

Epistemic indefinites, number marking, and certainty

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Outline

Introduction

The existing picture. Challenges. A new picture.

Deriving between-item variation in the singular

Deriving between-item variation in the plural

Deriving within-item variation between the singular and the plural

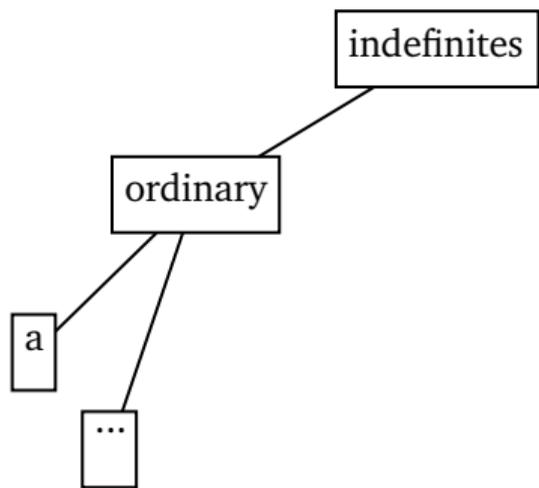
Conclusion, predictions, outlook

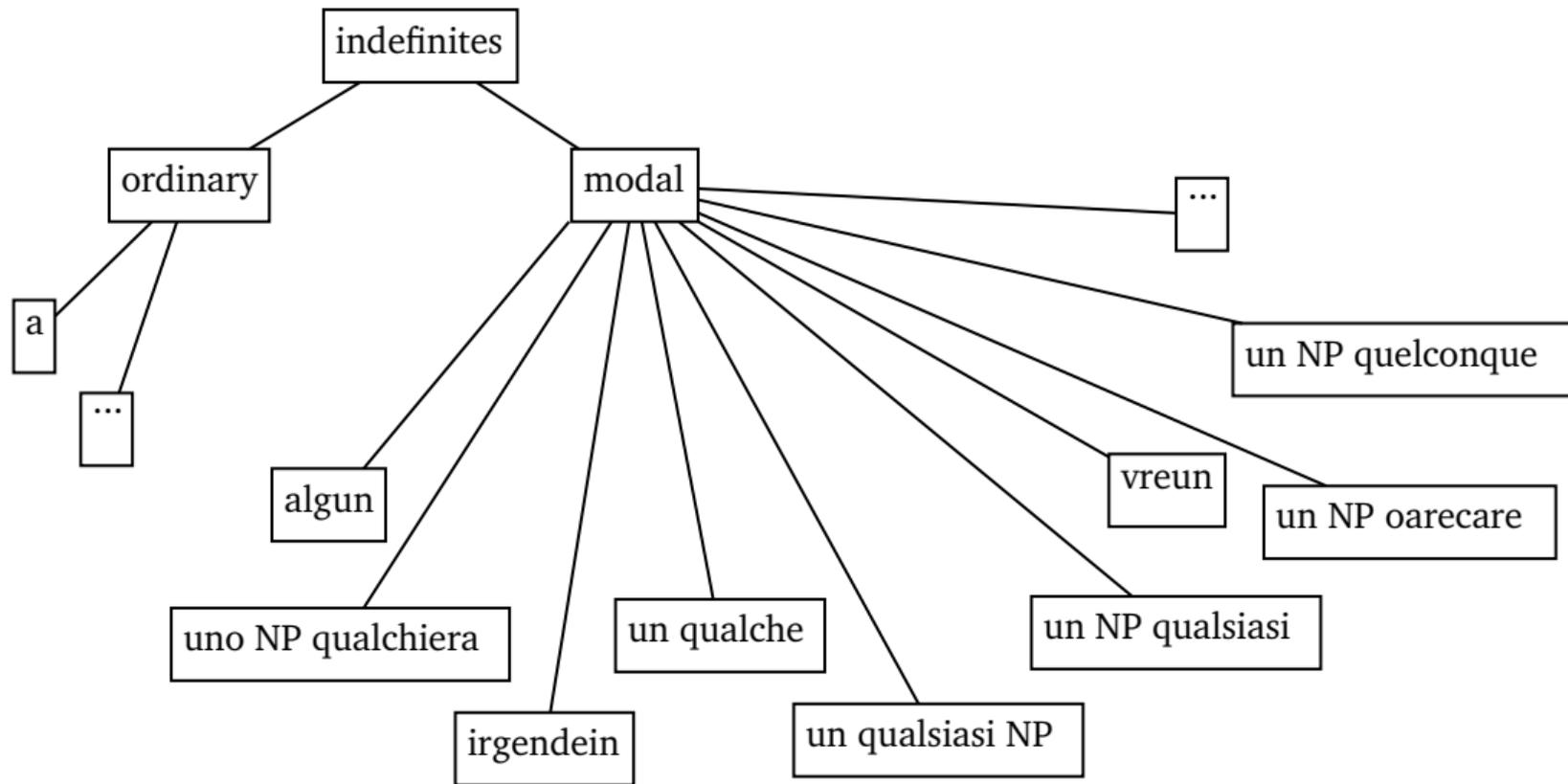
indefinites

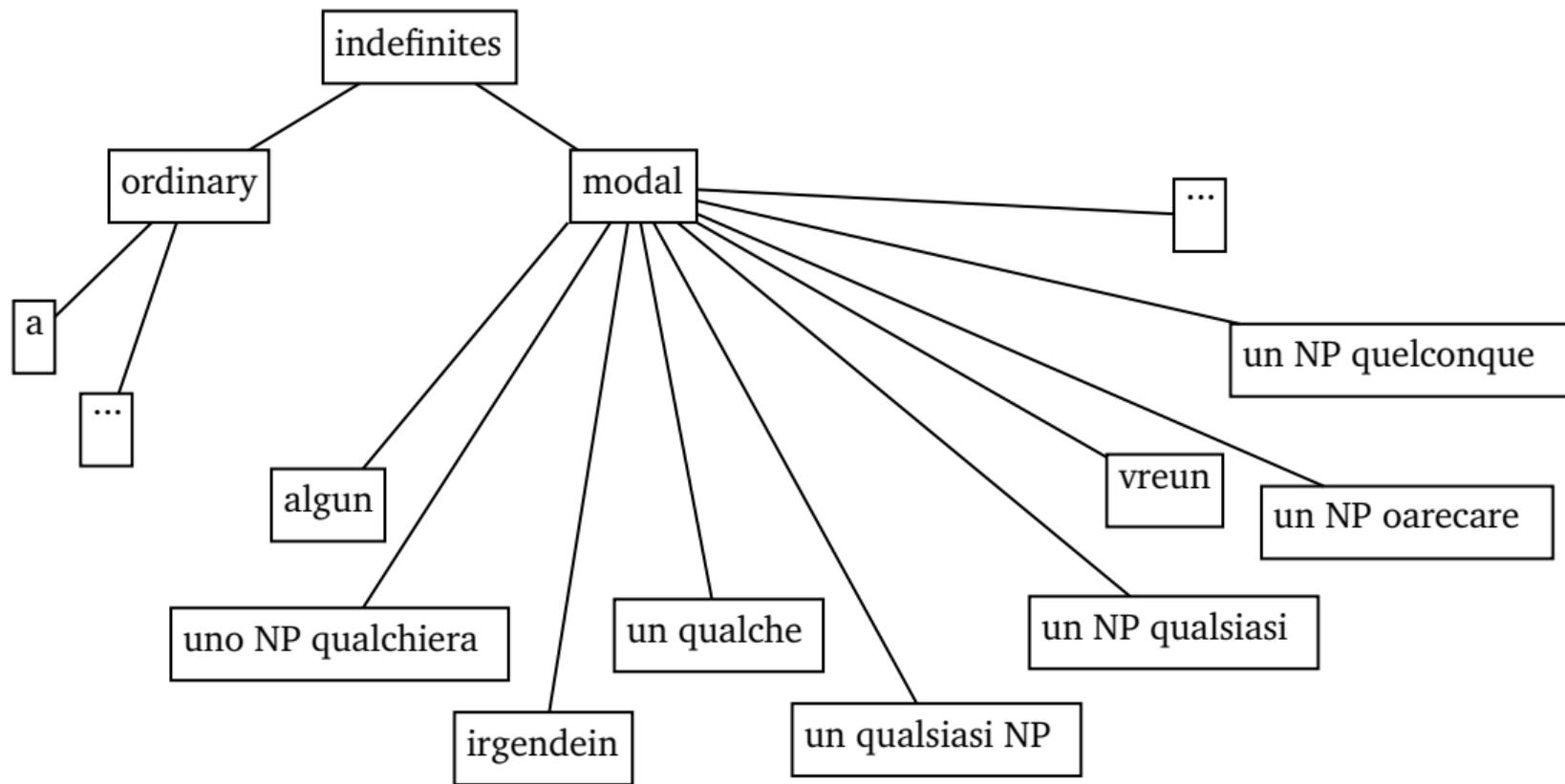
indefinites

indefinites vary ...

