

How Does Teaching Method Impact Social Transmission?

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Introduction:

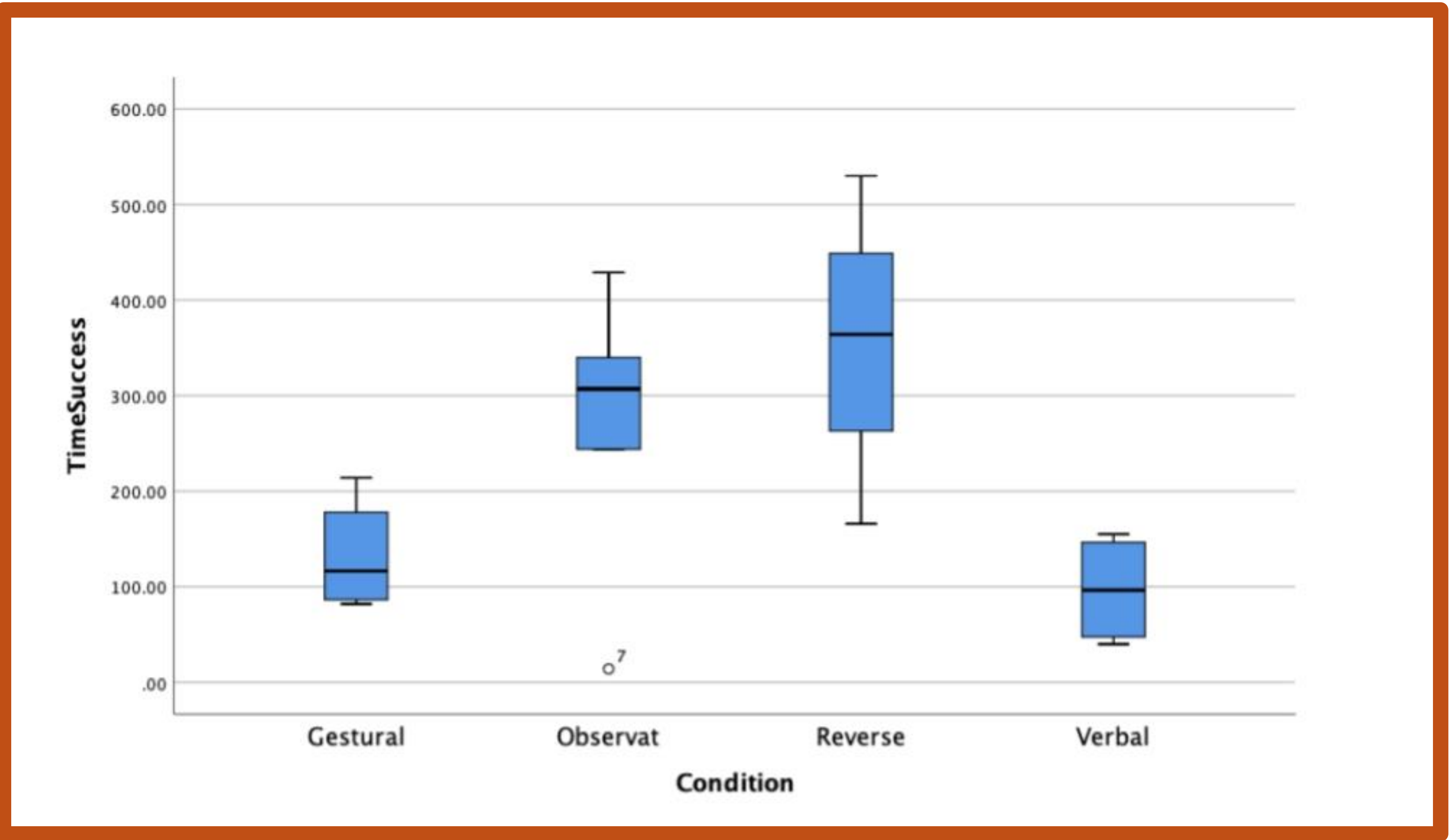
Within the anthropological world, it can be agreed upon that social transmission plays some role in the development of stone tools. However, exactly how much of a role it plays and what kind of social transmission is the most effective remains a mystery.

There have been conflicting answers to these questions. Some studies suggest that verbal transmission is necessary to be able to properly make tools (1), while others suggest that humans inherently know what they are doing (2)

This study aimed to fill that gap by utilizing different social transmission methods to teach the passive hammer technique and discern whether they were necessary, and if so which was the most effective. We hypothesized that social transmission would be necessary for flint knapping and that verbal transmission would be the most effective.

Methods

- **Participants:** 18 participants above 18 years of age were randomly divided into 4 groups, one per teaching method. 20 would have been ideal, however, due to conflicts 2 participants were unable to make it. The 18 we had were utilized to simulate a 4-5 generation social transmission chain
- **Teaching Methods:** Four methods were taught over the course of this experiment on different testing days: Gestural, Observational, Verbal, and Reverse Engineering.
 - **Task Design:** Each participant watched a five-minute demonstration of how to make a flake and effectively cut a carrot using the passive hammer technique. How it was taught followed the social transmission method designated to that chain. They would then have ten minutes to replicate the task, with the test ending once the carrot was cut with a flake on a line marked at a width of 2.3 cm. They would then have five minutes to teach the next participant in the same manner they had been taught. One of our researchers began the chain and it ended when either the task was not completed or the chain hit five people.
- **Data Collection:** The data collected was the number of strikes it took to make a successful flake, the number of tools produced, the time of a successful cut, and how long the chain lasted. All data was then stored on a secure Google Excel.
- **Data Processing:** The data was processed via the Kruskal-Wallis test to see if the results were legitimate or accidental.



Caveats

- The main caveat was us allowing questioning on both the verbal and gestural tests during the testing period. This was not representative of what we were trying to test.
- There was also some talking and retrieving flakes during the reverse engineering period that inadvertently hinted at the solution.
- Finally, it was not made clear to all subjects that they were supposed to cut the carrot on the black line, which led to dicing instead of cutting.

Results

- The results for the number of strikes and the number of tools were both inconclusive.
- However, the time of success was significant, and passed the Kruskal-Wallis test!
 - Gestural and Verbal teaching methods had very similar success times. Their means were both under the two minute mark.
 - Meanwhile, Observational's mean was around the three-minute mark and the Reverse was over it.
- Reverse also had a much wider range than any of the others, over double the size of gestural and verbal.
- As the chain progressed the average amount of time until success increased.
- The gestural and verbal chains were entirely successful, but the observational chain ended with Participant Four using the core instead of the flake, and the Reverse engineering group had no success using the right technology,

Conclusions

Our findings only partially support our initial hypothesis. They suggest that social transmission was likely to have played a major role in the development of the passive hammer technique, however, gestural learning is on the same playing field as verbal learning. This may suggest complex teaching patterns without the need for spoken language.

This is further supported by a strong conscience in the anthropological community that the passive hammer technique was developed earlier than initially considered, likely before spoken language was developed (3).

Acknowledgments

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Results show that Social Transmission IS necessary! The most effective forms of it are Gestural and Verbal!

References

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