Characterization of Discourse Salience in English Social Dialogs and its Application to Assessing Interactional Competence of Social Dialog Systems

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1 Characterization of Discourse Salience in English Social Dialogs

[1]To gain better insights into the co-constructed nature of meaning in social conversation, I conducted an empirical study of **discourse salience** in naturally occurring English casual dialogs. First, expert annotators are asked to put themselves in conversational participants' shoes and rely on their communicative competence to recognize the main point (most salient content) in the arguments of *2529* discourse relations annotated in NEWT-SBCSAE, a publicly accessible corpus of naturally occurring casual dialogs in American English (Du Bois et al., 2000; Riou, 2015; Lưu and Malamud, 2020), taking into account the interlocutors' shared social goal as defined in Lưu (2022b)[2]. In addtion, they annotate different linguistic aspects characterizing the salient content of utterances including its directionality (i.e. whether it is backward- or forward-looking) and information packaging (i.e. the given-new ordering of information and syntactic variations for realizing that ordering). The detailed annotation guidelines and outcomes are publicly accessible at https://alexluu.flowlu.com/hc/6/274--discourse-salience/. In this paper, I use the annotated data to systematically characterize discourse salience in English social dialogs, which directly relevant to social dialog system evaluation (Section 2) and modeling (future work).

1.1 Distribution of Discourse Relations

Figure 1 shows the distribution of all annotated discourse relation types. It is clear that social dialog is

Figure 1: Distribution of discourse relations.

by no means dominated by question–answer pairs (category 'interaction–query'). In fact, it is full of 'feedback' and utterances functioning across multiple sociocultural dimensions such as 'prominence-2', 'emphasis-repetition', 'positioning-evaluation', 'evaluation', 'positioning' and 'alignment'. These observations has several implications:

- Human users who wants to test a social dialog system should diversify their conversation moves instead of adhering to the question–answer pattern and informational dimension.
- Social dialog systems' conversational strategies should cover all sociocultural dimensions and leverage the power of simple 'feedback'.

1.2 Directionality of Discourse Salience

The directionality of discourse salience is showed in Figure 2, revealing that backward-looking salient content is much less popular than salient content that is both backward- and forward-looking. In addition, the 2nd argument of non-prominent 'feedback' and Q-relations ('interaction–query' and 'interaction–other') are more probable to be only backward-looking salient content. Hence, salient content that is both backward- and forward-looking is preferred; and if such content is not available, non-prominent 'feedback' is a safe choice.

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[1]This paper's live version is located at https://osf.io/yvjgb/.

[2]This goal is to create a coherent experience of together making sense of Self, the Other, and the relationship between them. Within this shared goal, performing a conversational move implies taking a public social act of simultaneously (1) evaluating the subject matter discussed in that move, (2) positioning interlocutors, and (3) aligning with other interlocutors, with respect to any salient sociocultural dimension such as informational, affective or normative.
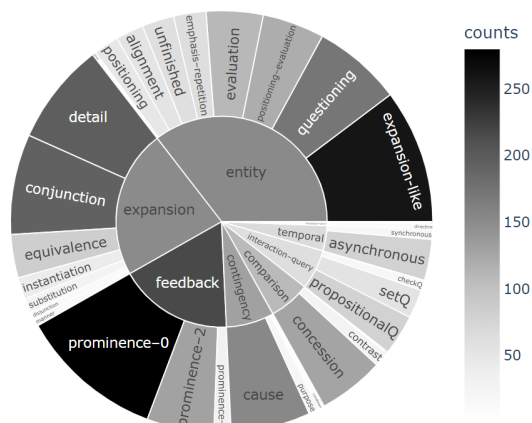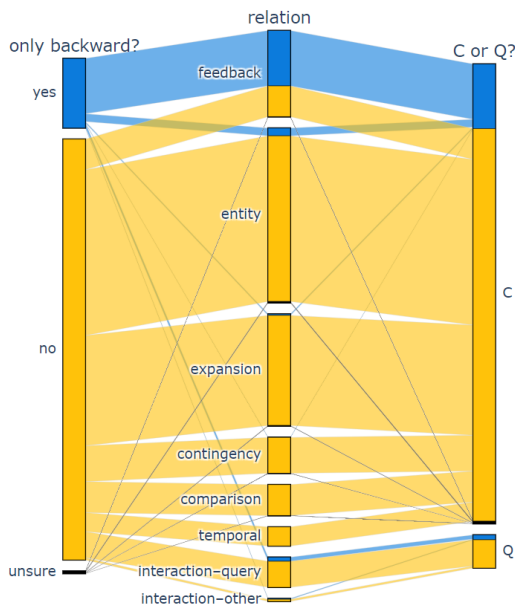
Figure 2: Directionality of at-issue content in the second arguments of informational coherence relations (C and Q are C-relations and Q-relations respectively.

