

## Abstract

For centuries, certain dog behaviors, known as appeasement behaviors (ABs)—such as averting the eyes, lowering the head and tail, or putting the ears back against the head—have been regarded as anecdotal evidence that dogs feel guilty for having committed wrongdoing about which the owner will be displeased. Furthermore, these ABs have been considered a demonstration of theory of mind in dogs, because they seem to indicate a functional relationship between the dog's behavior and its understanding of how its own behavior affects another. The present study used domestic dogs to investigate potential determinants of ABs by testing whether Pavlovian conditioning would be sufficient to produce ABs in dogs. Experimental trials were divided into three phases: In Phase 1, the dogs were in a room with one of two neutral objects; in Phase 2, sounds that predicted the owners' entrance (key noise, doorknob jiggling) occurred for 10 s; in Phase 3, the owners entered the room and demonstrated either "happy" (H) behavior in the presence of one object or "unhappy" (U) behavior in the presence of the other object. The owners' behavior served as first-order conditioned stimuli to establish the neutral objects as conditioned stimuli through higher-order conditioning. Specifically, each object became an element of a compound stimulus associated with H or U owner behavior. During the 10 s of Phase 2 when the owners were not visible to the dogs, ABs came under the control of the object associated with U owner behavior and the sounds that predicted the owners' entrance. The results showed that in U sessions, compared with H sessions, (a) dogs exhibited longer and more frequent ABs before the owners entered, and (b) dogs spent a significantly longer time away from the door and/or object, in a hidden location, with their eyes averted, and without a wide and/or loose tail wag. Because the dogs had not misbehaved before the owners entered, it can be concluded that (a) companion dogs can demonstrate ABs in response to stimuli other than the visual behavior of owners and (b) dogs' ABs are not synonymous with a demonstration of guilt for their own behavior or an indication of remorse for disobeying the owner.