

Language as a tool: Acceptance-based Pragmatics

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ABSTRACT

In this research, the communicative level of dialog or interaction is seen as the co-construction of a linguistic tool by dialog partners. The background mental attitude enabling such a practical reasoning is acceptance [3, 4]. The distinction between belief and acceptance is here based on their functional role: truth-oriented versus goal-oriented [8] - that is - by extension - encapsulating facts (declarative knowledge) versus tools (procedural knowledge). In order to precisely define this new mental attitude which is acceptance, its relationship with belief and communicative action, this research aims at developing a rational model of dialog [13] as well as specifying a cognitive architecture.

This approach contributes to the explanation of human behavior by refashioning the notion of cooperative speaker. This enables to mix reasoning-based approaches and reuse-based approach of collaborative view of dialog. Additionally, the notion of Acceptance and more especially its social counterpart - Collective Acceptance respects the properties of co-constructed linguistic tools. Enabling a system to both rely different perspectives (its own point of view, their addressees one or common/shared beliefs) or on existing linguistic tools built during the preceding interactions enhances system's flexibility and rationality [5, 14].

KEYWORDS

Dialog Model, Speech Act, Belief and Acceptance

1 RESEARCH QUESTION / MOTIVATION

Common ground corresponds to beliefs and knowledge shared by a group of people (ex. Swedish speakers share the knowledge of Swedish words meaning, two people at the same place share the same situational context, and so on). Common ground is a central notion within the collaborative view of dialog. On the theoretical side, a fine-grained model as well as a full understanding of its use, establishment and maintain are still needed.

Or rather:

- (1) A precise characterization of Common Ground is needed as there is a lot of confusion around this concept regarding its roles in dialog or confusion between its characterization, representation and the way it is established, for instance.
- (2) Existing formal models lead to an intractable representation and cognitive use that is incoherent with how human being easily rely on it. We claim that the traditional view of social epistemic states characterize as a function of individual beliefs and based on a single modality has to be replace by a ca non-summative view including several modalities. Our work is based on recent advances in Philosophy of Mind

which enlighten the notion of Acceptance and Collective Acceptance.

- (3) Existing formal models lead to an intractable representation and cognitive use that is incoherent with how human being easily rely on it. We claim that the traditional view of social epistemic states as being summative and based on a single modality has to be replaced by a characterization enabling different kind of compartmentalization with individual beliefs including several modalities. Our work is based on recent advances in Philosophy of Mind which enlighten notably the notion of Acceptance and Collective Acceptance.
- (4) Within the collaborative view of dialog, relying on common ground while generating or interpreting an utterance ensure mutual understanding. It's the expected rational and cooperative behavior of dialog partners. However, experimental and cognitive psychology show that dialog partners may rely on different perspective and switch between low-level and high-level reasoning processes. We claim that our view of dialog based on the notion of Acceptance is an explanatory model for this phenomenon.

2 BACKGROUND AND RELATED WORK

Integrating new kind of modal operator to model common ground has been integrated in formal model of interaction:

- In the Multi-agent-Systems field, an alternative definition of acceptance is used to model public facts [6]
- In order to enable compromise in argumentative dialog, Michael Baker [1, 2] use the same definition of collective acceptance to formalize the result of a negotiation process. Paglieri & Castelfran- chi [8] use the distinction between belief and acceptance to distinguish argumentation that is truth-oriented from argumentation that is goal-oriented.
- On the Pragmatic level, we have emphasize the advantages of including the distinction between belief and acceptance [11, 13].

3 RESEARCH METHODOLOGY

The aim of this work is twofold:

- (1) A characterization of Common Ground based on several mental attitudes (Common Beliefs, Shared Beliefs, Collective Acceptance). The key idea is based on the fact that Common Ground have several function in dialog (a possible motivation for dialog is to establish coordination for team members, the aim is to establish mutual understanding, a mean to ensure the grounding process).
- (2) We find interesting for dialog modeling to develop an approach allowing several characterization of rationality for each function as well as different kind of related object.