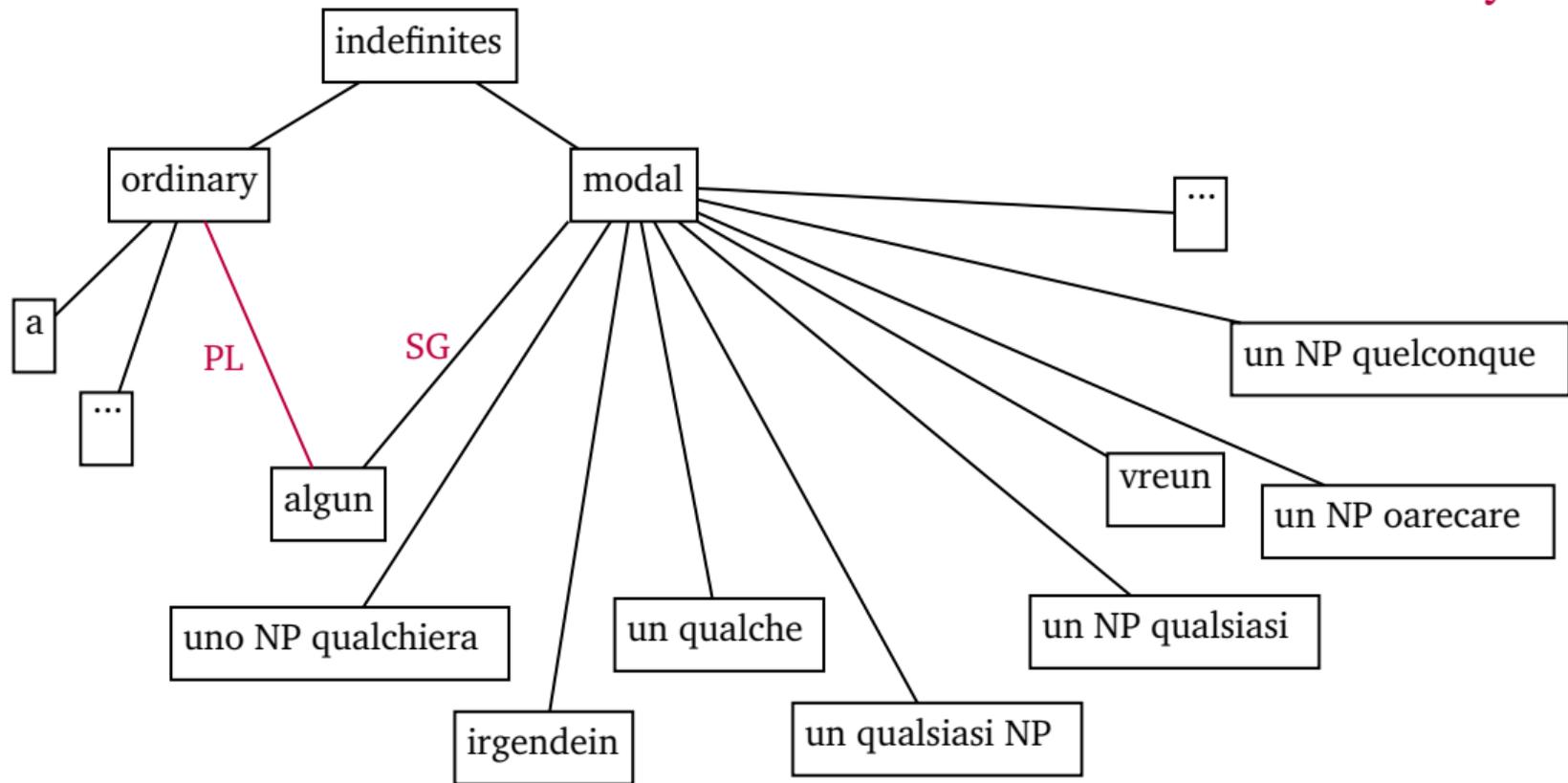
ordinary ...

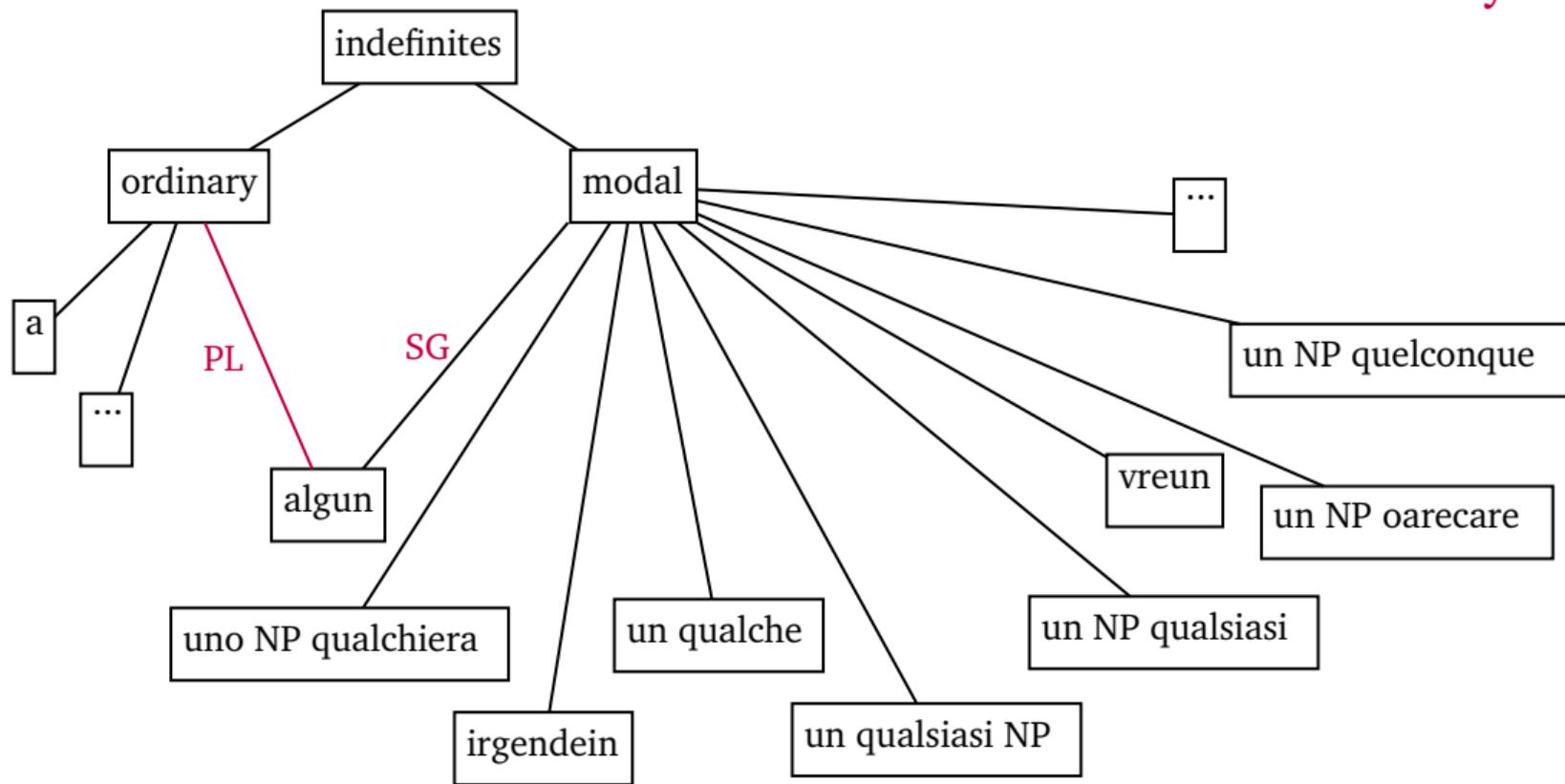






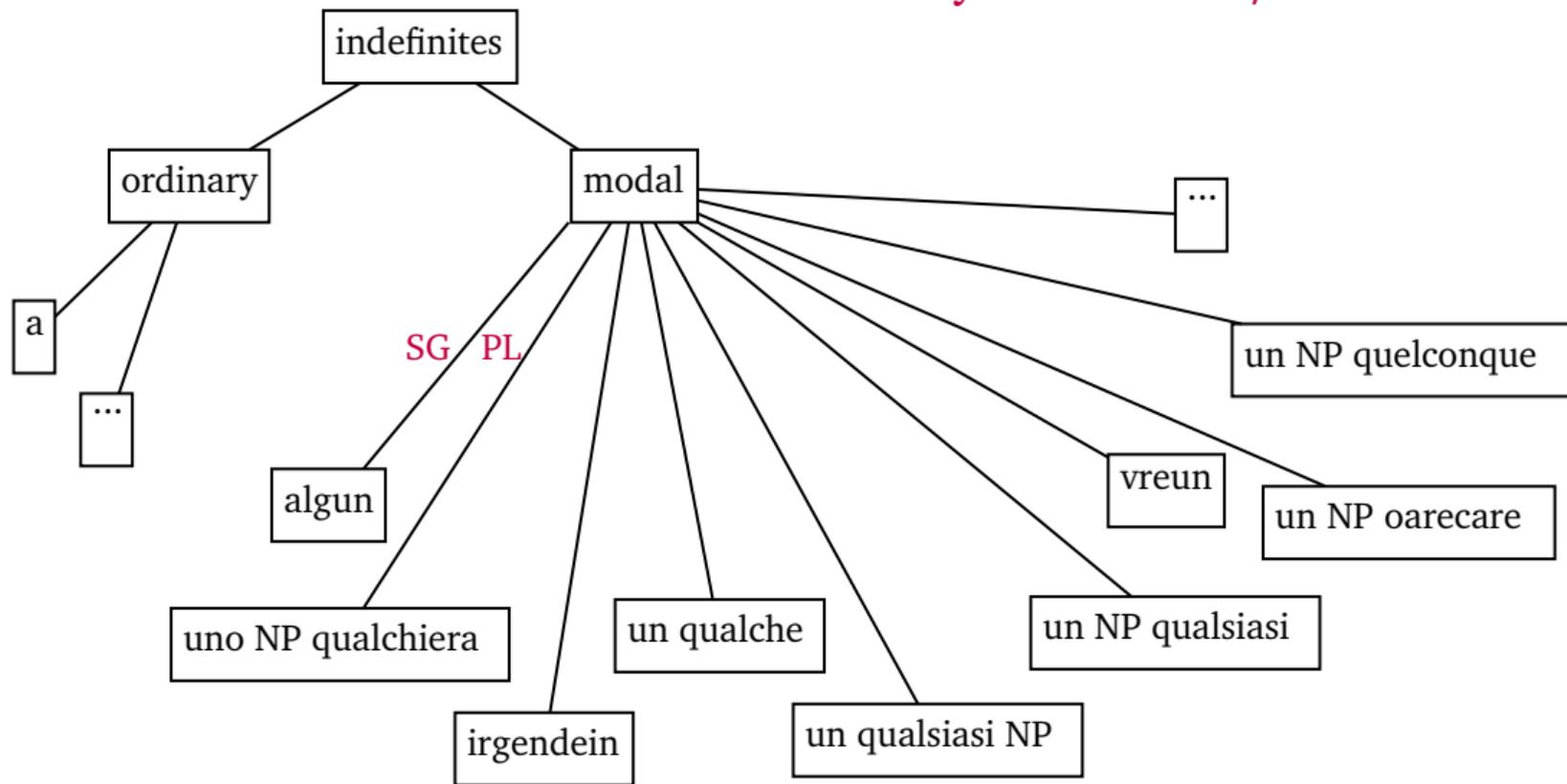
between-item variation by modal flavor, degrees of freedom, degrees of negativity [1–13]



