

# Assertion, cooperativity and evidence on X

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## 1 Question and Scope

Cooperative assertion is known to be grounded in a strong veridical commitment and to fulfill *Veridicality Principle* : one must assert  $p$  if and only if one believes or knows  $p$  to be true (see a.o. Searle (1975), Grice (1975), Bach and Harnish, (1984), Davidson (1985), Vanderveken (1990), Harnish (1994), Williamson (1996), Portner (2018), Giannakidou and Mari (2021a), Lauer (2013))

Assertions moreover aim at adding  $p$  to the *common ground* (see a.o. Stalnaker, (1978), (2002); Clark & Brennan, (1991), Traum (1994), Beyssade and Marandin, (2009), Farkas & Bruce (2010), Krifka (2015), Geurts (2019)). Grounding  $p$  in common knowledge is the result of a mutual acceptance phenomena (Clark & Brennan, (1991)) which can be facilitated by different strategies, including indicating one evidence for  $p$  (Grice (1975)).

Inherent credibility has been associated with different types of evidence marked within the discourse (both direct and indirect) (see, e.g., de Haan (1999), Faller (2002)). It has been acknowledged that the type of evidence might influence the groundedness level of  $p$ . For example, indirect evidence could weaken a strong veridical commitment as it is considered weak (see Karttunen (1972), Faller (2002), Krifka (2023)).

In this study we propose to analyze the relationships between the type of evidence and the degree of strength of veridical commitment for assertive statements on X (formerly known as Twitter).

In a recent strand of research, it has been acknowledged that grounding and marking evidence in a discourse might evolve depending on the conversational medium studied (Clark & Brennan (1991)) because of the different constraints and norms of the conversation. We claim that there are new discourse constraints governing social media : a specific algorithm (which discriminates the information disseminated), a delocalization of the

utterance situation, and the use of extralinguistic tools (hyperlinks, #, mention @).

To conduct this survey, we did an empirical study on a corpus of French tweets disseminated online during different ecological crisis (collected by Kozłowski et al (2020), then augmented by Bourgon et al. (2022)) (fires, hurricanes, storms, flooding etc).

We observe a significant markedness of evidence in our corpus and a strong correlation between *Relayed evidence* and *Assertive statements* (or Bare assertions).

We propose to analyze these apparently uncooperative Assertions grounded in Relayed evidence. We claim that the Gricean model is too limited to interpret them and that the norms governing the production of cooperative assertions and of the marking of evidence are redefined on X.

We offer to analyze three new norms governing online discourse on X : (i) *Introduce a topic or sustain interest in it*, (ii) *Mark affiliation to a social group*, (iii) *Veridicality Picture* (following the traditional picture) - the first two norms need a new definition of cooperativity as not only adding  $p$  to the common knowledge of the participants but also as signalling affiliation to a specific group or as indicating the degree of relevance of  $p$  on X.

## 2 Data

Our study relies on a French ecological crises corpus of 13, 378 tweets gathered in 2019 (Kozłowski et al. (2020), Laurenti et al. (2022)) and already annotated for speech acts categories: *Assertives*, *Subjectives*, *Interrogatives*, *Jussives* following Laurenti et al. (2022)'s framework. We will primarily focus on *Assertives statements* which are bare declarative sentences with no mark of subjectivity (no hedges, epistemic modals, or perspectival elements such as 'I believe, in my opinion', predicates of personal taste) (see (1)). Assertives in this view

convey the stronger veridical commitment (Gianakidou & Mari 2021a,b) and aim to add  $p$  to the common ground.

Relying on several categorizations of evidentiality (Aikhenvald (2004), Willett (1988)), including those discussed in the NLP literature (a.o. Castillo et al. (2011), Zahra et al. (2020)), we identified four main type of evidence : *Direct*, *Relayed*, *Loose sources* and *Lack of testimony*.

We will study more in depth the two Reported evidence : *Relayed* (1) and *Loose Source* (2). Relayed evidence on social media is conveyed by extralinguistic markers of information source, most notably hyperlink, mention (@) and less frequently #sourcename. *Loose sources* are marked with a mere # where related information can be found, without a precise link leading to the source of the information conveyed.

