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Exploring meaning-making practices via co-speech gestures in TED Talks

The TED talk (www.ted.com) is a hybrid popularising genre empowered by contemporary digital technologies in which different semiotic modes feature prominently and which is being extensively used in educational settings. This study is based on and further develops research on co-speech gestures in a selection of such talks from various knowledge domains, so as to shed light and raise awareness on the orchestration of different modal resources therein and as a way of contributing to the development of multimodal literacy in an ever changing educational landscape (Masi, 2016, 2019a, in press). Data description is based on multimodal transcription through an integrated method (Lazaraton, 2004), which makes it possible to advance hypotheses about the interpretation of gestures in different contexts. The qualitative analysis will show various ways in which speech-synchronised gestures in the talks can contribute different (also simultaneous) ideational, interpersonal and textual meanings or metafunctions (Halliday, 1978; Jewitt, 2014), especially when considered from a more global analytical perspective, viz. as repeated similar patterns over discourse chunks. Reference will also be made to Multimodal Critical Discourse Analysis (Ledin & Machin, 2018) as an overarching framework, as some of the patterns appear to have the potential not only to enhance cohesion but also to subtly emphasise emotional and value-laden meanings, thus pushing the highly persuasive discourse of this genre of talks forward.

Data Keywords: TED Talks; popularisation; multimodality; gesture; cohesion

Introduction: Why gestures in TED Talks?

The present study explores co-speech gestures in the hybrid genre of TED Talks (www.ted.com), i.e. short popularising speeches from various disciplinary domains

where experts (from and beyond the academic world) mainly address a lay audience, and which are stored and made freely available online by the homonymous non-profit organisation. Among the traits of the genre are the use of personal narratives, humour and a style variously described as informal, emotional, entertaining and persuasive (for some relevant descriptions see Caliendo, 2012; Laudisio, 2013; Caliendo & Compagnone, 2014; Scotto di Carlo, 2013, 2014a,b,c, 2015; Mattiello, 2017; *inter alia*). Probably owing to their accessibility and insightfulness, the talks have indeed been enjoying growing popularity in educational settings (e.g. Takaesu, 2013; Servinis, 2013; Dummett, Stephenson & Lansford, 2016; Wingrove, 2017)[1]. Another of their key features is the extensive use of different modal resources, including gestures, highly encouraged by the TED team (Anderson, 2016), although their study in this context has received relatively little attention so far (for some exceptions cf. Carney, 2014; Valeiras Jurado, 2017; Masi, 2016, 2019a, in press). In fact, fairly recent research on gestures has emphasised a variety of non-redundant purposes they can serve in communication (see Church, Alibali & Kelly, 2017, among others), so that it is all the more important to gain a better understanding of their contribution to this genre as a standpoint for the development of the multimodal literacy (Walsh, 2010) necessarily required in many contemporary technology-empowered educational scenarios.

The work is based on and further develops multimodal research on this topic (Masi, 2016, 2019a, in press)[2], which has underscored the multifunctional nature of

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[1] Also see one of TED's offspring devoted to 'lessons worth sharing', i.e. TED-Ed, (https://ed.ted.com/).

[2] The work was supported by the Italian Ministry for the University under the national programme 'Knowledge dissemination across media in English: continuity and change in discourse

different speech-synchronised gestures in the talks. It will show various ways in which they can convey different, also simultaneous, meanings with a special focus on repeated patterns of similar gestures over discourse chunks. As for the structure of the article, the next section will introduce the theoretical background with the main assumption and hypothesis guiding the work; the subsequent one will briefly present the methodology for the analysis, followed by the discussion of some examples and concluding remarks.

Background

Descriptive and experimental research on gestures over the past few decades has revealed the potential for a unique contribution to meaning of such a mode of communication, highlighting a range of gesture categories and different goals they can serve in thought, communication, language acquisition and learning (cf. McNeill, 1992; Kendon, 2004; Littlemore & Low, 2006; Gullberg & McCafferty, 2008; McCafferty & Stam, 2008; Mittelberg, 2008; Taleghani-Nikazm, 2008; Hostetter, 2011; Littlemore, MacArthur, Cienki & Holloway, 2012; Macedonia & von Kriegstein, 2012; O'Halloran, Tan & Smith, 2016; Church et al., 2017). For example, they have been found to unconsciously help memorisation and comprehension, and to produce a wealth of other beneficial effects on both text producer and receiver/observer. Amongst them, gesturing while explaining a concept reduces a speaker's cognitive load, and conveys a general cognitive benefit by aiding in the learning of both spatial and non-spatial information, for example by connecting abstract ideas to the concrete physical environment and thus improving one's mental imagery. Seeing the gestures of someone else may activate the

