

# Incremental Processing Difficulty in Cross-serial and Nested Verb Clusters

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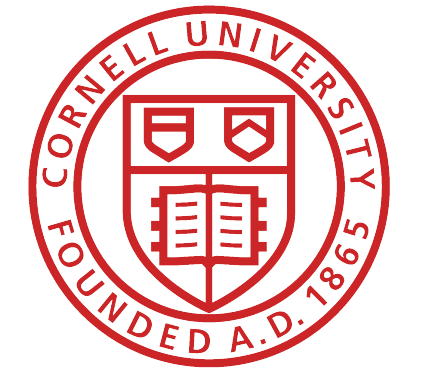
Ryan Musa



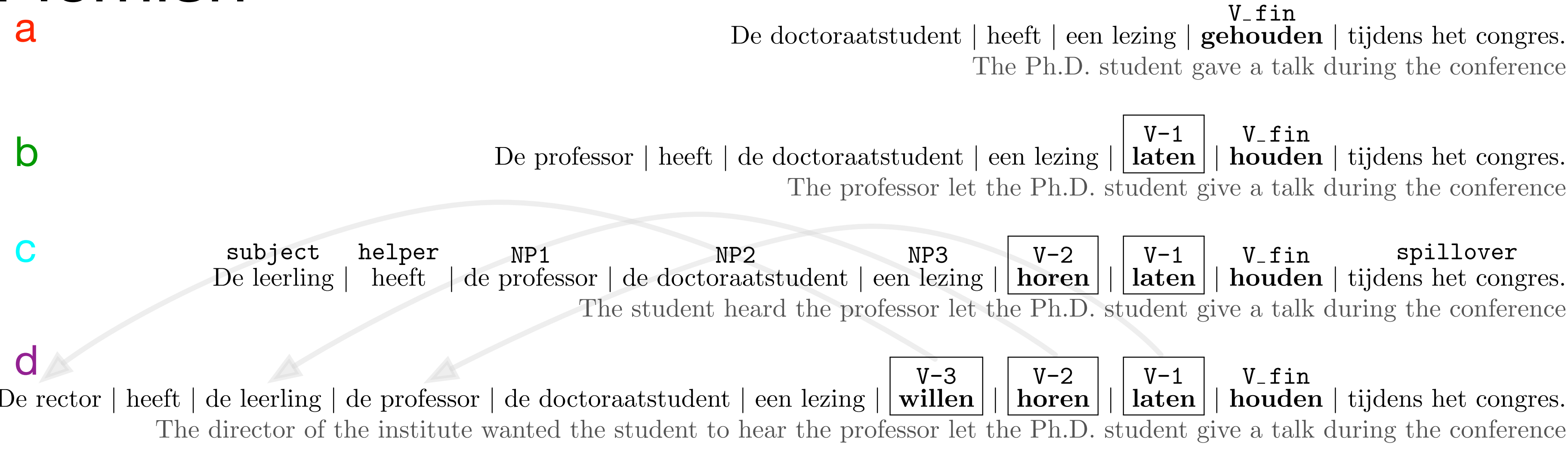
Sabrina Gerth

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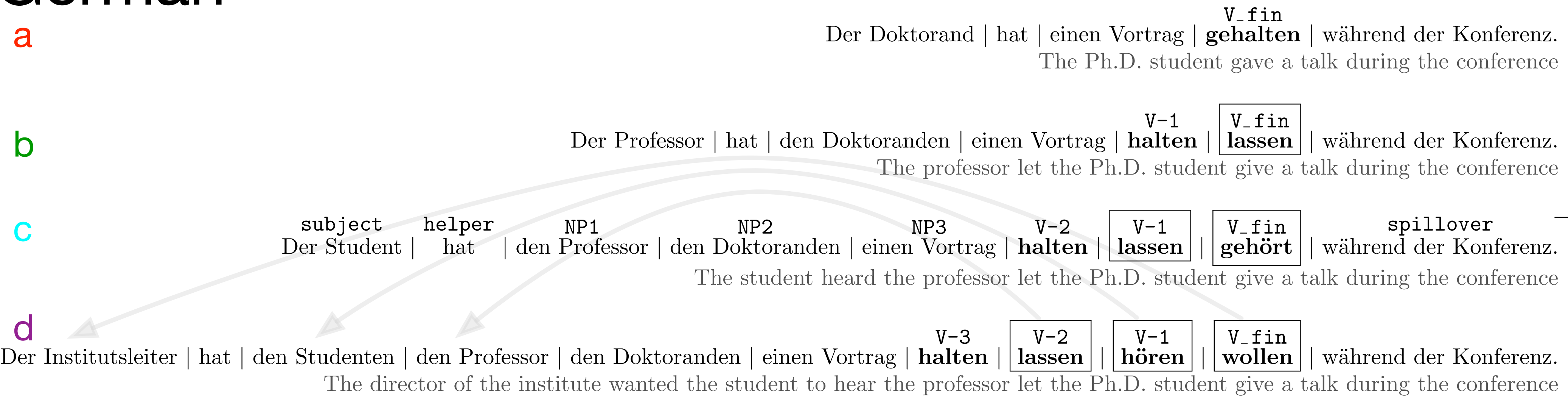
John Hale



