

English and Hebrew speakers use language-specific strategies to produce communicatively efficient relative clauses

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Object relative clauses (RCs)

I like the **[boy_i]** *[that the girl is pushing t_i]*

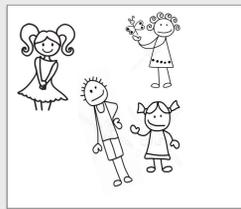
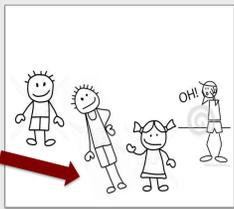
Relative Head

Restrictive (RES)

Non- restrictive (N-RES)

- **Essential for** determining the referent of the relative head in a given context

- **NOT essential** for determining the relative head's referent



Restrictive vs. non-restrictive RCs:

- N-RES: **"loose clauses"** (Jespersen, 1954)
- RES and relative head are the **same segment/information unit**; N-RES and relative head are **separate** (Mann and Thompson, 1988; Depraetere, 1995)
- N-RESs are **relatively independent** from the relative head, which is signaled by a pause (Ariel, 1999)
- Punctuation: N-RES *should* be bracketed by **commas**
- Also, in English the relative pronoun in N-RES *should* be which, who, whom.

Restrictive vs Non-restrictive RCs: Evidence and hypotheses

More resumption in N-RES?

Corpus study, **English** : **more resumptives** than gaps in **N-RES** (with a definite relative head) Prince (1990)
A pronoun can be used in N-RES since it refers to an already established discourse entity (=file card, Heim 1982). (Prince, 1990)

Corpus study, **Hebrew**: **more resumption in N-RES** than in RES Ariel (1999)
N-RES exhibit less connectedness with the relative head → lower accessibility of the relative head at the relativized position → more resumption (Ariel, 1999)

The information density hypothesis : speakers prefer **more explicit linguistic** signals where the alternative would convey disproportionately **high information** (Jaeger, 2010)

weak connectedness of the relative head and the RC → lower accessibility of the relative head at the relativized position → high information density → more signal (resumption)

Difference in passivization rate?

I like the **boy_i** *[that t_i is being pushed (by the girl)]*

English speakers often passivize RCs when the relative head is animate (Gennari & MacDonald 2009; Gennari et al., 2012)

- **Animacy-based accessibility**: animate heads are made the subject of relative clause (Bock & Warren, 1985; McDonald et al., 1993)
- **Similarity-based competition**: the animate relative head and the RC's agent are planned in close temporal proximity, hence the latter is inhibited (Gennari et al., 2012)

Two alternative hypotheses :

- **N-RES**: More resources are required to create the 'loose' dependency
- **stronger activation** of the relative head

- **RES**: The dependency is essential to determine the referent
- **stronger activation** of the relative head

- Fluency is maximized by producing more accessible portions of the utterance early (Gennari & MacDonald, 2009, Stallings & MacDonald, 2011).

(i) N-RES : more passives

(ii) RES: more passives

- Typed elicited production task (52 Hebrew speakers, 52 English speakers):
 - **Context**: 4 people, 3 events
 - **Question**: required choosing one person
 - **Fill-in-the-blank prompts**: imposed the formation of RCs

Two 2-level manipulations:

(1) Restrictiveness:

- ❖ **RES**: choosing the person demanded specification of the relative head's referent; prompt format: The ___ that ___
- ❖ **N-RES**: the NP was a sufficient answer ; prompt format: The ___, who _____ or The ___, that, as mentioned, _____

(2) Distinctive element: target subject /target verb, to control context composition and also:

- Are object RPs used when the verb is emphasized, hence will be more frequent in distinctive verb context?
- Would the prominence of the agent in distinctive verbs contexts affect passivization rate?

