Nature's Turing Test

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Introduction

What, if anything, is special about human cognition and how might we find out? This is the crux of the Turing test. In this symposium we suggest that identification of similarities and differences between humans and other species provides an opportunity to examine the Turing Test from a different perspective. Our goal is to show that the range of conceptual learning in nonhuman animals includes several of the of the major categories traditionally attributed to humans alone. Understanding concept learning in animals other than humans provides not only a more inclusive view of concept learning, but also provides a more objective perspective from which to understand the processes involved in such learning.

Perceptual Classes

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The most fundamental form of concept learning involves classification according to the perceptual attributes of objects (i.e., the features that they share). There is clear evidence that pigeons can sort complex stimuli into basic classes and that the basis for such sorting is similar to that used by humans (Bhatt, Wasserman, Reynolds, & Knauss, 1988).

Superordinate Classes

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At a more advanced level, animals have been shown to be capable of forming "superordinate" classes or functional equivalences. In a matching-to-sample task, pigeons that have learned to assign several arbitrary samples to a common comparison stimulus can be shown to develop emergent relations among those samples; later reassignment of one or more of those samples to a new comparison results in the untrained reassignment of the other members of the superordinate class (Urcuioli, Zentall, Jackson-Smith, & Steirn, 1989; Wasserman, DeVolder, & Coppage, 1992).

Relational Classes

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We will present a series of results concerning the cognitive abilities of children, chimpanzees, and monkeys. By combining these results with research on pigeons (discussed by Wasserman and Zentall in this Symposium) and carefully designed simulations, we will demonstrate how comparative methods can be used to identify specialized, if not unique, human cognitive abilities. Specifically, we address the role of symbolic representation and the role of social factors in shaping the expression of abstract relational and analogical cognitive abilities.

References

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