



Is implicit communication quantifiable? A corpus-based analysis of British and Italian political tweets



Davide Garassino ^{a, b, *}, Nicola Brocca ^c, Viviana Masia ^d

^a University of Zurich, Switzerland

^b ZHAW, Winterthur, Switzerland

^c University of Innsbruck, Austria

^d University of Roma Tre, Italy

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ABSTRACT

Twitter is nowadays a powerful means of political propaganda. Its effectiveness can be easily appreciated in the large amounts of messages exchanged by politicians every day. This wealth of data, together with the interactive nature of the social medium, provides an ideal basis for the analysis of a striking feature of political messages, i.e., their implicitness, often achieved using presuppositions, among other strategies. The present work proposes a comparative analysis of British and Italian politicians' use of Twitter by focusing on implicit communication (notably, presuppositions) and the pragmatic functions of tweets. Based on a sample of about 400 tweets, our analysis shows that some of these functions tend to associate either with presuppositional or non-presuppositional communicative devices. Moreover, a critical methodological discussion is offered in order to address the main challenges of quantitative corpus-based pragmatics.

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1. Introduction

In this paper, we show the challenges and the possibilities of a corpus-based pragmatic analysis of implicit meaning and its potentially manipulative effects. Notably, we will attempt to pinpoint correlations between presupposition strategies and pragmatic functions as represented in the tweets of four British and Italian politicians. The results of our inquiry suggest, besides the existence of idiosyncratic strategies and preferences shown by each politician, the presence of association patterns between presuppositions and certain types of content (such as the one represented by the pragmatic function 'stance-taking'), which seem relatively independent of the specific politician or language under examination.

Moreover, our study contributes to a strand of research which aims to bring together theoretical pragmatics and corpus-based analysis, as in Lombardi Vallauri and Masia (2014), Brocca and Garassino (2015), Brocca et al. (2016), Garassino et al. (2019), and Macagno (2022). By doing so, we offer a methodological discussion on some pressing issues concerning the annotation of categories whose interpretation can be subjective and context-dependent, showing a possible strategy to tackle low inter-rater agreement scores.

* Corresponding author.

E-mail addresses: davide.garassino@zhaw.ch, davide.garassino@gmail.com (D. Garassino), nicola.brocca@uibk.ac.at (N. Brocca), viviana.masia@uniroma3.it (V. Masia).

The paper is organized as follows. Section 2 introduces the complex relation between implicitness, political communication and Twitter. After an overview of the concept of implicitness with a focus on presuppositions, we argue that the investigation of implicit meaning in Twitter is motivated by some intrinsic characteristics of the medium as well as its role in global political communication. Section 3 introduces the pragmatic factors that we chose to investigate in our corpus, which are pragmatic functions and *bona fide* non true presuppositions. After presenting our work corpus in Section 4, in Section 5 we offer a quantitative analysis of the data accompanied by a detailed discussion on the annotation procedure.

2. Implicitness, political communication and Twitter

2.1. Implicitness in communication: theory and strategies

It is by now well accepted that implicitness epitomizes one of the most persuasive and powerful means of political propaganda. Pinker (2007: 437) describes implicit communication¹ as “the phenomenon in which a speaker says something he does not literally mean, knowing that the hearer will interpret it as he intended”. With a closer look at its linguistic manifestations, Sbisà (2007: 3) frames implicit communication as being represented by “presupposed and implied content which accompanies what is communicated explicitly and which, together with explicit meanings, are tacitly conveyed” (our translation). From a general perspective, it is believed that implicit content is more easily skipped by one's critical attention in a message, because it is always difficult to focus one's attention on some implicit information (Sbisà, 2007: 3).

When it comes to classifying some content as more or less implicit, two parameters should be regarded as playing a crucial role. For convenience, we will roughly refer to them with the terms *availability* and *challengeability*. Availability is here intended as the degree of retrievability of some content from prior discourse, and therefore the extent to which that content is overtly expressed in a text. Conversely, challengeability indicates the likelihood that some content can be put into discussion, and so the degree to which it can be addressed as potentially untrue by the receiver.

In the perspective adopted in the present paper, we categorize some content as *implicit* when it is either less available or less challengeable. The most common strategies of implicit communication may display one or the other feature, thus exerting a different impact on the mental representation of a sentence's meaning. We will see that a presupposition, although most of the times textually available, may remarkably reduce the challengeability of some content as it weakens the speaker's commitment to its truth. Implicatures, on the contrary, generally involve hiding the speaker's intentional meaning behind another literal proposition. Since, for cooperative rules, the speaker's hidden intentional meaning is expected to be recovered by the interlocutor, this latter gets the chance to better assess its truth and eventually put it into discussion. On balance, presupposition and implicature are both implicit meanings, yet while presupposition is more available and less challengeable, implicature is less available and more challengeable. The challenge-resistant attitude of presupposition is better discussed in the following section.

2.2. Presupposition: a working definition

Stalnaker defines presupposition as *taken for granted information* and, more precisely, information that is assumed to already belong to the common ground (Stalnaker, 1974, 2002) of both speaker and receiver. It should be highlighted, though, that the assumption that a presupposition holds in the common ground of both interlocutors is by no means a necessary and sufficient condition for some content to be presupposed. In fact, presuppositions may also involve content not previously shared by the receiver and conveyed as novel ideas, thus requiring accommodation (Lewis, 1979).

The literature is now abundant on the linguistic triggers projecting presupposed meanings in discourse. Below, some of the most recurrent categories of triggers are exemplified with authentic examples produced by politicians on Twitter.

DEFINITE DESCRIPTIONS are among the most common trigger types. For instance, in Boris Johnson's tweet in (1), the underlined definite description presupposes that his party has put or will put into practice policies that support working families.

(1) Boris Johnson: *Great to join the PM earlier to highlight our sound, common sense policies supporting working families.*

Another common and extensively debated trigger type is the class of CHANGE OF STATE (OR ASPECTUAL) VERBS. Owing to their meaning, these verbs typically presuppose a state of affairs that is antecedent to the one explicitly asserted by the verb. For example, the Italian verb *ritrovare* (“find again”) in (2) presupposes that the Italian people used to have a desire to fight, which they eventually lost.

(2) Matteo Salvini: *Stanco, preoccupato per ciò che accade, ma felice perché vedo tante persone che ritrovano la voglia di battersi. Che state facendo? #Salvini*
‘Tired and worried for what is happening, but also happy because I see many people who have found the desire to fight again. What are you doing?’
#Salvini’

Because of their meaning expressing addition or iteration, also some FOCUS-SENSITIVE OPERATORS can convey presuppositions in discourse. In the tweet in (3) *again* presupposes that Cameron was used to committing to open door immigration also before, which is clearly Farage's idea but maybe only partly true (if not false) for other opposing views.

