

Automatic intention recognition in conversation processing [☆]

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Abstract

A fundamental assumption of many theories of conversation is that comprehension of a speaker's utterance involves recognition of the speaker's intention in producing that remark. However, the nature of intention recognition is not clear. One approach is to conceptualize a speaker's intention in terms of speech acts [Searle, J. (1969). *Speech acts*. Cambridge, England: Cambridge University Press]. Four experiments were conducted to examine whether speech acts play a role in language comprehension. Participants performed either a recognition probe task or a lexical decision task after being exposed to utterances that performed specific speech acts (e.g., warn) or to carefully matched controls. Consistent with speech act theory, participants recognized the speech acts that speakers performed with their utterances. This recognition was automatic and occurred for both written and spoken utterances and for both observers and participants. Speech acts capture in a single word the action a speaker is performing with an utterance and this allows for efficient (good-enough) processing of conversation turns.

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Introduction

What does it mean to comprehend a conversation remark? Is it roughly equivalent to comprehending a sentence in isolation? Is it the same as comprehending the meaning of a sentence embedded in a text? When people understand another person's remark, what is it that they understand? In other words, what exactly is the nature of conversation comprehension?

In this paper I argue that comprehending conversation utterances involves an action dimension. People conversing with one another are using their words to perform actions, and understanding the meaning of

those words involves recognizing the actions that are being performed.

Conversation processing

Conversations differ from other types of discourse in numerous ways (Clark & Brennan, 1991; Pickering & Garrod, 2004; Schober & Brennan, 2003). For example, interlocutors are physically co-present and hence paralinguistic and nonverbal behaviors play an important role in conversation production and comprehension. Moreover, because interlocutors are face-to-face, there are interpersonal considerations that will influence what people say and how it is interpreted (Brown & Levinson, 1987; Goffman, 1967; Holtgraves, 1998). Also, conversing is cognitively demanding because interlocutors must produce and comprehend utterances very quickly and almost simultaneously. Unlike most written texts,

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conversation utterances are generally relatively ill-formed and contain false starts, hesitations, disfluencies, and so on (Clark, 1996).

Because of the real-time demands on conversationalists, it seems likely that conversationalists will not fully process each conversational turn. That is, conversationalists will not engage in a full-blown syntactic/semantic analysis of each remark. Instead, processing will reflect a more heuristic, on-the-fly approach, or what has been referred to as good-enough processing (Ferreira, Bailey, & Ferraro, 2002; Sanford & Stuart, 2002). Good-enough processing refers to instances in which comprehension involves an interpretation of language that is less than complete and precise but is good-enough for current purposes. On this view, sentence meaning is not always derived compositionally (i.e., built up from the meaning of individual words organized into hierarchical units). Instead, interpretations are sometimes derived from an integration of salient contextual information, easily accessible grammatical cues, and lexical meaning. This is one of the reasons that people sometimes normalize strange sentences as in the Moses illusion (Barton & Sanford, 1993; Erickson & Mattson, 1981:), or why people sometimes view passive versions of implausible sentences (e.g., the dog was bitten by the man) as being plausible (Ferreira & Stacey, 2001). Failure to detect these types of anomalies suggest that comprehenders are relying on prior knowledge and the meaning of the content words rather than deriving meaning from a full-semantic analysis of the sentence. Moreover, research suggests that initial misinterpretation of a sentence will persist after the original misinformation has been corrected (Christianson, Hollingworth, Halliwell, & Ferreria, 2001). There has been increasing awareness of the pervasiveness of this type of shallow processing (see e.g., Sanford & Graesser, 2006), not just in conversations but in text processing in general. Given the cognitive demands involved in conversation processing, it seems likely that good-enough processing should occur with some regularity during conversations.

What constitutes good-enough processing of a conversation utterance? One likely candidate in this regard is a quick take on the speaker's *intention* in producing a conversation turn. There are several reasons for this. First, humans appear to have both the need and the ability to interpret others as intentional agents, to see others' actions (including their talk) as a result of their intentional states (Carson, 2002; Gibbs, 1999; Malle, 2002; Sperber & Wilson, 2002). Second, fundamental to most theoretical approaches to conversation is the assumption that comprehension of a conversation utterance involves recognition of the speaker's intention, a recognition of what the speaker is attempting to accomplish with the utterance. Originally articulated by Grice (1957), this assumption is fundamental to many psychological theories of comprehension (Gibbs, 1999, 2003), as well as rel-

evance theory (Sperber & Wilson, 1986, 1995, 2002), speech act theory (Austin, 1962; Searle, 1969, 1979), and certain computational models of discourse comprehension (Cohen & Perrault, 1979; Stone, 2005).

Finally, intention recognition is important in conversations because in order for a conversation to proceed, interactants must have some understanding of each other's conversational turns, an understanding of what each person is attempting to accomplish with a remark (Clark & Schaefer, 1989). The structure of conversations reflects this concern as interactants quickly indicate their understanding (or lack thereof) through their talk (Atkinson & Drew, 1979; Clark, 1996; Davidson, 1984; Pomerantz, 1984; Sacks, Schegloff, & Jefferson, 1974). Clearly, conversationalists are mutually oriented toward an understanding of each others' communicative intentions.

Approaches to intention recognition

Although there is clear consensus regarding the importance of intention recognition in communication, there are disagreements regarding the nature of that recognition. According to speech act theory (Austin, 1962; Searle, 1969, 1979), conversational utterances involve the simultaneous performance of multiple acts: a locutionary act (i.e., propositional meaning), an illocutionary act (i.e., the force associated with the use of the utterance in a specific context) and a perlocutionary act (i.e., the effects on the recipient of the performed speech act). It is the illocutionary act that most closely captures the nature of the speaker's intention in producing a particular conversation turn. For example, when Bob says to Andy "I definitely will do it tomorrow", his utterance in many contexts will have the illocutionary force of a promise. On this view, then, understanding someone's conversation utterance entails recognition of the illocutionary force of the utterance. That is, Andy's understanding of Bob's utterance requires him to recognize that Bob is performing a promise. Note that the illocutionary force (or speech act) is not the same as the illocutionary point of an utterance. The latter is a high-level organizing scheme based on the direction of fit between one's words and the world and includes five categories (directive, assertive, commissive, expressive, declarative). Within each of these five illocutionary points are more specific illocutionary acts (e.g., warn, thank, brag, beg, etc.) that capture the specific intentional action the speaker is performing with the utterance (see Searle & Vanderveken, 1985).

An important distinction can be made between speech acts that are explicit and those that are implicit. Explicit speech acts (referred to as explicit performatives by Austin, 1962; see also Bach, 1994) are utterances that contain the performative verb, the verb that names the speech act being performed with the utterance. One

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