

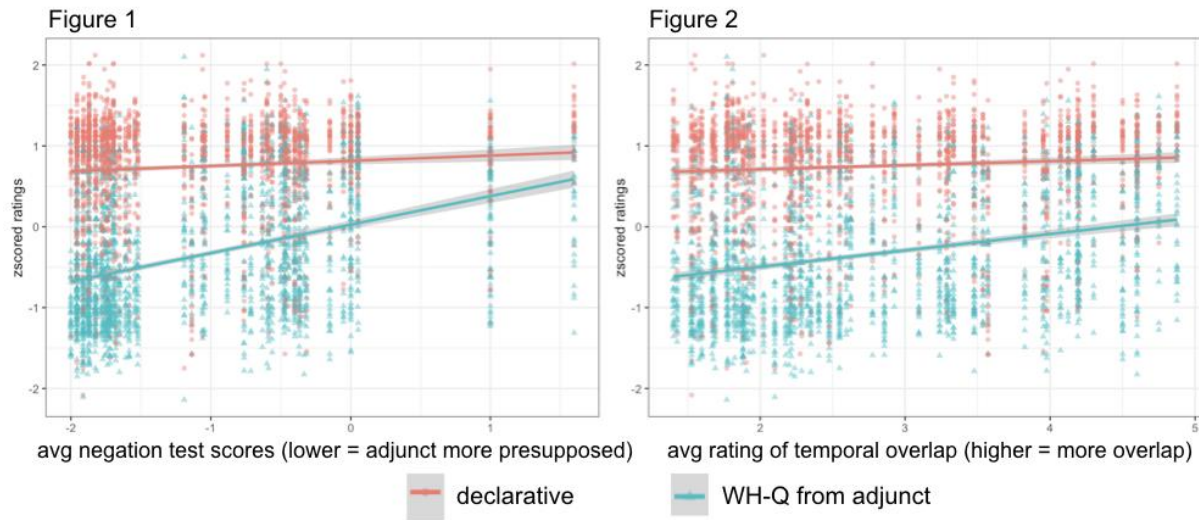
## Backgroundedness measures predict island status of non-finite adjuncts in English

Savithry Namboodiripad<sup>1</sup>, Felicia Bisnath<sup>1</sup>, Alex Kramer<sup>1</sup>, Noah Luntzlara<sup>1</sup> and Adele Goldberg<sup>2</sup>

<sup>1</sup>University of Michigan, Ann Arbor, <sup>2</sup>Princeton University

Previous work has argued that the extent to which a construction is “backgrounded” in discourse predicts the extent to which it is an island for long-distance extraction (Erteschik-Shir 1979; Goldberg 2006). While the claim was supported by a study of verb complement clauses (Ambridge & Goldberg 2008), the interpretation has been challenged due to a lack of super-additive effects, indicating that verb complement clauses may not be islands after all (Liu et al. 2019). The current study investigates the case of non-finite *adjunct islands* and asks whether the degree to which they are backgrounded predicts their status as islands to *wh*-questions. **Backgroundedness measures:** We operationalized backgroundedness in two ways. (1) *Negation test*: the extent to which an adjunct interpretation is unaffected by main clause negation predicts the adjuncts degree of backgroundedness (Erteschik-Shir 1979; Goldberg 2013; negated adjunct interpretation = less backgrounded/more acceptable). In a preregistered norming study, 96 participants rated the extent to which main clause negation implied that the adjunct clause was negated. (2) *Temporal overlap*: 80 participants rated how likely the events in the main and adjunct clauses were to occur at the same time (one event = less backgrounded; cf. Truswell 2007). We used two types of non-finite adjunct clauses (Michel & Goodall 2013), *to* clauses and *ing* clauses; we expected the differences in event structure across items would ensure variation in both measures.

