

1. Verbal Mood Distribution

The distribution of indicative and subjunctive presents a long-standing puzzle across languages. Particularly puzzling are cases of mood variation within a language: predicates expressing likelihood are known to be compatible both with indicative (1a) and subjunctive (1b) in several languages, as illustrated in Greek with the predicate *pithano* 'likely':

- (1) a. Ine (90%) pithano **oti** tha perasi o Nikos to mathima.
be.PRES.3SG likely that_{ind} FUT pass.3SG the Nick the course
b. Ine (90%) pithano **na** perasi o Nikos to mathima.
be.PRES.3SG likely SUBJ pass.3SG the Nick the course
≈ It is (90%) likely that Nick will pass the course.

2. Main Questions

Why is there mood variation across languages and within a language?

- What are the speakers' preferences (if any) with likelihood predicates?
- What are the relevant factors leading to variation?
- Is there a shared property among the different classes of predicates (i.e. *likelihood*, *emotive*, *bouletic*) that regulates mood preferences?

3. Approaches to mood distribution & Predictions

Theoretical approaches to mood distribution differ on whether the relevant parameter is:

(a) *commitment vs. lack thereof*

(b) *the presence of a comparative interpretation*

Commitment-based analyses: Indicative mood has a specification for *relative commitment to the prejacent by the attitude holder* (see Farkas 1992, Quer 2001, Farkas 2003, Schlenker 2005, Giannakidou 2009, 2015, Portner & Rubinstein 2012 for various implementations of the notion of commitment).

Gradable Commitment Hypothesis: a gradable notion of varying degree.

More recently, the commitment-based analysis is further elaborated in Portner & Farkas (2023), proposing the definition of commitment in (2).

(2) Commitment of *a* to *p* in *s*: $p \in B_a$ (at degree *d*) in *s*, where B_a is the private or public commitment base of *a* in *s*; *a* is publicly or privately committed to the truth of *p* (at degree *d*) in the world in which *a* locates themselves in *s*.

Portner & Farkas' proposal predicts that mood variability depends on the degree of commitment of *a* to *p* (and, consequently, on the likelihood of *p*), i.e. **the higher the degree of likelihood, the stronger the preference for indicative mood.**

- (3) Least likely ←————→ most likely
Subjunctive Indicative

Comparative Hypothesis: Subjunctive introduces/depends on a gradable modal interpretation (Giorgi & Pianesi 1997, Villalta 2008, Portner & Rubinstein 2020), → Prediction is that predicates of likelihood would not vary according to the degree of likelihood given their comparative interpretation across the board.

4. Aim of the study

- We experimentally test whether the **likelihood** of actualizing the prejacent affects speakers' preferences regarding mood choice with predicates of likelihood which are presumably flexible.
- Our ultimate goal is to differentiate between the gradable commitment hypothesis and the comparative hypothesis based on the outcome of our study.

5. Experimental Study I: Design & Materials

Task: Sentence Evaluation Task designed in PCIBEX (Zehr & Schwarz, 2018).

The bulletin said it would be cloudy but not rainy.
According to meteo:

It is 30% likely that it will rain tomorrow (Indicative)
Είναι 30% πιθανό ότι θα βρέξει αύριο.

Not at all natural 1 2 3 4 5 Absolutely natural

It is 30% likely to rain tomorrow (Subjunctive)
Είναι 30% πιθανό να βρέξει αύριο.

Not at all natural 1 2 3 4 5 Absolutely natural

- **75 Participants** were presented with a short context followed by two sentences involving a likelihood predicate embedding i) an indicative and, ii) a subjunctive. Participants evaluated each one on a separate naturalness scale.
- **Items:** 24 pairs of sentences were allied with different degree of likelihood: i) 12 pairs conveyed percentized likelihood (i.e. It is 5% likely that...), starting from 5% to 99%, and ii) 12 pairs involved predicates of **LOW, MID** or **HIGH** likelihood (i.e. *There is (slight/large) possibility that...*).
- 27 filler items

