Scales of Negativity

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(part of this research is joint work with Karen De Clercq)

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Introduction

When is a sentence negative?

Simple answer:

- A sentence is negative iff it involves sentential negation.
- In English: *not* (possibly contracted and with *do* support)

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Standard syntactic and semantic assumptions

- Syntactically, negation forms a high functional projection (Laka 1990, Haegeman and Zanutinni 1991, Haegeman 1995)
- Semantically, negation amounts to complementation

Beyond the simple case

Negativity without overt sentential negation

Klima 1964, Ladusaw 1992, Zeijlstra 2004, Penka 2011, Tubau 2008 a.o.

3. Sue never left. — N-WORD-ADV
4. Nobody left. — N-WORD-SUBJ
5. Sue saw nobody. — N-WORD-OBJ

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5. Sue saw nobody. N-WORD-OBJ
6. Sue rarely left. DE-ADV
7. Few students saw Sue. DE-SUBJ
8. Sue saw few students. DE-OBJ

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There is a whiff of negativity in all these examples, but ...

- are they as negative as the simple case (*Sue didn't leave*)?
- are there different levels/scales of negativity?

Today

Testing negativity using two criteria

I. Polarity particle responses (new)
   - Agreeing with positive sentences ⇒ YES / *NO
   - Agreeing with negative sentences ⇒ YES / NO

II. Question tags (Klima 1964)
   - Positive sentences ⇒ negative tags
   - Negative sentences ⇒ positive tags

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Outcome: two scales of negativity

I. Semantic scale: N-WORD ≻ DE

II. Syntactic scale: ADV ≻ SUBJ ≻ OBJ

Roadmap

I. Testing negativity using polarity particles
   - Experiment 1: ‘testing the test’
   - Experiment 2: applying the test

II. Testing negativity using question tags
   - Experiment 3

III. Discussion: scales of negativity

IV. Conclusions and future work

Polarity particles

It has been claimed that the felicity of polarity particles in responses to assertions and polar questions is sensitive to:

- The nature of the response: agreeing or disagreeing
- The polarity of the antecedent: positive or negative

(Pope 1976, Ginzburg & Sag 2000, Kramer & Rawlins 2009, Farkas 2011, Holmberg 2012, Cooper & Ginzburg 2012, Farkas & Roelofsen 2012)

Polarity particles in agreeing responses

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   B: Yes / *No, Paul stepped forward.

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In an agreeing response to a negative assertion, both YES and NO can be used:

10. A: Paul did not step forward.
    B: Yes / No, Paul did not step forward.

Testing negativity using polarity particles

The simplest cases

- Agreeing with positive sentences ⇒ YES / *NO
- Agreeing with negative sentences ⇒ YES / NO

More generally

The frequency of NO in an agreeing response can be seen as an indicator of the extent to which the antecedent is negative

frequency of NO in agreeing responses

⇕

negativity of the antecedent

Experiment 1: testing the test

Question

Our test assumes that in the simplest cases:

- Agreeing with positive sentences ⇒ YES / *NO
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This is a prediction of some (though not all) approaches in the theoretical literature. But is it real?

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Answer

- Description of experiment.
- Discussion of results.
- Conclusion: usage of NO in agreeing responses is indeed a good test for diagnosing negativity of the antecedent.

Experiment 1

Example items

11. This substance will prevent the clay from twisting.

$$\left\{ \begin{array}{c} \text{Yes, it will.} \\ \text{No, it will.} \end{array} \right\}$$

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    $\left\{\begin{array}{l}\text{Yes, it will.}\\ \text{No, it will.}\end{array}\right\}$

12. At most six volunteers did not sign up for free housing.
    $\left\{\begin{array}{l}\text{Yes, at most six of them didn't.}\\ \text{No, at most six of them didn't.}\end{array}\right\}$

Experiment 1

Response variable

resp encodes choice of polarity particle in responses;
factor with 2 levels: YES (‘success’); NO.

Two predictors

stim-pol encodes polarity of stimulus;
factor with 2 levels: POS (ref. level), NEG.

- If POS, we expect agreement with YES.
- If NEG, we expect agreement with either YES or NO.

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factor with 4 levels: REF (ref. level), ATMOST, EXACTLY, SOME.

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We want to see if the referential vs. quantificational nature of the subject NPs and their monotonicity properties affect particle choice.

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Example items, again

All stimuli have the structure subject + predication.