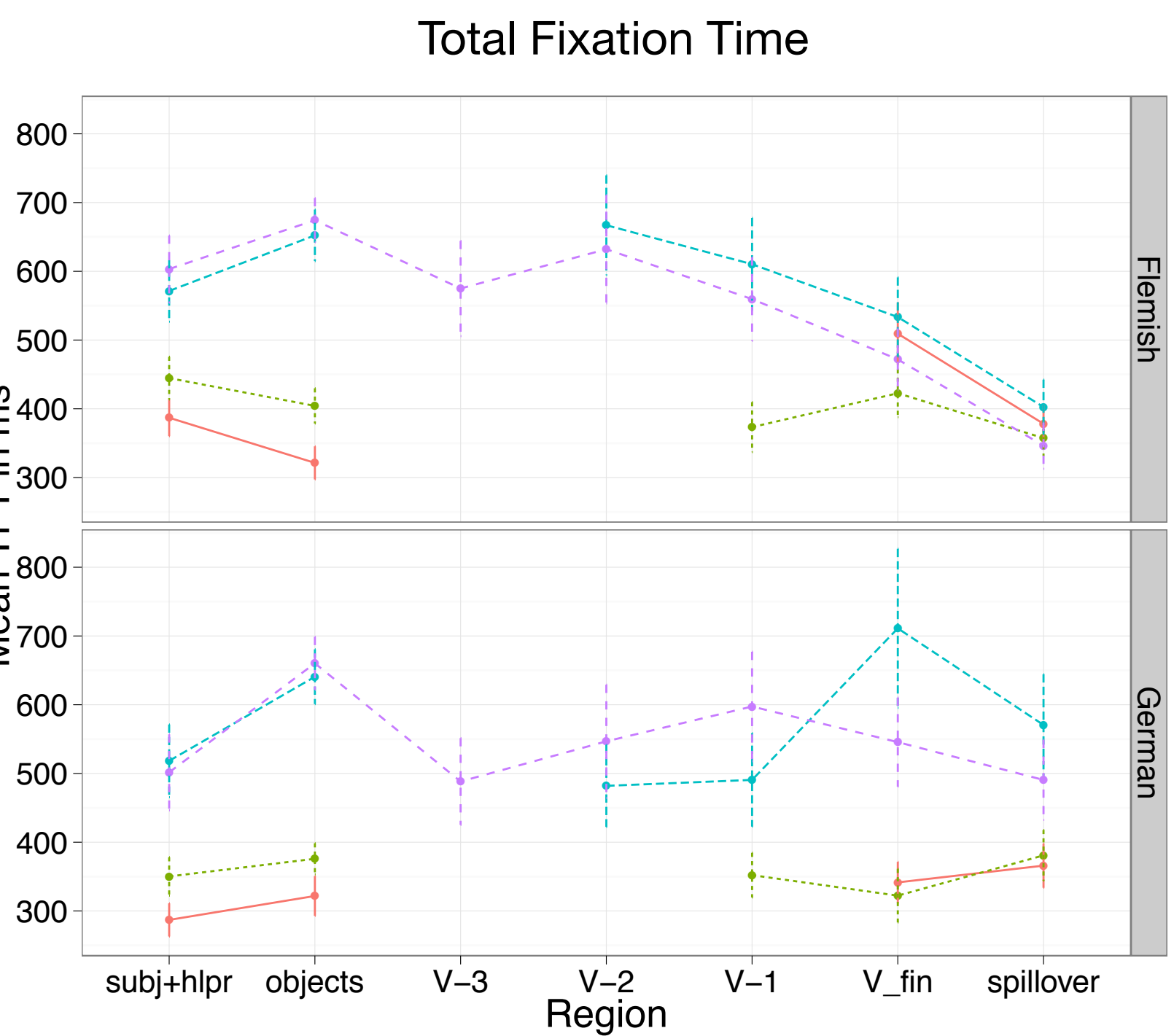
## Flemish



## German

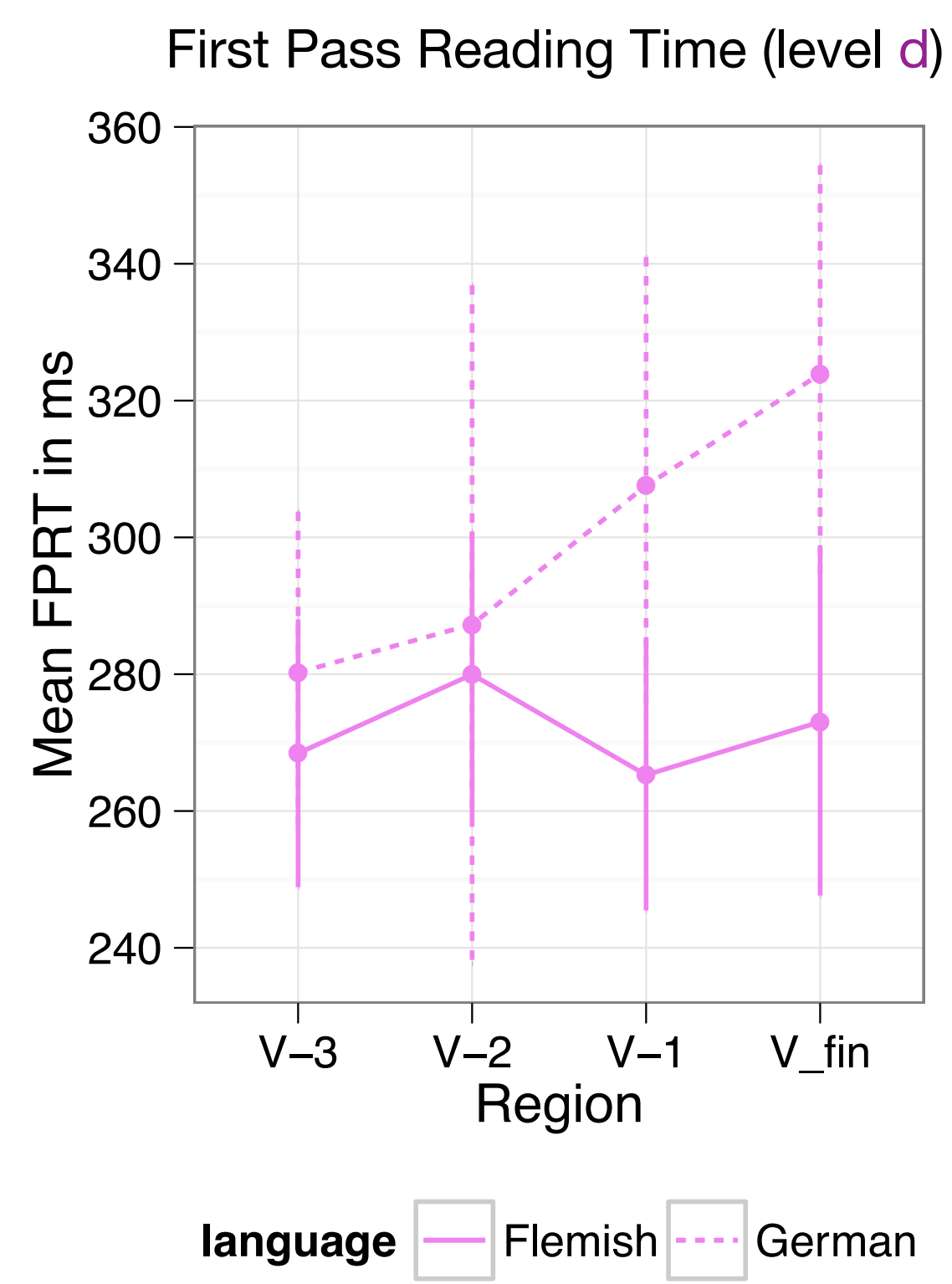


Embedding verbs		
Flemish	German	gloss
laten	lassen	to let
zien	sehen	to see
horen	hören	to hear
willen	wollen	to want