6. Experimental Study I: Results

A two-way (DEGREELIKELIHOOD × MOOD) within-participant ANOVA showed an impact of **DEGREELIKELIHOOD** on sentence ratings. Overall participants showed a **significant preference for subjunctive over indicative across conditions**. This is not surprising since the study did not include any absolute (i.e. non-gradable items). Regarding the MID/LOW/HIGH likelihood items (Fig. 1a), the statistical analysis within subjunctive condition showed significant difference only between **MID vs HIGH** likelihood levels ($p < 0.001$). Within **indicative**, significances were observed between **LOW vs HIGH** ($p < 0.001$) and **LOW vs MID** ($p < 0.001$) likelihood levels, but not between MID vs HIGH. Across **percentized** comparisons (Fig. 1b), **ratings significantly differed only within indicative condition**, between the group of **lower percentages** (i.e. 5-20%) and the group of **higher percentages** (i.e. 80-99%) ($p < 0.05$).

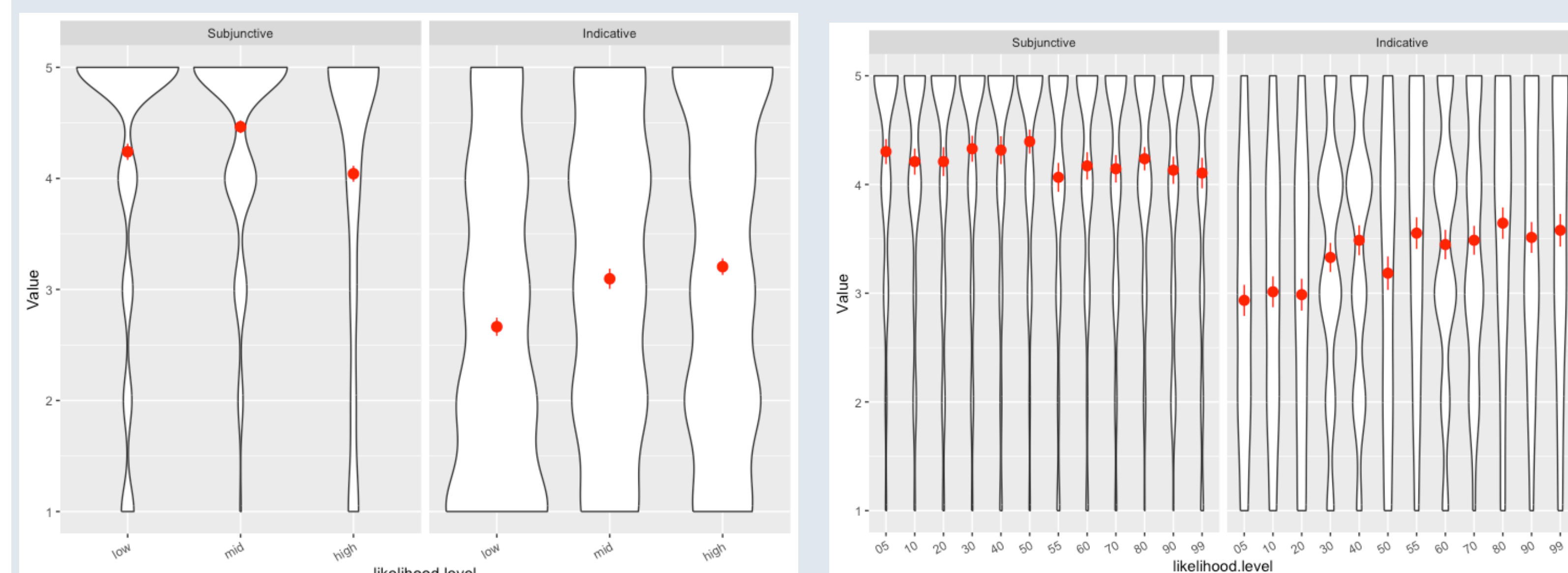


Figure 1(a): Ratings for low, mid, high likelihood sentences (with modifiers).

Figure 1(b): Ratings for percentized sentences.

Figure 1: The violin plots show the spread and density of responses, while the red circle within each plot indicates the mean rating value.

7. Interim Discussion

- The impact of the likelihood degree is attested as **indicative complements are judged significantly more natural when the predicate expresses high degree of likelihood.**
- However, the schema in (3) is not fully represented in our data. This is because with *likelihood* predicates there is an overall preference for subjunctives. Thus, the degree of likelihood affects the indicative variable (the higher the degree of likelihood, the higher the ratings of indicative are) but not the subjunctive.
→ The experimental findings partially corroborate the predictions by the gradable commitment-based hypothesis (following Farkas & Portner 2023).

