

# Optimality Theory and Cognitive Science (seminar)

LING 228 01 / 628 01

## Written response #3

Due: April 21, 2014

The goal of this *written response* is to formally check you have done the readings, as well as to help you **synthesize** your knowledge. Your response can be submitted either on paper or in email, but please avoid hand-written answers.

## Problem: Food Cognition

Let us develop a model of food choice, and its acquisition in childhood. Can we do it using Optimality Theory, or some “OT-style” framework?

Here is a toy example that I employed in the past to introduce Optimality Theory to an audience of non-linguists:

/You enter restaurant/	DON'T EAT(BEEF)	DON'T EAT(SPINACH)	DON'T STARVE	DON'T EAT(CHICKEN)
beef	*!			
spinach		*!	*	
nothing			*!	
☞ chicken				*

Given some situation as the input, the candidates are possible choices available to the person facing the situation: items on a menu card, food in a fridge, or what can possibly be hunted-gathered. Beside the constraint DONTSTARVE, I have also posited a constraint family DONT EAT( $x$ ), where  $x$  can be any substance.

Can you turn this (or a similar) toy example into a “real cognitive model”? In fact, what would you require of a “real cognitive model”? Here is your

Assignment: Write a **project proposal** (approximately 3 pages of length) to work out a *cognitive science of gastronomy*. Convince the reviewers of your proposal that, if the research project gets funded, you will be able to establish a new subfield in the cognitive sciences.

Additionally, I also would like you to cover **acquisition**, explaining how different people, and people in different cultures develop different preferences, by referring to OT learning algorithms. In fact, observe that there are not only individual differences, but also more significant cultural differences, the extreme cases of which are *food taboos* (such as pork in the Middle East, beef in India, or dogs and cats in the Western culture). Moreover, learning can be based both on primary personal experience and on cultural transmission (information received from others, who have or have not undergone a personal experience).<sup>1</sup>

<sup>1</sup>A piece of “anecdotal data”: my 2.5-year-old daughter, until recently, was willing to eat

A project proposal should consist of (at least) the following parts:

1. **General introduction**, including a preliminary formulation of the goals of the proposed research project.
2. **Past work, state of the art and embeddedness**: How does the proposed project relate to other disciplines? Although this would be the place for you to provide a general overview of the field, I am certainly *not* asking you to do literature research. Instead, please consider the various forms of *integration*, as introduced by Smolensky and Legendre in Chapter 3 of *The Harmonic Mind*.
3. **A preliminary model**: Based on “common knowledge” (or a fake dataset made up by you), develop a preliminary model accounting for food preference.<sup>2</sup> You are free to pick any variant of OT, but motivate your choice.  
It is probably this part of your proposal that will take most of the space (and feel free to introduce subsections). You may first introduce your data to be accounted for, then develop a formal analysis, and finally reflect on the explanatory power of this analysis. Be self-critical to anticipate the criticism of the reviewers. Solving (some of) the problems may be your...
4. **Aim**: Define the problem that you would like to solve in your research. Alternatively, define the research question that you would like to answer.
5. **Goals**: Break down your aim into more specific goals, such as different aspects of establishing your model as a convincing cognitive model of gastronomy. For instance, what about a longitudinal study of a group of toddlers? (Hints: you might consider computational, neuro-scientific, evolutionary, ontogenetic and cross-cultural aspects, among others.)
6. **Workplan**: If your project gets funded, what will you do, and in what order? Estimate the time and resources needed.<sup>3</sup> Also specify *deliverables*.
7. **Relevance, timeliness**: Why is it important to carry out such a project, and why in 2014? Is it a hot topic? Does it have societal relevance? Who would benefit from this research: does it help make the world a better place, or are there potential industrial implementations, or would it benefit other theoretical research fields?
8. **Personal qualities**: Why are *you* the best person for this project?<sup>4</sup>

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any food provided by her parents. Nowadays she first refuses any new food; but when she sees her father eat it, she also wants to try it out. Then she may realize she does not like it.

<sup>2</sup>In a real proposal, you obviously *must* use real data, based on past work by you or others.

<sup>3</sup>You can ask for a high sum, buy instruments, and hire any number of research assistants. Use your creativity! Unlike real reviewers, I will not check if the amounts are realistic.

<sup>4</sup>Unlike in real grant proposals, I am not asking you to provide your CV, etc. But for the sake of the game, try to give me a few – possibly fake – reasons why I should commission **you** with this project. It is fine if this part consists only of a few sentences.