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If-conditionals, modality, and Schrödinger's cat

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Abstract

This talk addresses the modal nature of *if*-conditionals. *If*-conditionals are seen as bipartite constructions (Fillmore 1986: 196, 1998: 36) which (a) attract modality statistically significantly above average, and (b) show a markedly higher degree of modal density than non-conditional sentences and *when*-constructions. The discussion will also draw on the notion of "mental spaces" (Fauconnier 1994) as adapted for conditionals by Dancygier & Sweetser (2005)

To illustrate the point, I used the written BNC as a whole, as well as random samples of *if*-conditionals, non-conditional sentences, and *when*-constructions from it. These were subjected to (a) automatic and manual keyword analysis, and (b) modal density analysis (cf. Halliday's measure of lexical density, 2004: 654-655). The keyword analysis of *if*-conditionals against the whole written BNC showed that the bulk of modal expressions were key in the sample (Gabrielatos 2006, 2007). Even more key modal expressions were found by comparing all *if*-sentences in the written BNC with that corpus as a whole. The modal density analysis revealed the following: (a) On average, each *if*-conditional construction has 1.13 modal expressions (discounting *if*); (b) in contrast, the modal density of non-conditionals and *when*-constructions is 0.34 and 0.4 repectively.

The high modal content of *if*-conditionals is all the more intriguing given that they are already within the scope of the modal expression *if*. However, the high attraction exerted by *if*-conditionals to modality does not, in itself, define their modal nature. Two questions are pertinent to that nature: Can they be seen as being modalised? Can they be seen as being modal themselves? It will be shown that a remarkable characteristic of *if*-conditionals (and, it would seem, conditionals in general) is that they are modally dense constructions, without being either externally modalised or modal themselves. Moreover, the case will be made that *if*-conditional constructions are internally modalised – or self-modalised. Seen as such, *if*-conditional constructions can usefully be treated as the language equivalent of the box in Schrödingers' famous thought experiment (1935, English translation by Trimmer 1980). This conception can show how the fundamental nature of *if*-conditionals gives rise to their different types and functions in English.

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Motivation

- Reported connection between conditionality/ conditionals and modality:
  - "A conditional … never expresses the factuality of either of its constituent propositions" (Comrie, 1986: 89).
  - "Conditionality has long been known to be related to modality and causality" (Sweetser, 1990: 141).
  - "Conditionals have an intimate link with the domain of epistemic qualification" (Nuyts, 2001: 352).
  - "Modality seems … to be doubly marked in conditionals" (Palmer, 1986: 189).

→ What is the nature of this connection?

Corpus-based approach: Data

- Written BNC
- Written BNC Sampler
- FLOB
- S-units containing *if* from BNC
- Non-conditional S-units from BNC
- Random samples from written BNC
  - 831 *if*-conditionals.
  - 855 non-conditional S-units.
  - 1000 *when* S-units

Definitions

Colligation:

- The statistically calculated co-occurrence of grammatical categories (Firth, 1968: 181), or lexis and grammatical categories (Stubbs, 2002: 65).

Semantic preference

- The attraction "between a lemma or word form and a set of semantically related words" (Stubbs, 2002: 65).

Corpus-based approach: methodology

- Keyword analysis

- Manual calculation of *modal density*
- "Lexical density": content words per clause (Halliday, 2004: 654-655)

- Modal density: modal words/constructions per
  - S-unit
  - clause.

Keyword analysis (1)

Comparison	Modal keywords			
	Positive	Negative	*Positive %*	*Negative %*
Sample * BNCSw	27	0	*3.09*	*0*
Sample * FLOB	21	1	*2.77*	*1.39*
if-BNCw * BNCSw	93	6	*4.47*	*0.14*
if-BNCw * FLOB	63	9	*3.92*	*0.20*

Keyword analysis (2)

Key words in the sample and *if*-BNCw contained

- All central modals.
- Most marginal auxiliaries (e.g. *be able to*) and modal catenative verbs (e.g. *want to*).
- Constructions involving words with modal meaning
  - main verbs (e.g. *doubt that*) ,
  - nouns (e.g. *there is a chance that*),
  - adjectives (e.g. *it is possible that*),
  - Adverbs (e.g. *presumably*).