1.3 Information Packaging of Discourse Salience

Figure 3 shows information packaging of discourse salience. The minor portions of new-before-given and noncanonical word order cases confirm the preference of given-before-new information ordering and canonical word order (CWO) in naturally occurring discourse (Prince, 1992; Birner, 2012, inter alia). In addition, all new-before-given cases are realized in CWO, and can be classified in two categories (see more detail in Lưu, 2022a):

- dialogic resonance (Du Bois, 2014)
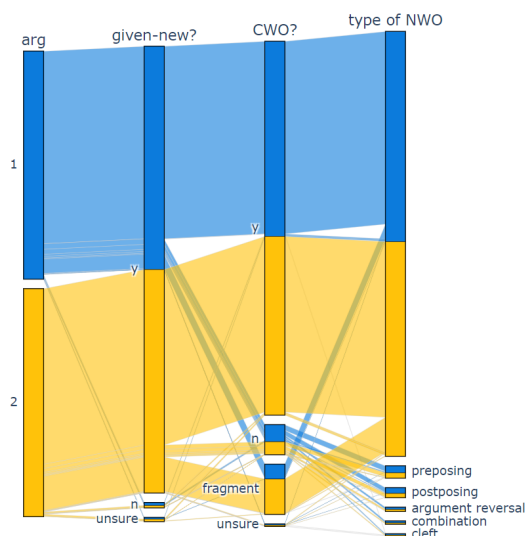- non-informational emphasis (Lưu, 2022b)

Figure 3: Information packaging of discourse relations.

2 Application to Assessing Interactional Competence of Social Dialog Systems

Questioning the status quo of research on human–computer communication, Kopp and Krämer (2021) argue that we should prioritize modeling the key aspects of mutual understanding in conversation, instead of surface-level behaviors learnable from data. Consequently, adequate evaluation of dialog systems should take into account their **interactional competence** (IC) (e.g. Galaczi and Taylor, 2018, inter alia), which captures the real-time context-sensitivity of interlocutors' meaning interpretation and production.

Based on the characterization of discourse salience presented in Section 1, we can identify a social dialog system's IC by whether its responses:

- pick up on forward-looking salient content in prior discourse
- contribute new content which
  - can be forward-looking salient content or simple feedback
  - is relevant to and consistent with prior discourse with respect to different sociocultural dimensions (see detailed discussion in Lưu, 2022b, pp.155–157)

In addition, to create an adequate setup for the interaction between human evaluators and social dialog systems, we can adopt the concept of **scaffolding conversation** (Imberi-Olivares, 2012), originally referring to an important learning avenue for children in social interaction and based on the notion of scaffolding in developmental psychology (Vygotsky, 1978; Bruner, 1975; Wood et al., 1976). Being applied to human–computer communication, scaffolding conversation[3] is conducted in such a way that human interlocutors, as the more competent conversants, actively adjust their conversational moves to increase dialog systems' IC. To successfully converse with humans in scaffolding conversation is a realistic goal of social dialog systems, and the analysis of problematic conversational moves can directly inform the systems' improvement. Moreover, scaffolding conversation allows human interlocutors to raise the bar in a systematic and constructive manner when social dialog systems become more and more competent.[4]

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[3]This is comparable to a specific strategy of inquiry in the communication game in the Question Under Discussion framework (Roberts, 1996/2012), except for the fact that social conversation is not only about information exchange or inquiry.

[4]Based on the principles proposed in this section, I develop an expert human evaluation protocol publicly accessible here.

Acknowledgements

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