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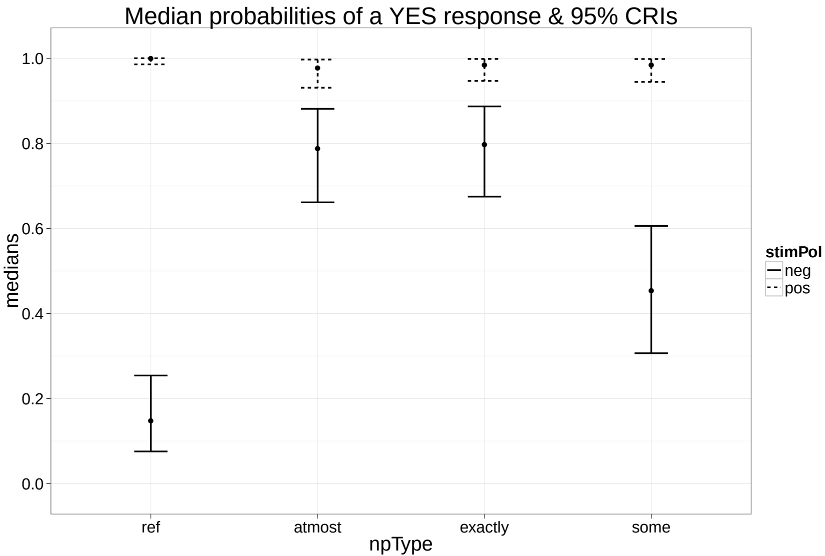
11. **stim-pol** = POS, **np-type** = REF

    This substance will prevent the clay from twisting.
    {Yes, it will. / No, it will.}

12. **stim-pol** = NEG, **np-type** = ATMOST

    At most six volunteers did not sign up for free housing.
    {Yes, at most six of them didn't. / No, at most six of them didn't.}

Experiment 1: Results



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Generalizations

I. POS stimuli with REF subjects license only YES.

II. NEG stimuli with REF subjects license both YES and NO, as expected, with a rather strong preference for NO.

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II. NEG stimuli with REF subjects license both YES and NO, as expected, with a rather strong preference for NO.

III. POS sentences: changing NP type diminishes preference for YES compared to REF subjects; decrease significant only for downward-entailing ATMOST (see appendix).

IV. NEG sentences: non-REF subjects neutralize or even reverse the preference for NO found with REF NPs.

V. This interaction of NEG polarity and NP type is not predicted by the theoretical literature to date.

Experiment 1: Conclusion

Main result: prediction confirmed

- The distribution of YES and NO in agreeing responses is indeed sensitive to the polarity of the antecedent.
- Negative antecedents license NO in agreeing responses; positive antecedents don't.

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Additional results

- Preference for NO over YES in agreeing responses to negative assertions with REF subjects.
  (predicted by the account of Farkas & Roelofsen 2012)
- This preference is neutralized by existential subjects and even reversed by downward/non-monotonic subjects.
  (not predicted by any existing theoretical account)

Experiment 2: Applying the test

Main question

Do sentences with N-WORDS and DE quantifiers
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Eight conditions

- Six ‘treatment’ conditions:

two semantic types × three syntactic positions
(N-WORD, DE) (ADV, SUBJ, OBJ)

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Eight conditions

- Six 'treatment' conditions:

  two semantic types × three syntactic positions
  (N-WORD, DE) (ADV, SUBJ, OBJ)

- Two control conditions: POSITIVE and NEGATIVE sentences in which the adverb, subject and object are referential.

Experiment 2: Stimuli

- All stimuli have the following structure:

  subj + verb + obj + adv

- Example:

  The representatives + visited + the colonies + this year.

- The arguments and the adverb are always referential except when experimentally manipulated.

- When referential, the adverb is more natural after object; when manipulated, it is more natural before verb.

Experiment 2: Example items

Controls

13. **cond** = POSITIVE

    The representatives visited the colonies this year.

    {Yes, they did. / No, they did.}

14. **cond** = NEGATIVE

    The representatives didn't visit the colonies this year.

    {Yes, they didn't. / No, they didn't.}

Experiment 2: Example items

N-WORDS

15. **cond** = N-WORD-ADV

    The representatives never visited the colonies.

    {Yes, they never did. / No, they never did.}

16. **cond** = N-WORD-SUBJ

    No representatives visited the colonies this year.

