

Reply to Dymond et al.: Clear evidence of habituation counters counterbalancing

Dymond et al. (1) raise four possible issues with our recent paper on causal reasoning in New Caledonian crows (2).

First, they suggest that the crows in our study became sensitized, rather than habituated, to the probing stick. However, there is direct evidence of habituation in our experiment [the decrease in inspections over trials 1–3 in the unknown causal agent (UCA) condition] that rules out this possibility. Furthermore, neophobia in these crows, like most birds, generally decreases over time (3).

Second, they suggest that our design should have been counterbalanced. Counterbalancing is useful when there is likely to be a directional trend in the data that could confound the results. However, in our experiment, the most probable directional effect (habituation to the probing stick) runs counter to the predictions of the hidden causal agent hypothesis. What is striking about our results is the low rate of inspections in the initial human causal agent (HCA) condition and then, despite the habituation to the stick, the high rates in the initial UCA condition.

The third issue Dymond et al. (1) raise is the suggestion that the crows paired the moving stick with a human leaving the hide. However, there are two sides of our results that need to be explained: (i) a lack of increase in inspections in the HCA trials and (ii) an increase in the UCA trials. An account based on the pairing of the emerging stick and human cannot account for the HCA results. The crows see a stick emerge from the hide for the first time into a place where they are about to put their heads, yet they show no increase in inspections. New Caledonian crows are highly neophobic, and so should have been averse to going near where the stick was, particularly one that might hit them.

Thus, the associative account has to assume that the crows, on seeing a new object and an event that could cause them harm if repeated, immediately risked serious injury. We find this extremely implausible. The most probable reason why the crows reacted calmly was that they inferred that because the human had left the hide, the stick could no longer hit them. In the UCA condition, the fact that the crows inspected the hide, rather than the location from which the person might emerge, is consistent with this account.

Finally, Dymond et al. (1) speculate that other differences between our conditions could have led to the observed effect. In the HCA condition, the crows observed two people enter and exit the cage, whereas in the UCA condition, they observed one. The crows had rarely seen two humans enter the cage at the same time but had seen a single human enter and exit the cage daily. However, they showed a neophobic reaction to this more familiar event in the UCA condition. Similarly, variation in the spatial location of the humans in our experiment runs counter to our observed effect. In the HCA condition, two people moved into novel spatial locations in the room. In the UCA condition, one person moved into what was now a familiar spatial location, yet it was in this condition that we saw a reaction.

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Author contributions: A.H.T., R.M., and R.D.G. wrote the paper.

The authors declare no conflict of interest.

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