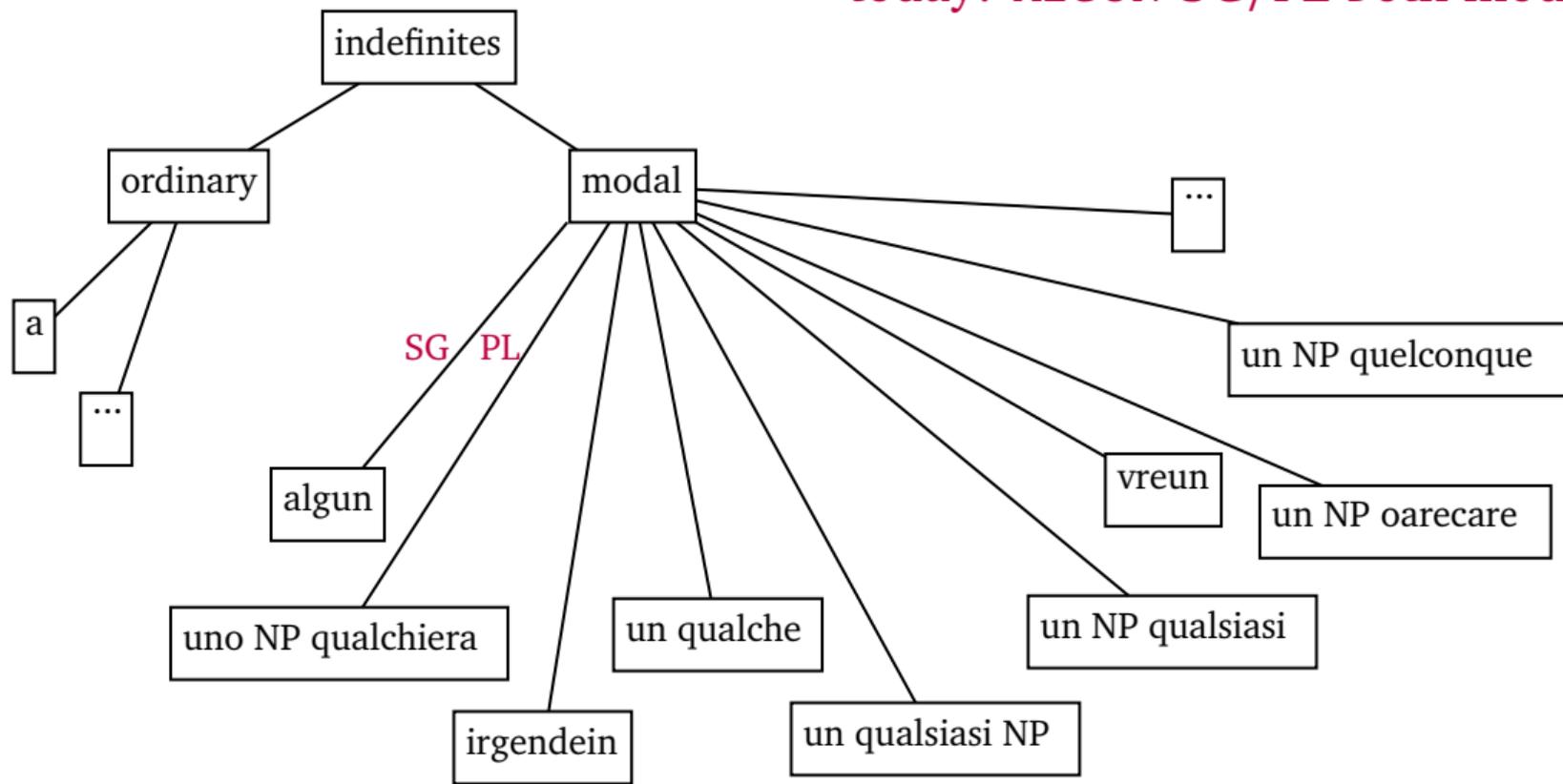


within-item variation by number [14–16]

today: ALGUN-SG/PL both modal

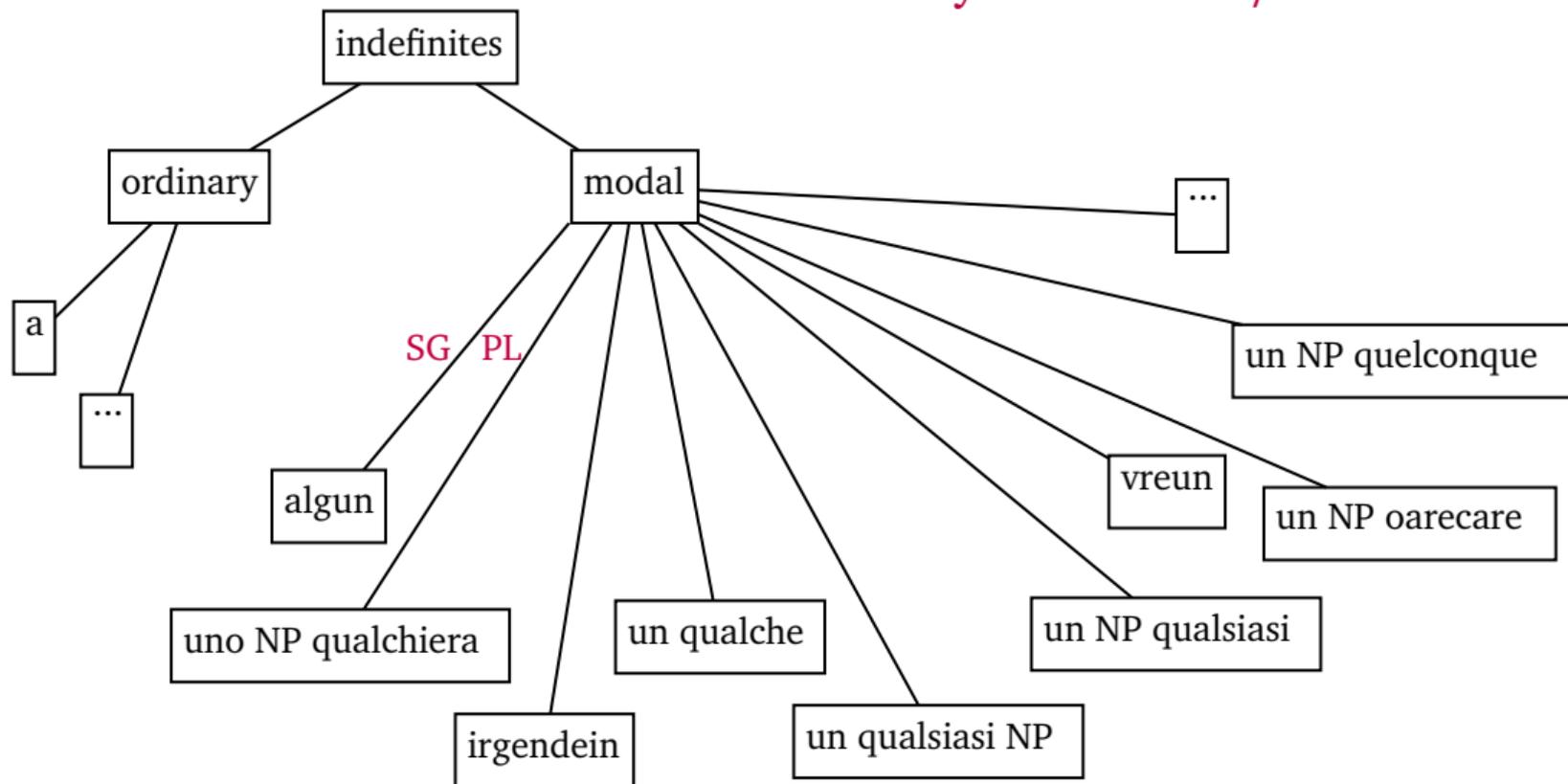


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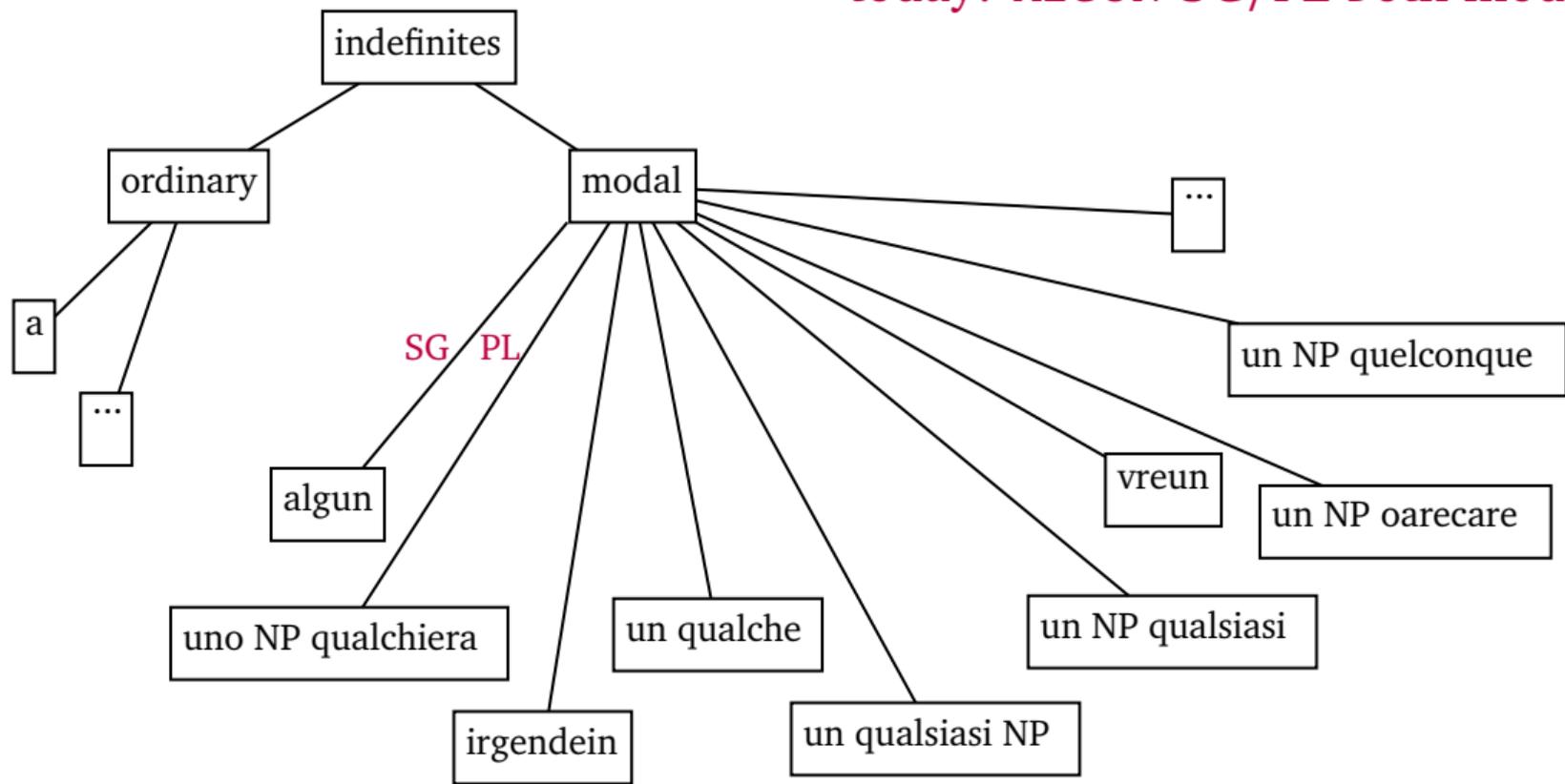
Across modal indefinites, variation by number is variation *within* number:
Both SG and PL can be compatible with specific *positive* certainty.