- (1) *Relayed : Reported evidence*: des rafales de vent jusqu'à 110 km/h attendues dans l'Yonne  
<http://ift.tt/2EAdBaJ>  
 Wind gust up to 110km/h expected in Yonnes
- (2) *Loose sources : Reported evidence*: #VentViolent cette nuit : forte migration de Normands vers l'Alsace ...  
 #ViolentWind tonight: strong migration from Normandy to Alsace

The annotation of evidence was performed by two annotators with a kappa of 0.7.

We found that the most frequent category is *Relayed* which accounts for 62.64% (see 1). We also studied the correlations between speech acts categories (and especially Assertive statements) and Evidence type categories (see Table 1 for the positive correlations between speech act and evidence type). We observed that *Assertive* statements are highly correlated to *Relayed* evidence and that *Loose Sources* are dispreferred for Assertive Statements. Furthermore, we found a high markedness of information source with 65, 37% of the tweets (on a sample of 1000 tweets).

Evidentiality	Assertive	Subjective	Interrogative	Jussive	Total
Direct	123 (3.92%)	75 (2.39%)	6 (0.19%)	17 (0.54%)	221 (7.04 %)
Relayed	1442 (45.97%)	161 (5.13%)	33 (1.05%)	326 (10.39%)	1962 (62.64%)
Loose Sources	150 (4.78%)	217 (6.92%)	26 (0.83%)	22 (0.70%)	415 (13.23%)
No Testimony	177 (5.64%)	235 (7.49%)	31 (0.99%)	96 (3.06%)	539 (17.18%)
Total	1892 (60.31%)	688 (21.93%)	96 (3.06%)	461 (14.70%)	3137 (100%)

Table 1: Evidence type vs Speech Acts

### 3 Discussion

The strong correlation between Relayed evidence and Assertive statements is a puzzle if we interpret them in the traditional picture of cooperativity (ie the transmission of truthful content with the aim to add it to the common ground) (a.o. Grice (1975)).

We observed that a strong veridical commitment (in assertive statements) can be anchored on X using different types of evidence: direct evidence (pictures or video), relayed evidence (hyperlinks, mentions @, #), loose evidence, or no evidence at all. As the threshold for evidence seems to become more lax, relayed evidence appears to be the preferred type of evidence to ground strong veridical commitments.

We propose that this phenomenon is not a case of uncooperative discourse (as discussed by Frankfurt (2005), Oswald et al. (2016), and Meibauer (2019)) but that it rather fulfills a new definition of cooperativity. We claim that online discourse is governed by three new norms that have emerged due to their unique constraints and features (specific algorithms, the delocalization of the utterance situation, and the extensive use of various extralinguistic tools).

The first norm is the *Veridicality Picture* (or traditional picture). Assertions aim to add a truthful  $p$  to the common ground and are associated with specific evidence, which is chosen based on the speaker's evaluation of its trustworthiness (rather than an inherent reliability associated with its type). The second norm is to *Sustain a Topic*: assertive statements aim to introduce a topic for discussion or to sustain interest in it. We propose that the use of extralinguistic tools, regardless of their function or content, aims to fulfill this goal. The third norm is to *Mark Affiliation to a Social Group*: choosing to discuss a specific topic and indicate specific evidence is a way to emphasize one's belonging to a particular community (ideological, social, political).

### References

- Aikhenvald, Alexandra Y. *Evidentiality*. OUP Oxford, 2004.
- Bach, K. and R. M. Harnish (1984). *Linguistic communication and speech acts*. 2nd edition, Cambridge [Mass.] ; London : MIT Press.
- Beyssade, C. and J.-M. Marandin (2009). Commitment: une attitude dialogique. *Langue française* (2), 89–107.