⇒ **Follow-up Question:** We should look into predicates which show preference for indicative, but allow subjunctive (i.e. predicates exhibiting the opposite pattern from likelihood predicates).

- We aimed at testing **emotive predicates** which typically combine with the indicative factive complementizer *pu* (4a) (Giannakidou & Mari 2021). However, when factivity is not ensured, they can combine with subjunctive (4b).

- (4) a. I Elsa tha entusiasthi pu tha kanete ena tetjo taksidi.
the Elsa FUT EXCITE.PRF.3SG that_{ind-fact} FUT do.2PL a such trip
b. I Elsa tha entusiasthi na kanete ena tetjo taksidi.
the Elsa FUT EXCITE.PRF.3SG SUBJ do.2PL a such trip
'Elsa will be excited to do such a trip.'

8. Experimental Study II: Design & Materials

Modified Sentence Evaluation Task (IN PROGRESS).

Christina tells George: Kostas will come to the party.
George answers:

How Nice! The kids will be excited that he will come.
Αχ τι καλό! Τα παιδιά θα χαρούν πολύ να έρθει!

Not at all natural 1 2 3 4 5 Absolutely natural

How Nice! The kids will be excited if he comes.
Αχ τι καλό! Τα παιδιά θα χαρούν πολύ να έρθει!

Not at all natural 1 2 3 4 5 Absolutely natural

- **39 Participants** (so far) were presented with a **question/sentence** followed by two sentences i) a likelihood predicate embedding an indicative and, ii) one with a subjunctive. Participants evaluated each one on a separate naturalness scale.
- We modified the contexts in the case of the likelihood-items into a more neutral question (i.e. *Lydia is listening to the weather broadcast and her partner asks her "What did they say?"*)
- **Items:** 10 pairs of emotive sentences were allied with **high (likelihood)** and 10 pairs with **certainty**. The contexts were either "*x will (certainly) happen*" or "*it is highly likely that*"
- 27 filler items

9. Experimental Study II: Results



Figure 3(a): Ratings for low, mid, high likelihood sentences with modifiers.