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In both SG and PL this arises in the same way: From exhaustification with just NonSgDA.

today: ALGUN-SG/PL both modal



Within-item variation comes from an indefinite number filter on specific positive certainty: SG epistemic indefinites make it mean no free choice. PL do not. Hence the occasional contrast.

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Spanish ALGUN-SG/PL

[6-8, 14-16]

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[1–3]; Marty, Picat, and Mascarenhas (work in progress, p.c.)

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Without the continuation, this also suggests speaker ignorance or indifference!

Taking stock...

indefinite number

ALGUN SG
 PL

IRGEND SG
 PL

SOME SG
 PL

Taking stock...

indefinite	number	spec. neg. certainty
		'one loser'
ALGUN	SG	✓
	PL	✓
IRGEND	SG	✓
	PL	✓
SOME	SG	✓
	PL	✓

Taking stock...

indefinite	number	spec. neg. certainty 'one loser'	spec. pos. certainty 'one winner'
ALGUN	SG	✓	#
	PL	✓	✓
IRGEND	SG	✓	#
	PL	✓	#
SOME	SG	✓	✓
	PL	✓	✓

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	PL	✓	✓
IRGEND	SG	✓	#
	PL	✓	#
SOME	SG	✓	✓
	PL	✓	✓

There is between-item variation in the SG. How do we derive it?

Taking stock...

indefinite	number	spec. neg. certainty	spec. pos. certainty
		'one loser'	'one winner'
ALGUN	SG	✓	#
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There is between-item variation in the SG. How do we derive it?

There is between-item variation in the PL. How do we derive it?

There is sometimes within-item variation between SG & PL. How do we explain it?

Outline

Introduction

The existing picture. Challenges. A new picture.

Deriving between-item variation in the singular

Deriving between-item variation in the plural

Deriving within-item variation between the singular and the plural

Conclusion, predictions, outlook

Question:

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How do we derive between-item variation in the SG?

Assumptions: Truth conditions and alternatives

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- b. $\{\exists x \in D' [C(j, x)] \mid D' \subset \llbracket \text{SG} \rrbracket (\llbracket * \text{student} \rrbracket)\}$ (DA)

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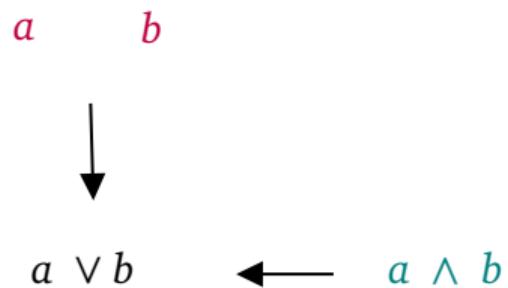
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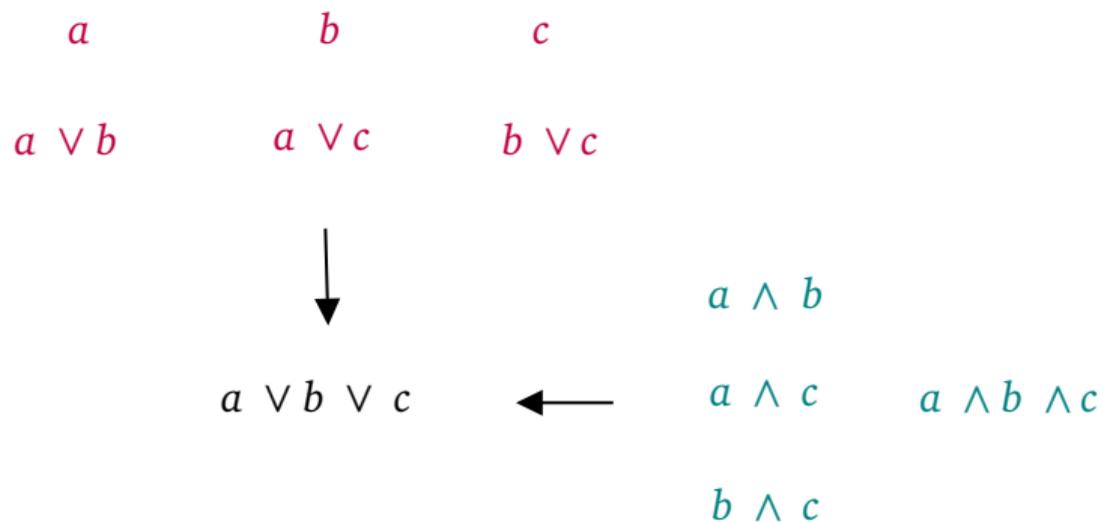
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Assumptions: Truth conditions and alternatives



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$$\text{E.g., } O_{ExhDA}(a \vee b) = (a \vee b) \wedge \underbrace{\neg O(a)}_{a \wedge \neg b} \wedge \underbrace{\neg O(b)}_{b \wedge \neg a}, = (a \wedge b)$$

$$\underbrace{a \wedge \neg b}_{a \rightarrow b} \quad \underbrace{b \wedge \neg a}_{b \rightarrow a}$$

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- ▶ For epistemic indefinites, both the ExhDA and the SA are used by default:

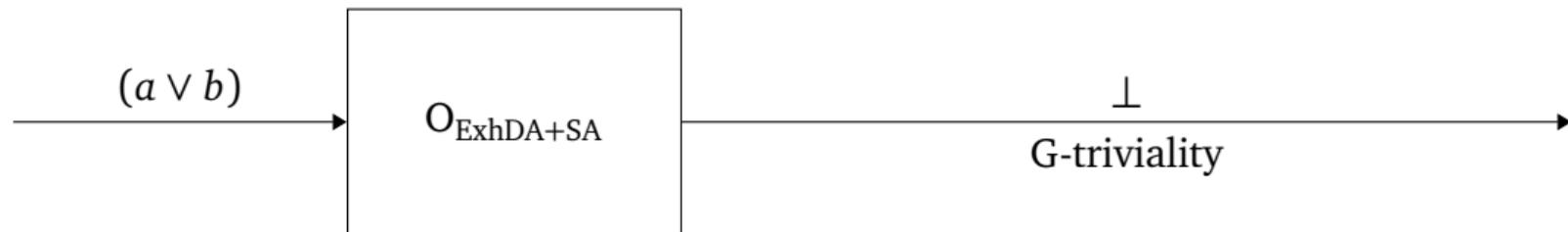
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- For epistemic indefinites, both the ExhDA and the SA are used by default:

$$\text{E.g., } O_{\text{ExhDA+SA}}(a \vee b) = \underbrace{(a \vee b) \wedge \neg O(a) \wedge \neg O(b)}_{(a \wedge b)} \wedge \neg(a \wedge b), = \perp$$

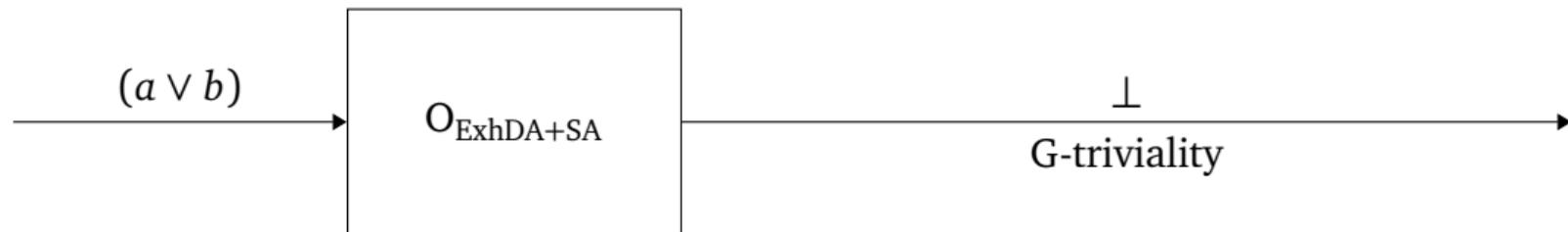
Jo called [epistemic indefinite] student_{a,b}.

