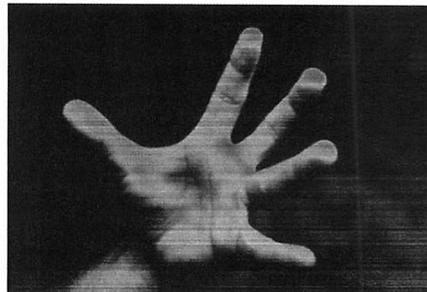


# SPATIAL REPRESENTATION

PNP 495  
SPRING 2009

David M. Kaplan  
TuesThurs 1–2:30



CLASS LOCATION: Wilson 104  
COURSE WEBSITE: via TELESIS

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OFFICE: Wilson 101  
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## DESCRIPTION:

Representing space is of central importance to just about every aspect of our lives—from simple motor tasks, such as reaching for one's morning cup of coffee, to more complex cognitive tasks such as navigating the layout of city streets or entertaining a thought about the objective world. This course explores some major philosophical and empirical issues concerning spatial representation and cognition. The course divides into two parts. In the first part of the course, we will consider important philosophical views defending the idea that there is an important connection between spatial representation and the objectivity of thought and experience. We will also address the topic of object perception from the perspective of developmental psychology. In the second part of the course, we will consider issues related to spatial representation in perception such as the way space is represented across the sensory modalities and whether motor behavior itself might contribute to spatial perception to a significant degree. We will also consider recent empirical work from cognitive science and the neurosciences on the neural and computational basis of spatial perception and sensorimotor control.

## TEXTS:

- *Spatial Representation: Problems in Philosophy and Psychology*, (Eds.), N. Eilan et al. (SR)
- *Individuals: An Essay in Descriptive Metaphysics*, P.F. Strawson (I)

Both texts are available at the *WU Bookstore*. Additional readings will be available through TELESIS or distributed directly. (E)

## MECHANICS:

This is an interdisciplinary course—drawing on philosophy, psychology, and cognitive neuroscience—however, the overall approach taken and the means of assessment will be more closely aligned with the discipline of philosophy. The ability to produce good philosophical writing starts with the ability and willingness to read good philosophical texts in a careful manner. Accordingly, each session of the seminar will focus on one or at most two target readings and often we will spend more than one session on a single piece. Sometimes there will be optional, supplemental readings that closely relate to the target paper. (\*For graduate students, I will often assign additional readings to be done concurrently with the standard required readings). Lectures will introduce the central issues relevant to the current topic or article under consideration and will provide the necessary background for seminar discussions. However, it should be noted that this is *not* a lecture course. Discussion among the seminar participants and direct engagement with the material is the primary mode of student learning. This means the success of the course will largely hinge on having seminar participants who have come to class well prepared to engage in vigorous discussion and debate.

## REQUIREMENTS:

- **Three papers.** Undergraduate students will be responsible for writing three papers over the semester: two short (5-page) papers and a final paper of roughly 10 pages (due at latest at the official final examination time). Because this is a writing-intensive (WI) designated course, the first two papers will have rewrites. Upon completion of each paper (except for the Final Paper), each student will receive detailed comments suggesting ways to improve the content and quality of the paper. Instructor comments will be given on Paper 1. For Paper 2, students will be giving and receiving comments from two other students in peer-review fashion. (\*The WI-designation is not applicable to graduate students enrolled in the course. Therefore, writing requirements differ slightly: one 5-7 page paper and a final paper of roughly 15-20 pages. No rewrites are required.)
- **Two rewrites.** Students will rethink (important!) and then rewrite the paper on the basis of comments, and submit a paper that demonstrates *significant revision* and sharpening of the ideas contained in the first draft. Note that rewriting a paper does not mean simply rewording a paper; any paper submission that confuses this point will be returned, and the student will be required to complete the assignment again. Rewrites will be graded as *independent exercises* on the basis of overall improvement. Therefore, a grade of "A" on the first essay does not mean that a grade of "A" will be given on the rewrite. Note there are only two rewrites, yet there are three papers. This means that no rewrite will be possible for the third and final paper, which is weighted accordingly.
- **Weekly discussion comments.** After reading the target piece students must post to the discussion board in TELESIS a short (1 page) discussion paper. Discussion paper submission is to be done no later than 8:00PM the night before the class meeting. No

late papers will be accepted, although students can miss one discussion paper without it affecting their grade. Comments should have three main components:

- An identification of what you consider to be the most significant insight or claim in the reading;
- An identification of the claim, argument, thesis you take to be most problematic, controversial, or vulnerable to criticism;
- Any additional ideas, questions, or issues you think we might want to raise in the seminar discussion.

