% (Cohen's k 0.84 (near perfect agreement); in the Swedish data agreement was 90.1% Cohen's k 0.73 (substantial agreement). In cases of disagreement, we retained the first rater's coding.

4.4 Analyses

Statistical analyses were conducted in the software *R*, version 0.98.953 (R Development Core Team, 2014). We ran an independent *t*-test on mean gesture rates, and a Mann Whitney U test on mean gesture/clause rates. To explore the relationship between gesture functions across narrative levels, we used the glmerMod package in *R* to perform Generalised Mixed-effects Models (GLMMs) with random intercepts for participants (Baayen, 2008; Baayen et al., 2008). Models were fitted using maximum likelihood (Laplace approximation) ["glmerMod"] of the binomial family (logit).

5 Results

We first present descriptive details of the data sets starting with the overall gesture rate and rate of gestures per clause across the languages, followed by the distribution of two gesture functions, and of spoken clauses over three narrative levels. We then examine the distribution of gesture function by narrative levels across the two languages to address the research question.

5.1 Overall gesture rate and gesture rate per clause across the languages

Italian speakers overall produced more gestures ($n = 698$) than Swedish speakers ($n = 389$). We first examined the overall mean gesture rate (gestures/100 words) in Italian and Swedish speakers. To check for normal distribution in the data, we performed Shapiro-Wilk tests which confirmed that the gesture rates did not depart significantly from normality in Italian ($W = 0.959$, $p = 0.768$) nor in Swedish ($W = 0.964$, $p = 0.839$). Further to this, homogeneity of variance was examined with Levene's test, which showed no evidence of unequal variances [$F_{(11, 11)} = 1.841$, $p = 0.326$]. Subsequently, an independent samples *t*-test was run on the mean gesture rate comparing Italians to Swedes. The results showed that the Italians produced significantly more gestures per 100 words on average than the Swedes [MIt = 21.95 vs. MSwe = 11.04; $t_{(22)} = 4.5$, $p < 0.000$].

We also examined the gesture rate per clause in the two languages, since the clause is the relevant unit of analysis for the narrative levels. Swedish speakers produced more clauses ($n = 547$) than Italian speakers ($n = 454$), but Italian speakers on average produced 1.8 gestures/clause whereas Swedish speakers on average

TABLE 1 Distribution of gesture functions in raw numbers (percent) in Italian and Swedish.

	Referential	Pragmatic
Italian	272 (0.39)	426 (0.61)
Swedish	310 (0.80)	79 (0.20)

TABLE 2 Distribution of clauses over narrative levels in raw numbers (percent) in Italian and Swedish.

	Metanarrative	Narrative	Paranarrative
Italian	110 (0.24)	278 (0.61)	64 (0.14)
Swedish	133 (0.24)	305 (0.56)	108 (0.20)

produced 1.2 gestures/clause. Shapiro-Wilk tests confirmed that the gesture rates did not depart significantly from normality in Italian ($W = 0.931$, $p = 0.387$) nor in Swedish ($W = 0.889$, $p = 0.113$). However, Levene's test showed unequal variances [$F_{(1, 22)} = 8.43$, $p = 0.008$]. A non-parametric Mann-Whitney U test was therefore run, showing that Italian speakers had a significantly higher rate of gestures/clause than Swedish speakers ($U = 7, p < 0.001$).

5.2 Distribution of gesture functions by language

Table 1 shows the distribution of gesture function (referential vs. pragmatic) by language group. Italian speakers produced more pragmatic than referential gestures and Swedish speakers showed the opposite pattern.

5.3 Narrative levels by language

Table 2 presents the number and proportion of clauses at each narrative level (narrative, meta- and paranarrative levels) across the two languages. The groups behaved similarly in that the majority of the clauses were narrative clauses (61% in Italian vs. 56% in Swedish). Both groups produced the same proportion of metanarrative clauses (24%) and Swedish speakers produced somewhat more paranarrative clauses (20%) than the Italian speakers (14%).

