Topic and genre in dialogue

Amandine Decker[1,2], **Ellen Breitholtz**[2], **Christine Howes**[2] and **Staffan Larsson**[2]

[1]Université de Lorraine

`amandine.decker@loria.fr`

[2]University of Gothenburg

`{ellen.breitholtz,staffan.larsson}@ling.gu.se`, `christine.howes@gu.se`

1 Introduction

In this paper we argue that *topic* plays a fundamental role in conversations, and that the concept is needed in addition to that of genre to define interactions. In particular, the concepts of genre and topic need to be separated and orthogonally defined. This would enable modular, reliable and controllable flexible-domain dialogue systems.

In communicative activities, genre and topic tend to be interleaved in the sense that the manner in which a particular topic is addressed can differ significantly across various genres. For instance, a conversation about politics may unfold differently in a formal debate compared to a casual conversation among friends, and a recipe for a dish can be the topic of an instructional dialogue, or a discussion among participants as how to best prepare the dish.

Analysing the influence of genre on the treatment of topics would allow us to understand how general features of interaction are adapted to specific conversations. In this paper we discuss the treatment of topics and genres in different linguistics theories and how studying the way they influence each other may help designing reliable and controllable open-domain dialogue systems that could be adapted to task-oriented conversations in many different domains.

2 Topic and genre in linguistic theories

There are several areas of research which aim to categorise interactions in ways that are predictive of their communicative (including linguistic) features. These theories are based on a variety of concepts such as (social) (communicative) *activity* (Allwood, 2000), (communicative) *project*, *frame* (Levin and Moore, 1977; Carlson, 1982), (language) (dialogue) *game* (Lewis, 1979; Ginzburg, 2012), *genre* (Wong and Ginzburg, 2018), etc.

When defining genres, a frequently used concept is that of *activity* in the context of which language occurs. On Allwood's account an activity type is characterised by the *goals*, *roles*, *artefacts* and *environment* that are associated with it. The carrying out of an activity consists of a number of sub-goals being completed. These may be more or less communicative in nature. For example, instances of the activity type "Buying/selling coffee in a café" are made up of sub-goals such as "conveying which product one wants to order", "conveying how much the costumer should pay", and, finally, "paying/receiving money". These sub-goals could be topics in a discussion carrying out the activity type "Buying/selling coffee in a café" but they could be organised in many ways with for example all the topics following each other linearly or on the contrary being all embedded in each other.

Similarly, genres can be seen as a set of actions that must be realised, or a set of questions under discussion that must be resolved (Ginzburg, 2016), to make a certain interaction successful. In that sense, the genre sets the minimal requirements in terms of outcome for a conversation but it does not say anything on the content of it beyond these requirements. Besides, while genre constrains the surface structure, content plays an important role in the detailed one. Formalising topics and understanding the way they can be articulated could help modelling a hierarchical structure of content.

Topics have been discussed in different ways in the literature, the definitions mostly vary by their granularity. A sentence topic (Bolinger, 1952; Firbas, 1964; Halliday, 1967; Givón, 1983) is an element of the sentence, usually a noun phrase, that the sentence comments on (Hockett, 1958). *Discourse topics*, on the other hand, are not necessarily explicit. They refer to what a piece of discourse is about, though the formalisation of this "aboutness" is debated. Discourse topics have been defined as based on the "question of immediate concern" (Keenan et al., 1983), explicitly stated or not, or as

"the proposition or set of propositions that the question of immediate concern presupposes" (Schieffelin and Keenan, 1976). Discourse topics are also considered in the frame of certain discourse modelling theories such as Segmented Discourse Representation Theory (SDRT) (Asher, 2004). Coming up with a theory organising these different levels of granularity would enable us to come up with a hierarchical modelling of topics (Teh et al., 2006).

3   Variability in dialogue

The fulfilment of a conversation goal can be achieved in many different ways, encompassing linguistic and extra-linguistic elements, and their various combinations. Consider a scenario at a café where a customer wishes to order a drink. This goal can be accomplished by pointing at the desired drink, providing a verbal description, employing both actions simultaneously, or in some cases, no action may be necessary if the customer is a regular one with a well-known preference. The diverse range of methods exemplifies the flexibility inherent in achieving conversation goals.

The straightforwardness of attaining conversation goals also varies. Sometimes, intermediate questions need to be resolved before reaching a final decision. For instance, a customer may inquire about the type of milk used in the café and only place their order once they know which drinks are lactose-free. In such cases, the fulfilment of the conversation goal is contingent upon gathering additional information and resolving relevant queries. Such examples show how a straightforward request for action can sometimes turn into something more complex, where information is requested and different alternatives can be discussed and compared.

Conversations may also deviate from a strictly goal-oriented path, allowing for detours and tangential discussions. For instance, while inquiring about a specific product, an individual might share an anecdote related to the product itself. Questions about lavender cookies could trigger memories of holidays in Provence and lead to a spirited debate about the finest variety of lavender or even spark a discussion about the seller's vacation plans. Such diversions from the primary topic rely on the participants' freedom and inclination to explore different avenues within the conversation.

While many conversational goals are associated with a default genre (and related dialogue structures), it sometimes happens that dialogue participants deviate from these defaults. The extent to which default structure diverge from the original goals of a conversation is likely influenced by the genre of the conversation and its level of formality or standardisation. Additionally, the social aspect of the interaction also plays a central role. It appears that conversations with a greater social orientation tend to afford participants more freedom to deviate from the central goal.

4   Application to dialogue systems

Variability in dialogue is a challenge for general-purpose dialogue models. There may well be an open-ended universe of dialogue genres (language games, dialogue types), which we cannot hope to map out (Wittgenstein, 1953). In any case only a limited number of dialogue genres has so far received attention from the dialogue systems / conversational AI community (including industry). Having a better understanding of the way topics and genre interact could help creating a more modular and general framework that could be fine-tuned for more specific tasks.

Different dialogue genres will be associated with different kinds of dialogue patterns. In a sense, a notion of dialogue genre is not strictly necessary for dialogue systems. What is needed in each domain is dealing with the dialogue patterns that appear there. However, we believe that the notion of genre can serve as a powerful abstraction, allowing dialogue designers to understand which dialogue patterns are relevant in a domain.

5   Discussion

Distinguishing genre and topic and treating the two as orthogonal contributing factors could provide insights regarding the structural analysis of conversation. In terms of dialogue systems it would improve the adaptation of the model's interventions based on the current topic and its links to the previous ones as well as the type of conversation. However, topic modelling is a complex task even for human annotators (Purver, 2011) and creating guidelines to annotate dialogues based on the topics they discuss and the hierarchy between them is not a trivial problem. Such an annotation guide would make it possible to analyse the differences in terms of topical structure between different types of conversations and make dialogue systems adaptable to specific genres of conversations following this analysis.

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