(first try)



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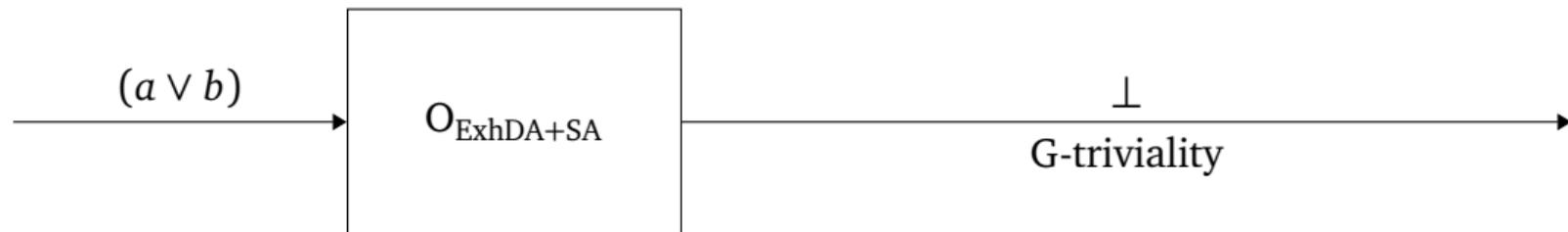
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Why is this grammatical, and how does it give rise to ignorance?

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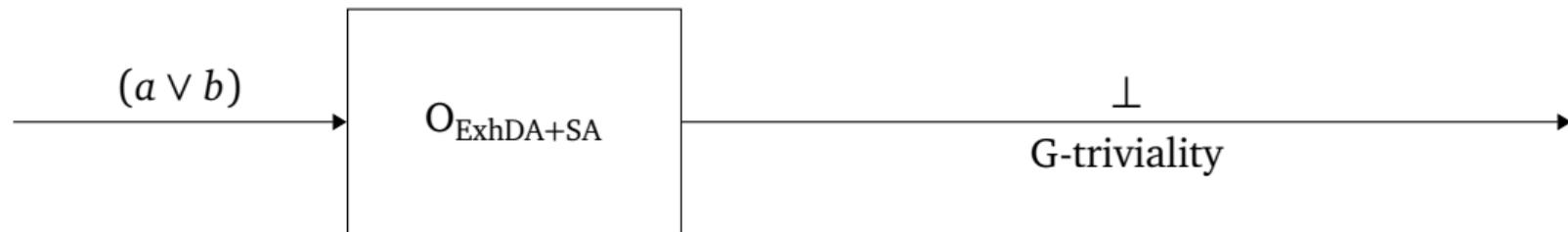


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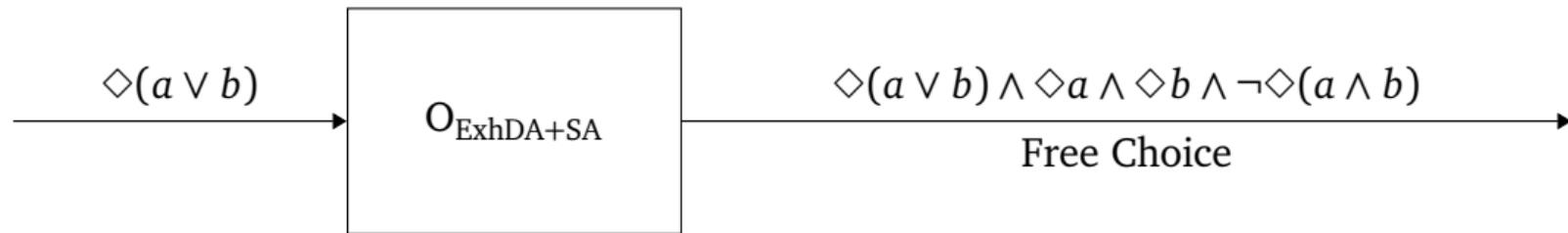


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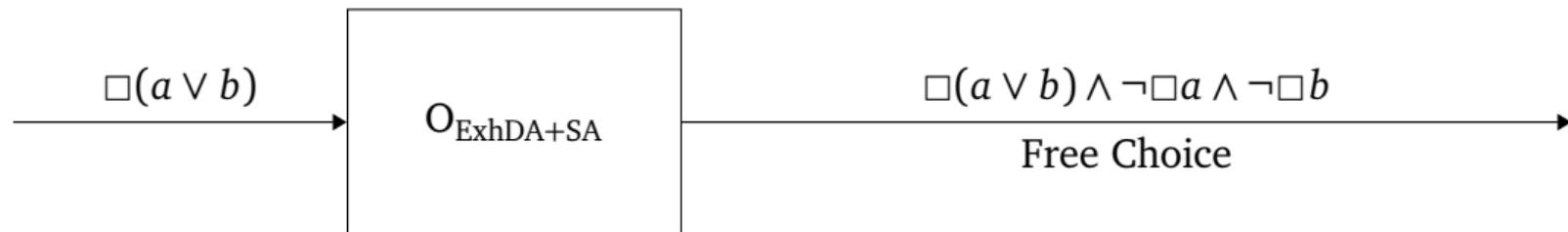
Ignorance is a silent modal effect.

Let's look at some sentences with modals ...

Jo may call [epistemic indefinite] student_{a,b}.



Jo must call [epistemic indefinite] student_{a,b}.



Jo called [epistemic indefinite] student_{a,b}.

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The literature says: Silent speaker-oriented epistemic necessity modal.

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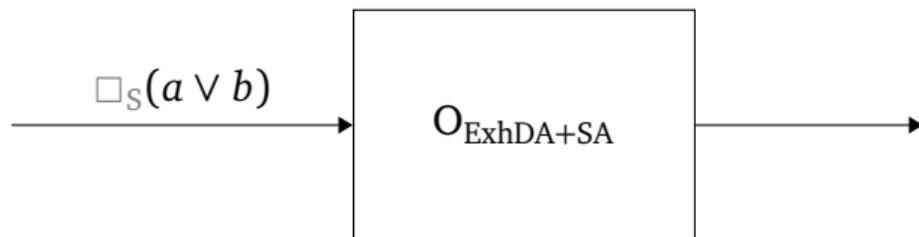


Epistemic states of interest

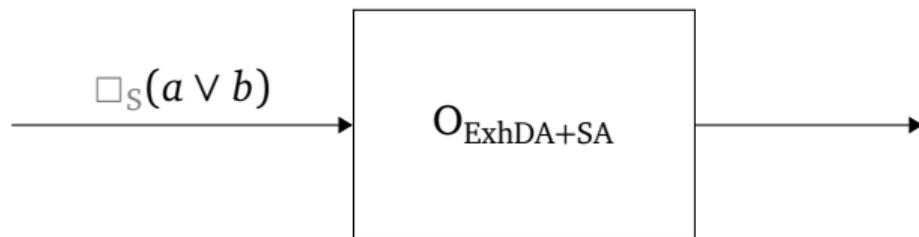
total ignorance	partial ignorance		no ignorance
'no winner'	'one loser'	'one winner'	'all winners'
e.g.,	e.g.,	e.g.,	e.g.,
$w_1: x \neq y z$	$w_1: x \neq y z$	$w_1: x y z$	$w_1: x y z$
$w_2: x \neq y z$	$w_2: x \neq y z$	$w_2: x \neq y z$	$w_2: x y z$
$w_3: x \neq y z$	$w_3: x \neq y z$	$w_3: x y z$	$w_3: x y z$

Jo called [epistemic indefinite] student_{a,b}.

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'no winner' ✓

'one loser' ✗

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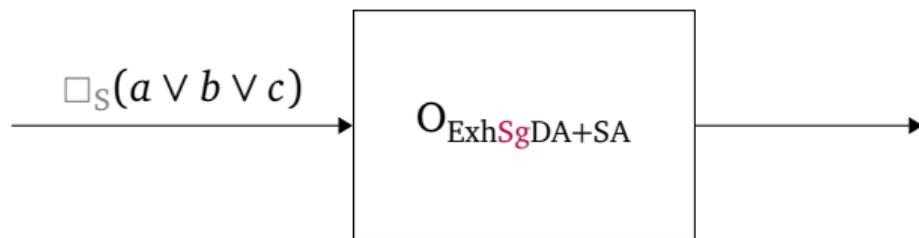
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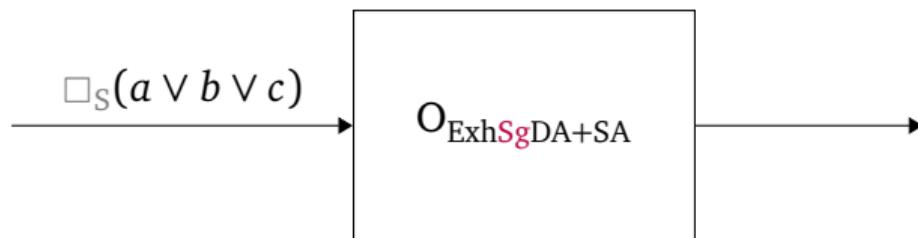
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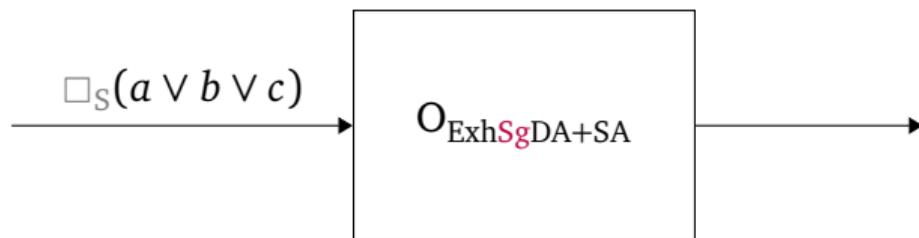
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SG epistemic indefinites that can use just SgDA: OK with 'one loser' scenarios.

(to appendix »)

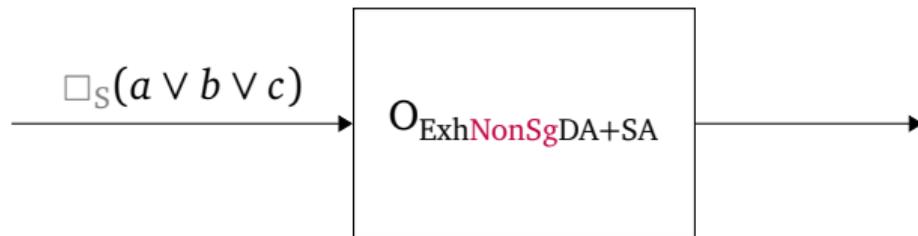
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Proposal: 'One winner' comes from just NonSgDA!

