Available online at www.sciencedirect.com
SCIENCE DIRECT®
Journal of Memory and Language 54 (2006) 407–424
Journal of Memory and Language
www.elsevier.com/locate/jml

The importance of being coherent: Category coherence, cross-classification, and reasoning ☆

Andrea L. Patalano [a,*], Seth Chin-Parker [b], Brian H. Ross [c]

[a] *Department of Psychology, Wesleyan University, 207 High St., Middletown, CT 06459-0408, USA*
[b] *Denison University, USA*
[c] *University of Illinois at Urbana-Champaign, USA*

Received 25 July 2005; revision received 20 October 2005
Available online 10 January 2006

Abstract

Category-based inference is crucial for using past experiences to make sense of new ones. One challenge to inference of this kind is that most entities in the world belong to multiple categories (e.g., a jogger, a professor, and a vegetarian). We tested the hypothesis that the *degree of coherence* of a category—the degree to which category features go together in light of prior knowledge—influences the extent to which one category will be used over another in property inference. The first two experiments demonstrate that when multiple social categories are available, high coherence categories are selected and used as the basis of inference more often than less coherent ones. The second two experiments provide evidence that ease of category-based explanation of properties is a viable account for coherence differences. We conclude that degree of coherence meaningfully applies to natural social categories, and is an important influence on category use in reasoning.
© 2005 Elsevier Inc. All rights reserved.

Keywords: Categories; Reasoning; Inference; Coherence

A critical function of categorization is inference (Heit, 2000; Smith & Medin, 1981). Once an entity has been identified as a member of a known category, a wealth of category knowledge can be used to reason about that entity. A challenge for category-based inference is that most entities belong to multiple categories. Cross-classification is important to consider because people rarely incorporate information from more than a few categories (Heit & Rubinstein, 1994; Murphy & Ross, 1999; Ross & Murphy, 1999), so they must somehow solve the problem of selecting among available categories. The goal of this paper is to integrate cross-classification issues with recent category coherence research towards understanding how people make novel property inferences about cross-classified entities.

Cross-classification

Past research has identified three influences on category preference when more than one category is available. First, people are more inclined to use the

☆ This work was supported by National Science Foundation Grant SBR 97-20304. We thank Nick Haslam and Gregory Murphy for comments on an earlier draft of this paper. Thanks also to Melissa Paulson and Jane Erickson for their assistance in data collection.
* Corresponding author. Fax: +1 860 685 2761.
E-mail address: apatalano@wesleyan.edu (A.L. Patalano).

0749-596X/$ - see front matter © 2005 Elsevier Inc. All rights reserved.
doi:10.1016/j.jml.2005.10.005

category with the greatest relevance to the property in question (Heit & Rubinstein, 1994; Kalish & Gelman, 1992; Murphy & Ross, 1999; Ross & Murphy, 1999). Second, inferences are more often made from categories with increased mental activation relative to others (Macrae, Bodenhausen, & Milne, 1995; Sinclair & Kunda, 1999; Smith, Fazio, & Cejka, 1996). And third, greater emphasis is placed on the most distinctive category available (Nelson & Klutas, 2000; Nelson & Miller, 1995; van Rijswijk & Ellemers, 2002), where distinctiveness refers to the relative number of members of one category over another in a particular situation or in the population at large.

One of Nelson and Miller's experiments (1995; Exp. 3) influenced the design of our own experiments, and serves as a good example of the kind of situation under discussion. Problems were used such as: "80% of dog owners prefer non-fiction to fiction. 80% of skydivers prefer fiction to non-fiction. Bob is a dog owner and a skydiver. Which is he more likely to prefer, non-fiction or fiction?" Each problem paired one high distinctiveness (e.g., sky diver) and one low distinctiveness (e.g., dog owner) category, and used properties previously unrelated to either category. Participants chose the more distinctive category 69% of the time.

One striking absence in this research is the exploration of factors independent of context or of a specific property in question. This leaves open the important question of whether some structural properties of categories might promote inference more than others. In the next section, we motivate the study of one such structural factor, namely, *category coherence*.

Category coherence

Category coherence refers to the extent to which category features go together in light of prior theoretical, causal, and teleological knowledge (Medin, 1989; Murphy & Medin, 1985; see Murphy, 2002, for a review) rather than being just incidentally co-occurring. "Lives in water, eats fish, has many offspring, is small" describes a more coherent category than "lives in water, eat wheat, has a flat end, is used for stabbing bugs" (Murphy & Wisniewski, 1989). It is well documented that most natural categories are at least somewhat coherent (Ahn, 1998; Keil, 1989; Malt & Smith, 1984; Sloman, Love, & Ahn, 1998), and that coherence of novel categories influences ease of learning and use (Heit & Bott, 2000; Kaplan & Murphy, 2000; Lin & Murphy, 2001; Murphy & Allopenna, 1994; Pazzani, 1991; Rehder & Ross, 2001; Spalding & Murphy, 1996; Wattenmaker, Dewey, Murphy, & Medin, 1986; Wisniewski, 1995).

The relations that make features "go together" can be causal (Ahn, 1998; Rehder & Hastie, 2001, 2004), spatial or temporal (Lin & Murphy, 2001), abstract themes (Erickson, Chin-Parker, & Ross, 2005; Rehder & Ross, 2001), or goals (Barsalou, 1983, 1985). While all facilitate learning, there is some evidence that a *common cause* structure, one in which a few causal features give rise to many effect features, results in especially high category coherence (Ahn, 1998; Ahn & Kim, 2000; Ahn, Kim, Lassaline, & Dennis, 2000; but see Rehder & Hastie, 2004; Sloman et al., 1998). This structure is consistent with *psychological essentialism* (Medin, 1989; Medin & Ortony, 1989), the finding that people believe that entities in the world have deep underlying features that are enduring and unchangeable even though their surface features might change (Atran, 1990; Hirschfeld, 1994, 1996; Keil, 1989; Rothbart & Taylor, 1992; Yulill, 1992). We will focus on the common cause structure in this paper; it is what will be meant by coherence unless otherwise noted.

The coherence of a category has been shown to influence category-based inference. Using experimental methods, Rehder and colleagues (Rehder & Burnett, 2005; Rehder & Hastie, 2004; see also Lassaline, 1996) found that people are more likely to transfer a property from a category to a new member when the category is causally coherent rather than incoherent. Haslam, Rothschild, and Ernst (2000) conducted a factor analysis on the Likert-scale ratings of 40 social categories (including jobs, racial and ethnic groups, hobbies, religious groups, etc.) on nine dimensions. An emergent "entitativity" factor approximated coherence, and was associated with three scale items targeting common-cause structure: inherence (the presence of deep underlying features giving rise to surface ones), uniformity (the similarity of category members), and informativeness (the inference potential of a category).

While the coherence of natural categories can be assessed through entitativity scale ratings and elicitations of mental representations (e.g., listings of deep underlying category features), most inference experiments have used artificial categories. Because artificial categories are typically created to be maximally coherent versus maximally incoherent, it has been difficult to assess the effects of everyday variations in coherence on inference.

Current research

The present research was guided by two major goals. The first goal was to consider the extent to which category coherence influences category use in reasoning from multiple categories. In particular, when high and low coherence categories are placed in direct competition with one another, are higher coherence categories favored over less coherent ones? The second goal was to begin to explore cognitive processes underlying differ-

Download English Version:

https://daneshyari.com/en/article/932424

Download Persian Version:

https://daneshyari.com/article/932424

Daneshyari.com