5.4 Gesture functions by narrative levels across languages

To address the research question, we probed how Italian and Swedish speakers distributed gesture functions over narrative levels. Figure 1 presents the mean proportion of gestures by narrative level in Italian and Swedish. Referential gestures occurred most frequently with narrative clauses (as expected) both in Italian (46 %) and in Swedish (85 %). Interestingly, Swedes also produced many referential gestures with meta- (72 %) and paranarrative clauses (66 %) compared to Italians (31 % with metanarrative and 10% with paranarrative clauses). Conversely, pragmatic gestures occurred more frequently with metanarrative clauses in both groups, followed by paranarrative clauses in Italian and Swedish.

To explore the relationships in more detail, we ran a Generalised linear mixed model fit by maximum likelihood (Laplace Approximation) ["glmerMod"] on the binary variable gesture function, with pragmatic gestures, Italian, and metanarrative set as baselines. The model output (Table 3) indicated a significant main effect of language confirming that Italians produced more pragmatic gestures than Swedes overall. There was also a main effect of narrative level, such that there were fewer pragmatic gestures with narrative clauses and more with meta- and paranarratives. For referential gestures, the pattern was the reverse, that is, more referential gestures with narrative clauses than with meta- and paranarrative clauses (which is in line with the findings by Cassell and McNeill, 1991). The analysis revealed no interaction ($\chi^2 = 4.491$, df $= 2$, $p = 0.106$), meaning that the patterns were overall the same in Italian and Swedish.

In the following we provide examples of the typical patterns in the two groups. In the transcription, boldface indicates the stroke, and the number in [x] indicates the sequence of the gestures.

The two excerpts relate to the same part of the Pingu story and in both cases all clauses are narrative clauses. Example (4) comes from a Swedish speaker; all gestures are referential gestures, illustrated in Figure 2.

(4) och sen så gick **de till mamman** [1]
som stod och **bakade pepparkakor** [2]
å som så här **så fick de smaka lite av degen** [3]
och sen så gick de **tog de degen** [4]
och **tryckte ut stjärnor och månar** [5]
och sen kom mamman
och hämtade **plåten** [6]
och stoppade in den i ugnen
'and then they went **to the mother** [1]
who **was baking ginger cookies** [2]
and like this **they got to taste some of the dough** [3]
and then they went they **took the dough** [4]
and **pressed out stars and moons** [5]
and then the mother came
and took **the plate** [6]
and put it in the oven'

This Swedish speaker uses only referential gestures to represent the different actions she is talking about.

Gesture 1: the right hand, closed with the index loosely extended, is moved towards the speaker's left side. It represents the path of the movement of the child penguins, mentioned in the previous part of her discourse, who go towards the mother penguin.

Gesture 2: both hands closed as if holding something and parallel to each other moved back and forth alternatively. This gesture likely represents the movement of the rolling pin, not mentioned in the speech.

Gesture 3: right hand with fingers loosely extended closes as if picking something. This gesture represents the action of taking a part of the dough.

Gesture 4: both hands open with palm down move towards each other as if collecting something and move towards the left (as if positioning something on the side).

