Project Proposal Research Traineeships 2019-2020

1. Project title

The Cognitive Turn in Psychology: The Narrative and the Numbers

2. Coordinators

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3. Project Summary

Background

In the late 1950s and early 1960s, American psychology witnessed what has often been called a 'cognitive turn'. Where experimental psychology had been dominated by behaviorism in the first half of the twentieth-century, cognitive psychologists developed a new interdisciplinary framework for the study of mind and behavior in the first decades after the Second World War. Inspired by the invention of the computer and developments in neuroscience, linguistics, and philosophy, psychologists started to doubt the feasibility of the behaviorist approach (e.g. Lashley, 1951; Chomsky, 1959; Breland & Breland, 1961) and developed new methods, theories, and experiments to study 'mental' processes in a strictly empirical fashion (e.g. Miller, 1956; Newell & Simon, 1958).

The nature of the cognitive turn has been highly disputed by historians of psychology. Some view the cognitive turn as a paradigmatically Kuhnian revolution (Baars, 1986; Gardner, 1985)—as a historical process in which the behaviorist paradigm was displaced by a competing cognitivist paradigm that is at least to some extent incommensurable. Others, however, have suggested that that there is much continuity between cognitive psychology and methodological behaviorism (Leahey, 1992; Mandler, 2002), or even that the very notion of a 'cognitive turn' should be dismissed as an "origin myth", invented in the early 1970s by cognitive psychologists (Joynson, 1970; Dember, 1974) in order to foster a shared identity (Hobbs and Chiesa, 2011).

Traditionally, historians of psychology rely on qualitative methods—e.g. archive study, close reading—in studying developments like the cognitive turn. In recent years, however, a number of historians have started to use quantitative techniques to analyze developments in the study of mind and behavior. In 2018, for example, the journal *History of Psychology* published a special issue on the value of digital methods in historiography, featuring a number of innovative approaches to the study of psychology and its history (e.g. Burman 2018; Flis & van Eck 2018). As yet, however, little work has been done to quantitatively test claims about the cognitive turn. Except for a small study featuring citation data of four behaviorist and cognitivist journals between 1979 and 1988 (Friman et al., 1993), historians have not yet attempted to analyze the cognitive turn in a quantitative way.

Research questions

This project aims to make amends by answering two questions about mid-twentieth-century psychology: (1) To what extent can we speak about a cognitive turn in Anglophone experimental psychology between 1945 and 1985? (2) To what extent does cognitive psychology differ from alternative (e.g. behaviorist) approaches to experimental psychology?

Using advanced text analysis tools (e.g. (co)citation analysis, term co-occurrence analysis), this projects seeks to answers these questions by:

(1a) analyzing the development of (co-)citation patterns in psychology and cognitive science between 1945 and 1985;

(1b) analyzing the development of term co-occurrence patterns in psychology and cognitive science between 1945 and 1985;

(2a) comparing term co-occurrence patterns of papers published in paradigmatic cognitive psychology journals and paradigmatic behaviorist journals; and

(2b) constructing and comparing indices of interdisciplinarity for papers published in paradigmatic cognitive psychology and behaviorist journals.

Especially in subprojects (1a) and (1b), we will build on an earlier project in which we quantitatively analyzed 119.278 journal papers published in American psychology journals between 1920 and 1970 in order to test the historical claim that behaviorism dominated American psychology in the first half of the twentieth century. This project resulted in a paper about the rise and fall of behaviorism (Braat et al., ms.) that has been presented at a few prestigious conferences and is currently under review at *History of Psychology*. Figure 1 and 2 show examples of a co-citation network and a co-occurrence network from this paper.

