



REPLY TO MCGREW:

Chimpanzees do not exhibit widespread cultural diffusion

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McGrew (1) objects to the proposal that Middle Pleistocene fire use signaled the onset of widespread cultural diffusion in our lineage (2). He argues that, given the commonness of cultural diffusion among chimpanzees, cultural diffusion plausibly emerged already as long ago as the Last Common Ancestor of chimpanzees and humans, which he situates at about 6 Mya to 7 Mya. Further, in light of this, he contends that cultural diffusion should not be considered a distinctive feature of the cultural behavior of *Homo sapiens*.

To substantiate his points, McGrew (1) refers to a study where Whiten et al. discriminate 39 behaviors in nine chimpanzee communities, behaviors that they argue to be cultural (3). Or rather, they assume them to be cultural, and then test with which process of cultural diffusion (see figure 1 in ref. 1) the observed pattern of their spatial distribution is consistent. The main problem with using Whiten et al.'s dataset to substantiate cultural diffusion among chimpanzees is that it comprises only spatial data, and spatial data alone do not allow one to distinguish between cultural diffusion and other modes of distribution (genetic, demic, in response to environmental factors). To determine the rate at which behaviors spread, temporal data are required, and it is diffusion rates, not just the spatial distribution of behaviors, that put one in a position to discriminate between cultural diffusion and other processes.

Alternatively, cultural diffusion might be established by observations of it actually taking place. McGrew (1) refers to several studies that purportedly

describe such observations (4–7). We submit, however, that only one (7) provides compelling evidence of intercommunity cultural diffusion among chimpanzees: O'Malley et al. (7) describe how ant fishing might have traveled from one chimpanzee community (Gombe) to another (Kasekela), and this through cultural transmission from an immigrant female to the resident Kasekela population. Importantly, the authors also note that "Chimpanzee communities in similar habitats, and even neighboring communities with documented female transfer between them, do not necessarily demonstrate similar behavior patterns." So, even if cultural transmission does occur in chimpanzees, it seems to happen only (very) occasionally. By implication, our claim (2) that the spatiotemporal pattern of regular fire use indicates widespread cultural diffusion, as well as its earliest archaeologically visible manifestation in the history of our lineage, still stands. And our suggested explanation for the phenomenon remains just as strong: Plausibly, increased intercommunity tolerance and cooperation is a more potent driver of cultural diffusion than female dispersal—the mechanism chimpanzee cultural diffusion relies on—alone.

The rarity of cultural diffusion in chimpanzees also supports our contention that cultural diffusion is a distinct characteristic of the cultural behavior of *Homo sapiens* (2). For a trait to be distinctly characteristic of a species, it should conform to a statistical regularity (8): The trait should be observed not once but on a regular basis. Cultural diffusion in chimpanzees does not seem to fit the bill.

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The authors declare no competing interest.

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