



Are chimpanzees “stuck” on their “selves” in video?

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Summary

Hirata, Fuwa, and Myowa (Royal Society Open Science, 4; 170370, 2017) extended to chimpanzee subjects a paradigm that had been developed by Povinelli and colleagues (Povinelli, Landau, Child Development, 67; 1540–1554, 1996; Perilloux, Povinelli & Simon, Developmental Psychology, 34, 188–194, 1998) to demonstrate the concept of self-continuity in young children. However, Hirata and colleagues lacked critical controls that would have allowed the conclusion that some of their chimpanzees recognized themselves in the time-delayed videos.

Keywords Chimpanzees · Self-recognition · Time · Continuity · Delay · Video

Hirata, Fuwa, and Myowa (2017) performed an experiment that is long overdue, given the intense interest in whether nonhumans have the capacity for self-recognition. This ability is inextricably linked to concepts of the continuity of self; yet, no single study had previously tested nonhumans for both capacities. Hirata et al.’s study picked up on a stream of earlier research by, for instance, Povinelli and Simon (1998), who investigated whether young children recognized themselves in video images taken within the same test session or one week prior. Hirata et al. were able to use a similar methodology to explore this capacity in chimpanzees because of close relationships between the caretakers and their chimpanzees that allowed the humans to interact closely with their subjects. However, for reasons outlined below, the results of this research do not compel the conclusion that chimpanzees recognize the continuity of self across space and time.

Hirata et al. (2017) covered chimpanzees in stickers on visible and invisible parts of their bodies (arms, faces, and heads). Across eight conditions, the chimpanzees viewed videos that showed their own image concurrently, their own image with minimal time delays (i.e., 1, 2, and 4 s), their own image with and without stickers from more than one week prior, and a human both with and without stickers. The researchers were careful to control the timing of feeding the chimpanzees treats in the pre- and postvideo phases of the sessions; also, the sessions were spaced out to mitigate against habituation, and the video images were reversed to appear like

mirror images. To account for different trial durations, Hirata et al. appropriately scaled the proportions of stickers removed.

Three of the five chimpanzees appeared to respond as if they recognized their images in the videos. These subjects were more likely to remove stickers with no delay or with the very slight time delays than when they viewed themselves without stickers, viewed themselves after a one-week delay, or viewed the videos of humans. However, despite the researchers’ careful approach, several confounds of the videos’ relevance to the chimpanzees’ current states differentiated the control conditions from the live and slight-delay conditions. First, it appears that the long-delay videos were recorded only at the beginning of the study and were not updated, meaning that, in later sessions, the videos were much older than those in the comparison conditions. Second, the chimpanzee could see stickers being removed only in the live and short-delay videos, potentially making them more interesting. Third, because the live and short-delay videos captured current actions, chimpanzees may have recognized that when they removed more stickers, more stickers were removed in the live and short-delay videos—making those videos more interesting—without necessarily recognizing themselves in the videos. Although no changes in behavior were observed across sessions, a necessary control condition would involve video of a nonsubject chimpanzee removing stickers. Ideally, removal of these stickers would be yoked to the subject chimpanzee’s actions, in order to control for contingent behavior. Unfortunately, the long-delay videos contained no contingent movements (i.e., no reaches to the face); that confound may have rendered the long-delay videos less interesting, or made it less interesting to actively remove stickers while watching.

Additionally, the data from the human control video do not strengthen the case. If the chimpanzees do not have the ability to

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recognize themselves, perhaps they might have confused images of another chimpanzee with themselves and been motivated to reach up to explore the stickers on their heads, but it is unlikely that they would confuse themselves with humans. Thus, responses to video of other chimpanzees covered in stickers might have indicated whether high rates of sticker removal were due to contingent behaviors or to true self-recognition.

The statistical approach also raises some questions. Comparing proportions of stickers removed when watching versus not watching the monitor is irrelevant, because the monitor could have been used to locate the stickers in order to remove them after looking away. One does not need to view the mirror continuously to guide the removal of stickers if one recognizes oneself in the mirror. Furthermore, only one chimpanzee appeared to spend much time in self-directed behavior while watching the monitor. The researchers recorded chimpanzees from 2 min before the video was played, so they could have compared the removal of stickers during that pretest interval to removal during the test interval while the video was playing. If they had done so, they could have conducted a more powerful, within-subjects analysis of the difference between sticker removal pre- and postvideo within the same session, and allowed that factor to interact with test condition. Furthermore, although the authors argued that placing the stickers surreptitiously was unnecessary, it is difficult to know whether the chimpanzees removed the stickers because they could see them in the video or because they could feel them. There was no comparison of the removal of visible versus invisible stickers across conditions or between the periods pre- and post-video-presentation.

