

Categorical Perception: Not What It Seems

University of Leeds, 9 October 2008

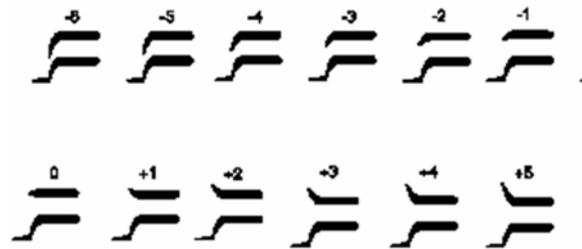
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§1 How do we know it exists and what does categorical perception explain?

Categorical perception explains facts about phenomenological character, patterns of discrimination, pop-out effects, and verbal communication.

categorical perceptual process: one that performs some of its proper functions in part by treating as equivalent stimuli which another perceptual process treats as distinct, where classifying together the stimuli treated as equivalent yields categories

categorical perception: perception involving categorical perceptual processes



From <http://www.columbia.edu/itc/psychology/rmk/T2/T2.2b.html>

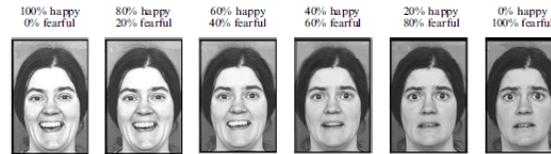


Figure 1. An example of one of the two morphed continua from happy to fearful used in experiments 1 and 2.

(Kotsoni, Haan and Johnson 2001: 1118)

§2 What do we perceive when we perceive speech?

1. Speech perception is categorical
2. The category boundaries correspond (imperfectly) to differences in articulatory gestures
3. The best explanation of (2) involves the hypothesis that the objects of speech perception are articulatory gestures.

If it is possible given what we know for the objects of speech perception to be articulatory gestures, the following claims are false of categorical perception:

- To describe what someone perceives as including a particular object or property is to describe a characteristic of their experience which is introspectable
“Describing [Mary’s experience] as being as of a dodecahedron ... is ... normally intended to describe its introspectable character, that it is of how the physical world appears to be” (Martin 1992: 762).
- Perceptions are reasons for beliefs (Brewer 1999)

§3 Is cat’ perception a mode of awareness?

I.e. does categorical perception involve awareness of similarities or properties matching the perceived categories?

No: “there is ordinarily nothing in children’s experience with speech ... to make them aware that all words are specified by an internal phonological structure, the shortest elements of which are the phonemes ... the constituent phonemes do not ordinarily rise to the level of awareness” (Liberman and Liberman 1990: 60-1)

Yes: “The *category question* concerns whether observers perceive qualitative similarities ... Discriminable wavelengths seem to be categorized together because they appear perceptually similar.” (Bornstein 1987: 288-9)

My claim: categorical perception involves at most a characteristic signal of sameness or difference; it does not involve awareness of *in which respect* stimuli are the same or different.

Failure to distinguish similarity of experience from experience of similarity:

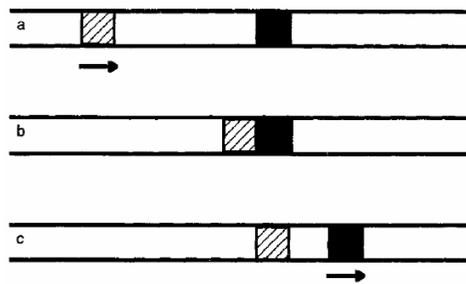
“*Resemblance*. x and y sensorily appear (on a particular occasion) to resemble each other if there is some epistemic action E , such that the sensory experience of x and the sensory experience of y (on that occasion) suggest that x and y be treated similarly with respect to E .” (Matthen 2005: 231)

If categorical perception of speech *did* involve awareness of phonemes, what would follow about how phonetic concepts are acquired?

