

Iterated conditionals. As ordinary as can be?

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2. Report of the London visit: July 4-8, 2012.

The goal of this project is to adjudicate between opposing theories about the meaning of conditionals by focusing on iterated conditionals of the form ‘if p, then if q, then r’. We use a combination of conditional probability evaluation and truth table evaluation tasks, based on the paradigm used in Politzer, Over & Bagartin (2010). Participants are presented with abstract iterated conditionals describing chips, and a betting vignette in which two speakers place a bet on a conditional. They are then asked to evaluate the probability of winning the bet, and the truth-value of several truth-table conditions, chosen to maximize the differences in predictions between the theories.

During the visit, we have presented our findings at the symposium on the new paradigm in psychology of reasoning, at the [International Conference on Thinking](#), 2012. We have received positive feedback, especially on two aspects of our design:

- Unlike previous psychological experiments, our design enables a more clear-cut distinction between the conditional theories known as T2 (intensional truth conditions; Lewis) and T3 (no truth conditions; Adams).
- Our design offers a much needed psychologically plausible measure of similarity (by counting features), which enables to make the T2-predictions precise enough to be tested. This could be used to further test T2, not only with iterated conditionals, but also with counterfactuals, for which the theory was originally designed. We plan to do this as our next experiment (see below).

After the symposium, we discussed our experiment again and, in light of the comments, decided to take the following steps:

- Besides the counting the features measure of similarity, we will also check our data for a T2-pattern based on frequency as a measure of similarity, and for a T2-pattern combining these two strategies.
- In the ultimate analysis, we will only use the data from the web experiments, and will exclude the DMU participants, to make the sample more homogenous.
- In discussing the results, it is important to distinguish between Import and Export. In philosophy it is uncommon to do this because the only argument that has ever been given for either principle works equally well for both if it

works at all (the argument simply is that we don't hear a difference in meaning between the imported and exported form). Whereas the results from Douven & Verbrugge (in press) speak against Export, our results seem to go against Import.

- We will submit our findings as a short paper to Cognitive Science, seeking to address a wide audience (not necessarily restricted to the psychology of reasoning).
- Our design seems perfect for testing theories about the relation between indicatives (if p, then q) and counterfactuals (if it were the case that p, then it would be the case that q). According to a popular view, the confidence people have in a counterfactual equals their confidence in the corresponding indicative at a prior time.

sample item

Here is a collection of chips:



A random chip is to be drawn in a fair way.

Mary says:

If the chip is round, then it is white.

How justified is Mary's view? (On a Likert scale 1-7)

This is the chip that was actually chosen:



Mary says:

If the chip had been round, then it would have been white.

How justified is Mary's view? (On a Likert scale 1-7)

- Import-Export needs further investigation. One idea is to study Modus Tollens inferences, i.e. $p \rightarrow (q \rightarrow r)$, $q \ \& \ \text{not-}r$, therefore not-p versus $(p \ \& \ q) \rightarrow r$, $q \ \& \ \text{not-}r$, therefore, not-p. If this is harder or takes longer with the imported form, then it seems to show that people do not process the iteration by rewriting it as the imported form. Another idea that came up during the discussion after our talk is to compare $p \rightarrow (q \rightarrow r)$ to $q \rightarrow (p \rightarrow r)$, which should be equivalent if import-export holds and conjunction is symmetric.

To conclude, the symposium and the discussion afterwards made clear that it is fruitful to extend the basic psychological methods for simple indicative conditionals

to more complex conditionals. We have now studied iterations, and the next step is to include other non-simple conditionals like counterfactuals.