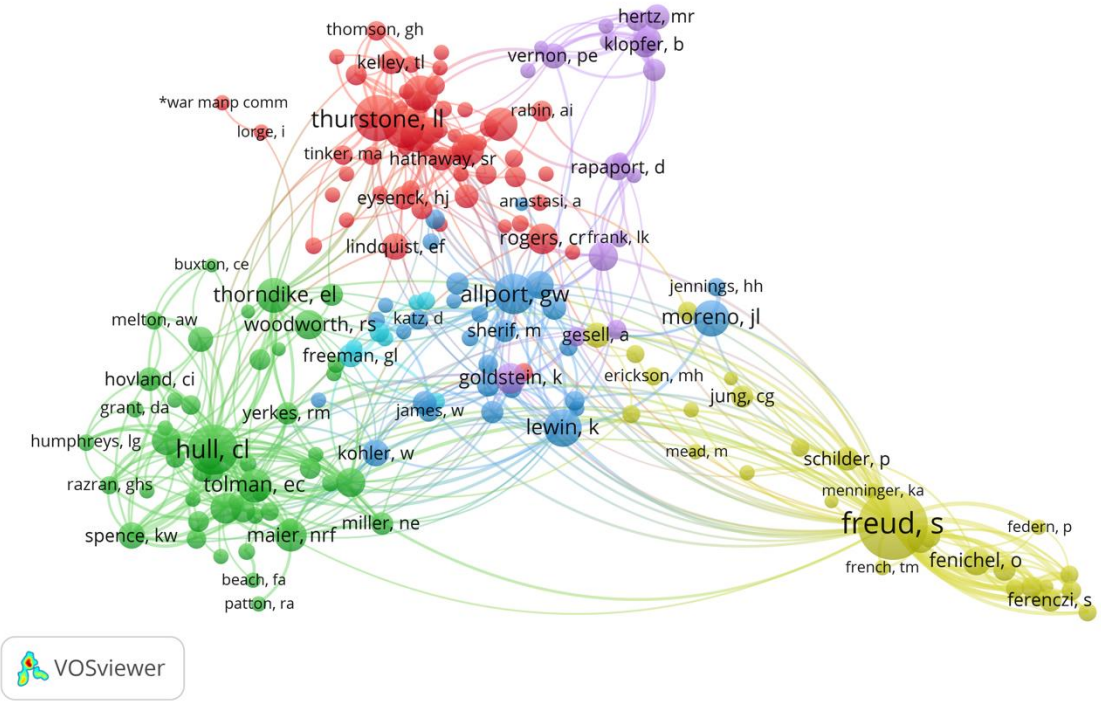

Figure 1. Co-citation network of the 193 most cited authors from the period 1941-1950. All behaviorist authors (e.g. Hull, Tolman, Spence) are located in the green cluster. Cognitive psychologists are not yet included in the list of most-cited authors.

