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Functional Communication in Waterfowl Birds

Applying pragmatics linguistics theory of Speech Act Theory to naturally occurring animal behaviour

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Working Paper 17

Functional Communication in Waterfowl Birds

Applying pragmatics linguistics theory of Speech Act Theory to naturally occurring animal behaviour

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Recent research directions have shed light on the complexity and value of the animal experience.[1] This cultural 'animal turn' acknowledging the agency of animals has been extended to linguistic theory[2]. The pragmatic study of how language is used in a social context has shown to be relevant to illustrate the complex social lives of animals and their experience[3].

INTRODUCTION

This paper examines one of the well-established, pragmatics linguistic theories from a non-anthropocentric perspective - namely Speech Act Theory (SAT), which has not yet been applied to animal communication[4]. By considering whether it is possible to apply a pragmatic, discursive theory to animal communication, we might show that SAT can critically engage outside of anthropocentric research content, and provide a new set of unstudied settings, broadening its reach and universality.

SAT's main claim is that language is a tool to perform an action (speech act) in the social world. A speech act is expressed by an individual that as well as presenting information, also performs an action while communicating. These actions commonly include apologizing, promising, requesting, warning, inviting etc. Speech acts are useful for describing both the function of individual utterances in conversation and how these individual utterances relate to one another within the context of the interaction (van Rees, 1992). In a SAT framework, the social function of speech is at the forefront of the analysis. The present research aims to consider animal behaviour as a performance of social function.

This study explores instances of SAT fulfilments in a case study of observed communication of Anatidae family waterfowls (ducks, geese, and swans) in urban Amsterdam parks during September 2022. Ducks and ducklike birds (waterfowls) are outgoing, social animals who feel most at ease when they are in large groups[5]. In waterfowl birds, social behaviours outside of courtship are done through vocal cues such as honking, whistling, cackling, or hissing; However, head as well as

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[1] A. Pennycook, Posthumanist applied linguistics. *Applied Linguistics*, 39(4), (2016), 445–461.
[2] E. Meijer, *When animals speak. Toward an interspecies democracy.* (New York: New York University Press, 2019); Andersson Cederholm, E., Björck, A., Jennbert, K., & Lönngren, A-S. (Eds.), *Exploring the Animal Turn: Human-animal relations in Science, Society and Culture*, 13–18. (Lund University: The Pufendorf Institute of Advanced Studies, 2014).
[3] S. W., Townsend, et al. Exorcising Grice's ghost: An empirical approach to studying intentional communication in animals: Intentional communication in animals. *Biological Reviews*, *92*(3), (2017), 1427–1433.
[4] A. G. Horn, Speech acts and animal signals. In D. H. Owings, M. D. Beecher, & N. S. Thompson (Eds.), *Communication*, 12, (Springer US, 1997), 347–358.
[5] G. R. Martin, Total panoramic vision in the mallard duck, Anas platyrhynchos, *Vision Research*, 26(8), (1986), 1303-1305.

neck gestures, eye gaze, and wing movement are also importantly considered[6]. Taking a more holistic and theoretically informed approach to studying communicative behaviours is an advantage of linguists approaching classic behaviourist fields of study.

SPEECH ACT THEORY (SAT) IN DISCOURSE

A mixed approach of SAT and Conversation Analysis is used in this paper to illustrate the multimodal and multisensory nature of animal communication.[7] This mixed approach has been coined Dynamic Speech Act Theory, a cognitive approach to social interaction that emphasizes the participant's intentions and goals, and which facilitates the use of SAT to account for natural conversational interaction[8]. Dynamic Speech Act Theory is a discursive approach to SAT that facilitates the discussion of how different speech acts can contribute to the social work of the interaction[9]. The aim should not be about naming an act in relation to a behaviour or signal, but about trying to clarify the rules that govern the use of these behaviours or signals. That is, focusing on the illocutionary and perlocutionary force of the utterance to consider what type of act is possibly being performed[10], while providing a reasonable argument for the presence of speech acts by accounting for both discursive and biological aspects of the animal behaviour.

Horn[11] argued that we must recognize each animal's individuality in the diversity of their linguistic repertoires (as we do humans). This means the researcher must be open to exploring the animal's units of language on their own and how they relate to each other in interaction. Horn's main argument for exploring SAT in animal communication is that signals are not just expressions of information, but they are 'tools for getting things done' in a social manner, (i.e., speech acts).[12] Therefore, speech acts are both context-renewing and context-shaped actions.