    {Yes, no representatives did. / No, no representatives did.}

17. **cond** = N-WORD-OBJ

    The representatives visited no colonies this year.

    {Yes, they visited no colonies. / No, they visited no colonies.}

Experiment 2: Example items

DE-quantifiers

18. **cond** = DE-ADV

    The representatives rarely visited the colonies.

    $\left\{\begin{array}{l}\text{Yes, they rarely did.}\\ \text{No, they rarely did.}\end{array}\right\}$

19. **cond** = DE-SUBJ

    Few representatives visited the colonies this year.

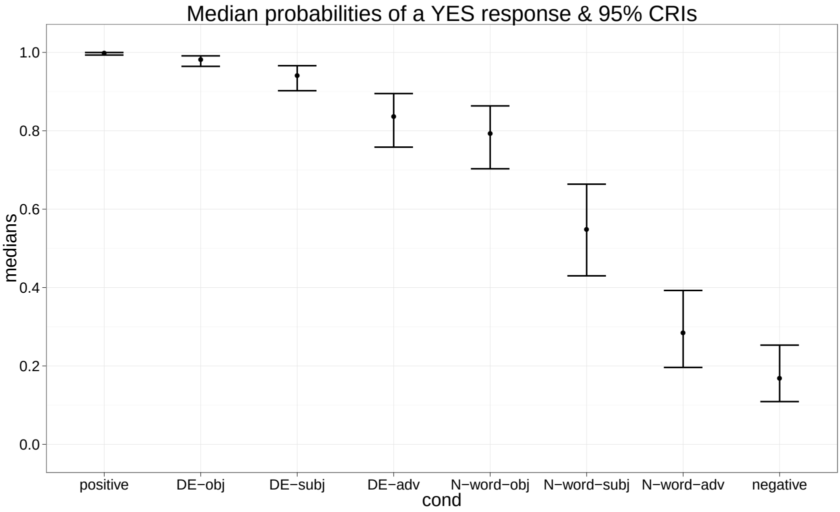
    $\left\{\begin{array}{l}\text{Yes, few representatives did.}\\ \text{No, few representatives did.}\end{array}\right\}$

20. **cond** = DE-OBJ

    The representatives visited few colonies this year.

    $\left\{\begin{array}{l}\text{Yes, they visited few colonies.}\\ \text{No, they visited few colonies.}\end{array}\right\}$

Experiment 2: Results



Experiment 2: Results

Generalizations

- Once again, we see that the POSITIVE and NEGATIVE (and across-the-board referential) controls behave as expected:
  - probability of YES for POSITIVE is practically 1
  - probability of YES for NEGATIVE is lowest, about 0.17
- The biggest split is the semantic one:
  N-WORDS are clearly more negative than DE-quantifiers.
  (although N-OBJ is not significantly more negative than DE-ADV)
- Within each semantic class, we have a clear, statistically significant syntactic hierarchy: ADV is more negative than SUBJ, which in turn is more negative than OBJ.

Experiment 2: Discussion

Scales of negativity

We have two scales of negativity, a semantic one and a syntactic one:

Semantic scale of negativity: N-WORD $\ggcurly$ DE

Syntactic scale of negativity: ADV $\ggcurly$ SUBJ $\ggcurly$ OBJ

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> Semantic scale of negativity: N-WORD $\gg$ DE
>
> Syntactic scale of negativity: ADV $\gg$ SUBJ $\gg$ OBJ

The semantic scale is primary: (unsurprisingly) semantics takes precedence in determining the negativity of a sentence.

Each of the two semantically-ordered strata is further refined by the syntactic scale (more surprising).

Experiment 2: Discussion

The semantic scale and NPI licensing

The semantic scale is reminiscent of the NPI literature
(Zwarts 1995, Levinson 2008, Giannakidou 2011, Hoeksema 2012, a.o.)

- Weak NPIs are licensed by downward entailing elements
- Strong NPIs are only licensed by anti-additive elements
- Anti-additive elements are always downward entailing, but not vice versa.
- N-WORDS are anti-additive.
- DE quantifiers are downward entailing, not anti-additive.
- So wrt NPI licensing we have the same semantic scale:

$$\text{N-WORD} \succcurlyeq \text{DE}$$

Experiment 2: Discussion

Downward entailingness and anti-additivity

A function $\mathcal{F}(\cdot)$ of quantifier type $\langle\langle et\rangle t\rangle$ is:

- DOWNWARD ENTAILING iff $\mathcal{F}(Y) \rightarrow \mathcal{F}(X)$ for any $X \subseteq Y$.
- *Few students are tall* $\rightarrow$ *Few students are tall and blond*
- ANTI-ADDITIVE iff $\mathcal{F}(X \cup Y) \leftrightarrow \mathcal{F}(X) \wedge \mathcal{F}(Y)$ for any X, Y
- *No students are tall or blond* $\leftrightarrow$
  No students are tall $\wedge$ *No students are blond*

Every anti-additive function is also downward entailing,
but not every downward entailing function is also anti-additive.

