

Seeing-Knowing Experiment

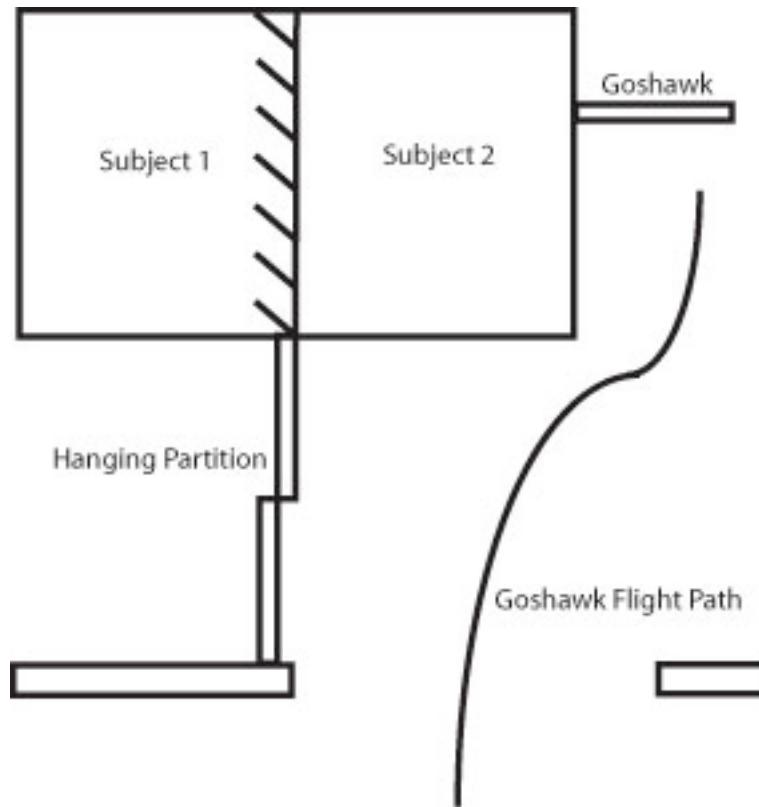
Subjects: Marmosets

Goal: The goal of this experiment is to study what marmosets understand about point of view. In earlier experiments with chimpanzees, subordinate apes have shown the ability to reason about what a dominant conspecific has or has not seen in order to obtain food without injury. The results of these experiments suggest that a chimpanzee understands that the perceptual experience of another animal is different from its own (Hare et al., 2000). In our experiment, by placing marmosets in a predatory context, we can use an ecologically relevant situation to test the animals' ability to judge what a conspecific can or cannot see. If one monkey cannot see an oncoming predator, does a second monkey that can see the threat modify its alarm call accordingly to alert his unsuspecting companion? If there is a difference in the focal monkey's alarm calls when his cagemate cannot see the goshawk versus when he can see, then the subject understands how his cagemate's perception and therefore knowledge of the threat has changed. Also, we can look at the behavior of the subject that has no view of the oncoming threat to judge how he interprets his companion's alarm behavior. In similar situations, male chickens do not alarm call in reaction to seeing a female behaving defensively to an oncoming threat that the male cannot see (Karakashian, Gyger, and Marler, 1998). We hypothesize that, unlike these chickens, the marmosets will react defensively to a conspecific's alarm behavior, even when they themselves cannot see the threat.

Procedure: Just as in the naïve presentation experiment to the tamarins, the marmosets will be presented with a goshawk. The hawk emerges from behind a barrier at the end of a long hallway, approaches the subject cage, and perches out of sight beside the monkeys. Unlike the naïve presentation experiment, however, the subjects will always be presented with the goshawk (the looming and control presentations will be eliminated), and two subjects will be present during each presentation. All subject pairs will be mated pairs. The three conditions of this experiment will be first that both animals can see the oncoming predator, second that only the male can see the hawk, and third that only the female can see the hawk. Even though only one animal can see the hawk in some of the conditions, both animals will be able to see each other throughout the experiment. In order to do this, we have placed perpendicular barriers in front of the cage and a series of angled slats within the cage that allow the animal to see side-to-side but not forward (see Figure1).

Each pair will receive 15 presentations. The presentations are divided into five blocks of three trials each. Each block contains, in random order, one of each of the three conditions. The trials will be analyzed with use of video and audio data. The factors used to distinguish alarm responses will be alarm duration, call frequency and intensity, delay of alarm response after the predator first appears, and general movement within the cage.

Figure 1



References:

- Hare, B., Call, J., and Tomasello, M. 2000. Do chimpanzees know what conspecifics know? *Animal Behavior*, 61, 139-151.
- Karakashian, S., Gyger, M., and Marler, P. 1988. Audience effects on alarm calling in chickens (*Gallus gallus*). *Journal of Comparative Psychology*, 102(2), 129-135.