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# Cultural Epidemiology

A quest for ontologies where the social and cognitive sciences can meet

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## Introduction

Recent years have seen several attempts to **bring the cognitive and social sciences together**. Social cognition or Cognitive economy are examples of such initiatives. But getting the cognitive and social levels of explanation to **interoperate** so they can participate in common questions requires a **common ontology** which does not yet exist.

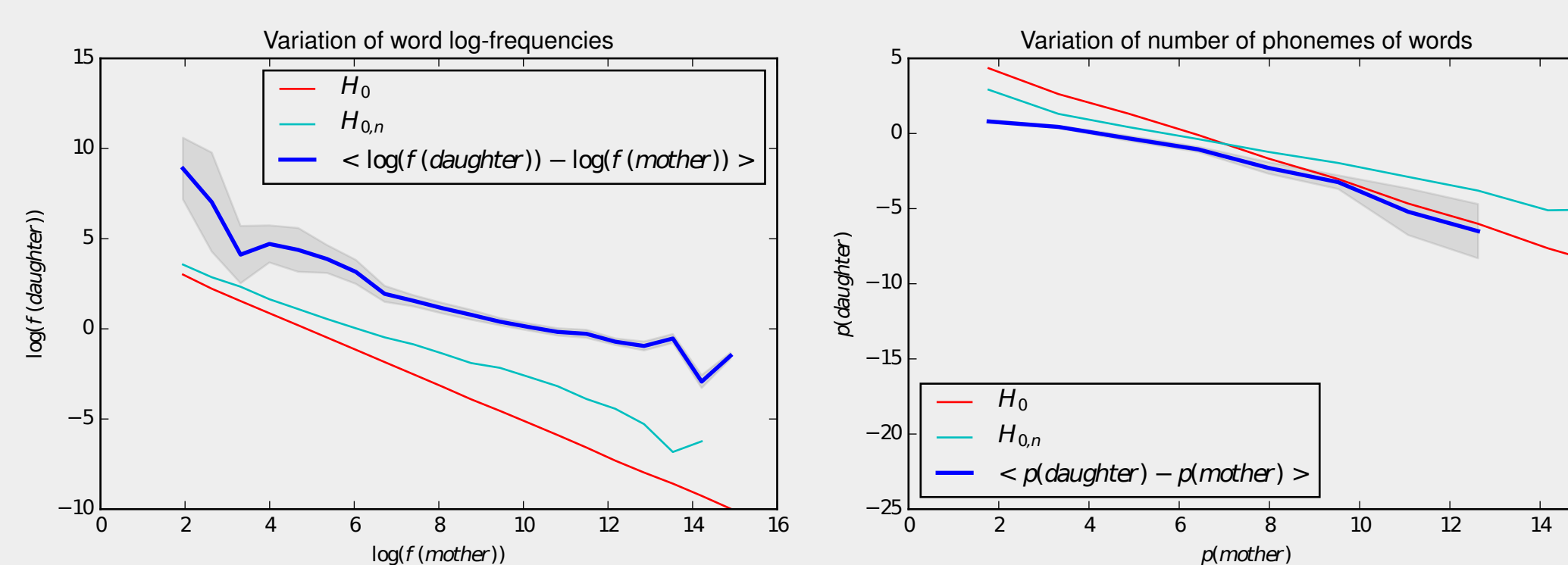
A promising approach was launched by Dan Sperber [1] in the mid-nineties: **cultural epidemiology**. It is theoretically well developed, but still empirically not well tested due to the challenge in setting up concrete experiments.

The ontology consists of **mental representations** (those of cognitive science), and their physical counterpart, **public representations** (those of social science). Mental representations live in the mind, are produced as public representations, and are interpreted by other minds to form new —different— mental representations. **Cognitive modules** determine how and why representations are interpreted and/or produced.