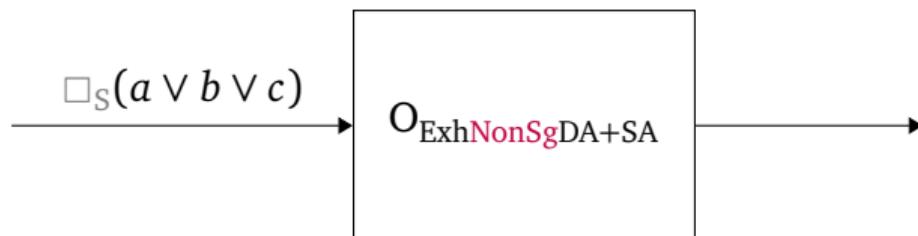
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'no winner' ✓

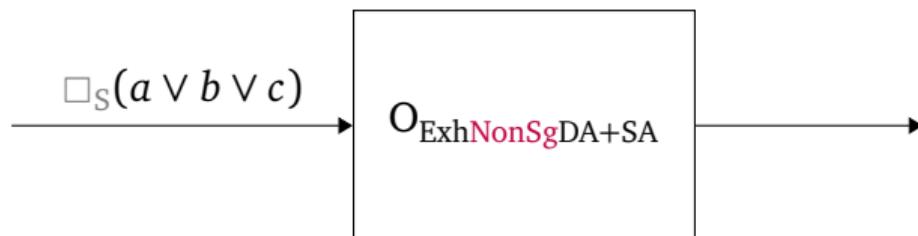
'one loser' ✗

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(to appendix »)

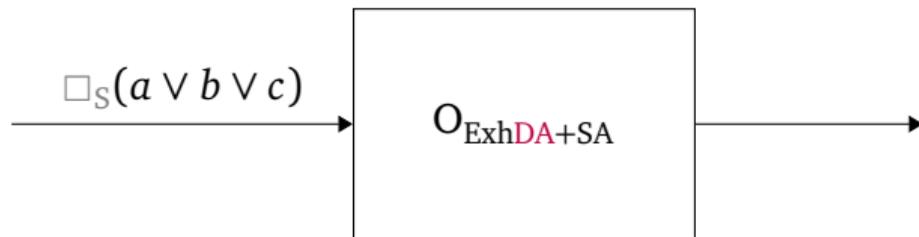
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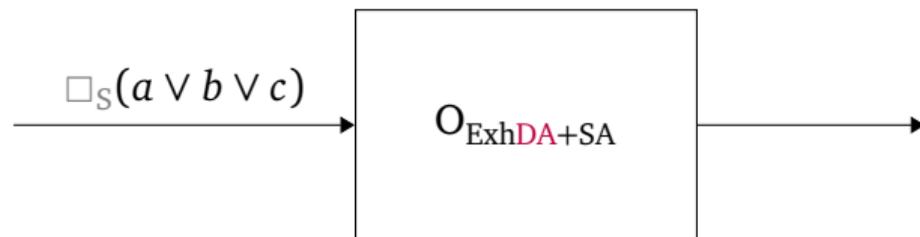
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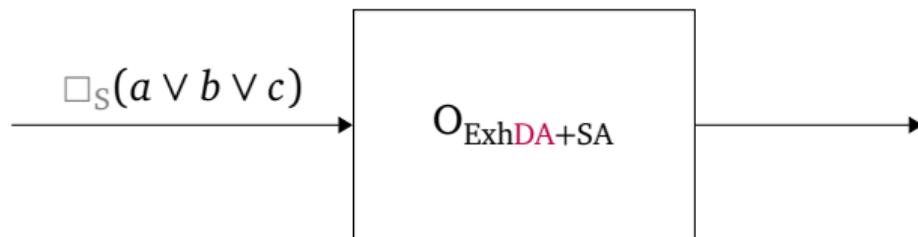
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SG epistemic indefinites that must use all DA: OK only with total ignorance.

Answer:

indefinite	number	spec. neg. certainty	spec. pos. certainty
		'one loser'	'one winner'
ALGUN	SG	✓	#
	PL	✓	✓
IRGEND	SG	✓	#
	PL	✓	#
SOME	SG	✓	✓
	PL	✓	✓

How do we derive between-item variation in the SG?

Ability to prune DA!

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IRGEND	SG	✓	#
	PL	✓	#
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	PL	✓	✓

How do we derive between-item variation in the PL?

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- a. $\exists x \in \llbracket \text{PL} \rrbracket (\llbracket * \text{student} \rrbracket) [C(j, x)]$ (PL picks out atoms & pluralities) (assertion)

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- b. $\{\exists x \in D' [C(j, x)] \mid D' \subset \llbracket \text{PL} \rrbracket (\llbracket * \text{student} \rrbracket)\}$ (DA)

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(11) Jo called [epistemic indefinite] students.

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- c. $\{\forall x \in \llbracket \text{PL} \rrbracket (\llbracket * \text{student} \rrbracket) [C(j, x)]\}$ (SA)

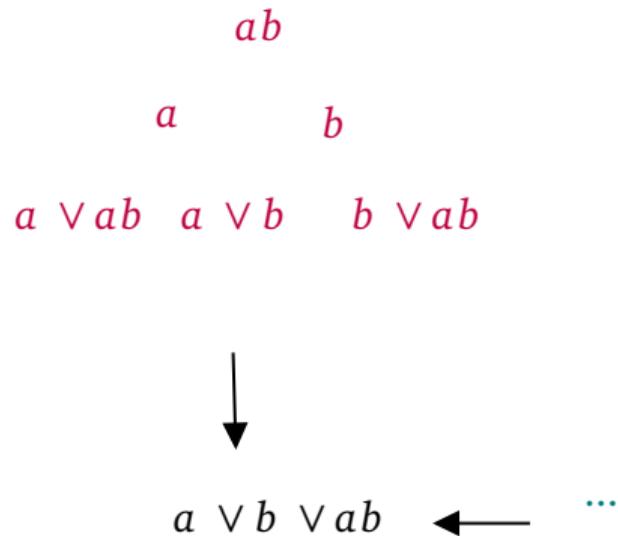
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- b. $\{\exists x \in D' [C(j, x)] \mid D' \subset \llbracket \text{PL} \rrbracket (\llbracket * \text{student} \rrbracket)\}$ (DA)
- c. $\{\forall x \in \llbracket \text{PL} \rrbracket (\llbracket * \text{student} \rrbracket) [C(j, x)]\}$ (SA)
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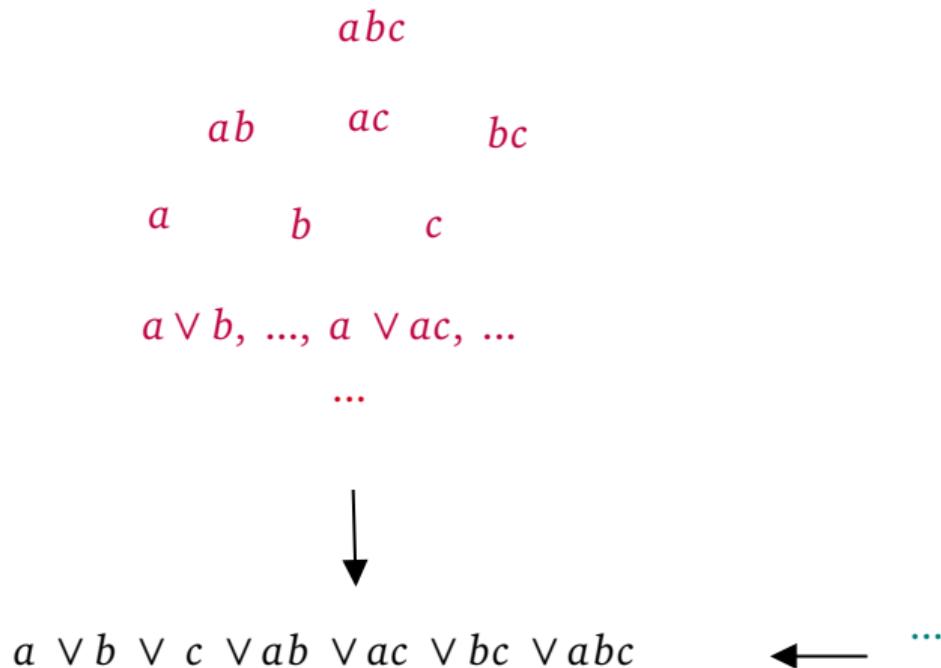
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$$|D| = 2^{|A^T|} - 1; |DA| = 2^{|D|} - 2; |\text{SgDA}| = |D|; |\text{NonSgDA}| = |DA| - |\text{SgDA}|$$



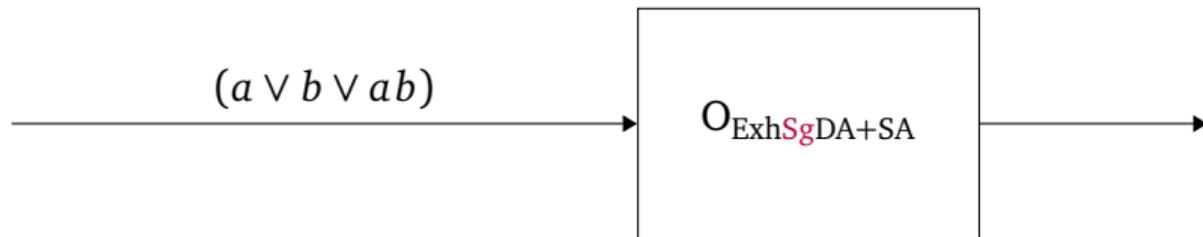
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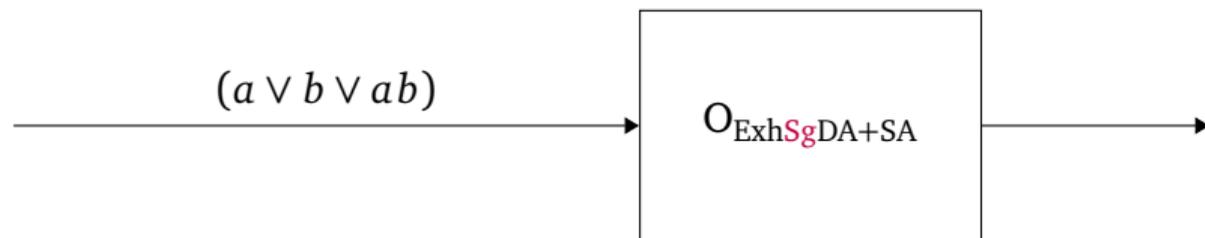