(3) Nigel Farage: *Mr Cameron made big overtures last month. But 48 hours with Mrs Merkel and he's already repeatedly committing to open door immigration again.*

¹ He also uses the term *indirect speech*; yet, we will comply with the most common terminology throughout this paper.

RELATIVE CLAUSES can presuppose when they are defining, that is, when they specifically identify the referent designated by the head noun. Generally, in written language, they do not appear as detached from the head noun, as is the case of non-defining relative clauses. While defining relative clauses presuppose that a given state of affairs holds for that particular referent, non-defining relative clauses assert that a certain proposition holds for a given referent. The tweet in (4), by Boris Johnson, presupposes that there is a chaos that might enfold the English people.

(4) Boris Johnson: *Becoming ever clearer that SNP would tilt Labour even further left - behold the chaos that might enfold us*. #leadersdebate

In Kiparsky and Kiparsky (1971) FACTIVE PREDICATES were portrayed as carriers of presuppositional meaning. This category includes verbal, adjectival and nominal predicates whose most relevant semantic property is to presuppose the content of the dependent clause they project. Matteo Salvini's tweet in (5) uses an adjectival factive (*è assurdo*, "it is absurd") which presupposes that somebody (the context does not specify who) wants to provide an income to whoever comes to Italy.

(5) Matteo Salvini: Con milioni di italiani senza #lavoro *è assurdo pensare di garantire reddito a chi arriva qui da chissà dove*. #Salvini #portaaporta #Lega 'With millions of people in Italy without #work it is absurd to think to provide an income to whoever arrives here from who knows where. #Salvini #portaaporta #Lega'

Stative or dynamic processes can also be presupposed by means of SUBORDINATE CLAUSES. Givón (2002) characterized syntactic subordination as a way to place some information in the background of a sentence. Subordinate clauses, similarly to factive predicates or change of state verbs, convey *truth presuppositions*, in that they take for granted that the truth of a given state of affairs is shared by both interlocutors. So, in (6) the indirect interrogative clause underlined in the tweet presupposes that the One Nation government led by Cameron will always be on the side of people who work hard and do the right thing.

(6) David Cameron: I'll be making a speech today on how our One Nation government will always be on the side of people who work hard and do the right thing.

So, as a general rule of thumb, the more implicit some content is, the stronger its persuasive and manipulative power may in principle be. This rule applies even more conspicuously when it comes to highly challengeable types of content, such as criticism and attacks against political rivals.

2.3. Twitter and political communication

Twitter is a worldwide micro-blogging platform with more than 330 million users^{2,3}. In 2020, the audience reached 10.4 million users in Italy (Ambrosio, 2021)⁴ and 15.25⁵ million in the UK. For many of them, Twitter is only a medium that allows one to stay tuned with everyday news and to follow public figures, such as influencers and politicians. For a minority, on the contrary, this medium can be used to spread information, influence public opinion and voting choices (Parmelee and Richard, 2012: 6). Many politicians use Twitter exactly for this purpose: in 2021, more than 90% of Members of Parliament (MP) in the UK had a Twitter account⁶ and a similarly high rate can be estimated for Italy too.⁷

The most compelling reason behind this increasing trend is that Twitter has embodied an opportunity for a more direct interaction with the public. This opportunity, however, has been in fact disregarded by most politicians, as shown by, among others, Spina (2012), Brocca and Garassino (2015) and Brocca et al. (2016). Due to its brevity constraints, as well as other features related to the effectiveness of the medium, Twitter provides a breeding ground for investigating linguistic phenomena at different levels of analysis. On the one hand, the limit of 140 characters⁸ might justify the use of implicit communicative strategies: in a medium in which the shortness of the messages is an intrinsic feature, relying on vagueness, implicatures and presuppositions, among others, seems a usual and almost mandatory strategy in order to avoid the explicit mention of well-known referents, such as political adversaries (Lombardi Vallauri, 2019: 241; Lombardi Vallauri et al., 2021). On the other hand, politicians show willingness to speak to their audience by relying on implicit meaning to back up a common ground and promote socially shared consensus.

All these aspects make politicians' use of Twitter a fertile ground for the investigation of under-encoded linguistic meanings (Gabrielova, 2015), such as presuppositions, as mentioned above. The pervasive use of these discursive devices in politicians' messages on Twitter, together with their correlation with specific pragmatic functions in communication, justifies our choice to delve into their manifestation in this social medium. More specifically, we intend to investigate the correlation patterns between presuppositions and their conveyed content as well as the individual variation observed between the examined British and Italian politicians in the corpus (§ 4.1). In the following paragraph, we will thus introduce two relevant factors (or variables) for our study: Pragmatic functions (§ 3.1) and Implicit meaning (§ 3.2).

² <https://www.statista.com/statistics/282087/number-of-monthly-active-twitter-users/>.

³ <http://expandedramblings.com/index.php/march-2013-by-the-numbers-a-few-amazing-twitter-stats/3/>.

⁴ <https://juliusdesign.net/28700/lo-stato-degli-utenti-attivi-e-registrati-sui-social-media-in-italia-e-mondo-2015/>.

⁵ <https://www.statista.com/statistics/242606/number-of-active-twitter-users-in-selected-countries/>.

⁶ <https://www.mpsontwitter.co.uk/> [the last control on all these links was carried out in Feb. 2022].

⁷ Precise figures are unfortunately not available. However, the percentage of Italian Members of Parliament having a Twitter account was more than 64% in 2014 (Comin and Partners, 2014). Given the overall increase of Twitter users, the percentage of users between MPs may well have raised too.

⁸ At the time our corpus was collected (April 2015), Twitter messages were still limited to 140 characters. In November 2017 the limit was raised to 280 characters.

3. Pragmatic functions and implicit meaning

3.1. Pragmatic functions: a taxonomic proposal

In order to single out the most distinctive discourse-pragmatic functions of the tweets, our taxonomy has drawn upon several classifications proposed in [Java et al. \(2007\)](#), [boyd et al. \(2010\)](#), [Naaman et al. \(2010\)](#), [Zhang et al. \(2011\)](#), [Graham et al. \(2013\)](#), [Brocca and Garassino \(2015\)](#), [López-Meri et al. \(2017\)](#). In particular, we relied on [Graham et al. \(2013\)](#), who put forward a detailed analysis of the communicative behavior on political Twitter during the UK 2010 general election.