- *Few students are tall or blond* $\not\leftrightarrow$
  Few students are tall $\wedge$ *Few students are blond*

Experiment 2: Discussion

N-words versus other anti-additive elements

- Broadly speaking, the semantic scales relevant for polarity particles and NPI licensing align very well.
- However, there also seems to be a subtle difference.
- There seems to be something special about N-WORDS, besides their general anti-additive nature, that determines their behavior wrt polarity particles.
- For example, *without* is also anti-additive, but seems to behave differently (still to be confirmed experimentally):

21. Bill ate without a spoon.
    Yes / *No, he ate without a spoon.

Coming next: Experiment 3

Checking whether the existence of the two scales of negativity is independently confirmed by another, more traditional test.

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Same main question

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- REV contexts: interlocutor is an authority for content of assertion, so q-tag used to ask for confirmation;
  q-tag polarity is the REVERSE of sentence polarity.

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- REV contexts: interlocutor is an authority for content of assertion, so q-tag used to ask for confirmation; q-tag polarity is the REVERSE of sentence polarity.
- RED contexts: interlocutor finds content of assertion hard to believe, so q-tag used to express skepticism / suspicion / sarcasm; q-tag polarity REDUPLICATES sentence polarity.

Experiment 3: Example items

Items have same basic structure as in Exp. 2.

Controls

23. **cond** = POSITIVE, **conx** = REV
    Mary has just told Jane something about government representatives. Jane knows it already and says:
    "Aha, I was right! The government representative visited the colonies this year, $\left\{\begin{array}{c}\text{did he?}\\ \text{didn't he?}\end{array}\right\}$"

    cond = POSITIVE, **conx** = RED
    Mary has just told Jane something about government representatives. Jane finds it hard to believe and says:
    "You don't say! The government representative visited the colonies this year, $\left\{\begin{array}{c}\text{did he?}\\ \text{didn't he?}\end{array}\right\}$"

Experiment 3: Example items

Controls (ctd.)

24. **cond** = NEGATIVE, **conx** = REV
    Geoff has just told Ryan something about composers.
    Ryan knows it already and says:
    "Aha, I was right! The composer did not use the cello in his late period, $\left\{ \begin{array}{c} \text{did he?} \\ \text{didn't he?} \end{array} \right\}$"

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Experiment 3: Example items

N-WORDS

25. **cond** = N-WORD-ADV, **conx** = REV
    Lilly has just told Adrian something about the children.
    Adrian knows it already and says:
    "Aha, I was right! The children never understood the science experiments, $\left\{\begin{array}{c}\text{did they?}\\ \text{didn't they?}\end{array}\right\}$"

    cond = N-WORD-ADV, **conx** = RED
    Lilly has just told Adrian something about the children.
    Adrian finds it hard to believe and says:
    You don't say! The children never understood the science experiments, $\left\{\begin{array}{c}\text{did they?}\\ \text{didn't they?}\end{array}\right\}$"

Experiment 3: Example items

DE-quantifiers

26. **cond** = DE-ADV, **conx** = REV
Bob has just told Justine something about the athletes.
Justine knows it already and says:
"Aha, I was right! The athletes rarely skipped the practice games, $\left\{\begin{array}{c}\text{did they?}\\ \text{didn't they?}\end{array}\right\}$"

cond = DE-ADV, **conx** = RED
Bob has just told Justine something about the athletes.
Justine finds it hard to believe and says:
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Experiment 3: Expectations