← Observation 1  
**Much slower beyond level b.**  
 Replicates Bach, Brown & Marslen-Wilson, 1986

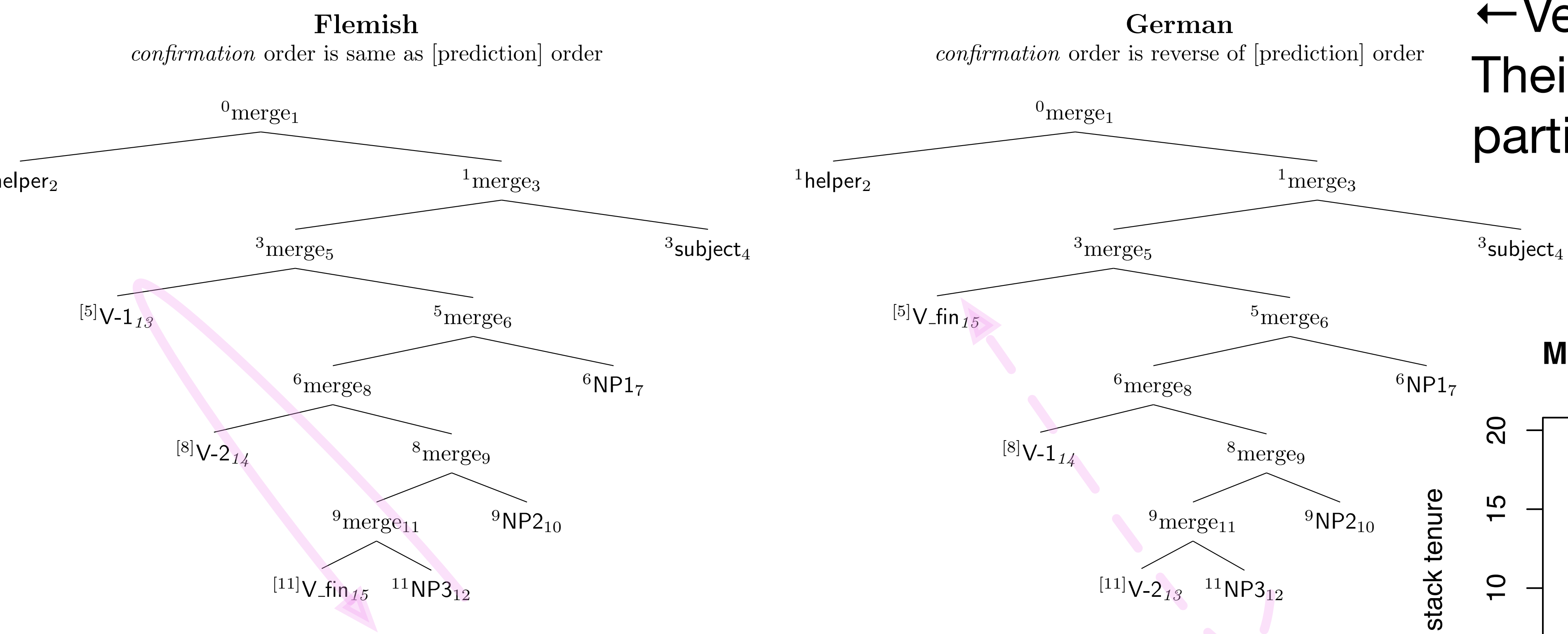
Observation 2 →  
 Along the verb cluster,  
**German readers slow down.**  
 Flemish readers don't.