However, unlike [Graham et al. \(2013\)](#) and the other aforementioned papers, the primary goal in establishing our classification was to find a limited set of functions to be associated with the use of implicit strategies in the observed tweets. We believe that pragmatic functions are a good indicator of the role played by implicit communicative strategies in politicians' tweets as well as of the politicians' inclination to ascribe more or less questionable content to a certain type of information packaging.

Following [Garassino et al. \(2019\)](#), we thus decided to restrict the number of categories to five pragmatic functions, in order to reduce the degree of individual variability in the annotation procedure. A sixth category, 'Other', was created for cases not included in the aforementioned five.

For each function, we offer a concise description and some examples (also see the Appendix). The labels used for the annotation are given in brackets.

CRITICISM (CRT): Explicit attacks against the actions and/or the ideology of other parties or politicians by means of criticism (7) or insults (8). To avoid possible overlapping with other pragmatic functions in our analysis, only attacks addressed to a specific target were considered.

- (7) David Cameron: *Ed Miliband won't rule out a vote-by-vote deal with the SNP so he can be PM. It would mean more borrowing and more taxes and you would pay*
- (8) Matteo Salvini: *In piazza a #Parigi c'era tanta gente, coraggiosa e perbene. Ma c'erano anche #Renzi, #Prodi e #Monti. Che schifo. #Salvini @matteosalvinimi*
'On the streets in #Paris there were many brave and respectable people. But there were also #Renzi, #Prodi and #Monti. How disgusting. #Salvini @matteosalvinimi'

STANCE-TAKING (STK): Extolling and enhancing the values and ideology of some political party, expressing opinion on a given (ideological) issue, including part of the political agenda, slogans or election proposals:

- (9) Matteo Renzi: *Centomila posti di lavoro in più in un mese. Bene. Ma siamo solo all'inizio. Ripoteremo l'Italia a crescere» #lavorotabuona*
'One hundred thousand job positions more in only one month. That's good. But it's just the beginning. Italy will grow again #lavorotabuona'

INFORMATIVE CONTENT (INF): it contains information about campaign events and other appointments involving politicians. Sometimes these information tweets contain links to the media, for example, to share an interview or a discussion in which the leader or another member of the party took part.

- (10) Matteo Renzi: *Adesso in onda a @OttoemzzoTW con Lilli Gruber e Marcello Sorgi*
'Now on the air at @OttoemzzoTW with Lilli Gruber and Marcello Sorgi'

PRAISE: We distinguished two types of praise. Speaker-Centered Praise (SPR) involves praises that politicians give to themselves or the party for some achievements, such as in the following example:

- (11) Ed Miliband: *I'm glad I persuaded @user that voting is important. Hands ahead telling people to vote Labour*

On the contrary, Praise-to-Others (OPR) is directed to other addressees, as Cameron does in (12), or it may be represented by speech acts through which politicians thank, appreciate, wish or offer condolences to someone:

- (12) David Cameron: *Congratulations to @AVFCOfficial on reaching the #FACup final. A tremendous achievement*

OTHER (OTH): The category Other is used for labeling tweets which cannot be included in the previous categories. This is the case, for instance, of tweets portraying the private life of politicians, representing instances of so-called *intimate politics*, cf. [Stanyer \(2012\)](#), as in (13), or direct replies to Twitter users (as in (14)) that do not show specific features of the already examined functions:

- (13) Ed Miliband: *I took some time out of the campaign to play pool against Ronnie O'Sullivan. I went easy on him.*
- (14) Matteo Renzi: *@user qualcosa si è iniziato a fare ma ancora non basta*
'We have started doing something, but it is still not enough'

3.2. Implicit meaning: the bona fide parameter for presuppositions

In several quantitative approaches to implicit communication ([Lombardi Vallauri and Masia, 2014](#); [Brocca et al., 2016](#); [Garassino et al., 2019](#)), annotation procedures have often faced theoretical and empirical challenges mainly hinging on the difficulty in (a) classifying some content as implicit or non-implicit, and (b) in deciding the extent to which implicitness can be considered manipulative or not. As a matter of fact, besides being an effective persuasive means, implicitness is also one of the distinguishing features of human language ([Reboul, 2011, 2017](#)). Indeed, it allows streamlining the structure of a discourse by not repeating already shared information or not overtly asserting content which is not relevant to the current communicative

task. These and others are non-deceptive uses of implicit communication, since they merely allow the smooth functioning of interactional processes.

Instead, the use of implicit communication we are interested in this study concerns its potentially manipulative purpose. Such purpose particularly involves tendentious content, that is, content which often reflects a subjective thought of the speaker and which can therefore be addressed as *bona fide* non true by the receiver. In our study, we decided to consider as *bona fide* non true those presuppositions whose content, albeit being true for the speaker, is not necessarily true for the receiver.

So, for example, in the following tweet, the presupposition triggered by ‘human traffickers’ (*i trafficanti di esseri umani*) was considered as *bona fide* true (which we labelled as ‘absence of *bona fide* non true presuppositions’, ABS),⁹ since the existence of human traffickers in this context can be considered to be shared truth:

- (15) Renzi: *Niente demagogia almeno oggi. La battaglia di tutti deve essere contro i trafficanti di esseri umani. Sono i nuovi schiavisti #Mediterraneo*
‘No demagogu at least today. The battle of all must be against human traffickers. They are the new slave traders #Mediterranean’

On the contrary, the tweet in (16) received the *bona fide* non true presupposition label (PPP), since the ‘havoc’ to which the politician is referring is not an objective, generally shared truth:

- (16) Meloni: *Continueremo a denunciare lo scempio che questi partiti stanno consumando.*
‘We will continue to expose the havoc that these parties are causing’

One may legitimately object that this parameter is not as straightforward as desirable since it is not always easy to discern whether some content is *bona fide* true or not. We address this issue in § 5.

4. The research design

4.1. The corpus

In order to investigate the use of implicit communicative strategies by politicians, we created our corpus by collecting tweets produced in 2015 by four well-known politicians, who were also quite active on Twitter: two Italian politicians (Matteo Renzi and Matteo Salvini) and two British politicians (David Cameron and Ed Miliband) leading respectively the running government and the opposition at the time (cf. Table 1):

Table 1
British and Italian politicians.

	Italy	UK
Prime Minister	Matteo Renzi <i>Partito Democratico</i> (Democratic Party)	David Cameron <i>Conservative and Unionist Party</i>
Opposition leader	Matteo Salvini <i>Lega Nord</i> (Northern League)	Ed Miliband <i>Labour Party</i>

For the analysis, we collected the first 100 tweets posted by each politician from March 1st to April 30th, 2015. We analyzed tweets produced before the Brexit referendum (June 23rd, 2016), since we expect that tweets prior to this time could allow a more varied range of topics, not necessarily focused on a single political issue. Tweets were gathered automatically by using the *twitteR* package (Gentry, 2016) on R (R Core Team, 2021).¹⁰ Tweets consisting only of links, hashtags or pictures, as well as retweets, were manually excluded from the data set. All in all, the corpus consisted of 391 tweets.