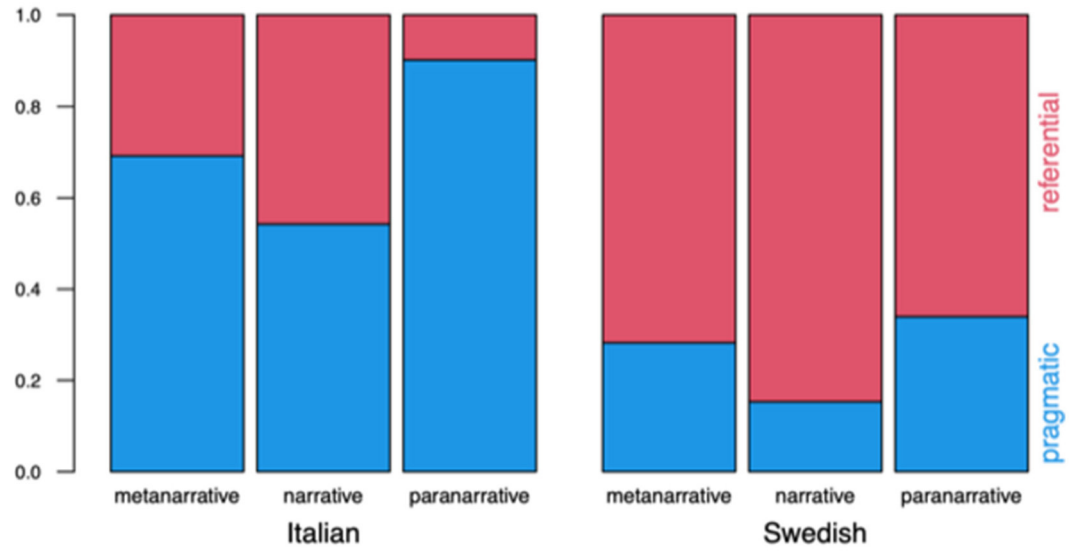

FIGURE 1
Observed proportions of referential and pragmatic gestures over narrative, metanarrative and paranarrative levels in Italian and Swedish.

TABLE 3 Gesture function by narrative levels and languages.

Model formula	Gesture_function_binary ~ narrative_level + language + (1|participant), dataset, family = "binomial"			
Random effects	Random intercepts for participants			
Groups (name)	Participant, 24			
Number of observations	1,087			
Variance	0.477			
Standard deviation	0.691			
Fixed effects	**Estimate**	**Std. error**	***z* value**	***p***
Intercept	−1.112	0.259	−4.290	1.78e-05
Narrative_levelNarr	0.745	0.173	4.311	1.62e05
Narrative_level_Para	−0.754	0.278	−2.715	0.00662
LanguageSwedish	2.108	0.336	6.272	3.56e10

Gesture 5: both hands with palm down and finger slightly bended forming a loose round shape move quickly up and down and laterally. They represent the action of pressing the molds for shaping the dough.

Gesture 6: both hands closed as if holding something moving towards the speaker. They represent the action of taking/holding the plate.

Example (5) in Italian shows an alternation between referential and pragmatic gestures, illustrated in Figure 3.

(5) **nell'assaggiare** [1] **nell'assaggiare la crema** [2]
e **poi_ eh** [3] lei **infonna questi dolci** [4]
e_ si prepara_
eh dice ai figl
di stare lontani dal dal fuoco [5]
dopo di che vengono cacciati questi dolci [6]
vengono fatti assaggiare [7]

'**tasting** [1] **tasting the cream** [2]
and **then eh** [3] she **bakes these cakes** [4]
and gets ready
eh tells the children to go away from the stove [5]
then these cakes **are taken out** [6]
and they got to taste' [7]

Gesture 1 and 2 are two very similar referential gestures: both hands are close as if holding something, in 1 both the left and the right hands move in circular movements with a wrist movement; in 2 the left hand is still, while the right hand performs the same circular movement. They probably represent the action of using an object to pick something (e.g., holding the spoon to take the cream she is talking about).

Gestures 3 and 4 are both pragmatic gestures, an example of a Palm Presentation (PP) gesture (Kendon, 2004a): the speaker had the hands crossed and opens them bringing the palm up with a