- i. The ability to think and reason about phonemes emerges as soon as: (a) children can perceive speech, and (b) children have any concepts at all.
- ii. Children are able to think and reason about all the phonemes they perceive at around the same time as they can think and reason about any of them.
- iii. Phonemes as children think and reason about them correspond to phonemes as children perceive them.

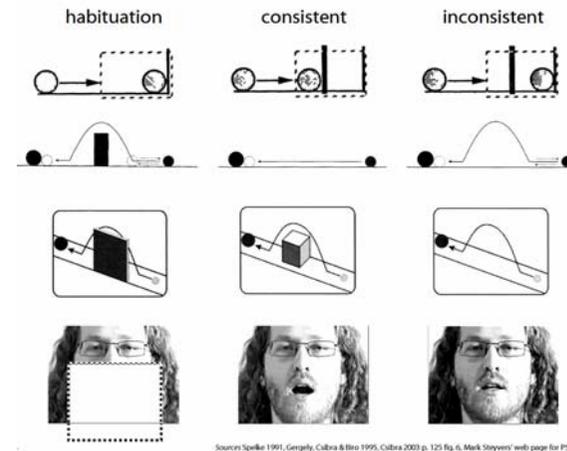
All of these predictions, (i)-(iii), turn out to be false. The following claims are therefore false of categorical perception:

- Perception is “matter of the world making itself apparent to us” (Martin 1992: 761).
- “Perceptual experiences are ... intrinsically ... belief-inducing, having ... an intrinsic nature which can only be specified in relation to belief” (Smith 2001: 291)



(from Thines, Costall and Butterworth 1991: 69)

§4 Categorical perception provides a model for claims about perception of simple causal interactions and behaviours



§5 What is the role of categorical perception in concept acquisition?

If core knowledge is categorical perception and if categorical perception is not a mode of awareness, these claims about the role of perception and core knowledge in explaining how concepts are acquired are doubtful:

Categorical perception provides “the building blocks—the elementary units—for higher-order categories” (Harnad 1987: 3)

“the earliest conceptual functioning consists of a redescription of perceptual structure” (Mandler 1992)

Core knowledge provides the building blocks for mature understanding of objects and minds (Spelke 2000)

References

- Bornstein, M. H. (1987), "Perceptual categories in vision and audition", in S. Harnad (ed.) *Categorical Perception: The Groundwork of Cognition*. Cambridge: Cambridge University Press.
- Brewer, Bill (1999), *Perception and Reason*. Oxford: Clarendon Press
- Harnad, Stevan (1987), "Psychophysical and cognitive aspects of categorical perception: A critical overview", in S. Harnad (ed.) *Categorical Perception: The Groundwork of Cognition*. Cambridge: Cambridge University Press. Retrieved 31 July 2006 from <http://cogprints.org/1571/00/harnad87.cpreview.html>
- Kotsoni, Eleni, Michelle de Haan and Mark H. Johnson (2001), "Categorical perception of facial expressions by 7-month-old infants". *Perception*, 30(9):1115-1125
- Lieberman, Isabelle Y. and Alvin M. Liberman (1990), "Whole Language vs. Code Emphasis: Underlying Assumptions and their Implications for Reading Instruction". *Annals of Dyslexia*, 40:51-76
- Mandler, Jean M. (1992), "How to Build a Baby: II. Conceptual Primitives". *Psychological Review*, 99(4):587-604
- Martin, M. G. F. (1992), "Perception, Concepts and Memory". *The Philosophical Review*, 101(4):745-763
- (2002), "The Transparency of Experience". *Mind & Language*, 17(4):376-425
- Matthen, Mohan (2005), *Seeing, Doing and Knowing*. Oxford: Clarendon
- Smith, A. D. (2001), "Perception and Belief". *Philosophy and Phenomenological Research*, 62(2):283-309
- Spelke, Elizabeth (2000), "Core Knowledge". *American Psychologist*, 55:1233-1243