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strategies, ideologies, and epistemologies,' (PRIN 2015 no.2015TJ8ZAS). The Pisa unit especially focused on the multimodal analysis of a collection of audiovisual materials covering different genres and disciplines to be used in the field of English for Specific Purposes.

motor system of the hearer/observer in similar ways. They support the transfer of knowledge, along with generalisation and inference making, thus helping people create new ideas (Church et al., 2017).

Gestures in the TED talks have been found to be mostly used as processing aids, for emphasis and to create rapport (Valeiras Jurado, 2017). Among other possible closely-related effects, they have been found to increase engagement (in line with the reduced distance between expert speakers and a non-expert audience as a trademark of the genre), to enhance the salience of the organisation of the talks, to contribute to evaluation (Masi, 2016, 2019a, in press). In fact, the qualitative multimodal analysis carried out thus far has highlighted recurrent patterns impacting on different meanings or dimensions of communication (ibid.), also called metafunctions, along with a varied combination of sub-functions (whose classification was based, for example, on Kendon, 2004, and Müller, 2008).

Indeed, the framework of multimodality as a whole rests on an idea of meaning as social action, indebted to the systemic functional linguistic concept of metafunctions that operate simultaneously in any language (Halliday, 1978), later expanded on to comprise other communicative modes as well (Kress & van Leeuwen, 2006). The metafunctions are served by interconnected categories of potential resources available in communication to 1) represent entities and ideas in the world of experience (thus contributing to the so-called ideational meaning or metafunction), 2) enact social relations and orient the people involved to each other or to what is communicated (interpersonal/orientational meaning or metafunction), and 3) give structure to discourse (textual/organisational meaning or metafunction)[3].

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[3] See, for instance, Jewitt (2014).

The multimodal approach adopted in the present research is generally inspired by Baldry and Thibault (2006) and follows a method whereby gesture description is directly integrated with the transcription of co-occurring words and with the relevant screenshot (Lazaraton, 2004), which supports and facilitates gesture interpretation in various contexts[4]. The categories of gestures focused on are deictic (indexical configurations pointing at referents), iconic and metaphoric ones, representing concrete entities or actions and abstract notions, respectively (McNeill, 1992). Metaphoric gestures have indeed been found to be of help in the teaching of abstract notions (Mittelberg, 2008). The research is thus based on the assumption that, despite cross-cultural differences, gestures can enhance comprehension in the international context of TED talks because TEDsters (i.e. TED speakers) tend to refer to a shared background of experiences and their gesturing can guide comprehension by (often unconsciously) reflecting a partly shared, basic conceptual structure on which figurative thinking is built.

Furthermore, gestures may reflect different patterns of reasoning at the same time, as metaphors, for instance, can be cumulative (Calbris, 2008). This allows them to be simultaneously meaningful on different discourse dimensions. In the TED talks this clustering of meanings was especially found to be conveyed by deictic/metaphoric gestures making distinctions in space and co-occurring with verbal enumeration or emphasising binary contrasts (thus regarded as having a parsing – i.e. textual – function, Masi, 2016, pp. 152-153). A change of hand often expressed a distinct location of entities which stood for the speaker's mental representation of discourse structure (i.e. highlighting a stylistic-pragmatic meaning subservient to the textual metafunction). At

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[4] For the coding parameters used in the descriptions, e.g. hand configuration and position, reference was made to McNeill (1992), Webb (1996), Kendon (2004), among others.

the same time, in several cases a change of direction complemented speech with further semantic meanings, e.g. the speaker's endorsement of a viewpoint, or the association of the ideas of 'past' and 'cause' with location on the left vs. 'future' and 'effect' with location on the right (ibid.). Distinct multimodal ensembles (Kress, 2010) were mainly considered[5], but the phenomenon is likely to be even more prominent when tackled from a more global analytical perspective, as hinted at by some complex cases whose interpretation involved local tension and required the detection of a wider thread of visual equivalence to be made sense of (Masi, 2019a).

