Turn-taking types, their cognitive requirements and a few neglected variables

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In his programmatic paper on the "human interaction engine", Levinson famously asserted that in social interaction people's responses "are to actions and intentions, not to behaviors" (2006: 45). This claim aims to emphasize the importance of inferential processing in the handling of communicative signals, the tendency of human beings to attribute intentions/goals to the production of signals and the fact that for humans, parsing other's signals means simulating others' mental worlds, at least to some degree. In other words, social interaction in humans has significant cognitive requirements, notwithstanding how easy it might appear to us (see e.g. Garrod & Pickering, 2004). The interdependence of language and cognition is not a recent finding though. Darwin famously made a similar point in The Descent of Man (1871), emphasizing how the evolution of a communicative system goes hand in hand with the cognitive abilities of the species that develops it and relies on it.

One of the ways through which interaction unfolds is through the exchange of communicative turns or moves that follow some general criteria for fittedness and appropriateness. The seminal paper by Sacks, Schegloff & Jefferson (1974) on turn-taking in conversation outlined the existence of several types of turn-taking systems among humans and even within a single culture, depending on the social context (e.g. classroom vs. psychoanalytic session vs. ordinary conversation). Yet because it also outlined similarities across the systems concerning general rules for turn allocation and turn composition/formation, several authors took away the message that humans rely on one basic turn-taking system, with minor variants mostly related to the timing between turns and who decides who gets to speak next.

Accordingly, in recent years, researchers interested in animal communication

have begun making claims about the similarity between human turn-taking and turn-taking in the vocalizations of primates (e.g., Chow, Mitchell, & Miller, 2015) and different species of birds (see, e.g., Henry, Craig, Lemasson, & Hausberger, 2015). While this research brings forward important information about the possible precursors to human turn-taking in conversation, it is important to emphasize the difference between the types of turn-taking there described and the ones clearly observable in humans. To this end, however, one has to add a few key features to the study of turn-taking in other species (and the answers will be species-specific): 1) What variables affect the occurrence of a first communicative signal in context? (e.g. internal vs. external factors such as fear, anger, excitement vs. environment, partners, competitors etc.); 2) How likely (and conditional) is any response, given the first signal?; 3) How wide is the range of possible responses that could be considered appropriate, given the first signal?; and 4) what would appease the initial signaler? (i.e. is the first signal targeted, intentional, goal directed in any way?) Conversation analysts have tried to capture these concepts from a sociological perspective through the notions of sequence organization, action formation and action recognition/ascription (see e.g. Schegloff, 2007). In this paper I attempt to tackle these issues from an evolutionary perspective by:

1) Presenting a typology of turn-taking systems likely present in the animal kingdom, their cognitive requirements and a theory about their likely evolution (see also Rossano, 2018);
2) Reporting on experimental and observational studies in humans and other animals (especially great apes) assessing the likelihood of occurrence and types of responses to different types of communicative signals;
3) Reporting on current evidence of goal directedness in animal signalling by

presenting evidence of pursuit if a response is missing and signal repair in case of misunderstanding.

These additional parameters should aid our investigations of the evolution of the human turn-taking systems, their similarities and differences when compared to other animal species and the cognitive underpinnings necessary to operate the different turn-taking systems.