COMPLEXITY EFFECTS IN A- AND A'-DEPENDENCIES

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BACKGROUND

- **Severity of island violations varies with filler**
(1) a. ?**Which of the boys** do you wonder [*why* Mary invited ____]?
   b. *__**Who** do you wonder [*why* Mary invited ____]?

WHAT IS THE SOURCE OF THE IMPROVEMENT IN ACCEPTABILITY?

	Grammatical account	Working Memory account
source	Filler linked to prior discourse (**D-linked**)	Syntactic and/or semantic **complexity** of the filler
analyses	D-linked filler mitigates effect of **island constraint** (Pesetsky 1987; Cinque 1990; Rizzi 1990)	Complex filler **facilitates retrieval** process (Kluender 1998; Hofmeister 2008)

Predictions under working memory account

Amelioration in acceptability will occur in a broader range of cases, i.e.:
(i) Whenever the filler must be retrieved at the gap site (not only inside an island)
(ii) Whenever the filler is complex (not only D-linked in the traditional sense)
(iii) Whenever a filler/antecedent must be retrieved (not just in traditional filler-gap (A'-) dependencies)

METHODS & MATERIALS

- Sentence acceptability experiment (1-7 scale, 7 "very good", Ibex)
- 72 native speakers of English
- Excluded: 9 participants born outside U.S.; 4 participants with responses ±2SD away from mean in 10% or more of filler items). As a result, N=59.
- 12 conditions (3x2x2)

Dependency	✖	Complexity	✖	Distance (length)
No dependency (active)		Simple		Short
A'-dependency (RC)		Complex		Long
A-dependency (passive)				

- 6 tokens per condition, 72 lexical sets, 12 lists + 12 lists (reverse order)
- 72 experimental items + 90 filler items (varying acceptability)
- 162 items total

STIMULI

NO GAP (ACTIVE)
SHORT	The (famous movie) director hugged the actress in the theater.
LONG	The (famous movie) director thinks that Paul hugged the actress in the theater.

A'-GAP (RELATIVE CLAUSE)
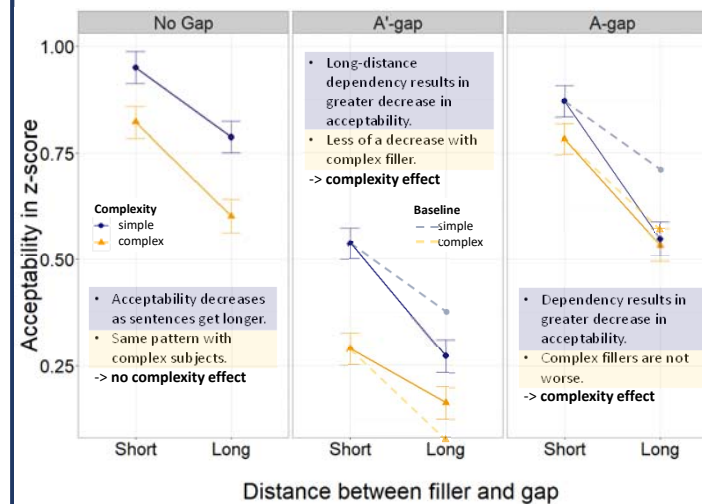|	
SHORT	The (famous movie) director who___hugged the actress received the award.
LONG	The (famous movie) director who the actress hugged ___ received the award.

A-GAP (PASSIVE)
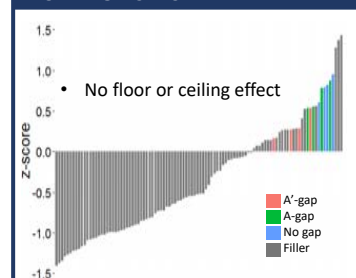|	
SHORT	The (famous movie) director was hugged ___ by the actress in the theater.
LONG	The (famous movie) director was believed to have been hugged ___ by the actress in the theater.

HYPOTHESIS & PREDICTIONS

	Grammatical account	Working Memory account
Filler complexity	No prediction	Amelioration due to increased activation and resistance to interference.
Non-island environment	No prediction	Amelioration with complex fillers even in this environment, due to easier retrieval.
A-dependency	No prediction	Amelioration with complex fillers if the "gap" of A-dependency is syntactically represented and involves retrieval comparable to A'-dependency. Otherwise, no prediction.

