

## PHIL-PSYC G4485. MIND, BRAIN, AND SPACE

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Fall 2004 • 200C Schermerhorn Hall • M 4:10–6:00

MICHELE MIOZZO

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Office hours: T 1:00–3:00

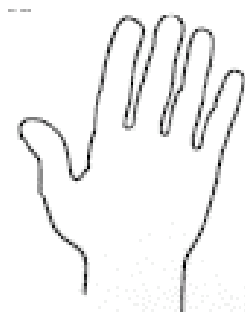
ACHILLE VARZI

702 Philosophy Hall • tel. 854-3531 • <http://www.columbia.edu/~av72>

Office hours: M 10:30–12:30

Course website: <http://www.columbia.edu/~av72/left&right>

- ❖ **GENERAL DESCRIPTION.** There are brain-damaged patients who systematically exchange the left and right parts of the objects with which they interact. Other patients can see only one half of the objects, or can only eat from one half of the plate. Neuroscientists believe that cases such as these can help us understand how the brain represents the space around us—the space in which we live and move and in which we locate ordinary objects and events. Philosophers, on the other hand, view the representation of space as a privileged entry point into the study of the external world. Different objects occupy different places and different parts of an object are spatially related to the whole, but where do these spatial properties come from? If nothing existed except a single hand, would it have to be either a left hand or a right hand? If not, what would explain the difference between that world and its mirror image? And why do mirrors reverse left/right but not up/down? The aim of this seminar is to bring together these neuroscientific and philosophical perspectives in a joint effort to better understand the two sides of space—its inner representation in the brain and its outer realization in the objects around us.
- ❖ **PREREQUISITES.** Instructor permission. Open to undergraduates and graduate students.
- ❖ **REQUIREMENTS.** The final grade will be determined on the basis of (a) class participation (10%), (b) a short paper (3-5 pages) to be presented during one of the three discussion sessions (30%); (c) a final paper (60%).
- ❖ **READINGS.** All required readings are collected in a packet that will be available in the Psychology Department Library, 409 Schermerhorn Hall.



*A left hand? A right hand?*

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### Schedule

#### 9/13 Course Presentation

#### 9/20 *The Space through the Mirror*

- L. Carroll: *Through the Looking-Glass and What Alice Found There* (1872), selection
- N. Block: ‘Why do mirrors reflect left/right but not up/down?’ (1974)
- D. Locke: ‘Through the Looking Glass’ (1977)

#### 9/27 *Hands, Gloves, and Space*

- I. Kant, three texts on left & right (1768, 1770, 1783)
- E. A. Abbott, *Flatland. A Romance of Many Dimensions* (1882) (text not included in reader)
- H. G. Wells, ‘The Plattner story’ (1896)
- M. Gardner, *The Ambidextrous Universe* (1989), selection

#### 10/4 *Explain the Difference!*

- J. Bennett: ‘The difference between right and left’ (1970)
- G. Nerlich: ‘Hands, Knees, and Absolute Space’ (1973)
- M. Curd: ‘Showing and telling: Can the difference between right and left be explained in words?’ (1984)

#### 10/11 Discussion session

#### 10/18 *Neglect and Ontology*

- G. Rizzolatti and A. Berti, ‘Neural mechanisms of spatial neglect’ (1993)
- A. Caramazza and A. E. Hillis: ‘Spatial representation of words in the brain implied by studies of a unilateral neglect patient’ (1990)
- P. W. Alligan and J C Marshall: ‘When two is one: A case study of spatial parsing in visual neglect’ (1993)

#### 10/25 *Primordial Metaphysics: Objects in Infants’ Mind*

- E. S. Spelke and G. Van de Walle: ‘Perceiving and reasoning about objects: Insights from infants’ (1993)
- F. Xu, S. Carey, and N. Quint: ‘Object individuation in 12-month-old infants: The use of color, size, and shape information’ (2004)
- R. F. Wang and E. S. Spelke: ‘Human spatial representation: insights from animals’ (2002)

#### 11/8 *Space and Action*

- J. K. Krakauer and C. Ghez: ‘Voluntary Movement’ (2000)
- J. O’Keefe et al.: ‘Place cells, navigational accuracy, and the human hippocampus’ (1999)
- C. L. Pritchard et al.: ‘Visuospatial neglect: veridical coding of size for grasping but not for perception’ (1997)

#### 11/15 Discussion session

#### 11/22 *Parts and Wholes*

- R. Casati and A. C. Varzi: *Parts and Places: The Structures of Spatial Representation* (1999), selection
- C. B. Cave and S. M. Kosslyn: ‘The role of parts and spatial relations in object identification’ (1993)
- G. W. Humphreys: ‘Neural representation of objects in space: a dual coding account’ (1999)

#### 11/29 *Parts and Holes*

- R. Casati and A. C. Varzi: *Holes and Other Superficialities* (1994), selection
- N. Giralt and P. Bloom: ‘How Special Are Objects?’ (2001)

#### 12/6 *Language and Space*

- R. Jackendoff: ‘The architecture of the linguistic-spatial inference’ (1996)
- B. Landauer: ‘Multiple geometric representations of objects in languages and language learners’ (1996)

#### 12/13 Discussion session