The research carried out for the present contribution aimed at testing the hypothesis above, namely that a wider analytical context may reveal and help to understand the contribution of complex threads of multimodal ensembles. The qualitative multimodal analysis was replicated by broadening the scope of the investigation across multimodal ensembles and around threads of repeated similar gestures, which maintain continuity via their location in space, the hand with which they are produced and/or their form (cf. the notion of catchment, McNeill, 2005; McNeill, Levy, Duncan, 2015), so as to consider the potential of some of them to produce meaningful effects on a more global level.

In fact, a broader perspective led to notice that not only did such patterns provide a gesture-based window on discourse cohesion and offer clues to discourse themes

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[5] Multimodal ensembles are meaningful orchestrations of different modes which may involve various types of semiotic resources. For the sake of clarity, in the present account the modes focused on were mainly two (viz. words and gestures), although others were occasionally considered and could/should be expanded on, too.

(McNeill, Levy, Duncan, 2015)[6], but, in some cases, also appeared to subtly emphasise evaluative components[7], thus lending themselves to be interpreted along the lines of Multimodal Critical Discourse Analysis (Ledin & Machin, 2018) as an overarching framework[8]. The latter aims at the detection of social practices and ideologies expressed by the interaction of different semiotic resources at work in discourse. This is especially relevant to TED, whose stage can be viewed as an ideal setting for the promotion of social change and practices guided by the slogan of 'ideas worth spreading', that is, by means of an approach that is inherently persuasive, often subjective, emotional and in which popularisation and argumentation frequently overlap[9].

Methodology

Twelve talks by British and American English speakers were focused on, recorded in the period from 2012 to 2018, from the domains of Business and Economics, Health and Medicine, Law, and Technology. The analysis was conducted manually and involved close scrutiny of the videos (which were viewed several times) and transcripts of the talks. Different types of searches were conducted in order to identify co-speech gestures

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[6] Also see Eisenstein, Barzilay, Davis (2008) for a computational approach to gestural cohesion as predictor of topic boundaries.

[7] Evaluation is here viewed as an umbrella term covering different types of affective-emotional attitudes and value judgements manifesting the speaker's stance.

[8] For a recent investigation of ideological stance in another genre (economics lecture) on the basis of the framework of Multimodal Critical Discourse Analysis see, for example, Crawford Camiciottoli (2019).

[9] On the view of the argumentative thread as superimposing on other discourse dimensions see Merlini (1981).

subservient to different metafunctions with local and global effects on the meaning(s) of discourse. First, the analysis focused on gestures that co-occurred with widespread verbal phenomena in the talks. Interesting gestures co-occurred, for instance, with humour (Scotto di Carlo, 2013), phrasal verbs (Masi, 2016) – in line with the informal speech style often found in the talks – or other parts of speech expressing key notions therein, and in the context of enumeration and binary contrasts (another typical trait, ibid.). Second, the analysis focused on gestures that seemed outstanding, in contrast with the rest, or recurrent, thus lending themselves to be studied as patterns.

Below (Table 1) is the list of talks taken into consideration, with information as to domain, title, speaker, date of recording and length of each of them.

Table 1 List of talks

Domain	Title of Talk	Speaker	Date	Length
Business and Economics	*Bitcoin. Sweat. Tide. Meet the future of branded currency*	Paul Kemp-Robertson	June 2013	10:48
Business and Economics	*The case for letting business solve social problems*	Michael Porter	June 2013	16:25
Business and Economics	*Why you should know how much your coworkers get paid*	David Burkus	Jan 2016	7:30
Health and Medicine	*Health care should be a team sport*	Eric Dishman	March 2013	15:56
Health and Medicine	*What really happens when you mix medications?*	Russ Altman	Nov 2015	14:42
Health and Medicine	*A new weapon in the fight against superbugs*	David Brenner	April 2017	10:14
Law	*A prosecutor's vision for a better justice system*	Adam Foss	Feb 2016	15:57
Law	*How I help free innocent people from prison*	Ronald Sullivan	Oct 2016	11:55
Law	*What if we ended the injustice of bail?*	Robin Steinberg	April 2018	14:25

Technology	*404, the story of a page not found*	Renny Gleeson	Feb 2012	4:01
Technology	*Everyday cybercrime – and what you can do about it*	James Lyne	Feb 2013	17:23
Technology	*Technology that knows what you're feeling*	Poppy Crum	April 2018	12:43

The following section will provide and discuss an illustrative selection of examples from some of the talks, which were especially prone to be studied as patterns.