RESULTS

No Gap
- Acceptability decreases as sentences get longer.
- Same pattern with complex subjects.
-> **no complexity effect**

A'-gap
- Long-distance dependency results in greater decrease in acceptability.
- Less of a decrease with complex filler.
-> **complexity effect**

A-gap
- Dependency results in greater decrease in acceptability.
- Complex fillers are not worse.
-> **complexity effect**

Complexity: simple, complex
Baseline: simple, complex

Acceptability in z-score vs. Distance between filler and gap

DISTRIBUTION OF ACCEPTABILITY

- No floor or ceiling effect

A'-gap / A-gap / No gap / Filler

- No complexity x distance interaction in No Gap but **significant interaction in A'-gap** (p <.05)

- **No main effect of complexity in A-gap** but it is significant in No Gap

	NO GAP	A'-GAP	A-GAP
Complexity	***	***	p=.09
Distance	**	***	***
Complexity x Distance	p= .53	*	p=.07

*p < .05, ** p < .01,*** p < .001
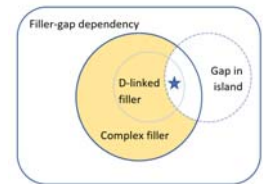
OUR FINDINGS

Effects of complex filler are observed

(i) even when the gap is **not in an island**
(ii) even when "**complexity**" is simply the addition of two modifiers to the head noun (the *famous movie* director vs. the *director*)
(iii) even in **A-dependencies**

DISCUSSION

- Our results add **new evidence to the debate on D-linking effects in non-island environments** (e.g., Alexopoulou & Keller 2013, Goodall 2015).
  → The results suggest that the *D-linking* effect might be a small piece (marked with star) of a larger phenomenon (shaded area).

- To our knowledge, our results are **the first demonstration that filler/antecedent complexity has an effect on retrieval at A-gaps.**
  → This suggests that there are important similarities between the retrieval process in A-dependencies and that of A'-dependencies.

REMAINING QUESTIONS & FUTURE PROJECTS

- Complexity effect in other types of A-dependencies?
  E.g., unaccusative vs. unergative
(2) a. The (famous movie) director *disappeared* after the award ceremony.
   b. The (famous movie) director *danced* after the award ceremony.

PREDICTIONS FOR ACCEPTABILITY

Unaccusative	Unergative
$Simple_a − Complex_a$ <	$Simple_b − Complex_b$

- Active vs. Passive or linear distance?
  Are passives different from actives simply because the subject and the verb are separated in passives (by "was")? These factors can be disentangled:
  e.g., The director **was** hugged vs. The director **was** hugging (cf. The director hugged)

- Complexity effect in gap-filler dependency?
  Will a complex filler also facilitate gap-filler processing?

FILLER-GAP	**the book** [that the girl read ___]	e.g., English
GAP-FILLER	[the girl ___ read] **the book**	e.g., Korean

REFERENCES

Alexopoulou, T., and Keller, F. (2013). "What vs. who and which: kind-denoting fillers and the complexity of whether-islands." in *Experimental Syntax and Island Effects*, eds J. Sprouse and N. Hornstein (Baltimore, MD: Cambridge University Press), 310-340. **Cinque, G. (1990).** *Types of A'-Dependencies*. Cambridge, MA: MIT Press. **Goodall, G. (2015).** D-linking in islands and non-islands. *Frontiers in Psychology.* 5, 1-11. doi: 10.3389/fpsyg.2014.01493 **Hofmeister, P. (2008)**. *Representational Complexity and Memory Retrieval in Language Comprehension*. Stanford, CA: Stanford University doctoral dissertation. **Kluender, R. (1998).** On the distinction between strong and weak islands: a processing perspective. *Syntax Semant.* 29, 241-280. **Pesetsky, D. (1987).** "Wh-*in-Situ*: movement and unselective binding," *The Representation of (in) Definiteness*, eds E. Reuland and A. ter Meulen (Cambridge, MA: MIT Press), 98-129. **Rizzi, L. (1990).** *Relativized Minimality*. Cambridge, MA: MIT Press.