

Dodging the Question in Competitive Spoken Dialogs: Semantic and Prosodic Characteristics

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Motivation The dimensions of conversational non-cooperation [5] and dependence relations of responsive dialogue acts [1] are so far less incorporated in spoken dialog research. We focus on a specific conversational strategy in spoken dialog: the avoidance of providing solicited information. We compare the prosodic and semantic characteristics of replies that emerged in such contexts, based on a corpus that holds task-solving human-human dialogues in competitive vs cooperative scenarios. We hypothesize that in competitive settings, respondents will instrumentalize various communicative means to dodge their partner’s question, and these strategies exhibit characteristic patterns in terms of prosody and content semantics depending on the scenario.

Data processing We used parts of the Illinois Game Corpus [4] that contains Tangram game dialogs by American English speakers in cooperative and competitive settings. The data was dialog act annotated with the tagset of [2]. We selected all acts related to questions about task-solving, for which either new content or the grounding of content is expected by the interlocutor who solicits the information (yes-no- and wh-questions, and checks). We manually defined and automatically linked the set of appropriate, inappropriate, and missing replies provided to such dialog acts, and extracted turn taking latencies. We then characterized the replies in terms of content and speech signal. To obtain semantic markers, we applied robust text analyses methods to measure the amount of new vocabulary and new information in replies, and scored their sentiment using the NLTK toolkit¹. The prosodic variables were mainly derived from computational superpositional intonation stylization [6] and reflect F0 register, local F0 movements, as well as energy and speech rate characteristics.

Results For competitive dialogs compared with cooperative ones we found amongst others:

- a higher amount of inappropriate and missing replies as well as larger turn-taking latencies,
- a lower positive and a higher negative sentiment score,
- a lower amount of new vocabulary, and a lower entropy,
- a stronger F0 declination trend, and at the same time
- a higher F0 register with respect to both level, and range, as well as
- an overall higher energy.

We conclude that these content- and signal-based results indicate for the given corpus that (1) competitive behavior tends to manifest itself in holding back information, which (2) requires a high cognitive workload. (1) is mainly expressed in the entropy, vocabulary size and F0 declination findings, while (2) is marked via turn-taking latencies as well as high F0 register and energy, the latter in line with findings of e.g. [3]. The results will be further discussed in the context of the Gricean Maxims, Relevance Theory, and dialogue annotation scheme design.

References

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¹<http://www.nltk.org/howto/sentiment.html>