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- POS sentences expected to discriminate
  very well between REV and RED contexts.
  They should trigger:
  - NO (negative tags) in REV contexts, and
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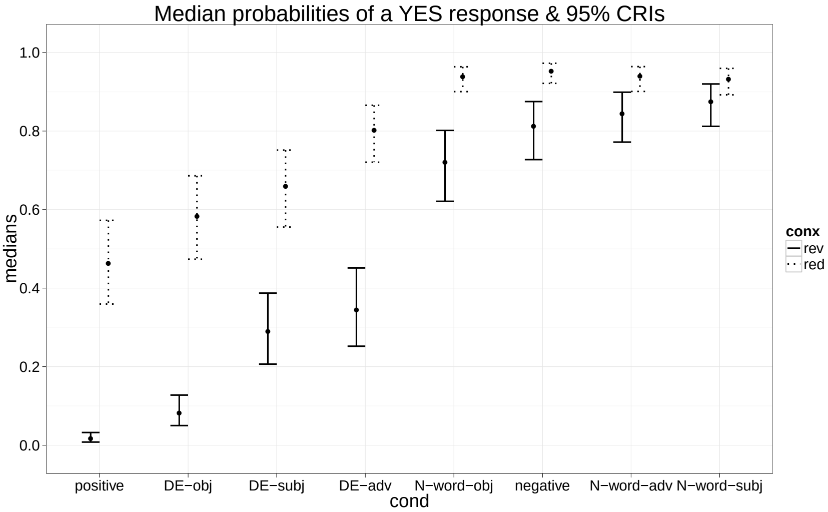
- POS sentences expected to discriminate very well between REV and RED contexts. They should trigger:
  - NO (negative tags) in REV contexts, and
  - YES (positive tags) in RED contexts.
- NEG sentences expected to be ungrammatical with NO; they should not discriminate between REV and RED.
  - E.g: *Sue didn't call, *didn't she?*

  (Quirk *et al.* 1985, McCawley 1998; turns out: not true).

Experiment 3: Results



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- The controls didn't work as expected in RED; we will therefore mainly focus on REV.
- Both POS and NEG controls worked more or less as expected in REV.
- POS in REV clearly the most positive, hence probability of getting a YES (positive tag) response very close to 0.
- NEG in REV among the most negative, hence probability of getting a YES (positive tag) response close to 1.

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Generalizations (ctd.)

- Semantic scale of negativity clearly confirmed:
  N-WORD sentences are more negative than DE sentences.

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Generalizations (ctd.)

- Semantic scale of negativity clearly confirmed:
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- Syntactic scale of negativity confirmed, but not completely.
  For each of the 2 semantically ordered strata, OBJ is clearly less negative than SUBJ and ADV, but there is no significant difference between ADV and SUBJ.

Experiment 3: Discussion

Main result: scales of negativity confirmed

Experiment 3 confirms the results of experiment 2:

- There are two scales of negativity, one semantic and one syntactic.
- The semantic scale takes precedence and the syntactic scale further refines it.

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Q-tags noisier than polarity particles

- Semantic scale completely confirmed: N-WORD $\gg$ DE
- Syntactic scale coarser grained: $\{$ADV, SUBJ$\}$ $\gg$ OBJ

Conclusion and future research

Most important findings

- Negativity of a sentence (as measured by polarity particles and q-tags) is a matter of degree.
- There are two interacting scales that influence negativity.

  Semantic scale: N-WORD ≫ DE

  Syntactic scale: ADV ≫ SUBJ ≫ OBJ

Questions for future research (1)

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How to formally capture the two scales and their interaction?

- Semantic scale maybe explained by N-WORDS being more negative than DE (anti-additive ⇒ de)

How about the syntactic scale?

- Most direct approach: assume that N-WORDS and DE items both have syntactic negative features, the former stronger than the latter.
- Assume that the negative strength of a sentence depends on the negative strength of the negative items occurring in that sentence, as well as their syntactic position.
- The latter dependency could perhaps be spelled out in terms of agreement.
- The negative indefinite approach to N-WORDS may help to explain the observed contrast between N-WORDS and other anti-additive items.

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- In particular: the more complex the quantifiers in the NEG sentence, the higher the rate of YES in agreeing responses.

quantifier complexity

↕

frequency of YES in agreeing with NEG sentences

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- In particular: the more complex the quantifiers in the NEG sentence, the higher the rate of YES in agreeing responses.

quantifier complexity

$\updownarrow$

frequency of YES in agreeing with NEG sentences

- Hypothesis confirmed in a self-paced reading experiment:
  I. Quantifiers are more complex than referential NPs.
  II. Downward entailing (and non-monotonic) quantifiers are more complex than upward entailing ones.
  III. Modified numerals are more complex than unmodified quantifiers.