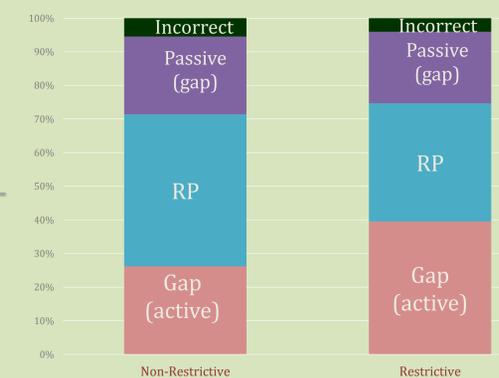
	Restrictive, distinctive subject	Restrictive, distinctive verb	Non-restrictive, distinctive subject	Non-restrictive, distinctive verb
Location	A Banana plantation		A Banana plantation	
People	Farmer, Day-worker A (female), Day-worker B (female), Day-worker C (female).		Farmer, Day worker (female), Cowboy, Banker (male).	
Events	The farmer praised day-worker A. Day worker C praised day-worker B. Day worker B praised day-worker C.	The farmer praised day-worker A. The farmer watched day-worker B. The farmer heard day-worker C.	The farmer praised the day-worker. The cowboy praised the banker. The banker praised the cowboy.	The farmer praised the day-worker. The farmer watched the cowboy. The farmer heard the banker.
Task	Who is most likely to buy the boss a nice gift for Christmas? The ___ that _____		Who is most likely to buy the boss a nice gift for Christmas? The ___, who _____ OR The ___, that, as mentioned _____	

Binomial mixed models were applied to the two most frequent structures

Hebrew: active **gaps** vs. **RPs**

Restrictiveness: more RPs in N-RES ($p = .005$)

Distinctive element: more RPs in distinctive subject contexts ($p = .003$)
- three different patients as of objects of same verb in the context → dependency is more informative → more signal?

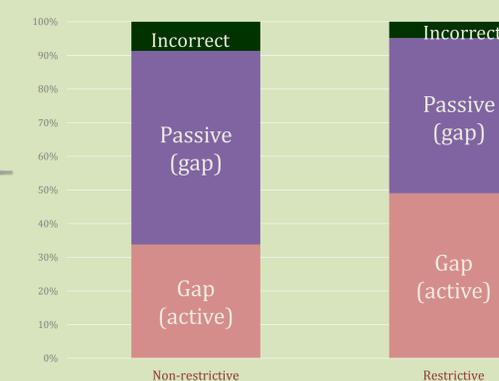


English: gapped **actives** vs. **passives**

Restrictiveness: more passives in N-RES ($p < .001$)

- no resumption
- no distinctive element effect: possibly since in passives, patient does not appear in object position

- Relative pronoun did not affect passivization rate (who: 55.2%; that: 56%).



- Structural choices were modulated by **restrictiveness**.
- N-RES are less connected to the Relative head, which renders dependency formation more demanding.
- **Communicative efficiency guided production choices**: in 'looser', N-RES dependencies, speakers produced more signal, e.g. resumptive pronouns (Hebrew) and maximized fluency by passivizing (English).

- Each population's choices were determined by the properties of its language:
 - **Hebrew** : both gaps and RPs are grammatical in object relatives (Meltzer-Asscher et al. 2015), Passivization is less frequent (Berman, 2008) → Resumption
 - **English**: resumption is extra grammatical (McCloskey, 2006) → passivization

Performance in both languages may be related to **animacy-based accessibility** and **similarity-based competition**:

English: relative head and RC agent are planned in temporal proximity + passivization is readily available → relative head is activated, RC agent inhibited (Gennari et al., 2012)

Hebrew: passivization is not as available → RC agent is activated, highly accessible relative head is inhibited → reactivation at the gap is more demanding → more signal is used → resumption

- Future study (in progress) : Do Hebrew speakers use resumption when English speakers passivize? (e.g. theme-experiencer verbs, F. Ferreira, 1994; Gennari & MacDonald, 2009)