

# Do dogs talk to each other? Field investigations on dog-dog acoustic communication

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## Introduction

Dog-human communication has been excessively investigated recently. We found that dog barking is highly informative for humans (1,2). However, the role of dog barking is still not clear in dog-dog communication. By measuring heart rate in the laboratory, it was shown that dogs can discriminate between barks, which were recorded in different contexts (3). The goal of this investigation was testing the effect of barking on dogs in their natural environment.

## Materials and methods

We worked with owners who had at least two adult dogs. At first we recorded the barks of each dog in two contexts: 'left alone' and 'stranger arrives' – these recordings served as playback material later. Each dog was tested four times, with familiar and unfamiliar barks, from both contexts. We left at least 2-day intervals between two tests. During the test only one dog was out in the garden, the owner and the other dogs were in the house. The playback device was hidden outside of the garden, within 1-m distance from the fence. Dogs' behaviour was recorded with two cameras in the garden, and also the bark responses were recorded with a DAT device. A test session consisted of three 1-min periods (pre-bark, bark and post-bark).

## Questions

**Do dogs behave differently if they hear barks from a familiar, or unfamiliar dog?**

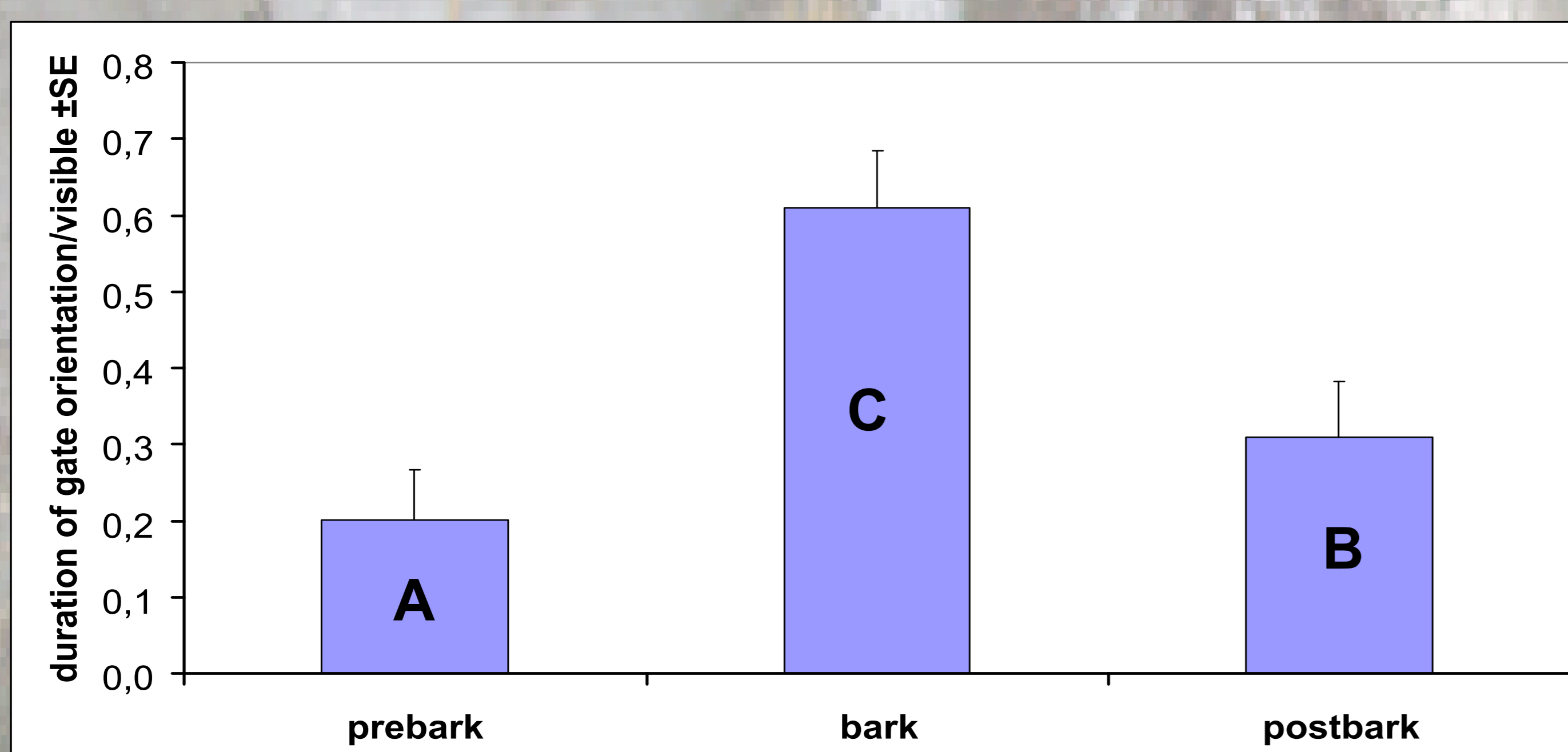
**Do dogs behave differently if they hear barks recorded in two different situations ('stranger' or 'alone')?**

## Results

### I. Comparison of the prebark, bark and postbark periods

The barks had a significant effect on dogs' behaviour (ANOVA for repeated measures): the number of bark responses ( $F(2,14)=56.60$ ;  $p<0.001$ ), moving towards the gate ( $F(2,14)=31.45$ ;  $p<0.001$ ) and moving at the gate ( $F(2,14)=20.48$ ;  $p<0.001$ ) were higher in the bark period than in the pre- or post-bark periods. See also the two figures below.