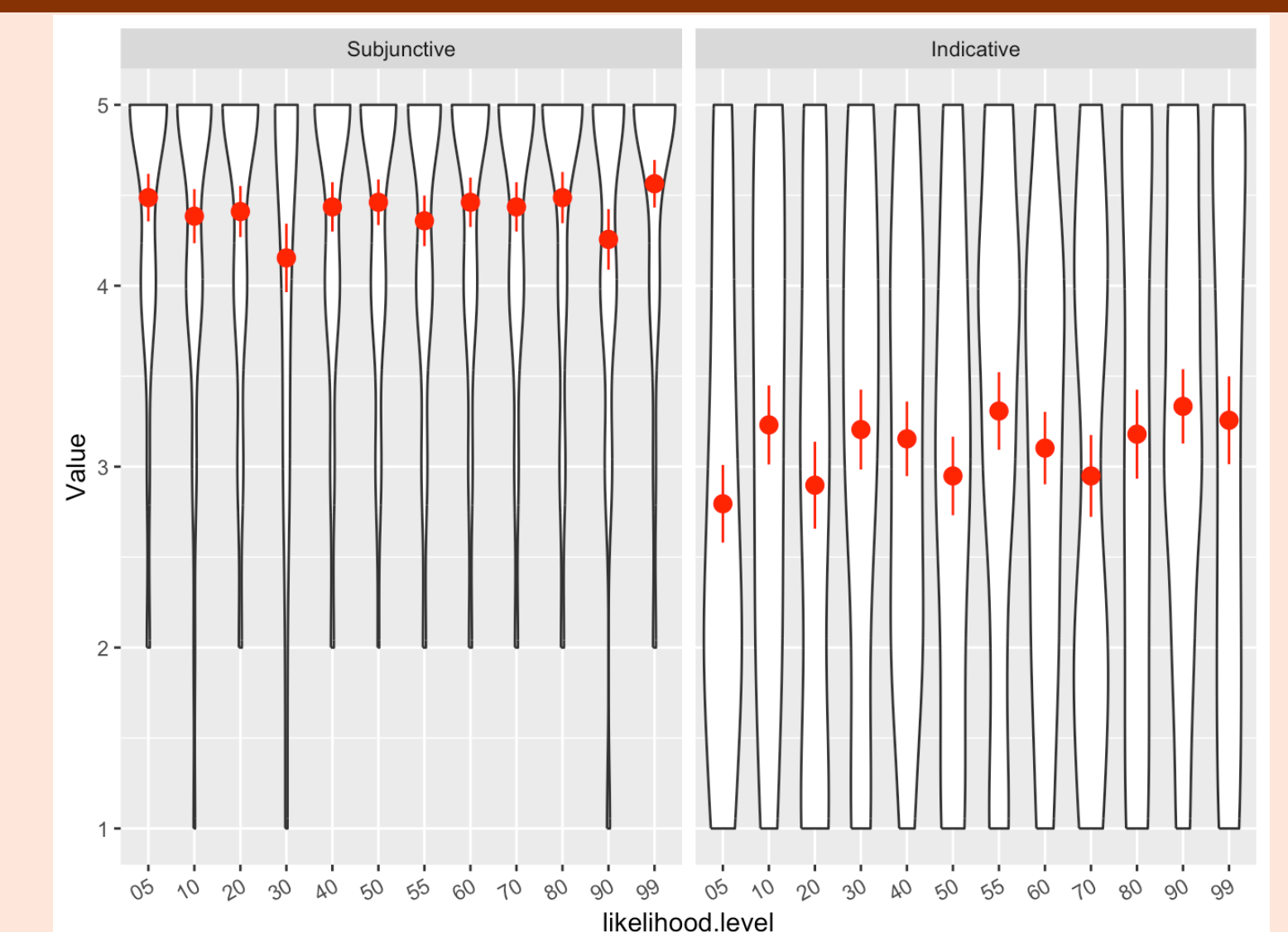


Figure 3(b): Ratings for percentized sentences.



Figure 4: Emotive predicates: Ratings for high likelihood and certainty. The violin plots show the spread and density of responses, while the red circle within each plot indicates the mean rating value.

LIKELIHOOD PREDICATES: Partial replication: In the MID/LOW/HIGH likelihood items (Fig. 3a), the statistical analysis within the indicative condition showed significant difference only between **LOW vs HIGH** likelihood levels ($p < 0.001$). Across **percentized** comparisons (Fig. 3b), **ratings did not differ significantly** in indicative or subjunctive.

EMOTIVE PREDICATES: The differences depending on **CERTAINTY vs HIGH LIKELIHOOD** are all significant ($p < 0.001$) in the direction we expected. The typical pattern is overall preferred but we notice that the level of certainty affects mood choice both for subjunctive (**lower degree of certainty → increased ratings for subjunctive**) and for indicative (**Absolute certainty → increased ratings for indicative**).

10. Conclusion

- Both experiments support the **gradable commitment hypothesis** as illustrated in (2). In addition, it is shown that lexical restrictions are also important. **Likelihood Ps:** Even though *aveveo* 'uncertain' encodes low likelihood, it shows preference for *indicative*. **Emotive Ps:** Even when the complement of an emotive predicate is certain that it will be actualized, the *indicative-factive* complementizer is preferred over the *subjunctive*.
- A first comparison between EXP1 & EXP2 (in-progress), suggests that contextual information may strengthen the *low-high likelihood* contrast. In EXP2, in which the context was neutralized, we didn't get significant difference between the lower and higher percentized degrees. However, the difference pertains when the low-high contrast is conveyed with modifiers (Fig. 3a).

11. Further Questions and Future Work

Our study indicates the relevance of several factors in mood choice by participants (*likelihood*, *lexical selections*, *contextual information*). We think that further experimental work is necessary to evaluate the multidimensional nature of mood choice.

Further supporting evidence in favor of the gradable commitment approach comes from matrix subjunctives in Greek, which convey either a directive/optative interpretation or extremely low likelihood, as illustrated in (5):

- (5) Ande/pu na perasi to mathima o Nikos. 'It's unlikely that Nick will pass the class.'
PRTC / PRTC SUBJ pass.3SG the course the Nick

Matrix subjunctives can convey low likelihood, but never mid or high likelihood.

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