**Minimalist grammar**  
 transitive verb d= d= v  
 embedding verb v= d= v  
 helper =v i

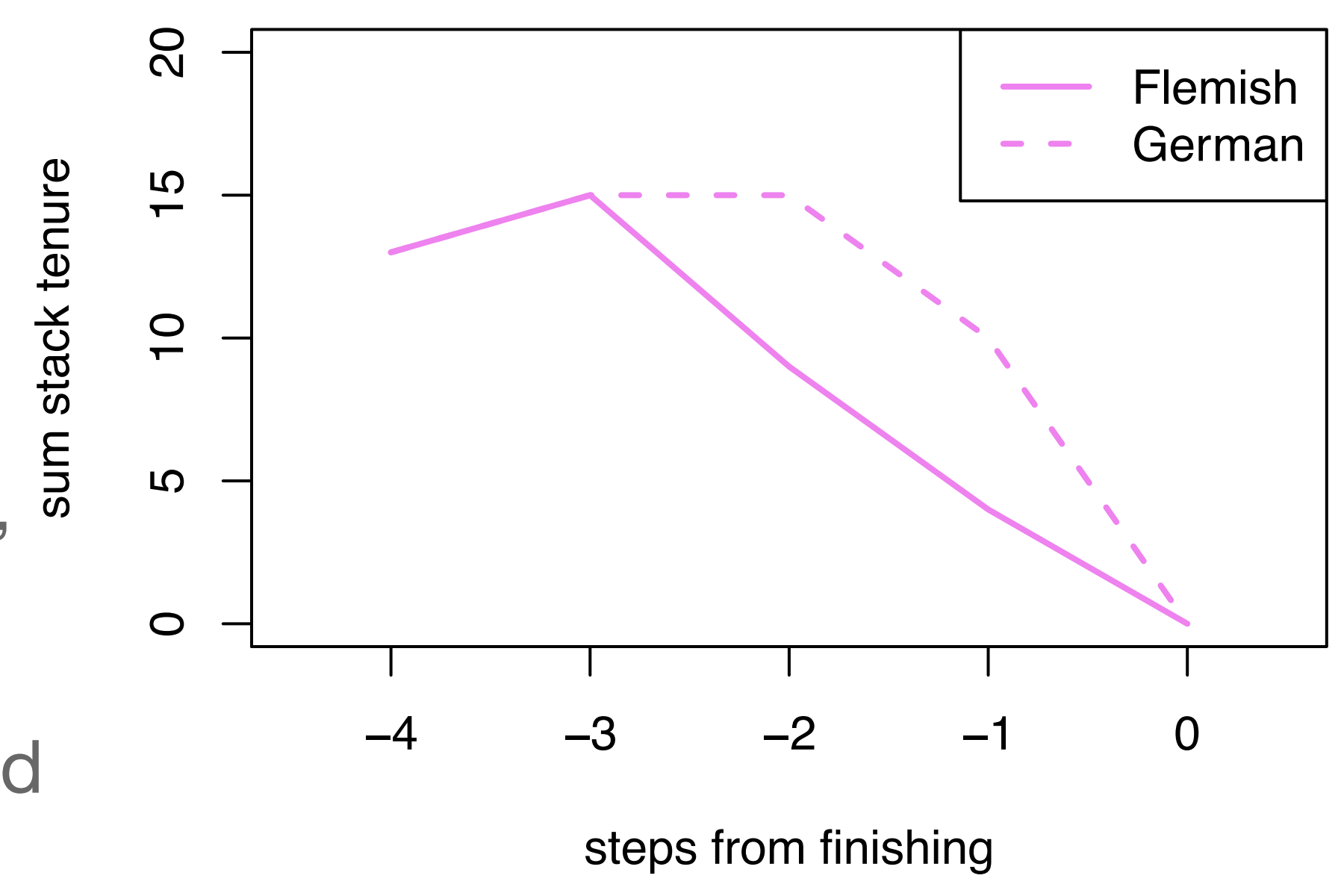
**Account of Observation 2**  
 A top-down parser confirms Flemish verbal expectations in order of their prediction, whereas German predictions are confirmed in **reverse** order. This selectively burdens German readers' memory.

### Derivation trees for level c



← Verbs raise into the cluster.  
 Their order reflects language-particular linearization.

### Memory use in incremental parser states



For more on stack tenure, see [Kobele et al](#) in Proceedings of Formal Grammar, 2012. For more on top-down parsing and Minimalist Grammars, see [Stabler](#) in Proceedings of the ACL Cognitive Modeling and Computational Linguistics Workshop, 2011. For more on the raising analysis of verb clusters as formalized in Minimalist Grammars, see chapter 9 of [Morawietz](#), 2003.