These are extremely short commentaries (no more than one page). Precision and concision are most important; you should not think of these as polished papers but rather as dense but readable comments or notes that inform the reader of your ideas in a highly efficient manner. In line with this, a different standard for grading will apply (basically, credit/no credit for each discussion paper). Discussion papers must be turned in *on time* each week, unless granted permission to do otherwise by the instructor *prior* to the time it is due. Again, credit will not be given for discussion papers turned in late. The discussion paper requirement will ensure that our class time is optimally spent and that everyone comes to the discussion well prepared to be an active discussion participant. In addition, these posted discussion papers will be available for the entire class to read as well as respond to, providing another informal venue for exchange of ideas. As an additional incentive to write carefully thought out discussion papers, each participant will also be required to lead the discussion during one class, maybe more, depending on how many participants we have. And these presentations will include highlighting and engaging the other students' posted commentaries.

- **Presentation:** Each student is required to present and lead at least one class discussion. Presentations can be in any format (e.g., powerpoint, handouts). Beyond providing a presentation on the target paper, discussion leaders will also be responsible for reading and incorporating material from the other student's posted discussion papers. In the second part of the presentation they should address common concerns (if any), difficulties, important problems brought up by others, etc. When writing up your weekly comments keep in mind the fact that you will at some point be the discussion leader reading everyone's comments—thus try to make your comments as clear and insightful as possible because that is what you'll expect when it comes to be your turn to lead the discussion.

### **ASSESSMENT & GRADING:**

Final grades will be computed as follows:

Paper 1 + rewrite	10%
Paper 2 + rewrite + peer review	20%
Final Paper	40%
Weekly discussion comments (cumulative)	10%
Presentation	10%
Quiz(es)	10%

Letter grades will be determined by the usual formula, with A= 90-100%, B= 80-89%, C= 70-79%, D= 60-69%, F= 0-59%. Pluses and minuses will be given to the upper and lower 2% of each 10% band.

(\*Graduate students: Paper 1 worth 20%, Final Paper 50%. No Paper 2. Other items remain the same.)

### **\*A note about proper citation of sources**

Sources must be cited appropriately in all written work submitted in this course. All cases of plagiarism will be taken very seriously in this course, and handled according to the protocols of Washington University. This can result in a failing grade in the course and expulsion from the University.

So what counts as plagiarism anyway? OED online defines plagiarism as the wrongful appropriation and publication as one's own, of the ideas, or the expression of the ideas (literary, artistic, musical, mechanical, etc.) of another. More concretely stated:

*Plagiarism occurs when a student, with intent to deceive or with reckless disregard for proper scholarly procedures, presents any information, ideas or phrasing of another as if they were his/her own and/or does not give appropriate credit to the original source. Proper scholarly procedures require that all quoted material be identified by quotation marks or indentation on the page, and the source of information and ideas, if from another, must be identified and be attributed to that source. Students are responsible for learning proper scholarly procedures (from Duke University Bulletin of Information & Regulations 2005-2006).*

For more information about what counts as plagiarism, how it will be handled, and guidelines to avoid it, please visit:

<http://www.wustl.edu/policies/undergraduate-academic-integrity.html>

<http://artsci.wustl.edu/~writing/plagiarism.htm>

**TENTATIVE READING SCHEDULE (\*subject to change):**

WEEK	DATE	TOPIC	READINGS
WEEK 1	TUES. 1/13	Course Introduction	"General introduction" (SR)
	THURS. 1/15	Kantian Background	Strawson, P.F. "General Review" <i>BoS</i> (ER)
WEEK 2	TUES. 1/20	Space and Objects: I	Strawson, P.F. <i>Individuals</i> , Ch1, "Bodies" (I)
	THURS. 1/22	<b>NO CLASS</b>	No additional reading
WEEK 3	TUES. 1/27	Space and Objects: II	No additional reading
	THURS. 1/29	Objects without Space: I	Strawson, P.F. <i>Individuals</i> , Ch2, "Sounds" (I)
WEEK 4	TUES. 2/3	Objects without Space: II	No additional reading
	THURS. 2/5	Evans-Strawson Exchange	Evans, G. "Things without the mind" (ER) Strawson, P.F. "Reply to Evans" (ER)
WEEK 5	TUES. 2/10	Recent Challenges	Blaser et al. "Tracking an object through feature space" (ER)
	THURS. 2/12	Recent Challenges	<b>Campbell, J. "The role of physical objects in spatial thinking" (SR)</b>
WEEK 6	TUES. 2/17	Development of Object Perception: I	Spelke, E. & Van de Walle "Perceiving and reasoning about objects: Insights from infants" (SR)
	THURS. 2/19	Development of Object Perception: I	<b>Peacocke, C. "Intuitive mechanics, psychological reality, and the idea of a material object" (SR)</b>
WEEK 7	TUES. 2/24	Molyneux's Question: I	Meltzoff, A.N. 'Molyneux's babies: cross-modal perception, imitation and the mind of the preverbal infant' (SR) <b>PAPER 1 DUE</b>
	THURS. 2/26	Molyneux's Question: II	Heil, J. "Molyneux's Question" (ER) Degenaar, M. "Molyneux's problem" (web) <a href="http://plato.stanford.edu/entries/molyneux-problem/">http://plato.stanford.edu/entries/molyneux-problem/</a>
WEEK 8	TUES. 3/3	Molyneux's Question: III	<b>Evans, G. "Molyneux's Question" (ER)</b>
	THURS. 3/5	<b>NO CLASS</b>	
WEEK 9	TUES. 3/10	<b>SPRING BREAK</b>	
	THURS. 3/12	<b>SPRING BREAK</b>	
WEEK 10	TUES. 3/17	Human Time Perception and the Brain: Lessons	<b>Dennett, D. "Time and the brain" (ER)</b> Eagleman, D. et al. "Time and the brain: How subjective time relates to neural time" (ER)

WEEK	DATE	TOPIC	READINGS
	THURS. 3/19	Reference Frames in Vision: I	Braddick, O. "Computing 'where' and 'what' in the visual system" (SR) Pouget, A. & Sejnowski, T. "Egocentric spatial representation in early vision" (ER)
WEEK 11	TUES. 3/24	Reference Frames in Vision: II	<b>Logothetis &amp; Sheinberg "Visual object recognition" (ER)</b> Logothetis, N. et al. "Shape representation in the inferior temporal cortex of monkeys" (ER) Logothetis N. et al. "Psychophysical and physiological evidence for viewer-centered object representations in the primate" (ER)
	THURS. 3/26	Reference Frames in Sensorimotor Control	<b>Stein, J. "The representation of egocentric space in posterior parietal cortex" (ER)</b> Andersen et al. "Multimodal representation of space in the posterior parietal cortex and its use in planning movements" (ER)
WEEK 12	TUES. 3/31	Perceptual space and motor space: Integration or Separation?	<b>Milner, D. &amp; Goodale, M. "Two visual systems re-viewed"</b> Goodale, M. & Milner, D. "Separate visual pathways for perception and action" (ER) <b>PAPER 2 DUE</b>
	THURS. 4/2	Challenges & Developments: I	Millikan, R. "Content and vehicle" (SR)
WEEK 13	TUES. 4/7	Challenges & Developments: II	<b>Grush, R. "Skill and spatial content" (ER)</b>
	THURS. 4/9	Evans' on Objective Space: I	<b>Evans, G. "Demonstrative identification" (ER)</b>
WEEK 14	TUES. 4/14	Nonconceptual Content & Perception	Bermudez "What is at stake in the debate on nonconceptual content?" (ER)
	THURS. 4/16	Challenges & Developments: III	<b>Clark, A. "Visual experience and motor action" (ER)</b>
WEEK 15	TUES. 4/21	Space and Objectivity Revisited	<b>Eilan, N. "Molyneux's question and the problem of the external world" (SR)</b>
	THURS. 4/23	State of the Art	Grush, R. "Skill theory v2.0" (ER)
WEEK 16	TUES. 4/28	<b>Reading Period; no class</b>	
	THURS. 4/30	<b>Final Exam Period; no class</b>	<b>FINAL PAPER DUE</b>