

# Revisiting *and*, the dynamics of additivity

Jacques Jayez<sup>+</sup> and Grégoire Winterstein<sup>++</sup>

<sup>+</sup> ENS Lyon and LSC<sub>2</sub>, <sup>++</sup> Laboratoire de Linguistique Formelle, Université Paris Diderot-Paris 7  
jjayez@isc.cnrs.fr gregoire.winterstein@linguist.jussieu.fr

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## Introduction

- What we do in this talk.
- Summarise some basic observations on *and*.
- Review some proposals and diagnose the remaining problems.
- Propose a description based on Bayesian effects, along the lines of Merin's framework.

## 1 Basic Observations

### Observations

- A standard observation: *and* is not symmetric.
- (1) a. Paul forgot his passport and he was blocked at the frontier by the police  
b. Paul was blocked at the frontier by the police and he forgot his passport

### Observations

- For (1-a): Result interpretation (no passport → problems).
- For (1-b): sequence of events (problem then passport forgetting)

### Observations

- *And* can be problematic with Elaboration and Explanation
- (2) a. Paul wore a tie (?and) he had a red one  
b. Paul wore a tie (?and) he wanted to impress his students

### Observations

- Pretheoretically, the dominant intuition is:
- *And* is not natural (or shifts the D(iscourse) R(elation)) whenever it conjoins non-independent pieces of information (Lang).

## Observations

- Why should it be so?
- *And* as an additive particle. A *and* B : B should not repeat what A made clear.
- No logical *stuttering* (adapting from Anderson and Belnap, about Strawson): no A *and* A.

## 2 The coordination theory

### The coordination theory

- Txurruka (2003): *and* cannot express a subordinating DR between two constituents.
- SDRT: subordination vs. coordination.
- Provides a straightforward explanation of (1-a) vs. (1-b).
- For (1-a): Result is coordinating (Asher and Vieu, 2005), for (1-b): Explanation is subordinating.

### The coordination theory

- What are we going to do with (3)?
- (3)
- a. Measles is back, and it's because your kids aren't vaccinated  
[http://current.com/news/92737012\\_measles-is-back-and-its-because-your-kids-arent-vaccinated.htm](http://current.com/news/92737012_measles-is-back-and-its-because-your-kids-arent-vaccinated.htm)
  - b. Paul had worked very hard and yet he flunked his exam
  - c. Paul a renoncé à passer l'examen; (?et) en effet il n'avait pas beaucoup travaillé  
Paul gave up his exam; (and) EN EFFET he had not worked much

### The coordination theory

- It's difficult to claim that (3-a) is not an Explanation.
- For (3-b): if it's not coordinating, it's a counterexample.
- It might be coordinating.

### The coordination theory

- Polanyi (1985) view.

2.4 Discourse Coordination and Subordination

Discourse constituents are related structurally to one another by coordination and subordination. Interruptions, elaborations, asides and parentheticals are subordinations. They all disturb the orderly development of some ongoing discourse activity. Topic chains, narratives, and other list structures as well as sequences of moves in Discourse Units and Speech Events and sequences of independent interactions are all coordinations.

### The coordination theory

- Manipulating (3-a) to make it subordinating.
- (4)
- A – How is the situation about childhood diseases?  
B – Measles is back (and, by the way, it's because our kids aren't vaccinated), scarlet fever is less frequent, whooping cough is increasing

## The coordination theory

- Same remark for
- (5) a. They got returns by the semi-load! And yet they refused to admit the problem  
<http://www.ihatedell.net/forum/phpBB3/viewtopic.php?f=21&t=18036>
- b. A – What happened to TechniSnore?  
B – Well, they got returns by the semi-load-and yet they refused to admit the problem-and they had to hire extra people to deal with replacements

## The coordination theory

- French *en effet*: Confirmation or Explanation marker.
  - Confirmation is compatible with a sequence of events (coordination)
- (6) Nous avons choisi ce trek [...] parce qu'il est beaucoup moins fréquenté que ceux des Annapurnas ou de l'Everest. Et en effet, nous avons croisé que quelques touristes  
<http://asie.envoyagesurunuage.net/w/2010/03/21/nepal-trek-langtang-et-gosainkund/>  
We chose this trek because it is much less popular than Annapurna or Everest. And indeed we met only a few tourists

## The coordination theory

- *Et* awkward with the Explanation value.
  - $\Rightarrow$  The predictions of the theory are correct for *en effet*.
- (7) Nous avons choisi le trek du Langtang et celui de Gosainkund. (? Et) En effet il est beaucoup moins fréquenté que ceux des Annapurnas ou de l'Everest  
We chose the Langtang and Gosaikund treks. EN EFFET they are much less popular than Annapurna or Everest

## The coordination theory

- Summarising: the coordination theory is OK for *en effet*, but not for *It's because* and *yet*.
- Similar in French for *C'est parce que* and *pourtant*.