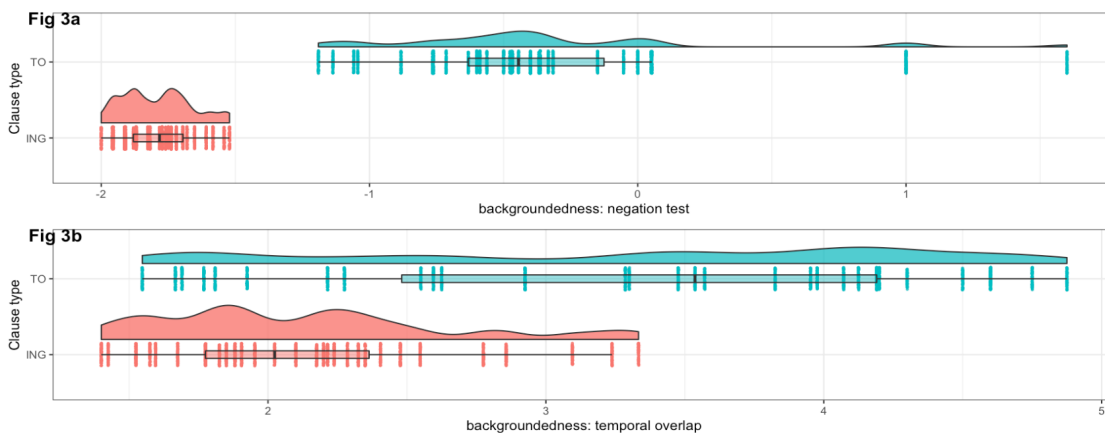
**Acceptability study:** Our preregistered experiment employed a 2x1 design, crossing SENTENCE TYPE (declarative vs. adjunct-extracted) with DEGREE OF BACKGROUNDEDNESS as described above. 32 declarative and 32 adjunct-extracted sentences were recorded and distributed across 4 lists pseudorandomly using a Latin Square design. 128 English-speaking participants were recruited via Prolific.co and asked to rate acceptability on a 1-7 Likert scale. Participants heard 16 items from each sentence type (no more than one type for any item), and 48 fillers which varied in acceptability. **Results and discussion:** As predicted, both backgroundedness measures predicted the acceptability of adjunct-extracted sentences more than they did declarative sentences. Specifically, linear mixed effects models were fit for each backgroundedness measure (fixed effects = z-scored rating, SENTENCE TYPE, & BACKGROUNDEDNESS MEASURE; random effects = PARTICIPANT, ITEM). Model comparison via ANOVA confirmed a significant interaction between judgments on the negation task and SENTENCE TYPE as compared to an additive model ( $\chi^2 = 20.5$   $df = 1$   $p < 0.001$ ; Fig 1). Similarly, model comparison via ANOVA confirmed a significant interaction between temporal overlap ratings and SENTENCE TYPE compared to an additive model ( $\chi^2 = 6.4848$   $df = 1$   $p < 0.011$ ; Fig 2). That is, the extent to which an adjunct was presupposed (not negated) was inversely correlated with independent judgments on the corresponding *wh*-question (adjunct extraction); the extent to which an adjunct was interpreted as a distinct event also inversely correlated with judgments on extractions. Since adjunct type varied categorically (Table 1), we tested whether the continuous backgroundedness measures predicted ratings above and beyond adjunct type, by including adjunct type as well as backgroundedness and sentence type as fixed effects; results showed the negation test predicted acceptability above and beyond adjunct type, but the temporal overlap measure did not. Variation across *to* adjuncts is driving this effect (Fig 3). This work supports the claim that non-finite adjunct clauses are islands for *wh*-questions to the extent they are backgrounded in discourse, and we show the first experimental evidence for systematic differences between *to*-infinitival and gerundive adjunct clauses. Additionally, the construction- and measure-specific variation seen here opens the door to ask how processing-relevant factors such as frequency (e.g. Chavez & Dery 2018; Liu et al. 2019; Dąbrowska 2013), type of extraction (Abeillé et al. 2019; Sag 2010), or working memory (Deane 1991; Hofmeister & Sag 2012) might contribute to the within- and across-language variation.



**Fig 1:** x-axis: the degree to which main clause negation was interpreted as negating the adjunct clause (higher = more negated/less backgrounded); y-axis: z-scores of acceptability ratings. **Fig 2:** x-axis: the degree to which the main clause and adjunct clause were interpreted as occurring at the same time (higher = more overlap/less backgrounded); y-axis: z-scores of acceptability ratings. **Green:** WH-Q extractions from adjuncts; **Red:** Declarative sentences. Lines represent smoothed linear model fits.

**Table 1. Sample items; Sentence type (declarative vs. wh-question) and adjunct clause type. Backgroundness measures were based on declarative sentences.**

SENTENCE TYPE	Adjunct ( <i>to</i> )	Adjunct ( <i>ing</i> )
<b>Declarative</b>	The mechanic changed classes to meet the engineer.	The mechanic changed classes after the engineer.
<b>Wh-Q from adjunct</b>	Who did the mechanic change classes to meet?	Who did the mechanic change classes after meeting?



**Fig 3:** backgroundedness measures by clause type (blue/top = *to*, red/bottom = *ing*); *to* shows more by-item variation, and the negation test (3a) and temporal overlap (3b) differentially correspond to clause type