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Authors

Wege, Mija Van Der

Clark, Herbert H.

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Turn-taking Systems for Computer-Mediated Communication

Mija Van Der Wege and Herbert H. Clark

Department of Psychology

Stanford University

Stanford, CA 94305-2130

{mija, herb}@psych.stanford.edu

Introduction

Taking turns is an integral part of our everyday lives. It is needed whenever a resource is scarce, in demand, and can only be used serially. In some activities, such as using a copier machine, these criteria are obvious, but in others, they are not. In face-to-face conversation, for example, people are limited in perception and attention, so turns seem inevitable. But what about other communication media? And where do turns really come from?

One class of theories assumes that taking turns is rule-governed. In this view, people in face-to-face conversation regulate their turns via verbal and non-verbal signals (Duncan, 1972) and follow certain rules of turn-taking (Sacks, Schegloff, & Jefferson, 1974). It is often assumed that these same rules apply in other media as well. According to McKinley et al. (1994), for example, interactive computer-mediated communication should be most efficient when it is regulated by explicit turn-taking rules.

An alternative theory is that turns in communication are not the result of rules, but emerge from the collaborative actions of the participants. This theory is based on two general principles: grounding and least collaborative effort (Clark, 1996; Clark & Wilkes-Gibbs, 1986). According to grounding, the participants try to establish the mutual belief that they have understood each message. According to least collaborative effort, they try to do this in the most efficient collaborative manner.

In this study, we compare the predictions of the two types of theories with regard to overlaps in spontaneous communication. In the rule-governed theories, overlaps are considered violations of the rules and should be minimized. Their frequency may increase in media in which conventional turn-taking is more difficult, but the overlaps should remain brief as the participants try to minimize these violations. According to the collaborative emergence theory, in contrast, both overlap frequency and length should increase in media in which they are useful for grounding with least collaborative effort.

Methods

We analyzed 18 face-to-face (79K words) and 31 telephone (31K words) conversations from the London-Lund corpus. We also analyzed 22 conversations (32K words) by people using Unix Talk, a text-based computer-mediated system

that allows instantaneous and simultaneous communication; we collected these conversations from pairs of students who were asked to solve a series of logic puzzles.

Results and Discussion

The number, lengths, and types of overlaps in these 71 conversations supported collaborative emergence. As predicted, there were more overlaps in the computer-mediated than in the face-to-face or telephone conversations (27.44 per 1000 words vs. 20.99 and 17.37, respectively; $F[1,68] = 12.76$, $p < .001$). Also, overlaps were longer in the computer-mediated conversations than in the other two media (5.71 vs. 5.16 and 4.55, respectively; $F[1,68] = 5.97$, $p < .02$).

Turn-taking in computer-mediated communication, therefore, is better accounted for by collaborative emergence than by rule following. We argue that collaborative emergence is the more powerful tool on which to design and study computer-mediated communication over a broad range of media.

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