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[6] E. Meijer, *When animals speak, (*2019).
[7] D. M., Logue, & T. Stivers, Squawk in interaction: A primer of conversation analysis for students of animal communication. *Behaviour*, *149*(13–14), (2012), 1283–1298; , C. Mondémé, Why study turn-taking sequences in interspecies interactions? Journal for the Theory of Social Behaviour, 52(1), (2022), 67–85.
[8] M. Geis, *Interaction* (1st ed.). (Cambridge: Cambridge University Press, 1995).
[9] M. Geis, *Speech Acts and Conversational, (*1995); N. van Han, Contrast and critique of two approaches to discourse analysis: Conversation analysis and speech act theory. *Advances in Language and Literary Studies*, *5*(4), (2014).
[10] J. R. Searle, *Speech acts: An essay in the philosophy of language* (1st ed.). (Cambridge: Cambridge University Press, 1969).
[11] A. G. Horn, Speech acts and animal signals, (1997).
[12] Idem

METHOD: ETHNOGRAPHY

The data are collected using an ethnographic framework, following previous animal communication research[13]. To understand the complex world of animals, it is important that the behavioural data is described, not interpreted, while positioning the researcher within the narrative. Animals are treated by the researcher as subjects and co-participants of knowledge production, therefore are considered during research design by acknowledging the unique subjectivities of the individual as one would human subjects. To mitigate the anthropocentric bias, the perspectives and social relationships observed should be acknowledged to be intrinsically different and incomparable from human relationships[14]. One case study of an attempt at applying SAT insights to animal communication is introduced below.

A CASE STUDY: *DIVING*

This communicative event (Location *Vondelpark*, Date 06/09/2022) as observed in Figures 8 to 13 takes place between a pair of adult coot waterfowl birds diving together for food in a seemingly collaborative way. In the sequence pictured below, 'K1' approaches 'K2' as the latter is diving on a particular spot (See Figure 9). 'K2' reacts to 'K1''s approximation (See Figure 10), but 'K1' continues to approach the diving spot and 'successfully' manages to stay and dive in the desired spot ('K2''s initial spot; See Figure 13) through meaningful vocal and body cues.

A CASE STUDY: *CONVERSATION ANALYSIS*

The interactions occurring during this event are described in the Figures 8-14 and described through a Conversation Analysis background in lines 1-16. The first observable behaviour is 'K1' picking at its feathers and turning its head while 'K2' dives about two meters away (Figure 8). 'K1' swims towards what seems to be 'K2''s diving position at an accelerating rate (Figure 9). Immediately after 'K1' approaches 'K2', 'K2' turns its body towards 'K1''s position and stretches its neck forward (Figure 10).

[13] L. Mondada, Challenges of multimodality: Language and the body in social interaction. *Journal of Sociolinguistics* 20(3), (2016), 336-366.
[14] F. B. M. de Waal, & P. F. Ferrari, Towards a bottom-up perspective on animal and human cognition. *Trends in Cognitive Sciences*, *14*(5), (2010), 201–207.

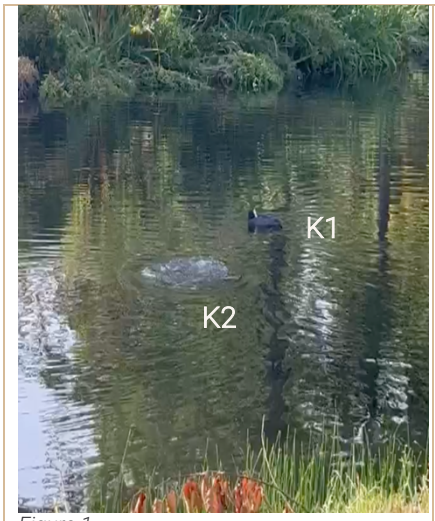

Figure 1

1 K1: (picks at its feathers while turning head to both sides)=
2 K2: =[(dives)]

Figure 2

3 K1: (slowly swims left while turning head to both sides)
4 K2: (re-surfaces from dive)=
5 K1: =(swims towards the left faster)

Figure 3

6 K1: [(approaches K2)]=
7 K2: =(faces 'K1' and stretches neck forward towards 'K1' repeatedly)=
8 K1: = °krrp° krrp KRRP [(quickly swims in the opposite direction)]

Meanwhile, 'K1' swims a few centimetres away from 'K2''s position and swims around 'K2' - while producing increasingly loud speech (Figure 11-12), to eventually reach 'K2''s initial position (Figure 13-14).