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Appendix: Experiment 1

Data Analysis

The response variable **resp** is categorical binary, so mixed-effects logistic regression models:

- fixed effects: **stim-pol**, **np-type** and their interaction;
- random effects: correlated subject random effects for the intercept and the **stim-pol**-NEG slope.

- random effects for subjects factor out the variability in responses between subjects; whatever variability remains more confidently attributed to the experimental manipulations
- the items did not account for any variability in this experiment, so we do not include item random effects

When **stim-pol** = POS, most counts are 0 or extremely low, so usual frequentist procedures less reliable.
But: Bayesian modeling with the same likelihood structure and vague / low-information priors OK.

Appendix: Experiment 1

Priors for the fixed effects

Priors for the intercept and the non-reference levels of **stim-pol**, **np-type** and their interaction:

- All independent normals $\mathcal{N}(0, 10^2)$.
- These priors place most of their probability on the interval $(-20, 20)$, a very wide interval on the standard logit scale.
- Therefore, they contribute very little information and the posterior estimates overwhelmingly reflect the data.

Priors for the random effects

Priors for the random effects are similarly vague / low information:

- A bivariate normal distribution for the intercept and **stim-pol**-NEG random effects with correlation ρ between the two random effects $\mathcal{N}\left(\begin{bmatrix}0\\0\end{bmatrix}, \begin{bmatrix}\sigma^2 & \rho\sigma\tau\\ \rho\sigma\tau & \tau^2\end{bmatrix}\right)$.

Priors for the intercept standard deviation σ and the **stim-pol**-NEG standard deviation τ: independent uniforms $\mathcal{U}(0, 10)$.
Prior for ρ: $\mathcal{U}(-1, 1)$.

Appendix: Experiment 1

Estimated means, standard deviations and 95% credible intervals (CRIs) for posterior distributions of random and fixed effects (logit scale):

RANDOM EFFECTS		mean	std.dev.	95% CRI
	σ	0.978	0.661	$(0.057, 2.570)$
	τ	1.614	0.591	$(0.568, 3.025)$
	ρ	-0.262	0.500	$(-0.906, 0.866)$
FIXED EFFECTS		**mean**	**std.dev.**	**95% CRI**
	intercept	7.104	1.874	$(4.228, 11.526)$
	stim-pol-NEG	-8.868	1.894	$(-13.296, -5.891)$
	np-type-ATMOST	-3.249	1.849	$(-7.561, -0.268)$
	np-type-EXACTLY	-2.877	1.898	$(-7.314, 0.218)$
	np-type-SOME	-2.903	1.873	$(-7.183, 0.201)$
	stim-pol-NEG : NP-TYPE-**atmost**	6.326	1.885	$(3.206, 10.676)$
	stim-pol-NEG : NP-TYPE-**exactly**	6.015	1.933	$(2.823, 10.474)$
	stim-pol-NEG : NP-TYPE-**some**	4.481	1.898	$(1.247, 8.805)$

MCMC: 3 chains, 275000 iterations per chain, 25000 burn-in, 100 thinning.

Appendix: Experiment 2

Data Analysis

The response variable **resp** is categorical binary, so mixed-effects logistic regression models:

- fixed effect: **cond** (factor with 8 levels, reference level: POSITIVE)
- random effects: intercept random effects for subjects

- the items or more complex random effects structures for subjects or items accounted for (practically) no variability in this experiment, so we do not include item random effects

Appendix: Experiment 2

Priors for the fixed effects

Priors for the intercept and the non-reference levels of **cond** (reference level: POSITIVE):

- All independent normals $\mathcal{N}(\mu = 0, \sigma^2 = 1000)$.
- These priors place most of their probability on the interval $(-65, 65)$, which is an extremely wide interval on the standard logit scale.
- Therefore, they contribute very little information and the posterior estimates overwhelmingly reflect the data.

Priors for the random effects

Priors for the random effects are similarly vague / low information:

- A normal distribution for the intercept random effects for subjects $\mathcal{N}(0, \sigma^2)$.

Prior for the intercept standard deviation σ: a uniform $\mathcal{U}(0, 100)$.

