

Researchers question the cooperative eye hypothesis

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The sclera of the eye is devoid of pigment, which is why humans can easily follow where counterparts are looking. Researchers have long believed this facilitates glance-based communication. A team of

zoologists based at the University of Duisburg-Essen (UDE) and the Anthropological Institute in Zurich is now challenging this traditional view in a new study. The researchers looked at communicative behavior and eye color in apes and question the proposed connection between the two phenomena. The results have just been published in *Scientific Reports*.

"Part of this hypothesis is based on the idea that among primates, only humans have white sclerae," says study leader Kai Caspar (UDE). "However, only few comparative data have been available to back up this claim. Therefore, we assessed scleral pigmentation and measured eye contrast values in photos of more than 380 hominoids from 15 species. These included humans, great apes such as chimpanzees and orangutans, and gibbons, the small apes."

Although all hominoids are closely related, they communicate by different means. UDE zoologist Caspar says, "Different from us humans, glances play only a subordinate role in [great ape](#) communication, and for the gibbons they seem to have no communicative significance at all. So if the traditional assumption were true, differences in pigmentation should comply to differences in communicative behavior: the lighter the sclera, the more are the eyes used to convey information."

But this is not the case, as the study was able to show. Neither is the white of the [human](#) eye unique, nor can a connection be made between scleral color and communicative demands. "The expression of contrast in our eyes is not significantly different from that in some great apes, such as the Sumatran orangutan. Interestingly, however, scleral pigmentation can sometimes be highly variable within the same ape species. In humans, there is only plain white. This uniformity is a quite unusual extreme."

The zoologists around Kai Caspar fully reject the common assumption that the lightening of our sclera arose for the purpose of effective communication. Instead, they suspect other evolutionary mechanisms such as [genetic drift](#) or [sexual selection](#) to be at play: "These may have altered the appearance of our eyes in comparison to that of our closest living relatives."

More information: Kai R. Caspar et al, Ocular pigmentation in humans, great apes, and gibbons is not suggestive of communicative functions, *Scientific Reports* (2021). [DOI: 10.1038/s41598-021-92348-z](https://doi.org/10.1038/s41598-021-92348-z)

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