With respect to AOIR internet research ethics (<https://aoir.org/ethics/>), we consider the use of political tweets in our corpus as not problematic since they are publicly available messages produced by public figures. However, in case private Twitter accounts were directly addressed by the four politicians, they were anonymized and the “@user” label was used instead of their real name.

Most British tweets were collected during the campaign for the general election in the UK and are obviously influenced by high tones of political propaganda. Instead, Italy was not running for elections at that time. This may represent a potential weak point for comparability, especially in relation to the most recurrent themes of the British and Italian Twitter messages. Nonetheless, many of the British and Italian messages selected for this analysis share some relevant issues at that time such as EU's budget, war in the Middle East, international terrorism and immigration, among others.

⁹ ABS is a generic label whose only purpose is to be the ‘negative’ version of PPP, i.e., to allow us to single out what is *not* PPP in our dataset. As such, it comprises tweets with *bona fide* true presuppositions, plain assertive content as well as (potentially) other types of implicit meanings, such as implicatures. Because of this heterogeneity, ABS tweets will not be analyzed *per se* in this paper.

¹⁰ The data are openly available at <https://doi.org/10.6084/m9.figshare.19228128.v1>.

4.2. Research questions and hypotheses

Based on the previous discussion on presuppositions and the pragmatic functions of tweets, in the rest of this paper we aim to tackle the following research questions:

- (i) With which functions do *bona fide* non true presuppositions correlate the most?
- (ii) Are there significant differences between politicians in terms of their use of implicit strategies in connection with certain pragmatic functions?

Concerning (i), since presuppositions can be expected to resist addressees' critical reaction, they seem particularly suited to convey highly subjective and ideological content that can communicatively benefit from being presented as already shared between politicians and their audience and not deserving critical scrutiny (cf. also Garassino et al., 2019), such as the messages characterized by the STK function in our dataset. Vice versa, we expect that other functions such as INF and OPR, which can be conceived of as more 'neutral' as they typically pass noncritical content, do not preferentially associate with presuppositions. In general, we might predict that more tendentious content types are also more likely to be coded as presuppositions. Therefore, they are more likely to be coded more implicitly than less challengeable content types. This expectation can be assumed to be grounded in the speaker's need (which is even more compelling in given communicative contexts) to keep their reputation from being smeared by the potential reaction of the recipient (Masia, 2020).

Regarding (question ii), as observed in Brocca et al. (2016) and Garassino et al. (2019), inter-politician variation in the use of implicit strategies and pragmatic functions can be remarkable. However, some correlations between them were observed that seem to resist inter-speaker variation, such as the association between presuppositions and STK (as well as the association between implicatures and CRT).

Before answering questions (i)-(ii), however, we must discuss some important challenges presented by the annotation procedure and our attempts to find a solution (§ 5.1) in order to have reliably enough material for the quantitative analysis (§ 5.2).

5. Data analysis

While coding our corpus data, we opted for a balance between a theoretically sound analysis and straightforward annotation criteria. In order to do so, we relied on an annotation codebook (see the Appendix), following best practices in the domains of computational and corpus-based linguistics (cf. Artstein and Poesio, 2008; Hovy and Lavid, 2010; Spooren and Degand, 2010).

Along the lines of Graham et al. (2013) and Graham et al. (2016: 770), we considered the tweet as the unit of analysis. According to the principle *one tweet, one label*, each tweet was assigned by each of the three coders¹¹ only one label for the variables Pragmatic functions and Implicit meaning, respectively. If a tweet contained multiple implicit categories or functions, we chose only the *primary* or *dominant* one (i.e., "the function comprising of most of characters", Graham et al., 2016: 771).

Despite a training phase and mutually agreed definitions of the annotation criteria, some decisions could not elude a certain degree of subjectivity. Therefore, as we show in § 5.1, the amount of arbitrariness in our analysis was assessed by means of inter-rater agreement indexes.

5.1. On coding pragmatic functions and implicit meaning: inter-rater agreement

Following Artstein and Poesio (2008: 590), we believe that "annotation efforts should perform and report rigorous reliability testing". As a first step, we carefully chose the annotation methodology which best fitted our needs, since several measures for annotation reliability have been proposed so far in the literature, mainly depending on the research field.

The most accessible measure is observed agreement, which is "the percentage of judgements on which the two analysts agree when coding the same data independently" (Artstein and Poesio, 2008: 558, quoting Scott, 1955: 323) and can be considered as descriptive statistics (Spooren and Degand, 2010: 258). The main issue with this measure is that observed agreement is not adjusted for chance. In other words, it does not take into account the cases in which annotators could have chosen a label randomly.

For this reason, in current research, observed agreement tends to be used only as a complement to other indexes, such as Cohen's *k* or Gwet's AC1 (for the mathematical details of both, cf. Hoek and Scholman, 2017). Cohen's *k* is widespread in many research environments, especially in the medical field. However, it suffers from a frequency bias (Di Eugenio, 2000; Spooren and Degand, 2010), since "the infrequent use of a given tag results in a poor kappa score" (Spooren and Degand, 2010: 257). This is crucial in corpus-based linguistics, in which one typically observes a skewed distribution in the data since some categories are very frequent, while others occur only rarely. As observed by Hoek and Scholman (2017), this issue was taken

¹¹ The annotators are the authors of this paper (A1 = DG; A2 = VM; A3 = NB). All raters are native Italian speakers with an advanced level of L2 English.

into account by Gwet's AC1, which makes this index “more robust to skewedness and variability in the distribution of categories” (Hoek and Scholman, 2017: 7) and, as such, more appropriate for corpus-based linguistics.

In the following tables, we show the results provided by the three indices (observed agreement, *k*-score, which conflates both Fleiss' *k* for the values concerning three annotators and Cohen's *k* for the different pairs of annotators, and AC1) regarding Implicit meaning and Pragmatic functions for each politician.

Table 2

Inter-rater agreement scores for all the annotators and for each pair of annotators (Renzi, *n* = 99).

Renzi							
Implicit				Function			
	OA	<i>k</i>	AC1	OA	<i>k</i>	<i>k</i>	AC1
All		.63	.87		.53		.60
A1-A2	86%	.49	.81	57%	.42		.49
A1-A3	98%	.91	.97	75%	.67		.70
A2-A3	88%	.56	.83	68%	.52		.61

OA = observed agreement, *k* = *k*-score, AC1 = Gwet's AC1.