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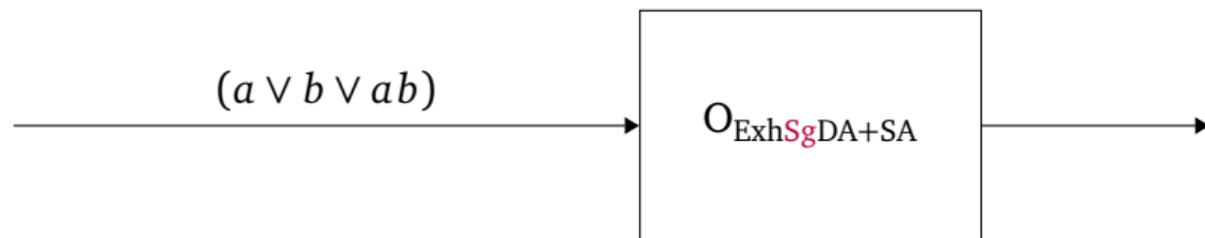


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'no winner' ✓ 'one loser' ✗ 'one winner' ✗ 'all winners' ✗*

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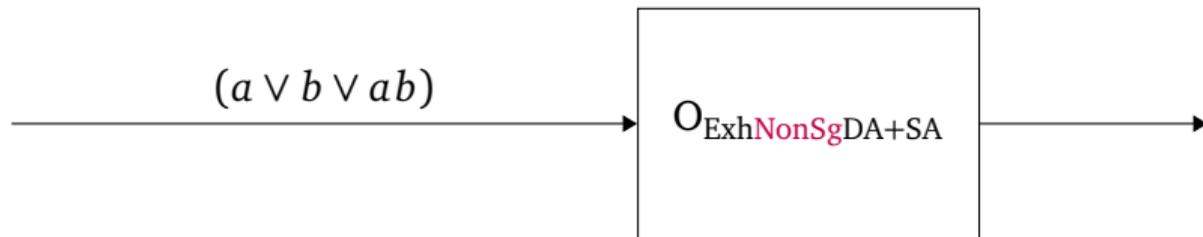
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We don't get compatibility with specific negative certainty / 'one loser'...

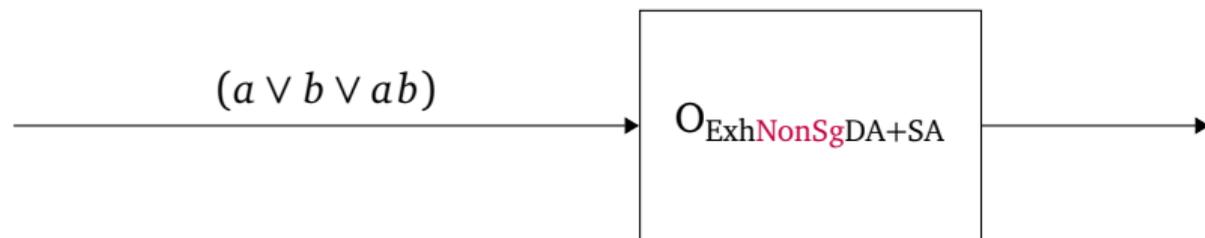
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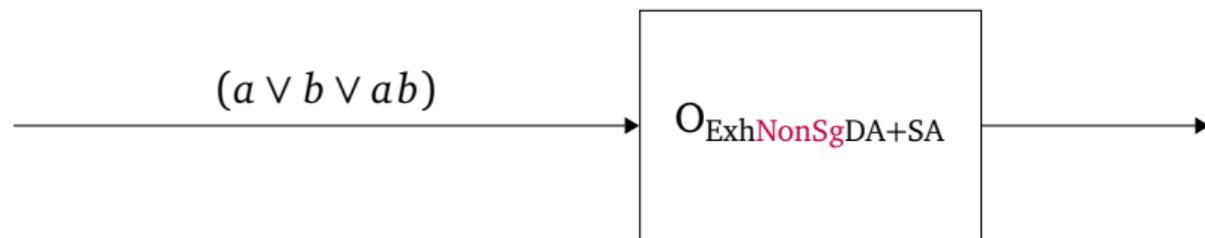


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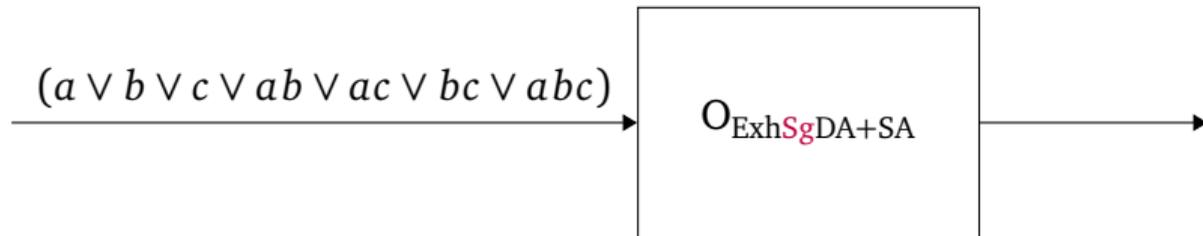
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We don't get compatibility with specific positive certainty / 'one winner'...

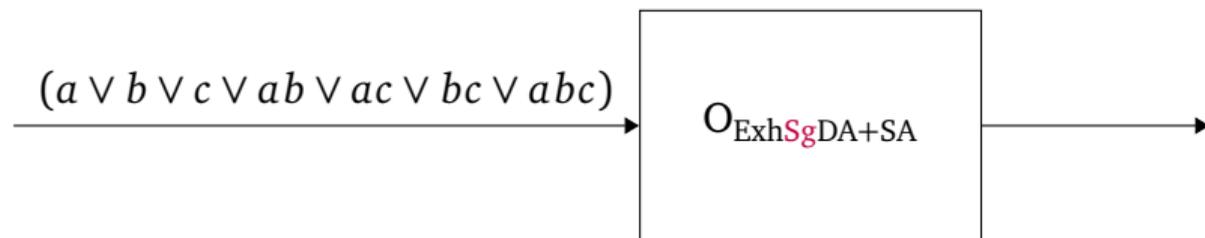
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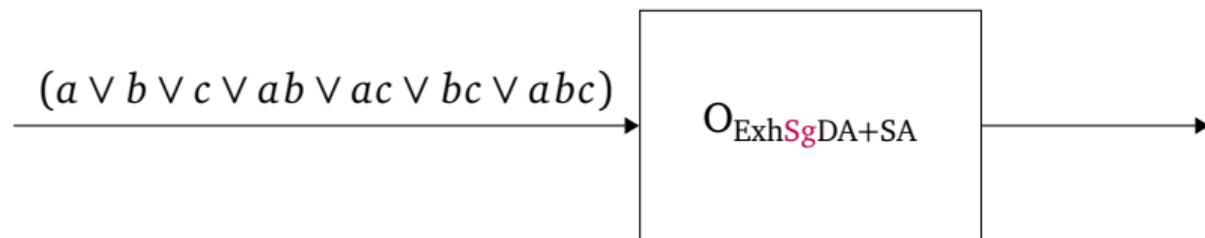


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We don't get compatibility with specific negative certainty / 'one loser'...

(to appendix »)

What is happening?

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Are SG and PL after all fundamentally different?

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I think not. . .

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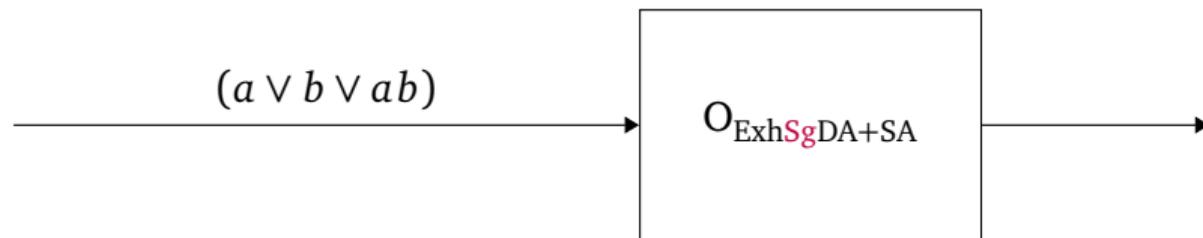
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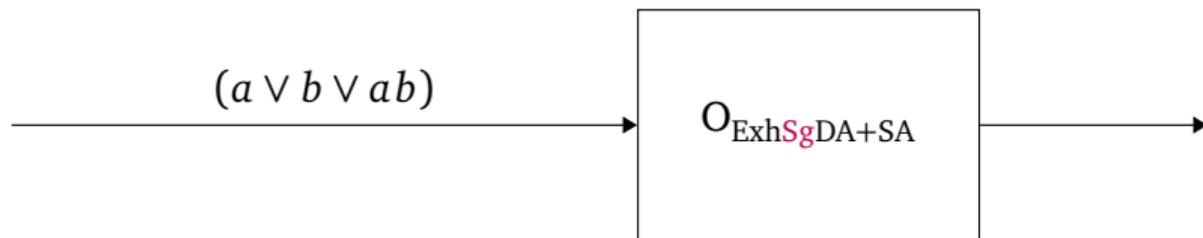
If we make the elements in the previous domains logically independent, we get the same results as for SG.

[epistemic indefinite] students_{a,b,ab} lifted a piano, but not Alice and Bob.