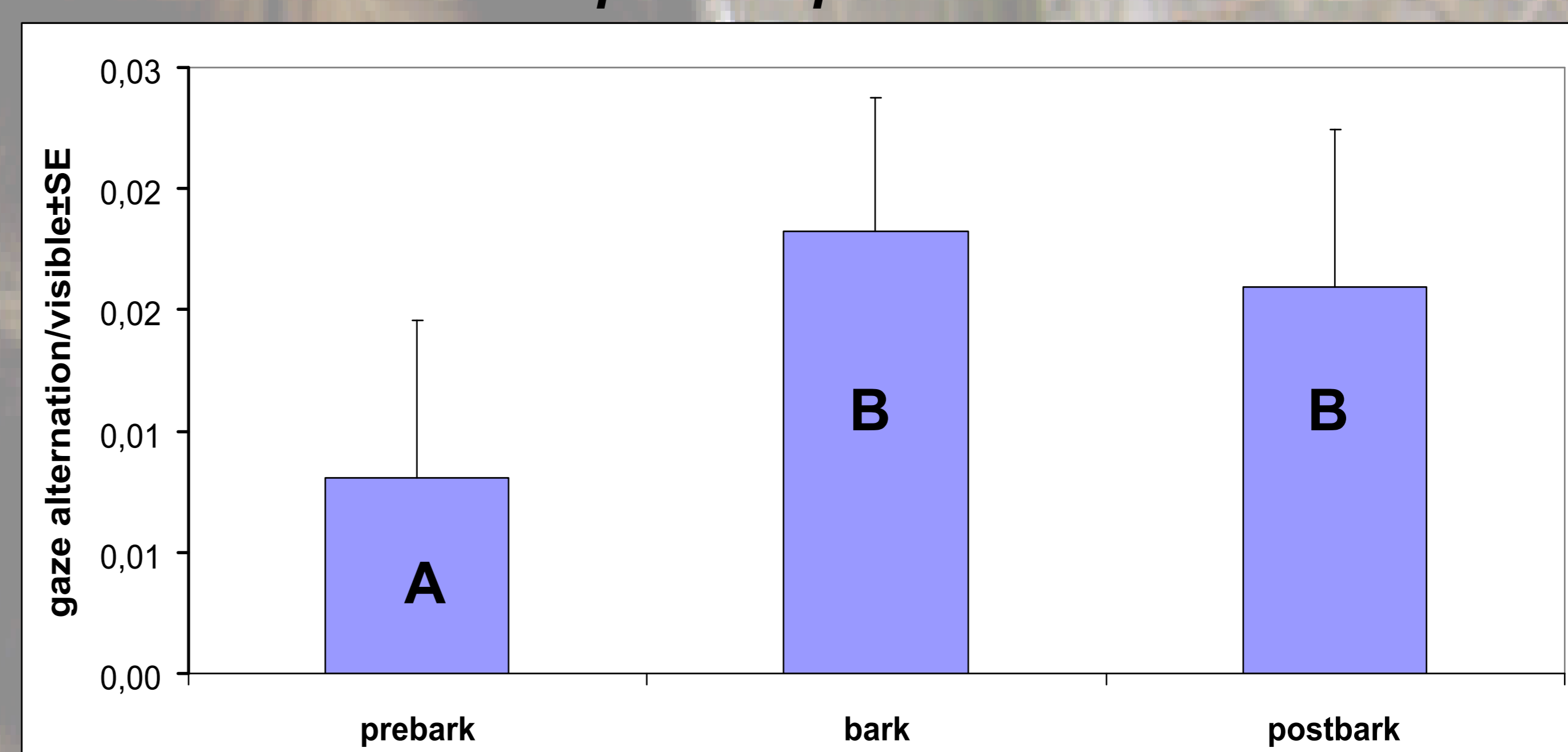
**Dogs show most gate orientations in the bark period, and the least in the prebark period.**



Gate orientation in prebark, bark and postbark period

Repeated measures ANOVA:  $F(2,14)=19,201$ ;  $p<0,0001$   
(Post hoc: prebark-bark  $p<0,001$ ; bark-postbark  $p<0,001$ ; prebark-postbark  $p<0,05$ )

**Dogs show more gaze alternations between the house and the fence in the bark and postbark periods, than in the prebark period.**