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We have three lines of works:

- (1) Developing theoretical fundamentals on the need of several mental attitudes to characterize Common Ground generally speaking and more specifically for dialog modeling. Defining Acceptance-based Pragmatics means to refashion a couple of fundamental notions in Pragmatics such as Cooperative Speaker, Speech Act Theory or the Semantics-Pragmatics interface.
- (2) In order to specify Acceptance in a dialog context, we are developing a rational model of dialog. Rational models, based on [10], can be considered as a logical reformulation of plan-based models. They integrate, in more, a precise formalization of dialog partners' mental states (their beliefs, choices (or desires) and intentions), of the rational balance which relates mental attitudes between them and relates mental attitudes with agents acts. Moreover, dialogue acts' preconditions and effects are expressed in terms of dialog partners' mental states. Thus, this is hopeful to model precisely mental attitudes.
- (3) Developing a cognitive architecture and extending a agent-programming language such as AgentSpeak. [9]

4 RESULT TO DATE

In recent works [12], We have argued that our approach contributes to the explanation of human behavior by refashioning the notion of cooperative speaker, by mixing reasoning-based approaches of perspective-taking and reuse-based approaches and by respecting properties of co-constructed linguistic tools.

In addition, looking forward a cognitive architecture of memory, we have extended the belief and acceptance distinction with a facts (declarative knowledge) versus tools (procedural knowledge) distinction. To provide a cognitively grounded definition of the semantics of Acceptance and Acceptance-based Pragmatics, we have presented preliminary elements based on the cognitive basis of tool use [7].

REFERENCES

- [1] Michael Baker. 1994. A model for negotiation in teaching-learning dialogues. *Journal of Interactive Learning Research* 5, 2 (1994), 199.
- [2] Michael J Baker. 2015. Collaboration in collaborative learning. *Interaction Studies* 16, 3 (2015), 451–473.
- [3] Michael E Bratman. 1992. Practical reasoning and acceptance in a context. *Mind* 101, 401 (1992), 1–15.
- [4] L Jonathan Cohen. 1992. An essay on belief and acceptance. (1992).
- [5] Gilles Coppin, François Legras, and Sylvie Saget. 2009. Supervision of autonomous vehicles: mutual modeling and interaction management. In *International Conference on Engineering Psychology and Cognitive Ergonomics*. Springer, 489–497.
- [6] Benoit Gaudou, Dominique Longin, Emiliano Lorini, and Luca Tummolini. 2008. Anchoring institutions in agents' attitudes: towards a logical framework for autonomous multi-agent systems. In *Proceedings of the 7th international joint conference on Autonomous agents and multiagent systems-Volume 2*. International Foundation for Autonomous Agents and Multiagent Systems, 728–735.
- [7] François Osiurak and Arnaud Badets. 2016. Tool use and affordance: Manipulation-based versus reasoning-based approaches. *Psychological review* 123, 5 (2016), 534.
- [8] Fabio Paglieri. 2006. Belief dynamics: From formal models to cognitive architectures, and back again. *Unpublished doctoral dissertation, University of Siena* (2006).
- [9] Anand S Rao. 1996. AgentSpeak (L): BDI agents speak out in a logical computable language. In *European Workshop on Modelling Autonomous Agents in a Multi-Agent World*. Springer, 42–55.
- [10] M David Sadek. 1991. Dialogue acts are rational plans. In *The Structure of Multimodal Dialogue; Second VENACO Workshop*.
- [11] Sylvie Saget. 2006. In favour of collective acceptance : Studies on goal-oriented dialogues. *Collective Intentionality V* (2006).
- [12] Sylvie Saget. 2018. Language as a tool: Acceptance-based Pragmatics. In *Poznań Reasoning Week - Logic and Cognition*.
- [13] Sylvie Saget and Marc Guyomard. 2006. Goal-oriented dialog as a collaborative subordinated activity involving collective acceptance. *brandial'06* (2006), 118–131.
- [14] S. Saget, F Legras, and G. Coppin. 2008. Cooperative interface for a swarm of UAVs. In *Proceedings of the first conference on Humans Operating Unmanned Systems (HUMOUS'08)*.