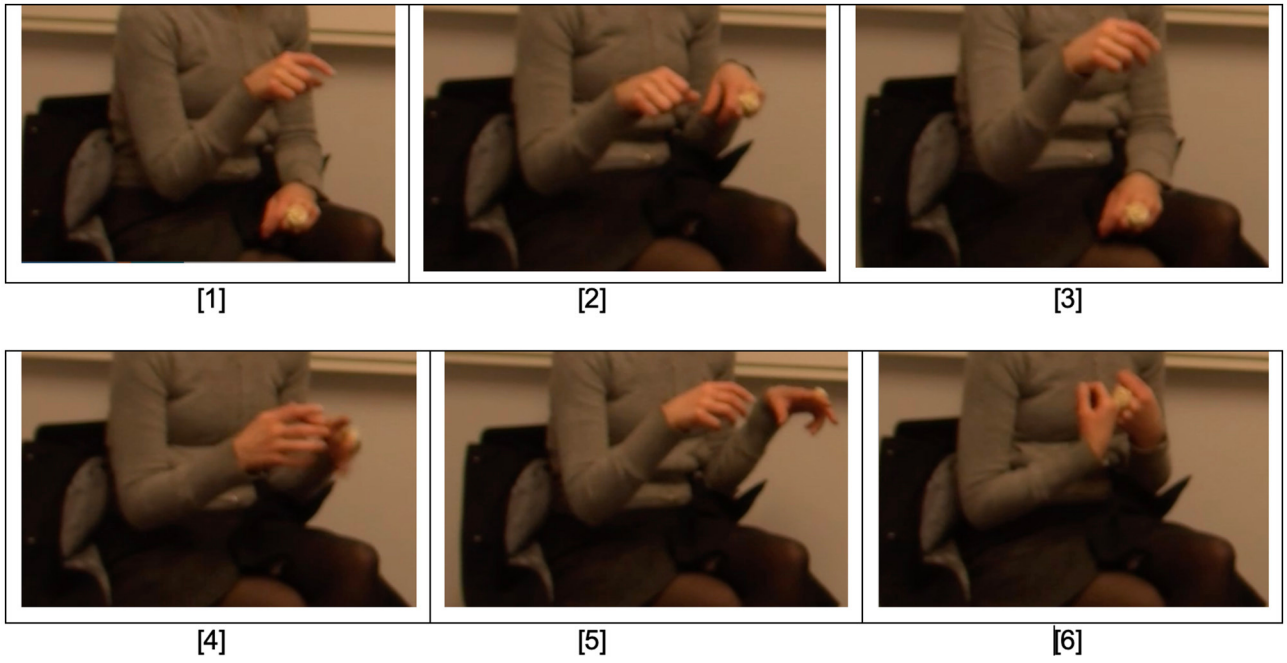

FIGURE 2
Strokes [1–6] of gestures in example 4.

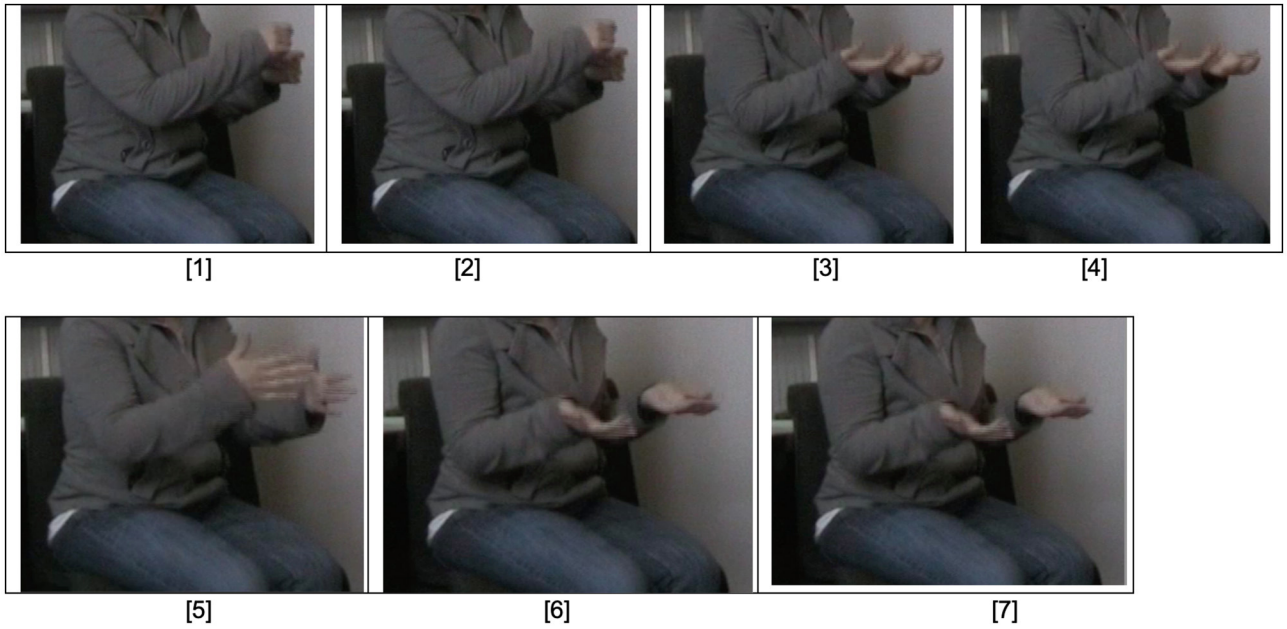

FIGURE 3
Strokes [1–7] of gestures in example 5.