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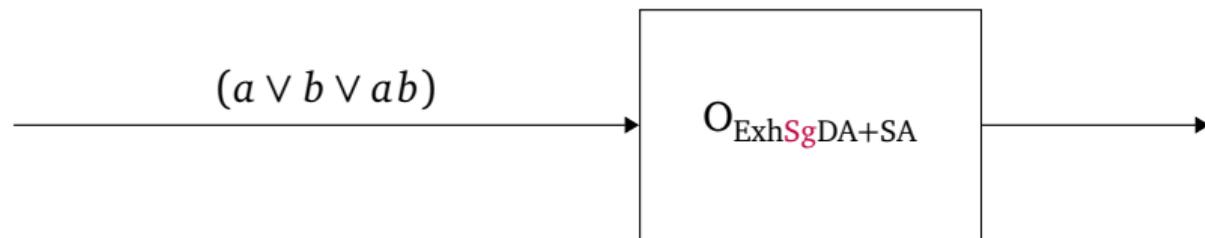
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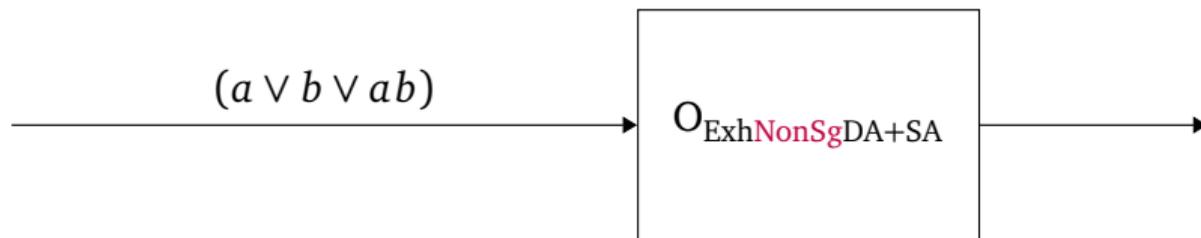


'no winner' ✓ 'one loser' ✓ 'one winner' ✗ 'all winners' ✗*

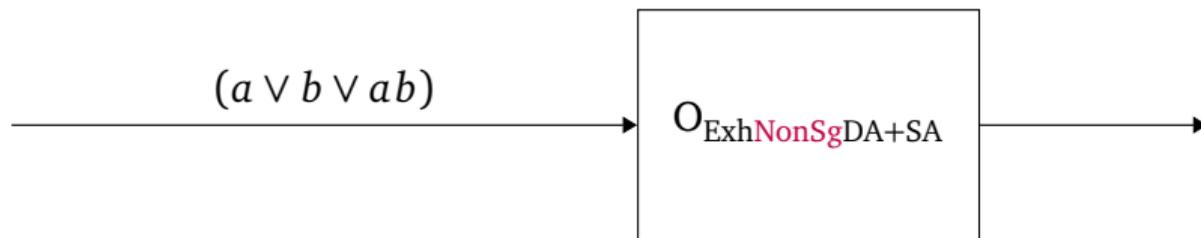
Now we can get compatibility with specific negative certainty / 'one loser' scenario!

Alice and Bob lifted a piano. So, [epistemic indefinite] students_{a,b,ab} lifted a piano.

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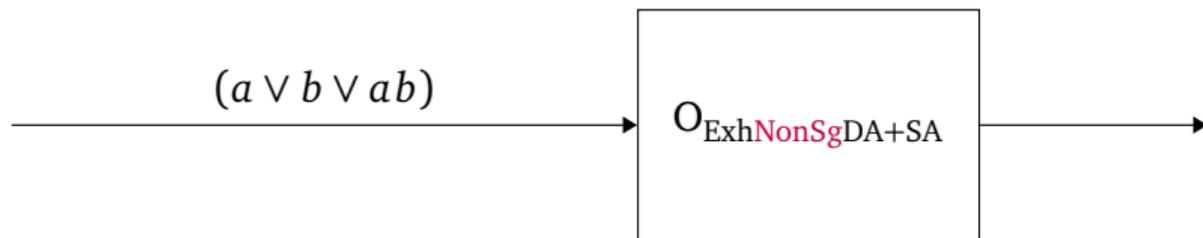
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Thus, SG and PL are *not* fundamentally different...

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Answer:

indefinite	number	spec. neg. certainty	spec. pos. certainty
		'one loser'	'one winner'
ALGUN	SG	✓	#
	PL	✓	✓
IRGEND	SG	✓	#
	PL	✓	#
SOME	SG	✓	✓
	PL	✓	✓

How do we derive between-item variation in the PL?

Ability to prune DA!

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Conclusion, predictions, outlook

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total ignorance	partial ignorance		no ignorance / total certainty	
'no winner'	'one loser'	'one winner'-1	'one winner'-2	'all winners'
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$w_1: x \neq z$	$w_1: x \neq y z$	$w_1: x y z$	$w_1: x \neq z$	$w_1: x y z$
$w_2: x \neq y z$	$w_2: x \neq y z$	$w_2: x \neq z$	$w_2: x \neq z$	$w_2: x y z$
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For SG, 'one winner' is always 'one winner'-2 – a no free choice scenario.

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?Some SG epistemic indefinites require that the *intended referent* is not plural.

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- ▶ This arises the same in SG and in PL epistemic indefinites.
- ▶ In SG, however, specific positive certainty may induce no free choice.
- ▶ An item that has specific positive certainty in PL but not SG may be simply an item that always wants at least a little bit of free choice.

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- ▶ On this analysis SOME-SG/PL and ALGUN-PL are not ordinary indefinites.
- ▶ In particular, they all obligatorily activate DA.
- ▶ This helps us derive another interesting fact about them, their PPIhood:

(12) Nobody read # some book.

(13) Nadie leyo # algunos libros.
nobody read ALGUN-PL books.

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Where do these all fit?

Thanks to Andreea Nicolae, Gennaro Chierchia, Anamaria Fălăuş.

Thank you!

$$\begin{aligned}
 (15) \quad & O_{\text{ExhSgDA}} \Box_S (a \vee b \vee c) \\
 = & \Box_S (a \vee b \vee c) \wedge \neg \underbrace{O \Box_S a}_{\underbrace{\Box_S a \wedge \neg \Box_S b \wedge \neg \Box_S c}_{\Box_S a \rightarrow \Box_S b \vee \Box_S c}} \wedge \neg \underbrace{O \Box_S b}_{\underbrace{\Box_S b \wedge \neg \Box_S a \wedge \neg \Box_S c}_{\Box_S b \rightarrow \Box_S a \vee \Box_S c}} \wedge \neg \underbrace{O \Box_S c}_{\underbrace{\Box_S c \wedge \neg \Box_S a \wedge \neg \Box_S b}_{\Box_S c \rightarrow \Box_S a \vee \Box_S b}} \\
 & \underbrace{\hspace{15em}}_{\text{verified, e.g., by } \Box_S \neg a \wedge \neg \Box_S b \wedge \neg \Box_S c}
 \end{aligned}$$

$$(16) \text{O}_{\text{ExhNonSgDA}} \Box_S(a \vee b \vee c)$$

$$\begin{aligned}
 &= \Box_S(a \vee b \vee c) \wedge \neg \underbrace{\text{O}\Box_S(a \vee b)}_{\substack{\Box_S(a \vee b) \wedge \neg \Box_S(a \vee c) \wedge \neg \Box_S(b \vee c) \\ \Box_S(a \vee b) \rightarrow \Box_S(a \vee c) \vee \Box_S(b \vee c)}} \wedge \neg \underbrace{\text{O}\Box_S(a \vee c)}_{\substack{\Box_S(a \vee c) \wedge \neg \Box_S(a \vee b) \wedge \neg \Box_S(b \vee c) \\ \Box_S(a \vee c) \rightarrow \Box_S(a \vee b) \vee \Box_S(b \vee c)}} \wedge \neg \underbrace{\text{O}\Box_S(b \vee c)}_{\substack{\Box_S(b \vee c) \wedge \neg \Box_S(a \vee b) \wedge \neg \Box_S(a \vee c) \\ \Box_S(b \vee c) \rightarrow \Box_S(a \vee b) \vee \Box_S(a \vee c)}} \\
 &\underbrace{\hspace{15em}}_{\text{verified, e.g., by } \Box_S a \wedge \neg \Box_S / \Box_S \neg b \wedge \neg \Box_S / \Box_S \neg c}
 \end{aligned}$$

$$(17) O_{\text{ExhSgDA}} \Box_S (a \vee b \vee ab)$$

$$= \Box_S (a \vee b \vee ab) \wedge \neg \underbrace{O \Box_S a}_{\Box_S a \wedge \neg \Box_S b \wedge \neg \Box_S ab} \wedge \neg \underbrace{O \Box_S b}_{\Box_S b \wedge \neg \Box_S a \wedge \neg \Box_S ab} \wedge \neg \underbrace{O \Box_S ab}_{\Box_S ab \wedge \neg \Box_S a \wedge \neg \Box_S b}$$

$$\underbrace{\Box_S a \rightarrow \Box_S b \vee \Box_S ab \quad \Box_S b \rightarrow \Box_S a \vee \Box_S ab \quad \neg \Box_S ab}_{\text{not compatible with 'one loser' scenario, only with 'no winner' } \times}$$

$$(18) O_{\text{ExhNonSgDA}} \Box_S(a \vee b \vee ab)$$

$$= \Box_S(a \vee b \vee ab) \wedge \neg \underbrace{O\Box_S(a \vee b)}_{\substack{\Box_S(a \vee b) \wedge \neg \Box_S(a \vee ab) \wedge \neg \Box_S(b \vee ab) \\ \Box_S(a \vee b) \rightarrow \Box_S(a \vee ab) \vee \Box_S(b \vee ab)}} \wedge \neg \underbrace{O\Box_S(a \vee ab)}_{\substack{\Box_S(a \vee ab) \wedge \neg \Box_S(a \vee b) \wedge \neg \Box_S(b \vee ab) \\ \Box_S(a \vee ab) \rightarrow \Box_S(b \vee ab)}} \wedge \neg \underbrace{O\Box_S(b \vee ab)}_{\substack{\Box_S(b \vee ab) \wedge \neg \Box_S(a \vee b) \wedge \neg \Box_S(a \vee ab) \\ \Box_S(b \vee ab) \rightarrow \Box_S(b \vee ab)}}$$

not compatible with 'one winner' scenario, only with 'no winner' ✗

Appendix: SG: specific negative certainty: 3 atom-domain [\(to main »\)](#)

Similar to PL: specific negative certainty: 2 atom-domain, just a lot more work, because there are 7 SgDA, each of which must be pre-exhaustified relative to the other SgDA.

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