Table 3

Inter-rater agreement scores for all the annotators and for each pair of annotators (Salvini, *n* = 98).

Salvini							
Implicit				Function			
	OA	<i>k</i>	AC1	OA	<i>k</i>	<i>k</i>	AC1
All		.51	.85		.65		.74
A1-A2	85%	.36	.80	75%	.60		.71
A1-A3	91%	.64	.88	78%	.65		.74
A2-A3	90%	.53	.87	80%	.68		.77

Table 4

Inter-rater agreement scores for all the annotators and for each pair of annotators (Miliband, *n* = 94).

Miliband							
Implicit				Function			
	OA	<i>k</i>	AC1	OA	<i>k</i>	<i>k</i>	AC1
All		.37	.55		.62		.78
A1-A2	63%	.20	.33	74%	.49		.71
A1-A3	81%	.45	.71	85%	.71		.83
A2-A3	78%	.52	.61	82%	.66		.79

Table 5

Inter-rater agreement scores for all the annotators and for each pair of annotators (Cameron, *n* = 100).

Cameron							
Implicit				Function			
	OA	<i>k</i>	AC1	OA	<i>k</i>	<i>k</i>	AC1
All		.46	.70		.73		.82
A1-A2	72%	.31	.55	83%	.72		.81
A1-A3	93%	.76	.92	84%	.74		.82
A2-A3	76%	.42	.61	85%	.75		.83

At first glance, these results show (i) an overall low level of *k* and (ii) a high level of variability between annotators, which also seems conditional on the politician.

It is important to notice that there is no shared acceptability threshold for *k* yet in the linguistic community. According to Artstein and Poesio (2008), this value should be at least .80 in computational linguistics, but it could lower to .70 for corpus-based pragmatics (as also suggested by Spooren and Degand, 2010: 256 in relation to discourse coherence phenomena). In any case, a lower *k* is to be expected when one deals with pragmatics. It can even be considered unavoidable, as shown by current research on discourse annotations and other pragmatic phenomena (Spooren and Degand, 2010; Grisot, 2017), due to the underdeterminacy of language.¹² Since pragmatic reasoning depends largely on contextual information, different

¹² These results are overall in line with those provided by similar inquiries. For instance, in Graham et al. (2016: 771), the Cohen's *k*-value concerning the annotation of the tweet functions is .66.

annotators may show different interpretations of the same linguistic content and thus diverging coding preferences and strategies. This is evident in our results as well, in which *k*-scores are overall poor (78% of the *k*-scores in Tables 2–5 present values well under the .70 threshold; 50% are even under .60). However, the AC1-values provide more encouraging results (25% of the AC1-scores are under the .70 threshold; only 12.5% are under .60). Moreover, the pairs of annotators A1–A3 and A2–A3 reveal higher and more consistent values than the pair A1–A2 which systematically obtains lower scores, pointing to different coding strategies adopted by A1 and A2.

A closer look at the data reveals in fact that the annotators labeled some categories, in particular *bona fide* non true PPPs, on different bases. For example, (17) was tagged as PPP only by A1 while A2 and A3 chose ABS; (18) was labeled instead ABS by A1 and A3 and PPP by A2:

(17) Miliband: *Here's six things you should know about Labour's plan for women and equality*

(18) Miliband: *Everything a Labour government will do is based on a simple truth: it is only when working people succeed that Britain succeed*

In the case of (17), A2 interpreted “Labour’s plan” as a *bona fide* non true PPP, i.e., something akin to a political slogan, while A1 and A3 considered it as a presupposition that can be accepted as *bona fide* true (‘the Labour party has a plan for women and equality’). In (18), for A1 the tweet conveyed a *bona fide* non true PPP (i.e., there can be *other* reasons for the success of Britain), whereas the interpretation of A2 and A3 relies on the fact that the message ‘a country flourishes when working people succeed’ can be considered a commonly accepted truth. Recognizing *bona fide* non true PPPs in the data is problematic, since the identification of PPPs may rely not only on contextual information but also on specific political knowledge and possibly, to a partial extent, even on individual political biases. It must also be observed that certain politicians pose a more difficult annotation challenge than others, as shown by Miliband (Implicit), in which each pair of annotators has low agreement values.

The values for the variable Pragmatic functions are overall better than the ones for Implicit meaning (at least if one considers the *k*-scores). The lower scores observed in Renzi’s data (*k*: .42; AC1: .49) for A1 and A2 are mainly due to the fact that different tweets labeled as OTH and INF by A1 and A3 were assigned to the STK category by A2, as in the following example:

(19) Renzi: @user1 @user2 *volentieri incontro una delegazione. Ci vediamo là. Buona serata*
@user1 @user2 I gladly meet a delegation. See you there. Have a good evening’

Although differences within raters are expected, it would be advisable to make final annotation choices aimed at reducing disagreements as much as possible. To do so, our strategy was to create a new annotation dataset based on shared choices of the annotators and a post-annotation discussion:

- (i) In case the three raters assigned the same label to the tweet, the label was maintained in the new annotation dataset;
- (ii) in case of partial disagreement, the label assigned by two raters was selected;
- (iii) in case of absolute disagreement, i.e., when each of the three raters chose a different label, the annotators engaged in a post-annotation consensus-building process (as suggested by Loewen and Plonsky, 2015: 90–91) to make the final decision. This process only concerned the pragmatic functions of 6 tweets.

The time has finally come to answer the question posed in the title. Is implicit communication quantifiable? Partly, yes. Quantifying implicit communication requires many compromises, including the presence of multiple expert annotators. By relying on different annotators pairs, we can in fact better recognize the biases of different coding strategies. This cooperative endeavor is certainly time-consuming and does not always seem able to provide overall reliable results. However, it also has important advantages: it can show, for instance, which categories are the most problematic and can possibly be revised before venturing into the quantitative analysis. It can also help reveal the main sources of variability in a dataset, as we observed in our corpus, in which this variability seems mainly amenable to the intrinsic characteristics of each politicians’ communication style.

While keeping in mind these issues as well as the relatively small data set on which we rely, in § 5.2, a quantitative analysis is offered.

5.2. Quantitative analysis

5.2.1. Data analysis

Fig. 1 offers an overall look at the distribution of the variables Implicit meaning and Pragmatic functions for each politician in the corpus:

It is immediately noticeable that (i) STK is, in general, the most frequent pragmatic function; (ii) *bona fide* non true PPPs are not very frequent (ca. 19% of all tweets); (iii) *bona fide* non true PPPs seem to associate with the STK and, partly, the CRT function while ‘dispreferring’ the other functions. Interestingly, several signs of idiosyncratic preferences are apparent: CRT is more frequent in Salvini’s dataset compared to the other politicians, OPR appears more frequently in Cameron and Renzi’s data (in both cases, it is the second most frequent function after STK, if we do not consider the heterogeneous OTH category).