slight rotation of the wrist and an up and down movement so that the hand are brought into the immediate frontal space; the two gestures follow each other in rapid movements. Kendon has proposed that this gesture is used to present a piece of information to the listener. It is worth noting that the PP constitutes a particular cluster of a movement pattern (write rotation) resulting in a manual form (open hand palm up) that sets it apart from a referential gesture of holding an object.

Gesture 5 is a referential gesture that accompanies two clauses: both hands are open with the palms towards the speaker and

move rapidly back and forth. This gesture represents the action of signalling something hot.

Gesture 6 and 7 are again two pragmatic gestures performed as gestures 3 and 4 with the same function.

6 Discussion

The purpose of this study was to determine whether a difference could be found in the gestural behaviour of Italian and Swedish speakers in narrative discourse in terms of gesture frequency and rhetorical style, defined as gesture functions across narrative levels. The study was motivated by the lack of empirical evidence in support of the popular assumption that Italians gesture substantially more than other populations, such as Swedes.

The results can be summarised in three points. First, Italian and Swedish speakers do differ in gesture rate, as expected by everyone, and Italians do indeed gesture more than Swedes overall.

Second and less expectedly, Italians and Swedes also gesture differently in terms of gesture functions. Swedish speakers overwhelmingly produce referential gestures, and Italians instead predominantly produce pragmatic gestures. The preponderance of referential gestures in Swedish speakers is not in line with popular expectation (but see Gullberg, 1998), nor is the preponderance of pragmatic gestures in Italian discourse entirely commensurate with Efron's (1941/1972) analysis of Italians as producing many depicting (representational) gestures. These results point in an opposite direction from popular expectations.

Third, the analyses of gesture function over narrative level reveal two distinct rhetorical styles in Italian and Swedish; styles that are mainly visible in gesture, not in speech. Both groups produce similar proportions of narrative, meta- and paranarrative clauses, and show some gestural sensitivity to narrative level (more referential gestures with narrative than other levels; more pragmatic gestures with meta- and paranarrative than narrative levels). However, the overall preferences in each group for different gestural functions mean that Swedes produce referential gestures also with meta- and paranarrative clauses, and Italians produce pragmatic gestures also with narrative clauses.

Considering the similar distribution of clause types in speech across the two languages (that is, similar constructions of the narrative), it is the gestural patterns that suggests two different perspectives on the narrative content. Swedes seem to focus more on referential content and the events of the story (cf. Gullberg, 1998 for similar findings), whereas Italians instead focus on the events but also more on the pragmatics of highlighting the presentation of new information in the story.

Tentatively, we can interpret this dissimilarity as a different way in the two languages to realise the communicative dynamism in speech and gesture (McNeill, 1992). In examples 4 and 5 in speech, both speakers operate on a narrative level producing a series of narrative clauses that refer to characters' actions in the first part of the story (preparing cookies, tasting the cream, putting cookies in the oven). For the Swedish speaker this level of narrative construction is reflected in the gestural channel as well: the speaker shows the different actions mentioned, representing them with referential gestures. In contrast, for the Italian speaker, the gestures indicate that she is operating also on a pragmatic level not expressed in speech. It is only through her pragmatic gestures that we can see that she is presenting these pieces of information with the palm presentation gesture (PP in Kendon, 2004a). This is the most common form of pragmatic gestures found in the Italian adults, similar to what Graziano (2009, 2014) found in Italian children's narratives. The speech does not contain any explicit information about the speaker's stance to the specific parts of the story; but the gestures reveal that she is constructing the story on multiple levels, one of which concerns the world of the story proper (what happened), accompanied by gestures representing actions, and the other her role as a narrator (why she tells you the story, how she makes the story interesting), unveiled by the use of pragmatic gestures.