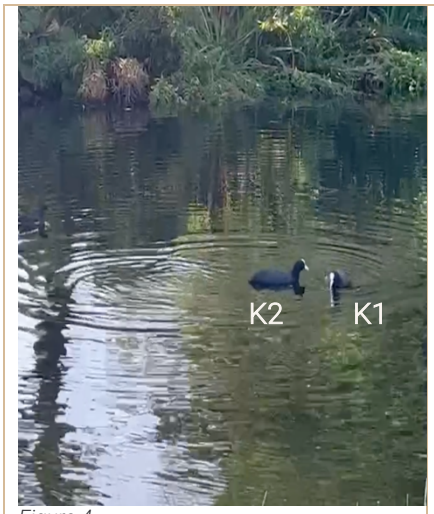

Figure 4

9 K1: KRRP KRRP krrp krrp (swims left)

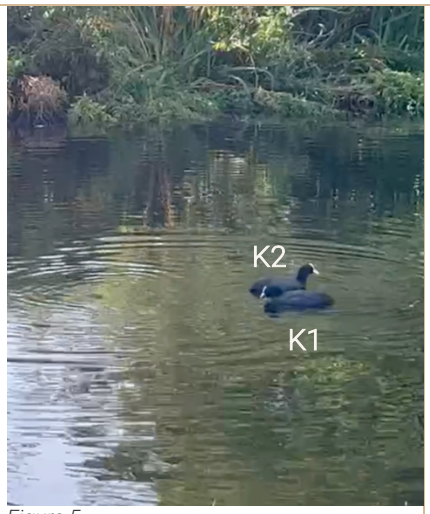

Figure 5

10 K1: krrp krrp (keeps swimming)
11 K2: (body and neck still face forward)

Figure 6

12 K1: °krrp° °krrp° =
13 K1: =(dives)

Figure 7

14 K1: (dives)
15 K2: (faces down)=
16 K2: =(dives)

A CASE STUDY: *DISCUSSION OF SAT*

The initial state of the interaction is pictured in Figure 8, where 'K1' and 'K2' are both doing their own individual activities (lines 1 and 2). Then, 'K1' performs the context-changing action of approaching 'K2' (line 3). There is some head turning movement to accompany 'K1's approach in line 3, which could be defined as an *assertive* speech act, emphasizing 'K1"s action to move towards 'K2'. Then there is 'K2"s lack of immediate reaction (line 4), and what seems like 'K1' reiterating and emphasizing its first speech act (line 5) for the sake of approaching the communicative goal (displaying audience-checking and goal-directed behaviour). 'K2' then sequentially responds through a change in body orientation towards 'K1', and an explicit, seemingly hasty *expressive* neck gesture and movement (line 7). In this interaction there is a clear sequential pattern (lines 3, 5, and 6), where 'K1"s assertive escalates onto a directive speech act, in which 'K1' seems to be trying to get 'K2' to move away from the desired diving spot. In response, 'K2' has a sequential reaction in line 7 that might be an assertion of violence against 'K1' or a contestation to 'K1"s directive, or the expressive description of 'K2"s emotional state after 'K1"s directive. What is clear is that 'K1"s actions in lines 3, 5 and 6 are in a matching pair relation with 'K2"s reaction in line 7. The context henceforth changes and there is an immediate action from 'K1' in response to 'K2's line 7 in the form of a change in the swimming trajectory as well as a very explicit vocal cue (line 8) that continues until line 12. As 'K2' maintains their body posture facing and their swimming direction forward (line 11), 'K1' swims away (creating more physical space from 'K1') and the voice cue diminishes in volume seamlessly (lines 9, 10 and 12). Finally, the goal seems to have been accomplished and 'K1' ends in the ideal diving position where 'K2"s initial position was, and this is emphasized by 'K1's action to dive at the ideal spot at the end of the event (line 13), and 'K2"s action to face down as 'K1' does so (lines 14-16).