Discussion of examples

The selected cases below will first illustrate separate instances of multimodal ensembles where co-speech gestures primarily serve the interpersonal, ideational and textual metafunctions, respectively. Then, some of the same examples will be reconsidered in wider contexts. As we will see, when gestures are reappraised from a broader perspective, the textual metafunction gains prominence, as it is possible to notice different types of cohesive ties that are supported or contributed by repetitive patterns across ensembles, whose description was inspired by relevant categories of rhetorical and linguistic cohesion (e.g. Halliday & Hasan, 1976). Furthermore, an interpersonal metafunction appears to intersect with the others, variously manifested by associations with value-laden or emotional meanings that are emphasised or suggested via such ties, and which may help to orient the audience towards the ideological stance the speaker is arguing for (or against).

For each example, the interpretation of the gesture(s) will be followed by the relevant speech excerpt from the talk (with co-speech items in bold type), the gesture description in between parentheses (with also the name of the speaker, the domain, and

the time at which it occurs within the talk), and the relevant screenshot(s)[10]. When more gestures are covered in the same passage, the description and time indication for each of them is placed soon after the relevant co-speech segment. Also, in some cases, a broader conception of gesture was taken into account, namely one involving the manipulation of objects.

Gestures serving interpersonal, ideational and textual metafunctions

From the point of view of the interpersonal metafunction, gestures were found to contribute to the humour often employed in the talks to entertain and involve the audience. In the case below (ex. 1), from the field of Technology, humour is supported by an iconic gesture (with also the contribution of closed eyes and face expression) mimicking a potential situation, in which it conveys an idea or repulsion/disgust (i.e. by means of raised open hands facing the audience as if shielding the speaker from something undesirable) synchronised with an imagined speech turn of a member of the audience. The scene is part of a larger pantomime which functions as one of several verbal and multimodal analogies with what it feels like to hit a 404 page on the Web (i.e. related to the main topic of the talk). Humour appears to rest on the overall far-fetched situation being represented on a local level, but also on the set of unexpected similes as strategies of engagement and persuasion this instance is part of[11]:

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[10] Using TED screenshots for research is permitted by CC BY – NC – ND 4.0 International. I would like to thank the TED Media Requests Team for their support.

[11] Multimodally-contributed humour would certainly deserve further exploration on its own (more examples, also involving enacted dialogism, where tackled in Masi, 2016, 2019b; on the multimodal enactment of characters cf. Valeiras-Jurado & Ruiz-Madrid 2019).

Ex. 1

Trying to think about how a 404 felt, and it would be like if you went to Starbucks and there's the guy behind the counter and you're over there and there's no skim milk. And you say, "Hey, could you bring the skim milk?" And they walk out from behind the counter and they've got no pants on. And you're like, "**Oh, I didn't want to see that**." That's the 404 feeling (laughter) (Raised arms, open hands, palms facing audience) (Gleeson, Technology, 01:59)

Figure 1. 'Oh, I didn't want to see that'

From the viewpoint of the ideational metafunction, several figurative gestures in my data represented concepts, actions or experiences on a referential level. In the following excerpt, from the field of Business and Economics, 'the conventional wisdom' being criticised by the speaker is visually represented as a clearly perceivable, impending space high up at front[12]:

[12] Even though this and the preceding example display gestures with co-speech containing deictic pronouns, the main contribution of the gestures there seems to be representational-ideational, while an indexical function reinforcing textual cohesion, in ex. 2 in particular, appears to emerge via repetition of a similar configuration across discourse chunks (see later on).

Ex. 2

[…] business actually makes a profit by causing a social problem. The classic example is pollution. If business pollutes, it makes more money than if it tried to reduce that pollution. Reducing pollution is expensive, therefore businesses don't want to do it. It's profitable to have an unsafe working environment. […]. **That's been the conventional wisdom** (Both open hands raised and apart at front) (Porter, Business and Economics, 09:35)

