

Abstract

Is it possible to enumerate large numbers of objects in the absence of language? Recent data suggest that preverbal human infants spontaneously represent large numbers approximately using imprecise mental magnitudes. Similarly, animals can be trained to discriminate between large numbers if they are sufficiently far apart. Unfortunately, however, few experiments have examined what animals understand about large numbers in the absence of training. In this thesis, I present several experiments with free-ranging rhesus macaques (*Macaca mulatta*) designed to test their spontaneous representations of large numbers. These experiments employ the expectancy violation looking time paradigm also used to study number representations in preverbal infants. Therefore, they afford a direct comparison between the abilities of infants and the abilities of nonhuman primates. Taken together, my results suggest that nonhuman primates spontaneously represent the outcomes of simple arithmetic operations with large numbers, and that they discriminate between the outcomes of these operations if they differ by a 1:2 ratio. These data are discussed in light of two models of non-linguistic number representation, and with a consideration of the necessary and sufficient cognitive prerequisites for the representation of number.