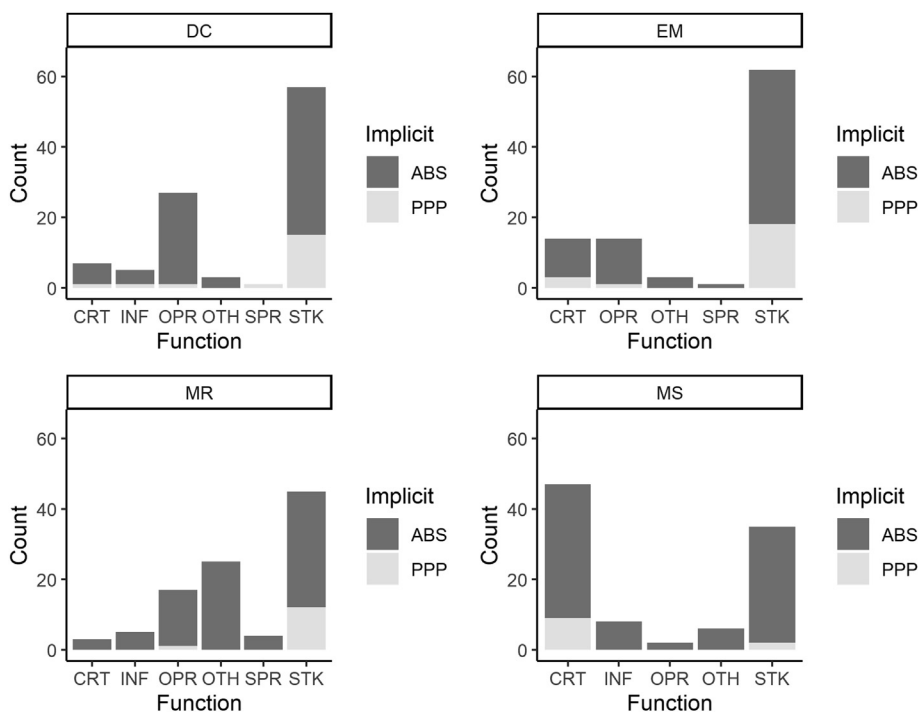


Fig. 1. Barplots ($n = 391$; DC = David Cameron, EM = Ed Miliband, MR = Matteo Renzi, MS = Matteo Salvini; CRT = Criticism, INF = Informative content, OPR = Praise-to-Others, OTH = Other, SPR = Praise-to-Speaker, STK = Stance-Taking; ABS = absence of *bona fide* non true presuppositions, PPP = *bona fide* non true presuppositions)¹³.

Moreover, the Information (INF) and Praise to Speaker (SPR) functions are rare; the category Other (OTH), with the exception of Renzi's tweets, also occurs rarely.

To explore the interaction between Implicit meaning and Pragmatic functions, while also considering their relation to Politicians (the third variable in our dataset), and to answer the research questions put forward in § 4.2, we carried out a *loglinear analysis*, excluding from the dataset the functions INF and SPR, because of their scarcity, as well as OTH, because of its internal heterogeneity (the total number of occurrences was thus reduced to 330). A loglinear analysis can be conceived of as an extension of the chi-squared test for independence when three or more categorical factors are involved (for a detailed introduction to this technique, the reader is referred to Field et al., 2012: 835–852). The statistical analysis proved that the three-way interaction between Implicit meaning, Politicians and Pragmatic functions is significant and is thus included in the final model ($\chi^2 = 20.53$, $p < .01$).¹⁴ As a second step, we examined all the two-way interactions between the three variables by relying on separate chi-squared tests. The association between Implicit meaning and Pragmatic functions is significant ($\chi^2 = 10.38$, $df = 2$, $p < .01$), but has a small effect size (Cramér's $V = .18$).¹⁵ The association between Politicians and Pragmatic functions showed a high significance and a robust effect size, albeit still moderate ($\chi^2 = 92.13$, $df = 6$, $p < .0001$; Cramér's $V = .37$). Finally, the association between Implicit meaning and Politicians ($\chi^2 = 6.46$, $df = 3$, $p = .09$) was not significant.

Since a three-way interaction is not immediately intuitive to grasp, we chose to visualize it by means of a mosaic plot, which helps better understand which cells of the contingency table contribute most to the significance of the results. This plot (Fig. 2) is based on Pearson's residuals, which compare the observed with the expected frequencies for each cell of the contingency table (Levshina, 2015: 217–221). A residual is considered to be statistically significant if it is higher than 2 or lower than -2 (Field et al., 2012: 844).

The plot “reflects the total proportions of the cells, rows and columns in the contingency table” (Levshina, 2015: 219). Thus, the size of each rectangle depends on the number of occurrences within that cell. A first glance reveals, for instance, that the category PPP is much less represented in the corpus than ABS and that the OPR function is less frequent compared to STK. Furthermore, the colors of the rectangles indicate the level of statistical significance (i.e. whether the difference between observed and expected frequencies in that cell can be considered significant),¹⁶ while their boundaries correspond to the sign

¹⁴ As observed by Field et al. (2012), the final model is selected through model comparison. Model comparison is supposed to stop when the removal of one term results in a poorer fit to the data (as it would happen in our case by removing the three-way interaction term). The loglinear analysis was performed by using the MASS package in R (Ripley et al., 2021).

¹⁵ Effect sizes provide a measure of the strength of association between two variables (cf. Levshina, 2015: 203–210).

¹⁶ Only significant residuals are displayed in the plot.

of the residuals: positive associations are shown by a straight line and negative associations by a dashed line. As an example, one can observe a positive association between PPP and STK in DC, which is however non-significant. On the contrary, the negative association between OPR and ABS in MS is significant.

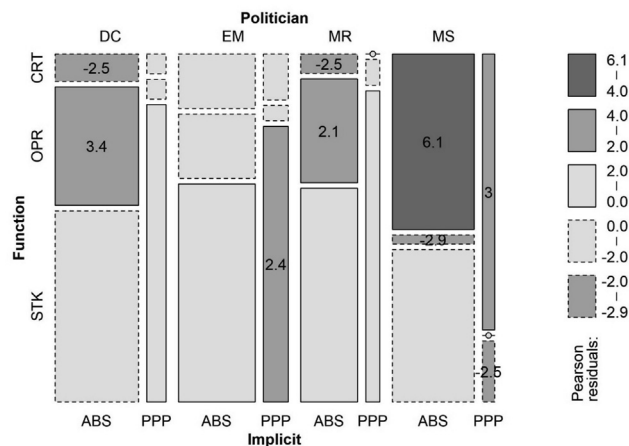


Fig. 2. Association plot ($n = 330$; DC = David Cameron, EM = Ed Miliband, MR = Matteo Renzi, MS = Matteo Salvini; CRT = Criticism, OPR = Praise-to-Others, STK = Stance-Taking; ABS = absence of *bona fide* non true presuppositions, PPP = *bona fide* non true presuppositions)¹⁷.