Figure 2. 'That's been the conventional wisdom'
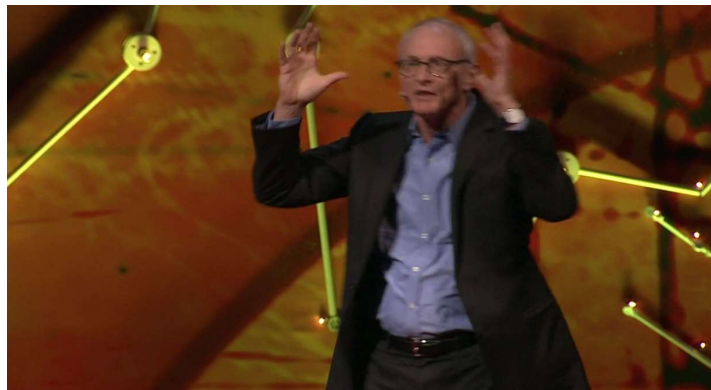
In the next passage, from another talk from the field of Business and Economics, the metaphoric gesture of the speaker represents 'secrecy' (referred to the amount of co-workers' salaries) as something that is difficult to perceive/be aware of via a small space between his fingers projected forwards:

Ex. 3

But what if **secrecy** is actually the reason for all that strife? (Right index and thumb at front, very close to one another) (Burkus, Business and Economics, 01:06)

Figure 3. 'secrecy'
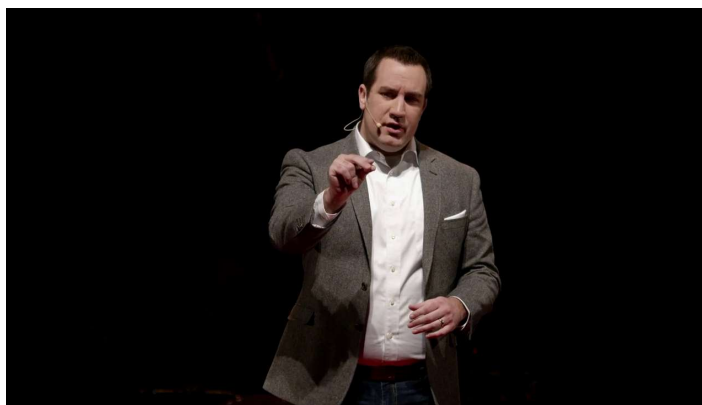
The example that follows, from the field of Medicine, is slightly different, as it contains an iconic gesture that represents the sense of the phrasal verb 'suck in' (in the structure 'sucked me in') as the action of 'being drawn' via motion (at front) from left to right, away from the speaker, who is the centre of the transversal axis. A more abstract idea of increasing lack of the speaker's control or awareness of the situation (as a metaphoric extension) appears to be involved, too:

Ex. 4

Now, with the gravity of this doomsday diagnosis, it just **sucked me in immediately** (Both arms are extended, hands are open, and move from left to right) (Dishman, Health and Medicine, 01:28)

Figure 4. 'sucked me in immediately'

The next case, once again from the domain of Medicine, shows a gesture that involves the use of two pillboxes repeatedly hitting each other to metaphorically stand for drug-drug interaction, produced soon before the verbal expression it represents:

Ex. 5

[…] and so we replicated this and we showed that this is a way that really works for finding (Hands hold two pillboxes that repeatedly hit each other at front) drug-drug interactions (Altman, Health and Medicine, 12:04)

Figure 5. Gesture preceding 'drug-drug interaction'

As for the textual metafunction, the example below, from the field of Law, zooms out on a segment in which almost consecutive deictic gestures locate the entities being talked about at opposite ends in space, rather than represent them, thereby making the logical organisation of ideas physically clear. The gesture dichotomy explicitly emphasises a contrast of entities by means of a contrast of arms (a frequent pattern in the data, as already mentioned above). Incidentally, possible underlying culturally-shared associations with left and right-wing political positions could also be reflected by the different directions on the transversal axis, viz. the association of young disadvantaged

black and brown people awaiting trial with the left wing, and of more powerful white actors within the justice system with the right wing:

Ex. 6

I walked into a courtroom, and I saw an auditorium of people who, one by one, would approach the front of that courtroom to say two words and two words only: "Not guilty." **They were predominately black and brown**. (Left arm points to the left) (02:32) And then a judge, a defense attorney and a prosecutor would make life-altering decisions about that person without their input. **They were predominately white**. (Right arm points to the right) (02:44) (Foss, Law)

Figure 6a. 'They were predominately black and brown'

Figure 6b. 'They were predominately white'

A broader outlook

The last example has foregrounded the relevance of a broader outlook for a deeper and finer-grained understanding of the meaningfulness of different co-speech gestures in the light of their interaction. In fact, we will now reconsider several of the preceding cases (renumbered below, for the sake of clarity) in a larger context, which will underscore other types of ties in addition to contrast.