(Quirk et al., 1985: 137, 236-237).

Modal density

Per S-unit

- Sample of *if*-conditionals: 1.13
- Sample of non-conditionals: 0.39
- Sample of *when* S-units: 0.40

Per clause

- Sample of *if*-conditionals: 0.55
- Sample of non-conditionals: 0.20

- In both cases, *if*-conditionals have about three times higher modal density than non-conditional constructions …
- … in addition to the modalisation by *if.*

Modal nature of *if*-conditionals (1)

- Modality attractors (Gabrielatos, 2006)
- Modal colligations (Gabrielatos, 2007)
  - Constructions with a statistically significantly mutual attraction to the semantic category of modality.

- The high attraction exerted by *if*-conditionals to modality does not, in itself, define their modal nature.

- Bipartite constructions (Fillmore 1986: 196, 1998: 36).

- → Are they modalised?
- → Are they modal?

Modal nature of *if*-conditionals (2)

Modalised?

- The protasis modalises the apodosis – but this modalisation is *internal* to the construction.
- The conditional construction can be externally modalised …
  - **Perhaps** if it's a bad case the patient has to wear a special boot or keep the leg held straight with iron braces. [CHG 80]
- … but this is not interesting.
- Also, this kind of modalisation has not been included in the calculation of modal density.

Modal?

- They do not modalise other constructions.

Modal nature of *if*-conditionals (3)

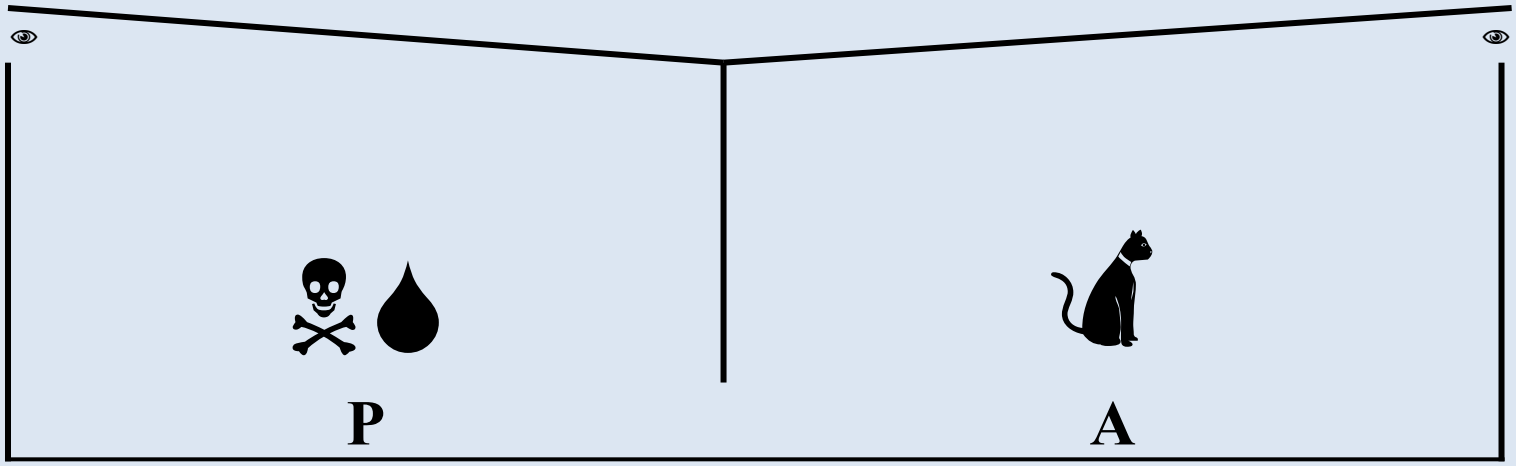
- They are modally dense …
  - regardless of external modalisation
  - without functioning as modals

- → Are they self-modalised?