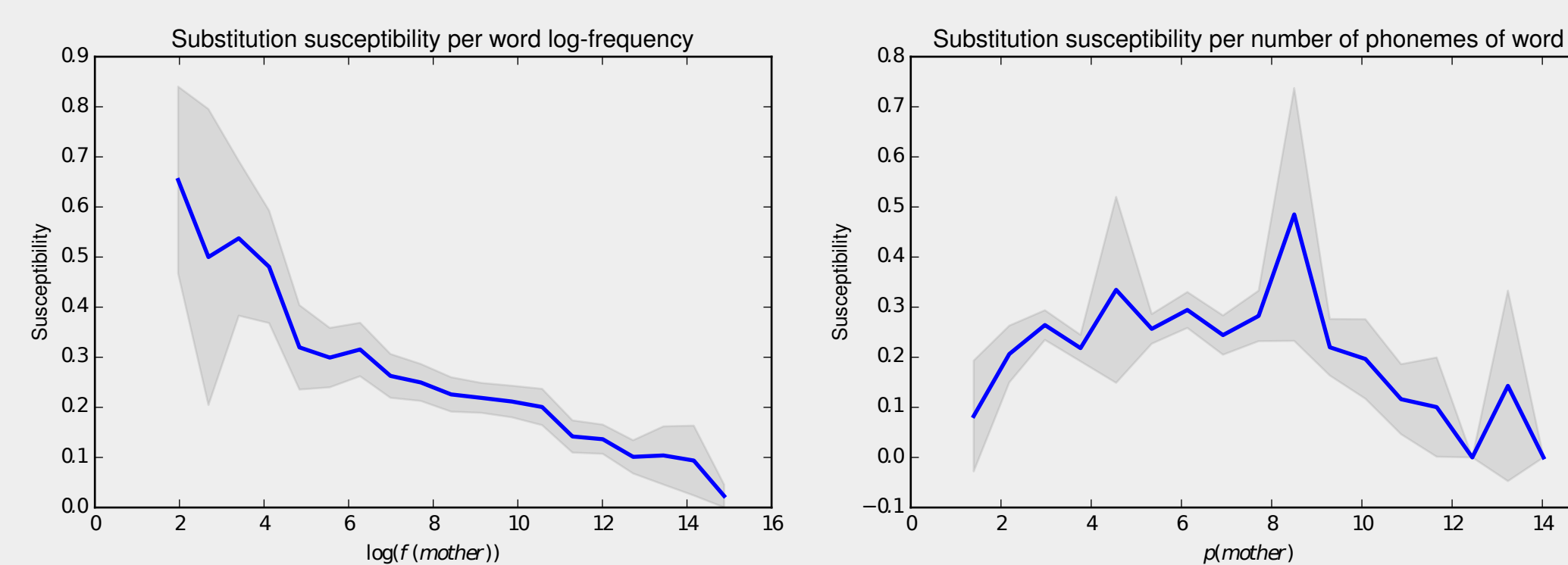
We aim to further **test the cultural epidemiology framework** with case studies, and **advance the debate** on a common ontology for cognitive and social sciences.

## Experiment 1 — psycholinguistics on quotes from the Internet

How word frequency and number of phonemes of a word vary upon substitution



How word frequency and number of phonemes relate to susceptibility to substitution



We use the MemeTracker dataset [2] to track the **evolution of quotes in blogspace**: quotes should not change, but authors often unconsciously transform them nonetheless when writing a blog-post.

By tracking **word substitutions** when quotes are copied, we characterize one of the ways in which these pieces of information are transformed as they go from blog to brain and back to blog, and so on.

« It was a very *strange* situation »  
« It was a very *dynamic* situation »

## Experiment 2 — real-life chinese whispers game-experiment



Smartphones and tablets let us gather very large amounts of data under controlled and filterable conditions [3].

We will develop a **smartphone game** using the **Science en Poche** tools to accurately measure how transformations are introduced and/or constraints are followed when people repeat short sentences, in various conditions.

The insight on transformations will provide the micro level for **multi-agent models** of epidemiology of representations.

A key claim from the theory that is to be tested is the emergence of **stable cultural attractors** as fixed points of the whole dynamical system.

## Wider questions

Most of the questions in this poster also relate to the notions of **interpretation, meaning** (or making sense), and **social interaction**, which are still all left out of the discussion. So does this approach properly address the social-cognitive communication question? Can we improve?

Smartphones are a new kind of microscope [4]. Can we leverage it better to ask questions relevant to both cognitive and social sciences?

## References

[1] Dan Sperber. Explaining Culture: A Naturalistic Approach. Oxford: Blackwell Publishers, 1996.

[2] Jure Leskovec, Lars Backstrom, and Jon Kleinberg. Meme-tracking and the Dynamics of the News Cycle. KKD'09, (June 28-July 1): 497-505, 2009.

[3] Geoffrey Miller. The smartphone psychology manifesto. Perspectives on Psychological Science, 7(3): 221-237, 2012.

[4] Anthony G Greenwald. There is nothing so theoretical as a good method. Perspectives on Psychological Science, 7(2): 99-108, 2012.