The metaphoric gesture representing 'the conventional wisdom' (in ex. 2) is actually part of a thread of similar gestures (see ex. 7 below) which accompany and emphasise the links within a chain of co-referential expressions, i.e. a sort of gestural recurrence or partial recurrence supporting verbal co-reference. The last occurrence, in particular, climaxes with an explicit value judgement on the verbal level, whose link with the previously mentioned co-referential elements (all variously referring to 'the conventional wisdom' and its negative impact on economics) is strengthened through the gesture, on account of its similar configuration with the preceding occurrences[13]:

Ex. 7

[…] business actually makes a profit by causing a social problem. The classic example is pollution. If business pollutes, it makes more money than if it tried to reduce that pollution. Reducing pollution is expensive, therefore businesses don't want to do it. It's profitable to have an unsafe working environment. […]. **That's been the conventional wisdom** (Both open hands raised and apart at front) (09:35) A lot of companies have fallen into that conventional wisdom. They resisted environmental improvement. They resisted workplace improvement. **That**

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[13] In the following examples, only the screenshots for some of the gestures involved in the different threads are provided (for lack of space).

thinking (Same gesture configuration as before) (09:50) has led to, I think, much of the behavior that we have come to criticize in business, that I come to criticize in business […] Business does not profit from causing social problems, actually not in any fundamental sense. **That's a very simplistic view** (Similar configuration to the preceding ones) (10:27) (Porter, Business and Economics)

Figure 7a. 'That thinking'

Figure 7b. 'That's a very simplistic view'

The metaphoric gesture representing 'secrecy', too, can be actually reappraised in a rather extended set of different interrelations within its co-text (see ex. 8 below). First, it appears to be in opposition with the gesture that, further down in the talk, represents the antonym of 'secrecy' on the verbal level, namely 'openness' (still referred to the

awareness of co-workers' pay amount, which is being promoted by the speaker). Indeed, a small space between fingers projected forwards (for 'secrecy') can be contrasted with the more visible space between both hands at front and apart, with palms facing one another (for 'openness'). Each notion (secrecy vs. openness) and correlated gestures are in fact part of opposite threads of (internally similar) co-speech gesture patterns that, altogether, reinforce a more global contrast on which argumentation is built. On the one hand, the same or similar gestures to the one for 'openness' are used, later on in the talk, to represent 'total pay transparency' and 'opening up the payroll', through what can be identified as gestural recurrence supporting verbal paraphrase. The gesture for 'opening up the payroll' is wider and slightly more projected towards the audience, so as to underline its performative function as an exhortation to take action. On the other hand, the gesture for 'secrecy' shares some features with the ones that subsequently represent the practice of 'keeping salaries secret', sort of gestural synonyms or paraphrases of the former, supporting verbal paraphrase. Both types of gestures, that is, appear to represent the difficulty of perceiving/being aware of something (the pay amount of co-workers) in different ways, viz. the already mentioned small space between fingers (for 'secrecy') and both hand palms facing down at front as if covering something (for 'keeping salaries secret'). This last gesture is also similar to the one that co-occurs with 'information asymmetry' at the end of the segment reported below. In other words, gesture similarity, in this case, seems to emphasise the connection between the practice of keeping salaries secret and one of its negative consequences:

Ex. 8

But what if **secrecy** (Right index and thumb at front, very close to one another) (01:06) is actually the reason for all that strife? […] What if **openness** (Both hands at front and apart, with palms facing one another) (01:14) actually increased the sense of fairness and collaboration inside a

company? What would happen if we had **total pay transparency**? (Both hands at front and apart, with palms facing one another) (01:20) […] **But keeping salaries secret** (Both hand palms facing down at front) (02:00) does exactly that […] You see, **keeping salaries secret** (Both hand palms facing down at front) (03:06) leads to what economists call "**information asymmetry**." (Both hand palms facing down at front) (03:08) […] maybe we should start by **opening up the payroll** (Both hands at front and slightly more apart, with palms in between facing one another and the audience) (05:03) […] (Burkus, Business and Economics)

Figure 8a. 'openness'

Figure 8b. 'But keeping salaries secret'

Figure 8c. 'information asymmetry'