- Dancygier & Sweetser (2005): mental spaces

Schrödingers‘ thought experiment

- Schrödinger’s thought experiment sought to demonstrate the absurdity of accepting that , while no observation is taking place, the cat is neither alive nor dead.
- “A cat is penned up in a steel chamber, along with the following device (which must be secured against direct interference by the cat): in a Geiger counter there is a tiny bit of radioactive substance, *so* small, that *perhaps* in the course of the hour one of the atoms decays, but also, with equal probability, perhaps none; if it happens, the counter tube discharges and through a relay releases a hammer which shatters a small flask of hydrocyanic acid. If one has left this entire system to itself for an hour, one would say that the cat still lives *if* meanwhile no atom has decayed. The psi-function of the entire system would express this by having in it the living and dead cat (pardon the expression) mixed or smeared out in equal parts” (Schrödinger, 1935; transl. Trimmer 1980).


P
A

If you are going to work for somebody else,	then you'll need to prepare a record of your abilities and experience. [CDK 789]

- Surface interpretation:
- Addressee's intention/plan regarding working for somebody else unresolved → also unresolved whether she will need to prepare such a record.

- However:
- Section heading: 'Going back to work'
- Next section heading: 'What can you do that's of interest to an employer?'

- → The co-text indicates that the text is targeted at people seeking employment .
- → Author uses the conditional construction to tentatively give information or advice.

The facts speak for themselves; if Dana had any feelings for you	she'd have refused my offer. [H8J 2736]

- Observation of the status of A provides clues for inference about the status of P.
- → Inferential conditional

As he spoke, Deems rose, clutching the MPRP weapon.
‘I prefer my cynicism to your self-deceiving optimism.’
‘Ibrox, my party wishes merely to see an end to conflict. We desire to finish with galactic war for ever. Is that self-deceiving?’

It is nothing	if not self-deceiving. [HA0 3580]

- On the surface, it is presented as inference.
- Observation in A → proposition is absurd → inference (= it is self-deceiving)
- → Rhetorical conditional

What appears on the surface as a reasoned form of life is in reality a mask for a partial approach to reason,	if not sheer irrationality. [G0R 361]

- Observation of P:
  - ☑ sheer irrationality
  - ☒ sheer irrationality → mask for partial approach to reason
- → 'at least' interpretation

- Firstly, the United States economic system was shown to be far from invincible: the myth of the Great American Dream was, if not exploded, at least undermined.

SVGA video memory is also on the motherboard and has 512K DRAM supporting up to 1024x768 resolution.

This is expandable to 1MB for high resolution 256 colour support	if required. [HAC 10775]

- Observation in P:
- ☑ 1 MB required → DRAM is expandable
- ☒ 1 MB required → DRAM is expandable

- → What ☑P activates is the relevance of the information in A.

If you have the stomach for it	minced worms make a wonderful fly food! [C96 375]

- Observation in P:
- ☑ have the stomach → wonderful fly food
- ☒ have the stomach → wonderful fly food
- → P and A not connected by causality
- → What ☑P activates is the speech act in A.
- Speech act / pragmatic conditional.

PHOTOGRAPHY NOW is planned then, as a diagram and a series of oppositions, or varieties.

If diagram is the right word,	we hope that it is like a set of arrows, or avenues, pointing outwards in some of the many directions an artist interested in photography might explore. [EV8 151]

- Observation in P:
- ☑ Right word → we hope it is like a set of arrows
- ☒ Right word → we hope it is like a set of arrows

- → What ☑P activates is the accuracy of the word 'diagram' in P.

- Metalinguistic conditional

Pernier was desperate to impress his colleagues with a find of his own, according to Dr Eisenberg, and needed to unearth something that could outdo the discoveries made by Sir Arthur Evans, the renowned English archaeologist, and Federico Halbherr, a fellow Italian. He believes that Pernier's solution was to create a “relic” with an untranslatable pictographic text.

If it was a ruse,	it worked.

Evans was so excited that he published an analysis of Pernier's findings. [*Times Online*]

- The ‘alternatives’ interpretation does not apply here.
- → If P is not the case, A makes no sense.
- Conditional seems to function as an epistemically modalised version of: ‘it was a ruse that worked’

Current steps

- Modal density of different types of *if*-conditionals.

- Hypothesis:
- Direct conditionals will have a higher modal load than indirect conditionals
- Classification: Quirk et al. (1985: 1091-1097).

Thank you*

* No cats were harmed in the making of this presentation