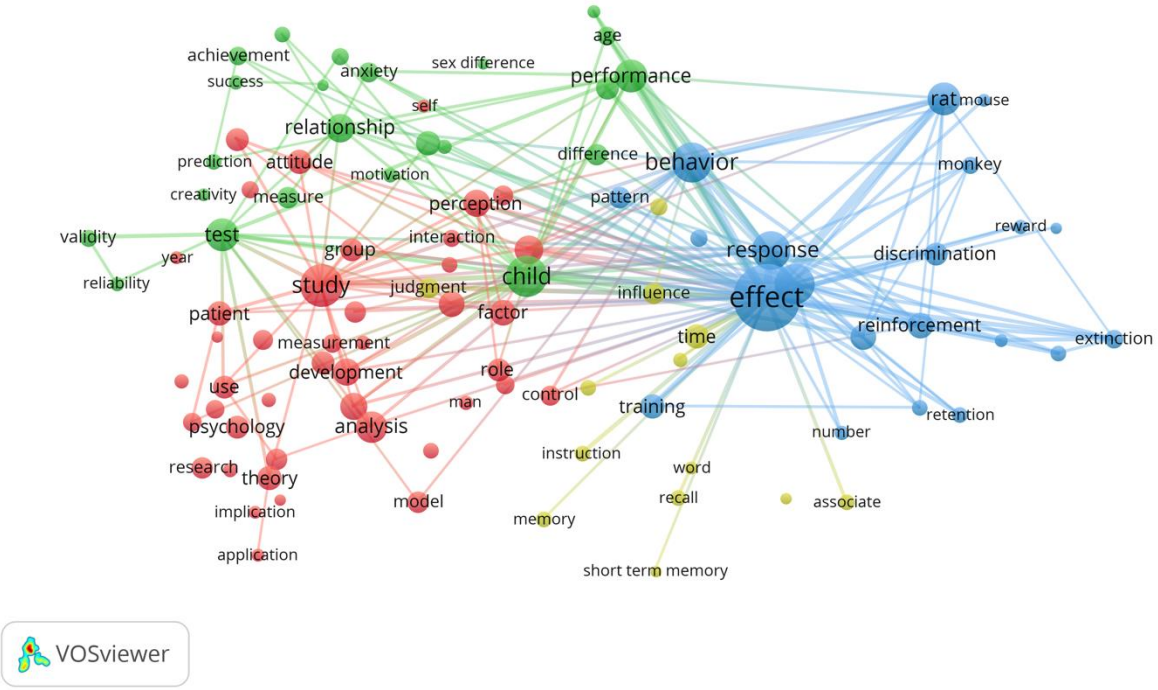

Figure 2. Term co-occurrence network of the 100 most frequent terms in psychology papers from the period 1961-1970. Typical behaviorist concepts like 'reinforcement' and 'extinction' are located in the blue cluster. Typical cognitivist concepts like 'short term memory', and 'recall' are making an entry in the 1960s and are located in the yellow cluster.

Methods

Data collection. First, the set of relevant scientific records representing the disciplines of psychology and cognitive science will be identified and collected via *Web of Science*. This will comprise mostly journal publications (in English). For all relevant records the full bibliographic information, including citation data, will be stored. Some of this data has already been collected in our previous project but the dataset will be extended by (1) collecting the scientific records of publications after 1970 and (2) collecting data from cognitive science journals and journals in neighbouring disciplines.

Data processing and analysis. For the co-citation analysis, the free software VOSViewer (Van Eck & Waltman 2010) will be used. This software enables the user to import records from Web of Science, and visualize the links that exist between publications, authors, and the terms that occur in these records. Part of the work will involve curating the thesaurus to improve the quality of further analyses.

Co-citation networks will be created for consecutive five-year periods. We will analyze the overall structure of the networks, but also zoom in and make more precise comparisons by tracking how the strengths of specific links change over time.

For the term co-occurrence analyses, we will focus on noun phrases that authors use to express psychological concepts (e.g., 'cognition', 'memory', 'representation'). These terms will be extracted from the records using natural language processing techniques. The frequencies of all relevant terms within a set of records (e.g., the word 'cognition' in all psychological records from 1945-1949) will be computed. Term co-occurrence maps will be constructed using VOSViewer.

Interdisciplinarity indices will be constructed by examining citations across (cognitive) psychology journals and journals from neighboring disciplines (e.g. neuroscience, biology, philosophy, and computer science).

4. Project timeline

	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Training												
History of Psychology	■	■										
Methodological training			■	■								
Research												
Data collection		■	■									
Data preparation				■	■							
Analysis						■	■	■				
Writing									■	■	■	■
Milestones												
Data set					■							
Conference presentation											■	
Paper												■

Output: The goal of this project is twofold. First, the trainees will present the results at a symposium about the cognitive turn organized by Sander Verhaegh as part of his NWO Veni project on the development of mid-twentieth century philosophy and psychology. For this symposium, we will also invite renowned experts on digital methods (e.g. Nees Jan van Eck, Leiden) and historians of psychology familiar with quantitative approaches (e.g. Jeremy Burman, Groningen). Second, the coordinators and the trainees will write a scholarly article reporting the results of this project and submit it to the journal *American Psychologist*.

5. Research Trainee Profile

We are looking for two Master or advanced Bachelor students with an interest in the topic of this project. One trainee will have a background in communication and information sciences and an affinity with bibliometrics or text mining. The other trainee will have a background in philosophy of science and an affinity with the history of psychology. The trainees will collaborate with the coordinators on the project. They will be responsible for data collection and contribute to data preparation and analysis. Furthermore the trainees will present the results of the project at the symposium (see section 3) and write, along with the coordinators, a scholarly article reporting on the results of the project. Candidates can apply by submitting:

- A letter of motivation (one page)
- A Curriculum Vitae
- A list of grades

Please send informal enquiries to:

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