Another example we are already familiar with is the one representing the action of being 'sucked in'. The larger extract below shows that the same structure and direction of motion (from left to right) is replicated when uttering other two expressions in the close co-text (before and after the occurrence of the phrasal verb). In the last occurrence the same sequence is slowed down and visibly segmented into three steps corresponding to the main stress (see underlining) of the lexical words in 'to <u>die</u> ac<u>cor</u>ding to the <u>sche</u>dule'. This sort of gestural parallelism running through the passage establishes cohesive ties between different negative experiences that mark the stages in the diagnosis of the speaker's cancer, also emphasising the attitude of sad resignation especially invoked by the last part:

Ex. 9

And before I knew it, I was involved and **thrown into** (Both arms are extended, hands are open, and move from left to right) (00:43) this six months of tests and trials and tribulations with six doctors across two hospitals […] Now, with the gravity of this doomsday diagnosis, it just **sucked**

me in immediately (Same configuration and direction as preceding gesture) (01:28), as if I began preparing myself as a patient **to die according to the schedule** that they had just given to me (Same configuration and direction but slowed down and structured into three steps corresponding to main stress of lexical words) (01:31) (Dishman, Heath and Medicine)

Figure 9a. 'to die'

Figure 9b. 'according'

Figure 9c. 'to the schedule […]'

The last case below resumes the discussion of the 'drug-drug interaction' example. The idea is fully expressed verbally only in the third mention reported in the subsequent segment, but the same gesture used for its representation (two pillboxes repeatedly hitting each other) had been used for the first time several minutes earlier, as a sort of gestural cataphora. The first occurrence highlights the complementary contribution of the gesture, as the interaction is depicted only gesturally (no speech co-occurs with it). In the second one the complementary contribution is even stronger, as the gestural representation is also associated with possible negative consequences ('bad things') of such an interaction.

Ex. 10

How much have we studied (Hands hold two pillboxes that repeatedly hit each other at front) (01.20) these two together? Well, it's very hard to do that. In fact, it's not traditionally done. We totally depend on what we call "post-marketing surveillance," after the drugs hit the market. How can we figure out if **bad things are happening** between two medications? (Same gesture as before) (1:35) […] He found several very important interactions, and so we replicated this and we showed that this is a way that really works for finding (Same gesture as before) (12:04) drug-drug interactions (Altman, Health and Medicine)

Figure 10. 'bad things are happening'

Overall, the examples above have shown the remarkable joint contribution of speech and gestures to the logical organisation of ideas over the 'talk diachrony', also highlighting the heuristic potential of a wider analytical perspective to identify multimodal meaning-making practices that do more than hold discourse together. In fact, by way of linking and maintaining discourse topics, several chains of consistent visuospatial imagery also appear to develop the argumentative threads of the talks by variously contributing to the emergence of the multimodally-expressed stance of their speakers.

Conclusion

A great deal of work still needs to be carried out for a systematic account of the interplay of different modes, as part of even wider threads of gesture families (and beyond them) in this genre[14]. In fact, the approach adopted in the present contribution is to be mainly intended as a heuristic tool to unravel meaning-making strategies at work in fast-evolving scenarios for knowledge dissemination that have brought and are bringing about a reshaping of communicative practices. Ever more popular audiovisual materials freely accessible on the web entail giving prominence to modes of communication (gestures, visuals, to name but a few) that take the scene together with the speaker and his/her speech, especially in a genre like that of TED talks, with its own well-defined format, style, and great attention to detail.

The present analysis of particular cases of families of similar gestures across multimodal ensembles in a sample of talks has highlighted that they are the locus around

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[14] Further developments are also needed to evaluate the role of gestural cohesion in relation to and as part of multimodal cohesion (van Leeuwen, 2005).

which not only is discourse organised (McNeill et al., 2015), but argumentation is also developed[15]. The latter has manifested itself through emotional or value-laden content expressing the speaker's viewpoint (subservient to the promotion/refutation of more globally identifiable ideologies), and through the unfolding of gestural cohesive devices moulded on the ones of the rhetorical-linguistic tradition, which have contributed emphasis or elaboration through contrast and different types of recurrence.

A greater awareness of the potential of different scopes in the analysis of co-speech gestures as to their different contributions to discourse may be quite beneficial for interpretive purposes. This is all the more relevant when speaker's stance and ideology are involved, whose possible multimodal emergence on a more global level should probably receive greater attention for the development of multimodal literacy and communication skills in and beyond educational contexts.

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[15] Multimodal argumentation (Tseronis & Forceville, 2017) is indeed an avenue for further investigation.

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