These findings contribute new insights to the literature examining the interaction between information structure in discourse and gesture, where a standard result is that gestures align with new information in an utterance (e.g., Levy and McNeill, 1992; Gullberg, 2006; Foraker, 2011; Debreslioska and Gullberg, 2019, 2020, 2022). These studies do not necessarily consider gesture functions, but the current results suggest that new information can be highlighted in gesture either by providing referential detail (referential gestures) or by presenting information as new through a presentational, pragmatic gesture. Given the higher gesture rate in the Italian narratives relative to the Swedish data, it seems that Italian speakers may be displaying a rhetorical style that embraces both modes.

We propose that the two different multimodal rhetorical styles suggest that Swedes and Italians conceptualise narrative production in different ways: a more concrete and event-focused conceptualisation in Swedish [similar to Nicoladis et al's (2018) chronicle style], and a more abstract, pragmatic one in Italian. This is reflected in the persistent use of referential gestures in Swedish speakers depicting events and actions, and in the greater alternation between referential and pragmatic gestures in Italian speakers both depicting events and presenting them as new through pragmatic presentational gestures.

At this point, we do not know why Swedish and Italian speakers conceptualise narratives differently. To make more definite claims about crosslinguistic or cultural differences and multimodal rhetorical styles, an analysis of linguistic features of the narrative content would be necessary. This could include, for example, an analysis of the lexical and semantic content of clauses at each narrative level, and of the extent to which the speakers switch between the three narrative levels in each language. Analyses in this direction are found in Debreslioska and Gullberg (2020) who analysed the type of clause and the semantic content of gestures at the introduction of new narrative entities in discourse. Similarly, Nicoladis et al. (2018) looked at adverbs, adjectives and explicit mentions of the speaker's stance to differentiate between chronicle vs. evaluative styles. However, a more detailed analysis of co-expressivity, that is, an examination of what spoken material the gestures exactly align with, is necessary to elucidate the details of these rhetorical preferences and perhaps their origins.

Finally, it is important to note, that both the overall gesture production and gesture functions might vary according to the type of discourse being delivered. Here we have

focused on narratives. Different discourse genres may show different patterns. This remains an empirical question. The relationship between interlocutors may also play a role. Here it was controlled so all participants knew each other, but different degrees of familiarity may well have an impact on the rhetorical choices made. This is another topic of relevance for a further study.

7 Conclusions

The results of this study show that, in a narrative task, Italian and Swedish speakers differ in gesture rate (Italians do gesture more than Swedes) but also, more interestingly, in preference for gesture functions (predominantly more pragmatic gestures in Italian, largely more referential gestures in Swedish).

Although this study could be said to endorse the popular stereotypical view of Italians' propensity for gesturing, the most interesting finding in our view is the unveiling of the different distribution of gesture functions in the two languages which in turn suggests two distinct rhetorical styles and two different ways of conceptualising narratives in the two languages. The analyses strongly suggest that if we are to fully understand narrative levels and rhetorical styles, we must consider speech and gesture jointly, since a monomodal (speech-based) view will miss important aspects of how speakers conceptualise and orchestrate the modalities to achieve their communicative intention. Moreover, the findings also suggest that we need to consider both the context and content of speech as well as all gesture functions if we are to develop a better understanding and better theories of crosscultural and crosslinguistic multimodal behaviour.

Data availability statement

The datasets presented in this article are not readily available because the data consists of video recordings that cannot be shared. Queries regarding the data can be directed to the corresponding author.

Ethics statement

At the time of data collection (2012), no ethics approval was required as long as the recommendations of the local ethics board was followed. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

MGr: Conceptualization, Data curation, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Writing – original draft, Writing – review and editing. MGu: Conceptualization, Formal analysis, Investigation, Methodology, Validation, Writing – original draft, Writing – review and editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

The author(s) declared that they were an editorial board member of Frontiers, at the time of submission. This had no impact on the peer review process and the final decision.

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