

**ELEMENTAL VARIATION IN THE TOOL USING BEHAVIOR OF WILD CHIMPANZEES**

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Recent findings of the diversity and complexity of the tool technology exhibited by chimpanzee populations residing in central Africa have had important implications for advancing our understanding of tool using behavior. Previous research in the Goualougo Triangle has shown that multiple tool use is exhibited on a regular basis by most mature members of a chimpanzee community. However, the aim of our research has been not only to document tool repertoires, but also the cognitive processes underlying these behaviors which can be notoriously difficult to study in free-ranging apes. We suggest that long-term remote video monitoring can overcome many of the obstacles (such as habituation effects, low frequency of observation, sample size) associated with the limitations of observational conditions in the wild. In this study, we used remote video recordings of tool use in termite gathering collected over a seven year period in the Goualougo Triangle to examine elemental variation in the tool use of chimpanzees. Tool using sequences of more than 100 identified chimpanzees were scored to the level of behavioral elements, which were defined as functionally distinct behavioral units. We hypothesized that novel behavioral elements or rare element transitions would provide information about chimpanzee problem solving in this context. Sequences of elements were summarized in transition matrices which provided an objective means of identifying rarities. Our results showed that rare behaviors such as reversals of tool orientation were exhibited by several individuals in a particular context and provided insight into chimpanzee understanding of object relations in this task.

Keywords: Pan troglodytes, tool complexity, tool diversity, Congo Basin