## 3 A Question-Answer approach

### The QA approach

- Zeevat and Jasinkaja (2007): in A and B, A and B must provide *disjoint* answers to (at least) one common question.
- (8)  $Q$  being a question,  $p$  and  $p'$  are disjoint answers to  $Q =_{df}$  there is no answer  $r$  to  $Q$  such that  $p$  and  $p'$  each entails  $r$  necessarily.

### The QA approach

- Takes care of subordination.
- Explanation: intended : A *because* B.
- A answers Q, and B answers A : no common answer.
- A and B answer Q, B entails A.
- Elaboration and Reformulation: the answers are not disjoint.

## The QA approach

- But look at (9).
- (9)
- A – Is Paul going to take the statistics exam?
  - B – He is tired ( $\alpha$ ) and has not worked much ( $\beta$ )
  - C – I think he'll give up ( $\gamma$ ) (? and) he has not worked much ( $\beta$ )
  - D – He has not worked much and (so) I think he'll give up
- Assumption: C's answer anomalous because  $\beta \Rightarrow \gamma$ .
  - Then why is not D anomalous too?

## The QA approach

- It is also not clear that Elaboration is incompatible with *and*.
- (10)
- a. I had dinner at Brook's and I ate their Thursday special
  - b. I bought a new car and I chose a Škoda
  - c. I have heard about Gauss-Jordan elimination and it was in the linear algebra course

## A quick diagnosis

- Are Txurruka's and ZJ intuitions and proposals on the wrong track?
- Not exactly: they point to the same phenomenon: A *and* B should not 'be' A & A or B & B.
- But what does that mean exactly?

# 4 Our Proposal

## The basic intuition

- A and B must be conducive to the same conclusion.
- A cannot settle the targeted conclusion by itself: B must have some effect once A is established.

## Conduciveness (Merin, 1999)

- If  $S$  is a set of epistemic alternatives, we note
  - $S \vdash p$  the fact that  $\forall s \in S (s \models p)$
  - $S \oplus p$  is the eliminative update of  $S$  with  $p$
- In a set  $S$  such that  $S \not\vdash p$  and  $S \not\vdash p'$
- $p \rightsquigarrow_S p'$  ( $p$  is conducive to  $p'$  w.r.t.  $S$ ) =<sub>df</sub>  $Pr_{S \oplus p}(p') > Pr_S(p')$ 
  - where  $Pr_S$  is a probability measure over information states.

## The proposal (Winterstein, 2010)

### A conventional implicature for *and*

*A and B* is felicitous in an epistemic state *S* with respect to a conclusion *C* iff. *A*, *B* and *C* express propositions *p*, *p'* and *q* such that:

1. *p* and *p'* represent *A* and *B* main content
2.  $p \rightsquigarrow_S q, p' \rightsquigarrow_S q$
3.  $Pr_{S \oplus p \oplus p'}(q) > Pr_{S \oplus p}(q)$

### Applications I

- (11) A – Is Paul going to take the statistics exam?  
C – I think he'll give up ( $\gamma$ ) (? and) he has not worked much ( $\beta$ )  
D – He has not worked much and (so) I think he'll give up = (9)
- $\beta$  does not entirely settle the question, even though it argues for a negative answer: the D answer is fine.
  - $\gamma$  answers the question by itself: the answer C is out because the second conjunct has no further effect on the question.

### Applications II: *en effet*

- (12) Paul a renoncé à passer l'examen; (?et) en effet il n'avait pas beaucoup travaillé Paul gave up his exam; (and) EN EFFET he had not worked much = (3-c)
- Explanation marker forces  $\beta$  the second conjunct to be conducive to  $\alpha$ , the first one.
  - Thus,  $\alpha$  must be conducive to itself.
  - Once  $\alpha$  is asserted, there is no way to raise its probability further, i.e. *and* is not licensed because  $\beta$  cannot have any effect on  $\alpha$ .

### Applications III: *because*

- The previous account also works for *because*.
- What about (13)?

(13) Paul gave up his exam, and it's because he had not worked much.

### (Jayez, 2004)

- *because* is integrated in the main content.
- Unlike *en effet* it is not a conventional or implicature trigger.
- *A and it's because B* has the same structure as:
  - *A and* the cause of *A* is *B* (*and* connects main contents)
  - “the cause of *A* is *B*” is not conducive to *A*
  - The sentence is not predicted to be infelicitous with *and*

## Applications IV: *so*

- *And* is compatible with *so* as long as the consequence is not presented as necessary:
  - If *so* marks a necessary consequence from *A* to *B*, then all the effects of *B* are also derived from *A*:

(14) #Paul has a german shepherd<sub>*i*</sub>, and so he has a dog<sub>*i*</sub>.
  - If *so* marks a non-necessary consequence, *B* can still add up some information on its own:

(15) Paul went to a Motörhead concert, and so he had a good time.

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