Appendix: Experiment 2

Estimated means, standard deviations and 95% credible intervals (CRIs) for posterior distributions of random and fixed effects (logit scale):

RANDOM EFFECTS		mean	std.dev.	95% CRI
	σ	1.656	0.182	(1.336, 2.051)
FIXED EFFECTS		mean	std.dev.	95% CRI
	INTERCEPT	6.368	0.839	(4.991, 8.242)
	cond-DE-SUBJ	−3.592	0.830	(−5.445, −2.221)
	cond-N-WORD-SUBJ	−6.174	0.822	(−8.021, −4.822)
	cond-DE-OBJ	−2.375	0.854	(−4.276, −0.925)
	cond-N-WORD-OBJ	−5.019	0.823	(−6.886, −3.675)
	cond-DE-ADV	−4.732	0.825	(−6.605, −3.389)
	cond-N-WORD-ADV	−7.291	0.828	(−9.143, −5.937)
	cond-NEGATIVE	−7.962	0.833	(−9.858, −6.594)

MCMC: 3 chains, 250000 iterations per chain, 25000 burn-in, 50 thinning.

Appendix: Experiment 3

Data Analysis

The response variable **resp** is categorical binary, so mixed-effects logistic regression models:

- fixed effects: **cond** (factor with 8 levels, reference level: POSITIVE), **conx** (factor with 2 levels, reference level: RED) and their interaction
- random effects: subject random effects for the intercept and **conx**-REV slope
- once again, the items did not account for any variability, so we do not include item random effects

Appendix: Experiment 3

Priors for the fixed effects

Priors for the intercept and the non-reference levels of **cond** (reference level: POSITIVE) and **conx** (reference level: RED) and their interaction:

- All independent normals $\mathcal{N}(\mu = 0, \sigma^2 = 1000)$.
- These priors place most of their probability on the interval $(-65, 65)$, which is an extremely wide interval on the standard logit scale.
- Therefore, they contribute very little information and the posterior estimates overwhelmingly reflect the data.

Priors for the random effects

Priors for the random effects are similarly vague / low information:

- A bivariate normal distribution for the intercept and **conx**-REV random effects with correlation ρ between the two random effects $\mathcal{N}\left(\begin{bmatrix}0\\0\end{bmatrix}, \begin{bmatrix}\sigma^2 & \rho\sigma\tau\\ \rho\sigma\tau & \tau^2\end{bmatrix}\right)$.

Priors for the intercept standard deviation σ and the **conx**-REV standard deviation τ: independent uniforms $\mathcal{U}(0, 100)$.
Prior for ρ: $\mathcal{U}(-1, 1)$.

Appendix: Experiment 3

Estimated means, standard deviations and 95% credible intervals (CRIs) for posterior distributions of random and fixed effects (logit scale):

RANEFS		mean	std.dev.	95% CRI
	σ	1.794	0.169	$(1.484, 2.149)$
	τ	2.655	0.227	$(2.243, 3.143)$
	ρ	-0.734	0.055	$(-0.828, -0.615)$

FIXEFS		mean	std.dev.	95% CRI
	INTERCEPT	-0.147	0.223	$(-0.577, 0.292)$
	cond-DE-ADV	1.548	0.219	$(1.127, 1.979)$
	cond-DE-OBJ	0.482	0.207	$(0.078, 0.888)$
	cond-DE-SUBJ	0.807	0.209	$(0.396, 1.226)$
	cond-NEGATIVE	3.152	0.268	$(2.630, 3.689)$
	cond-N-WORD-ADV	2.887	0.266	$(2.379, 3.425)$
	cond-N-WORD-OBJ	2.880	0.265	$(2.359, 3.394)$
	cond-N-WORD-SUBJ	2.775	0.253	$(2.290, 3.281)$
	conx-REV	-3.929	0.431	$(-4.797, -3.125)$
	cond-DE-ADV : **conx**-REV	1.882	0.407	$(1.110, 2.694)$
	cond-DE-OBJ : **conx**-REV	1.171	0.413	$(0.376, 2.010)$
	cond-DE-SUBJ : **conx**-REV	2.369	0.402	$(1.595, 3.167)$
	cond-NEGATIVE : **conx**-REV	2.386	0.457	$(1.507, 3.312)$
	cond-N-WORD-ADV : **conx**-REV	2.878	0.458	$(2.002, 3.804)$
	cond-N-WORD-OBJ : **conx**-REV	2.141	0.452	$(1.291, 3.035)$
	cond-N-WORD-SUBJ : **conx**-REV	3.244	0.454	$(2.380, 4.157)$

MCMC: 3 chains, 30000 iterations per chain, 5000 burn-in, 10 thinning.