Rather than showing the chimpanzees live video in which their movements were contingent with those in the video, one might instead show chimpanzees video from several minutes versus several days earlier, as has been done in earlier studies to tease apart the roles of behavioral contingencies in children's self-recognition (e.g., Lewis, 1986). If the chimpanzees had stickers in both videos but only one was current, they should have explored their heads for stickers only in the current condition. In one of Povinelli and Simon's (1998) experiments, children wore different clothing and so could identify whether the video was current or from one week prior. In addition, a context was created within the video shown in Povinelli, Landau, and Perilloux (1996) that coincided with the surreptitious marking of the children's heads, so that the children could identify the event. Furthermore, coming into the lab was rare and salient for the children. For the chimpanzees, which were filmed in the same test room repeatedly over a period of several years, there were no contextual cues to indicate whether a video was current or delayed and, thus, irrelevant. If stickers were routinely placed, how would the chimpanzees remember when the stickers were and were not placed, other than by feeling the stickers currently on their face, given that the stickers were not placed surreptitiously? That is, there is no real reason for chimpanzees to remove stickers more in one condition than in another, except for the contingency issue.

The video taken at a slight delay should be responded to differently than the live video if the contingency of movement is critical but the subject does not recognize the relevance of the video to its current state. The fact that three of the chimpanzees responded similarly in the live and short-delay conditions, and differently than in the long-delay conditions, supports the authors' interpretation, although they did not focus on this finding. In addition, the proportion of stickers removed was higher in the live condition than in the delay conditions for all three chimpanzees that differentiated between the conditions. Perhaps the contingency of movements is more important than the temporal relevance of the scene, which would argue against delayed self-recognition.

Finally, if chimpanzees differentiate between current and much delayed videos, this finding is mute with regard to their capacity to recognize themselves in videos taken at various time points. It is not clear whether the chimpanzees failed to recognize themselves in the older video or whether they recognized themselves but realized that the video was no longer relevant. The short-delay videos were recorded during the same testing session and were still relevant to the issue of removing stickers. Povinelli, Landry, Theall, Clark, and Castille (1999) had children observe two videos of events that the children had participated in but that differed in recency. Only older children realized that only the more recent video had relevance to the current task of finding the location of a hidden object. This study is better suited for replication with chimpanzees. I hope that Hirata and colleagues will continue to explore this topic with chimpanzees, because the results of properly controlled experiments would have the power to answer decades-long questions about the nature of representations of time and the continuity of self-representation in our closest relatives.

References

- Hirata, S., Fuwa, K., & Myowa, M. (2017). Chimpanzees recognize their own delayed self-image. *Royal Society Open Science*, *4*, 170370. doi:<https://doi.org/10.1098/rsos.170370>
- Lewis, M. (1986). Origins of self-knowledge and individual differences in early self-recognition. In A. G. Greenwald & J. Suls (Eds.), *Psychological perspective on the self* (pp. 55–78). Hillsdale: Erlbaum.
- Povinelli, D. J., Landau, K. R., & Perilloux, H. K. (1996). Self-recognition in young children using delayed versus live feedback: Evidence of a developmental asynchrony. *Child Development*, *67*, 1540–1554. doi:<https://doi.org/10.2307/1131717>
- Povinelli, D. J., Landry, A. M., Theall, L. A., Clark, B. R., & Castille, C. M. (1999). Development of young children's understanding that the recent past is causally bound to the present. *Developmental Psychology*, *35*, 1426–1439. doi:<https://doi.org/10.1037/0012-1649.35.6.1426>
- Povinelli, D. J., & Simon, B. B. (1998). Young children's understanding of briefly versus extremely delayed images of the self: Emergence of the autobiographical stance. *Developmental Psychology*, *34*, 188–194. doi:<https://doi.org/10.1037/0012-1649.34.1.188>