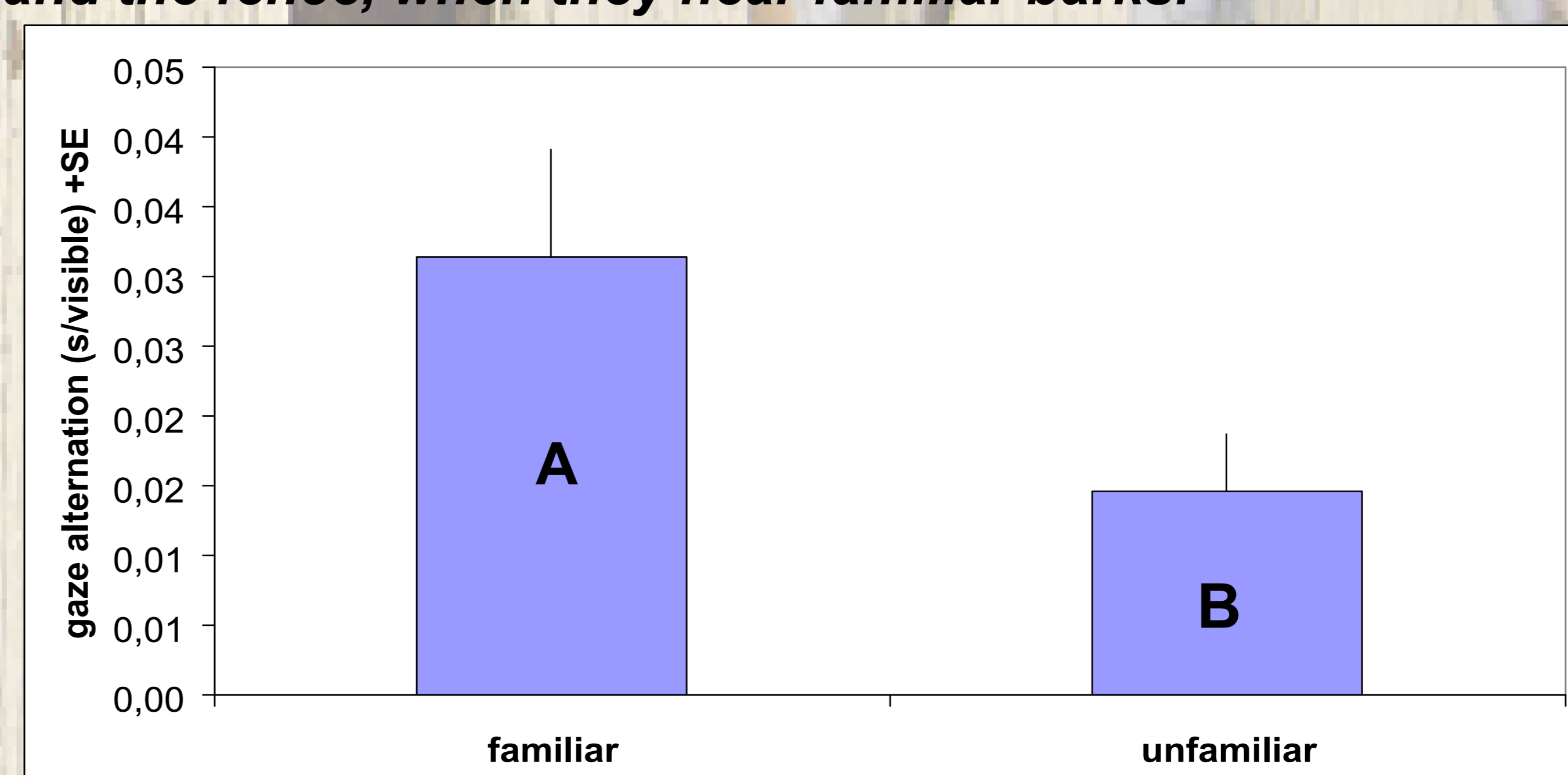
Gaze alternation in prebark, bark and postbark period

Friedman-test:  $F(2,14)=15,569$ ;  $p=0,0004$   
(Post hoc: prebark-bark  $p<0,01$ ; bark-postbark  $p>0,05$ ; prebark-postbark  $p<0,05$ )

### II. Bark period

We did not find clear effect of context and familiarity of the barks on dogs' behaviour, with the exception of the frequency of gaze alternation. At the same time we found several interactions between the two factors. The frequency of gate orientation ( $F(1,14)=6,092$ ;  $p=0.017$ ) approaching the yard ( $F(1,14)=4.310$ ;  $p=0.043$ ); the number of barks ( $F(1,14)=4.177$ ;  $p=0.046$ ); barks at the gate ( $F(1,14)=5.491$ ;  $p=0.023$ ); the duration of gate orientation ( $F(1,14)=12.510$ ;  $p=0.001$ ) and gaze alternations ( $F(1,14)=5.488$ ;  $p=0.023$ ) were higher in subordinate dogs, than in dominant dogs. The duration of house orientation was longer in dominant dogs ( $F(1,14)=9.394$ ;  $p=0.003$ ).

**The dogs show more gaze alternations between the house and the fence, when they hear familiar barks.**



Gaze alternation in bark period

Repeated measures ANOVA:  $F(1,14)=7,06$ ;  $p=0,008$

## Discussion

**Our results show that dogs react to other dogs' barking, and their responses are influenced by the social rank. These results support the theory that barking might have a role in dog-dog communication, too.**

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## References

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