Syllabus: Research Methods 1 (7.5 hp)

The aim of the course is to provide skills and tools for critical evaluation of research results. The theme of the course is causal inference: strength and weaknesses of various cause-probing designs, fallacies and paradoxes of causal interpretations, and tools for thinking clearly about causation. In addition, two seminars are dedicated to research ethics. A group assignment involve an in-depth analysis of a causal problem, including simulation of data using the statistical software R. A satellite course entitled “learn R by EXample” (REX) is included, to get started with data simulations in R.

Prior knowledge
The course assumes prior knowledge corresponding to the content of courses in methodology at Psychology 1-3 at Stockholm University (see literature lists for these courses at www.psychology.su.se).

Learning outcomes
After completing the course, you are expected to be able to:

1. Understand and contribute to theoretical discussions of causality, causal inference and cause probing research designs;
2. Analyze causal problems, including critical assessment of the credibility and generalizability of conclusions from empirical research studies;
3. Analyze research proposals and studies from an ethical perspective

Course content
The course will cover the following topics:
- Formal definitions of association and causality
- Randomized experiments and observational designs
- Potential outcome model of causality
- Directed Acyclical Graphs
- Mediation
- Moderation (interaction)
- Data simulation using R
- Research ethics

Activities
The course consists of lectures, group exercises and seminars. The lectures deal with behavioral science research methodology, with a strong focus on causal inference, and with research ethics. Group exercises and seminars discuss specific methodological problems or research articles from a methodological perspective. To be able understand and participate in the seminar discussions, you should have read the literature assigned to each occasion (see schedule on Athena).
Examination
After completing the course, you are expected to be able to:

| Learning outcome 1: | Understand and contribute to theoretical discussions of causality, causal inference and cause probing research design |
| Learning outcome 2: | Analyze causal problems, including critical assessment of the credibility and generalizability of conclusions from empirical research studies |
| Examination: | Written exam (individual). Written accounts of the group assignment (one per group), including written report, slide-show presentation presented at final seminar, and a well-commented R code of data simulations. |
| Learning outcome 3: | Analyze research proposals and studies from an ethical perspective |
| Examination: | Active participation at the Research ethic seminars 1 and 2 |

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<thead>
<tr>
<th>Type of examination</th>
<th>Grade</th>
<th>Form</th>
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<tbody>
<tr>
<td>Group assignment</td>
<td>0-5 points</td>
<td>Written report (one per group), slide-show presentation (seminar), data simulation (R code)</td>
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<tr>
<td>Analyzing a causal problem</td>
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<tr>
<td>Research ethics seminar</td>
<td>Pass/Fail</td>
<td>Oral (seminar)</td>
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<td>Discussion at seminar</td>
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<tr>
<td>Written examination</td>
<td>0-25 points</td>
<td>Written (individual)</td>
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The written exam is scored 0 to 25 points. In addition, the result of your group assignment (report, slide-show presentation and R-code) will be scored 0 to 5 points and this score will be given to all group members.

The course is graded on the seven-point ECTS-scale (A, B, C, D, E, Fx, F). Together, the written examination and the group assignment can give a maximum of 30 points. Grade A requires at least 27 points, B 24-26 points, C 21-23 points, D 18-20 points and E 15-17 points (Fx: < 15 points). In addition, grades A-E requires (a) at least 2 points on the group assignment, (b) passed research ethics seminar, (c) at least 12 points on the written examination.
Literature (preliminary and subject to change)

Theoretical articles (preliminary list, more articles may be added)

Empirical articles (very preliminary list, articles may be added)

Texts on research ethics
Download from www.codex.vr.se

Schedule
Date, time and room: see Athena

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<tr>
<th>Lecturer</th>
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<tbody>
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