A CASE STUDY: *SAT TAXONOMY*[15]

In line 3, 'K1' performs a head-turning gesture to *assert* their action of travelling towards 'K2'. The locutionary act (referential value) is head-turning, which has the illocutionary force (performative

[15] J. R. Searle, *Speech acts: An essay in the philosophy of language,* (1969)

function) of asserting their self to the action they are completing (moving towards 'K1'). The actor 'K1' is committing itself to what is being said, which would be a statement about the action of moving towards 'K1', something along the lines of, 'I want your diving spot'. The perlocutionary effect (perceived effect) is the continuation of 'K1''S action, and the reiteration of 'K1''s assertive after 'K2' fails to react as intended by the actor 'K1'. 'K1' repeats its *assertive* using a different grammatical form to do so (swimming faster in line 5), or it could have turned into a *directive*, an attempt to get the subject to do the act of moving away from its diving spot – which is then contested by 'K2'. The intended perlocutionary effect takes place where 'K1' approaches 'K2' (line 6), and 'K2' reacts (line 7). 'K2''s reaction is in its locution a body orientation and neck gesture and movement, that could be considered an expression of angry emotion (line 7) at the illocutionary level, where 'K2' is expressing their psychological state through the performance of an *expressive* that would potentially be saying something like, 'I am angry about leaving my diving spot for you'. Its perlocutionary effect is 'K1''s reaction in line 8 to change swimming directions abruptly and begin quacking. In lines 8, 9, 10 and 12, 'K1' continues to perform their *assertive* or *directive* speech act through means of a vocal cue (locution), with the illocutionary force of driving 'K2' away from the diving spot and the successful perlocutionary effect of 'K2' moving away from the diving spot. However, 'K2' continues its contestation of 'K1''s act in line 7 and 11 through the locutionary acts of neck stretching and body orientation. The illocutionary force is an *expressive* to the yielding of the diving spot to 'K1', but there is no clear perlocutionary effect as K1 continues their directive act successfully.

It seems that 'K1''s *assertive* and *directive* actions (expressed in body movements and gestures and vocal cues), as well as 'K2''s *expressive* act (in the form of body gestures and swimming trajectory) in response, collaboratively accomplish the conversational goal.

CONCLUSION

The Dynamic Speech Act Theory analysis that has been applied to the collected behavioural data on waterfowl birds has allowed us to observe a range of interactions in their natural environment. There are several theoretical assumptions required for this application of human pragmatic theory SAT: a discursive approach to SAT (Dynamic Speech Act Theory), a neo-Gricean view on animal intentionality,[16] and a flexible and multimodal interaction[17]. The set of behaviours that were observed in this group of waterfowls included gaze cues, body, head and neck gestures, and swimming trajectories. These locutionary units of waterfowl communication have been observed to perform

[16] Townsend et al., Exorcising Grice's ghost, (2016).
[17] C. Mondémé, Why study turn-taking sequences in interspecies interactions?, (2022).

assertive, *expressive*, and *directive* illocutionary speech acts with or without their intended perlocutionary effect in place. Although only directives could fulfil the felicity conditions in this paper, large enough amounts of analysed data in future research can build on the present exploratory findings to observe the physical behavioural fulfilment of speech acts through a conversation analysis framework, and then create a taxonomy of intentional animal behaviours from there. Thus, observing behaviours that fulfil the felicity conditions of speech acts, and from there describing the performance of intentionality in animal behaviour, instead of assuming intentionality and observing the possible performance of speech acts and felicity conditions.

We observed different forms performing the same illocutionary function, and similar forms performing different illocutionary functions. As well, there have been goal-directed and audience-checking behaviours throughout, showing that the animal behaviours were directed at an audience and with the intention to fulfil the communicative goal, thus displaying intentionality and communicative behaviour. The behaviours were sequential and in synchrony in all observed occasions. Importantly, the behaviours are observed to affect and be affected by context, showing their nature as speech acts and thus, social tools.

These findings explore the animal's social world and are a practical application of non-anthropocentric research methods that help interrogate the human exceptionalism bias in current Western culture and traditions. Both linguistic and animal communication theory can be advanced through interdisciplinary research. The universality of Speech Act Theory was explored, as should all other classic theories of linguistics to account for the current state of research in other disciplines such as ethology, cognitive science, or psychology, and vice versa.

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