- Bourgon, N., F. Benamara, A. Mari, V. Moriceau, G. Chevalier, L. Leygue, and Y. Djadda (2022). Are sudden crises making me collapse? measuring transfer learning performances on urgency detection. In R. Grace and H. Baharmand (Eds.), *19th International Conference on Information Systems for Crisis Response and Management, IS-CRAM 2022*, Tarbes, France, May 22-25, 2022, pp. 701–709. ISCRAM Digital Library.
- Castillo, C., Mendoza, M., & Poblete, B. (2011, March). Information credibility on twitter. In *Proceedings of the 20th international conference on World wide web*.
- Clark, H. H., & Brennan, S. E. (1991). Grounding in communication. In L. B. Resnick et al (Eds.), *Perspectives on socially shared cognition* (pp. 127–149). *American Psychological Association*.
- Davidson, D. (1985). Communication and convention. *Dialogue: An interdisciplinary approach*, 11–26.
- De Haan, F. (1999). Evidentiality and epistemic modality : setting boundaries. *Southwets Journal of Linguistics*. 18 (1), pp83–101.
- Faller, M. T. (2002). *Semantics and pragmatics of evidentials in Cuzco Quechua*. Stanford university.
- Farkas, D. F. and K. B. Bruce (2010). On reacting to assertions and polar questions. *Journal of semantics* 27 (1), 81–118.
- Frankfurt, H. G. (2005). *On Bullshit*. Princeton, NJ: Princeton University Press
- Geurts, B. (2019). Communication as commitment sharing: speech acts, implicatures, common ground. *Theoretical linguistics* 45 (1-2), 1–30.
- Giannakidou, A., & Mari, A. (2021a). *Truth and veridicality in grammar and thought: Mood, modality, and propositional attitudes*. University of Chicago Press.
- Giannakidou, A., & Mari, A. (2021b). A Linguistic Framework for Knowledge, Belief, and Veridicality Judgment. *KNOW: A Journal on the Formation of Knowledge*, 5(2), 255-293.
- Harnish, R. M. (1994). Mood, meaning and speech acts. In S. L. Tsohatzidis (Ed.), *Foundations of Speech Act Theory: Philosophical and Linguistic Perspectives*, pp. 407–459. Routledge.
- Karttunen, L. (1972). Possible and must. In *Syntax and Semantics Volume 1*, pp. 1–20. Brill.
- Kozlowski, D., E. Lannelongue, F. Saudemont, F. Benamara, A. Mari, V. Moriceau, and B. A. (2020). A three-level classification of french tweets in ecological crises. *Information Processing & Management*. 57 (5), 1–46.
- Krifka, M. (2015). Bias in commitment space semantics: Declarative questions, negated questions, and question tags. In *Semantics and linguistic theory*, Volume 25, pp. 328–345.
- Krifka, Manfred Fereshteh, M. (May 3, 2023). Modifications of assertive commitments and their effect on trustworthiness. ERC Advanced Grant Horizon 2020 787929 SPAGAD: Speech Acts in Grammar and Discourse Construction of Meaning Series Stanford University.
- Lauer, S. (2013). *Towards a Dynamic Pragmatics*. Ph. D. thesis, Stanford University.
- Laurenti, E., N. Bourgon, F. Benamara, A. Mari, V. Moriceau, and C. Courgeon (2022). Give me your intentions, i'll predict our actions: A two-level classification of speech acts for crisis management in social media. In N. Calzolari et al (Eds.), *Proceedings of the Thirteenth Language Resources and Evaluation Conference, LREC 2022*, Marseille, France, 20-25 June 2022, pp. 4333–4343. European Language Resources Association.
- Laurenti, E., Bourgon, N., Benamara, F., Mari, A., Moriceau, V., & Courgeon, C. (2022, July). Speech acts and communicative intentions for urgency detection. In *11th Joint Conference on Lexical and Computational Semantics (\*SEM 2022)*. *ACL: Association for Computational Linguistics*.
- Meibauer, J. (2019). *The Oxford handbook of lying*. Oxford Handbooks.
- Oswald, S., L. d. Saussure, and D. Maillat (2016). Deceptive and uncooperative verbal communication. *Verbal communication (Handbooks of communicative science 3)*, 509–534
- Portner, P. (2018). *Mood*. Kettering, Northamptonshire, UK: Oxford University Press.
- Stalnaker, R. C. (1978). Assertion. In *Pragmatics* (pp. 315-332)
- Stalnaker, R. (2002). Common ground. *Linguistics and philosophy*, 25(5/6), 701-721.
- Vanderveken, D. (1990). Meaning and speech acts. *Principles of Language Use*. Cambridge: Cambridge University Press. Vol.1.
- Williamson, T. (1996). Knowing and asserting. *The Philosophical Review*, 105(4), 489-523.
- Zahra, K., Imran, M., & Ostermann, F. O. (2020). Automatic identification of eyewitness messages on twitter during disasters. *IP&M*, 57(1).