In regard to *bona fide* non true presuppositions, the direction of Pearson's residuals (positive vs. negative) indicates that PPPs tend to positively associate with STK and negatively with CRT and OPR. However, in the first case, the association is only significant in the case of Miliband, while it remains a tendency in Cameron's and Renzi's data. An exception to this pattern is revealed by Salvini's tweets, in which a significant negative association between PPPs and STK and, vice versa, a significant positive association with CRT are observed.

Concerning the distribution of the pragmatic functions independently of the variable Implicit meaning, while also keeping in mind the internal lack of homogeneity within the ABS category (see Footnote 9), the highly significant positive association between Salvini and CRT is remarkable (which also corroborates the findings discussed in other studies, such as Garassino et al., 2019), while STK and especially OPR are underrepresented compared to the three other politicians. Finally, the mosaic plot also shows a significant negative association between Cameron's and Renzi's tweets and the CRT function as well as, conversely, a strong positive association between these two politicians and the OPR function.

5.2.2. Discussion

We can now come back to the research questions presented in § 4.2. First (question i), *bona fide* non true presuppositions tend to associate with certain functions (STK, in particular), but not with others (OPR). Secondly, these association patterns seem to be modulated by the variable Politicians (question ii): *bona fide* non true presuppositions positively (and significantly) associate with STK only in Milibands' tweets. They show, however, a tendency towards positive association in Renzi's and Cameron's, but not in Salvini's data, in which we observe a significant negative association. In Salvini's messages, one finds instead a significant positive association with CRT, whereas, in the other politicians' data, a tendency towards negative association emerges.

More generally, the association between *bona fide* non true presuppositions and STK seems motivated by the politicians' desire to reiterate their *ideological position without imposing it explicitly* on the receiver, an effect which has also been described for implicatures (Sbisa 2007). This suggests that some politicians are on the whole more likely to pass their views, stances, convictions and beliefs more 'subliminally', preferably subtracting them from potential challenge or discussion. The use of presuppositions, i.e., a less challengeable strategy, is therefore preferred. On the other hand, CRT, with the only exception of Salvini, and OPR show a negative association with *bona fide* non true presuppositions. In the case of the OPR function, this is largely expected and unproblematic since praises to other people do not usually involve potentially critical and manipulative content. A presupposition strategy for such tweets would thus be unnecessary.

The link between implicit strategies and the function of attack and/or criticism (CRT) is more subtle, as also revealed by Garassino et al. (2019), in which CRT was mostly conveyed by implicatures. This was explained by the fact that implicatures, being 'indirect assertions', are more likely to convey content which is less available and more challengeable. In other words, when expressing criticism to political opponents, speakers intend to pass a message that is easily recognizable, but at the same time is expressed indirectly for 'face-saving' reasons (Masia, 2020, 2021). The positive association between *bona fide* non

¹³ Fig. 1 was obtained by means of the ggplot2 package (Wickham, 2016).

true presuppositions and CRT in Salvini's data can possibly be a consequence of a more general preference for the CRT function shown by this politician. As also found in other studies (Garassino et al., 2019; Masia, 2020), in fact, a high frequency of the CRT function was also observed in Salvini's public speeches held in electoral rallies.

Finally, the negative association between Cameron and Renzi with CRT and, conversely, their positive association with OPR testify the impact of the politicians' role on their overall communicative strategy. Both Cameron and Renzi were prime ministers at that time: in this case, an overly 'aggressive' strategy (i.e. a significant positive association with CRT) would have felt 'out of character', in contrast to opposition politicians, such as Salvini (Garassino et al., 2019).

On balance, the implications of the proposed analysis are far-reaching, especially in the attempt to provide a general rhetorical profile of politicians using their Twitter accounts for (potentially) propagandistic purposes.

6. Conclusion

This study has analyzed some implicit strategies of political communication in a corpus of British and Italian tweets. At the same time, our analysis also had a methodological aim, which was to assess the reliability of annotations concerning categories dependent on inferential reasoning and contextual interpretation.

In line with recent studies in corpus-based pragmatics, we obtained overall low inter-rater agreement scores (even if the values of the Gwet's AC1 index were higher than the values of Cohen's *k*). These results can be partly expected in light of the pragmatic categories under examination (in particular, *bona fide non true presuppositions*). Moreover, they helped us acknowledge the presence of systematically diverging coding strategies and the internal variability in our dataset, in which some politicians (such as Ed Miliband) offer a tougher annotation challenge than others. In general, our analysis has also revealed the importance of relying on a codebook and of carrying out comparisons between multiple expert annotators.

With all these provisos, the quantitative analysis suggested the existence of association patterns between *bona fide non true presuppositions* and specific pragmatic functions (such as STK).

Author contributions

The three authors were equally involved in the conceptualization, methodology, investigation as well as creation of the codebook. Davide Garassino is responsible for formal analysis, software and project administration, and wrote Sections 1, 3.1, 5.1 (with Nicola Brocca), 5.2 and 6. Nicola Brocca holds responsibility for data curation and validation and wrote Sections 2.3, 4 and 5.1 (with Davide Garassino). Viviana Masia is responsible for the refinement of the theoretical background regarding presuppositions and wrote Section 2.1, 2.2 and 3.2.

Declaration of competing interest

All authors declare that they have no conflicts of interest.

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Appendix. The codebook

Coding instructions

Variable 1. Implicit meaning

PPP (= *bona fide non true presupposition*)

i. Search for a presupposition trigger in the message.

Based on Levinson (1983: 181–184), the following presupposition triggers are acknowledged:

- a. DEFINITE DESCRIPTION
The green box contains sleeping pills
- b. ITERATIVE ADVERBS
Jane has woken up late again
- c. FOCUS SENSITIVE OPERATORS
Also Mark has seen the last movie by Spielberg
- d. CHANGE OF STATE (OR ASPECTUAL) VERBS
Colin has stopped selling old French stamps
- e. FACTIVE PREDICATES

¹⁷ The mosaic plot was produced by means of the VCD package (Meyer et al., 2020) in R.

It's such a shame that Kate has not told her children the truth about their father!

f. DEFINING RELATIVE CLAUSES

The Irish girl you met yesterday is the vocalist in a Galway band

g. SUBORDINATE CLAUSES

When Norah decided to sell her house, her husband looked for another job

ii. In case a presupposition trigger is retrieved, the 'PPP' label is attributed if, and only if, a *bona fide* non true presupposition is conveyed:

- Use PPP if the presuppositional content is *subjective* and *not verifiable* on factual ground. This type of content usually reflects personal opinions or stances.

(1) Ed Miliband: *I am ready to put an end to the tired old idea that as long as we look after the rich and powerful we will all be OK.*

(2) Ed Miliband: *David Cameron has decided not to attend tonight's debate. If you're applying for the job of PM, you should turn up to the job interview.*

In (1), the complex object NP conveys the presupposition that such a tired old idea actually exists, which is of course hardly verifiable on objective grounds and relies on the ideological stance of the politician. In (2), framing a public debate as a job interview (another definite description) to become PM reflects again a subjective stance more than a matter of fact (i.e., it cannot be easily proven that a public debate is the equivalent of a job interview).

ABS (= absence of *bona fide* non true presuppositions)

Use ABS in the following cases:

- When no presupposition trigger is present;
- In case there is a presupposition trigger in the tweet, its presuppositional content needs to be *objective* and, in principle, *verifiable* (*bona fide* true presuppositions).

(3) Ed Miliband: *We will set tough targets for HMRC to reduce tax avoidance and evasion by at least £7.5bn a year.*

(4) Matteo Renzi: *Continuiamo a lavorare con @JosephMuscat_JM e Governo di Malta in attesa di consiglio europeo straordinario #Mediterraneo*
'We continue working with @JosephMuscat_JM and the Maltese government waiting for an extraordinary European council #Mediterraneo'

In (3), the existence of tax avoidance and evasion (definite description) is uncontroversial and, in principle, can be factually proven. The change of state/aspectual verb in (4) conveys the implicit meaning that previous work in cooperation with the Maltese government was carried out, which is again (in principle) verifiable.

Variable 2. Pragmatic functions

Criticism (CRT)

- the tweet conveys a *criticism or an attack* against another individual, often (but not always) another politician or a political party;
- there should be an *explicit target* against which this criticism or attack is addressed.

(5) Matteo Salvini: *#Torino, quartiere Europa. 1.200 cittadini denunciano INCUBO di vivere con centinaia di #ROM ABUSIVI. Furti, violenze, sporcizia. #Salvini*
'Turin, Europa neighbourhood. 1200 citizens complain about living with hundreds of illegal Roma. Theft, violence, filth. #Salvini'

(6) Matteo Salvini: *Como, marocchino condannato per aver picchiato figlia 12enne. Voleva impedirle di uscire con le amiche. Che bella INTEGRAZIONE! #Salvini*
'Como, a Moroccan man was sentenced for beating her 12 year old daughter. He wanted to stop her from going out with her friends. What a great integration! #Salvini'

In both (5) and (6), the targets of the politicians' criticism are explicitly stated (*illegal Roma* and *a Moroccan man*).

Stance Taking (STK)

- the message includes parts of the political program and/or propaganda (e.g., political slogans);
- the message reflects values and ideological stances of the politician/the party;
- there might be criticism involved, but unlike the CRT function, it is not directly and explicitly addressed to an individual, group or party.

(7) David Cameron: *I'm confident we can get a good deal for Britain in Europe - and we can fix those things that need to be fixed.*

(8) Matteo Salvini: *No alla famiglia fatta da genitore 1 e gen. 2.*
'No to the family made up of parent 1 and parent 2'

In (8), the politician expresses an ideological point of view (i.e., refusing a certain idea of family), while conveying, on the background of the message, a criticism towards the supporters of this idea of family. The specific target, however, is not made explicit nor directly addressed.

Information content (INF)

- The message contains specific spatio-temporal information concerning an event (i.e., a debate, a meeting during a political campaign, participation to a talk show, etc.);
- The message refers to interviews, press articles or public discussions involving the politician or other members of his/her party.

(9) David Cameron: *I'll be making a statement on "Syria: Refugees and Counter Terrorism" in the House of Commons at 330pm today.*

Praise (SPR and OPR):

- Praise to personal achievements or accomplishments of own party (SPR);
 - Praise to other persons, also involving appreciation, condolences, wishes, etc. (OPR).
- (10) Matteo Renzi: *Il merito dei risultati del 41% alle europee. Ci dà forza nel PD come richiamo alla responsabilità di ciascuno di noi*
'The credit for (= We take credit for) 41% of the votes in the European election. It empowers the PD [Partito Democratico, Authors] and serves as a call to responsibility for each of us'
- (11) Ed Miliband: *We won't know the result for a while but I want to say thank you to people who knocked on doors & everyone who voted it.*

Other (OTH)

- No one of the previous categories is easily recognizable. In our dataset, this category was mostly acknowledged in interactional exchanges between the politician and other members of the platform.
 - The message contains aspects of the private lives of politicians (hobbies, personal tastes, family, travels, etc.).
- (12) Matteo Renzi: *@user istat considera 80 euro come aumento di tasse (bonus e non abbattimento irpef). Ma chi riceve 80 euro sa che non è così*
'@user The Istat [Italian Statistics Office, Authors] considers 80 euro as a tax increase (as a bonus and not as Irpef [Italian personal income tax, Authors] reduction) but those who receive 80 euro know that it is not like that'
- (13) Matteo Salvini: *Vi lascio amici, affamato e influenzato...Godetevi la serata*
'Goodnight friends, I am hungry and cold... Enjoy your evening'

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Davide Garassino is a postdoctoral researcher at the University of Zurich (Institute of Romance Studies) and a lecturer at the Zurich University of Applied Sciences (Department of Applied Linguistics). His main research interests concern information structure, implicit communication, and prosody. He is also interested in methodological aspects of corpus-based and experimental research as well as in the use of quantitative methods in linguistics.

Nicola Brocca is postdoctoral researcher at the University of Innsbruck, where he teaches in the field of Italian lexical acquisition (L2), didactics of pragmatics and digital media in communicative approaches. His research interests include the promotion of multilingualism and digitization in teacher education, phraseology, pragmatic aspects of communication in social networks, as well as implicit language especially in relation to the political domain.

Viviana Masia is research collaborator and teaching assistant at the University of Roma Tre. Her main research interests revolve around the neurophysiology of information structure and presupposition processing. She has also worked on the manipulative effects of implicit communication in political discourse as well as on the relation between information structure and evidentiality.