



# How time limits shape response processes: Exploring cognitive validity of C-Tests

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# C-Test & its construct

general language  
proficiency (Grotjahn  
2012)

## Media, Please Leave Us Alone

Mainstream media continually reports on the expanding waistlines of Canadians. At the

**low-level skills:**  
lexical,  
grammatical, and  
orthographic at the  
sentence level

**higher order skills:**  
intersentential  
relationships,  
metacognitive  
strategies, global  
reading skills etc.

**fluid construct:**  
depends on test takers'  
proficiency and text  
characteristics (Sigott  
2002; 2006)

**modifications  
possible to  
construction principles,  
scoring and time**

# Construct of the speeded C-Test

**Canonical C-Test:**

**5 min** per text

amount of **declarative & procedural**  
language **knowledge**

**higher correlations** with learners'  
**writing** and **reading** skills measured  
under generous time conditions



**Speeded C-Test:**

**1:30 – 2:30 min** per text

+ **degree of automaticity** of skills and  
**efficiency** of information **processing**

**higher correlations** with measures of  
**listening comprehension** and **speaking**  
skills (also under **time pressure**)

*(Grotjahn, 2010)*

# Research on the speeded C-Test

**Zimmermann (2019):** Higher correlations between the speeded C-Test and listening comprehension and speaking (especially dialogic tasks) for B2 learners of GER

**Timukova, Möller & Drackert (submitted):**

Speeded C-Test scores significantly lower than canonical C-Test scores (by 3.7 points in ENG and 5.1 points (out of 100) in GER);

Speeded C-Test scores predict listening/speaking performance slightly better than canonical C-Test scores

(A2-C1 learners ENG and GER)

**Cognitive validity: Looking for (more) *automaticity* in response processes involved in solving *speeded C-Tests***

# Participants, instruments, data collection

- computer **screen recorded** during test taking (*Wondershare DemoAir*)
- N=16 GER & N=25 ENG; level **B2-C1** (ENG more proficient)
- 4 texts\* with 20 gaps each in each test version; coded and analysed recordings for **Text 2** (easy) and **Text 4** (difficult)
- time limits: canonical - **5 min** each text; speeded - **1:40 min** (Text 2), **2:00 min** (Text 4)
- prior text **analysis** – minimal context required: **micro gaps** (gap plus up to two words before and/or after) & **macro gaps** (broader context)

## Text 2: Orcas

Reaching up to ten metres in length, the orca is the largest member of the dolphin family. Orcas alw\_\_\_ live i\_\_\_ family gro\_\_\_; they a\_\_\_ highly soc\_\_\_ animals. T\_\_\_ size o\_\_\_ a gr\_\_\_ can va\_\_\_ from ju\_\_\_ a sm\_\_\_ number t\_\_\_ as ma\_\_\_ as fifty.

*\*Texts from onSET item bank; comparable difficulty in logits*



# Sample recording

Data collection live: ENG (DFG)

Dashboard / My courses / Data collection: ENG / Variant A / Text 2: Au Pair (Variant A)

Text 2: Au Pair (Variant A)

Make sure to save the previous recording. Now start recording your screen again and click on *Attempt quiz now*.

Attempts allowed: 1

Time limit: 5 mins

Attempt quiz now

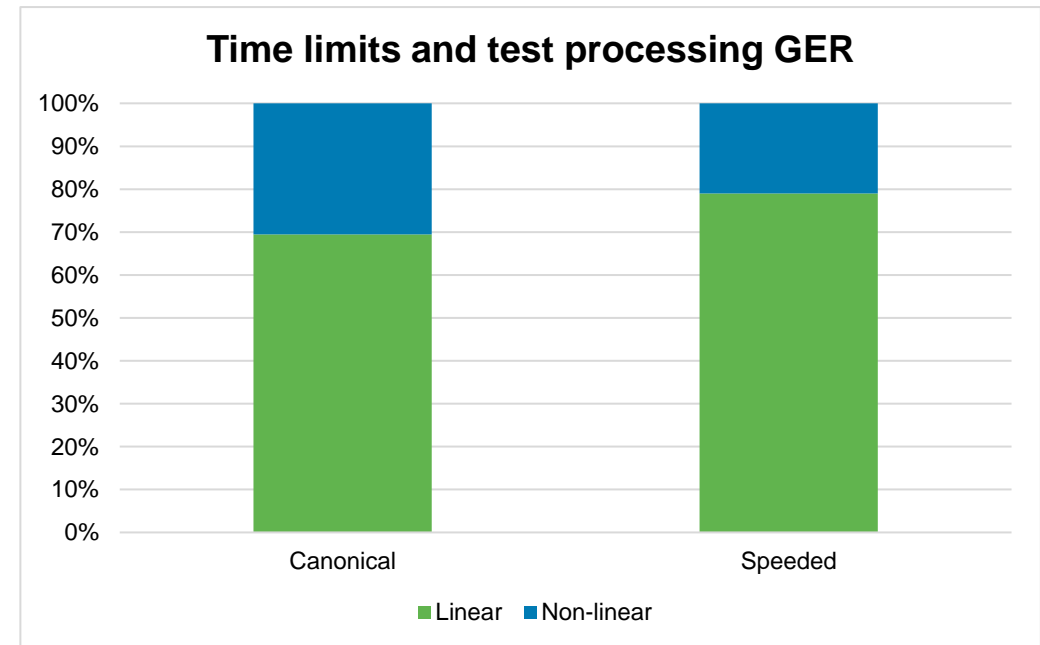
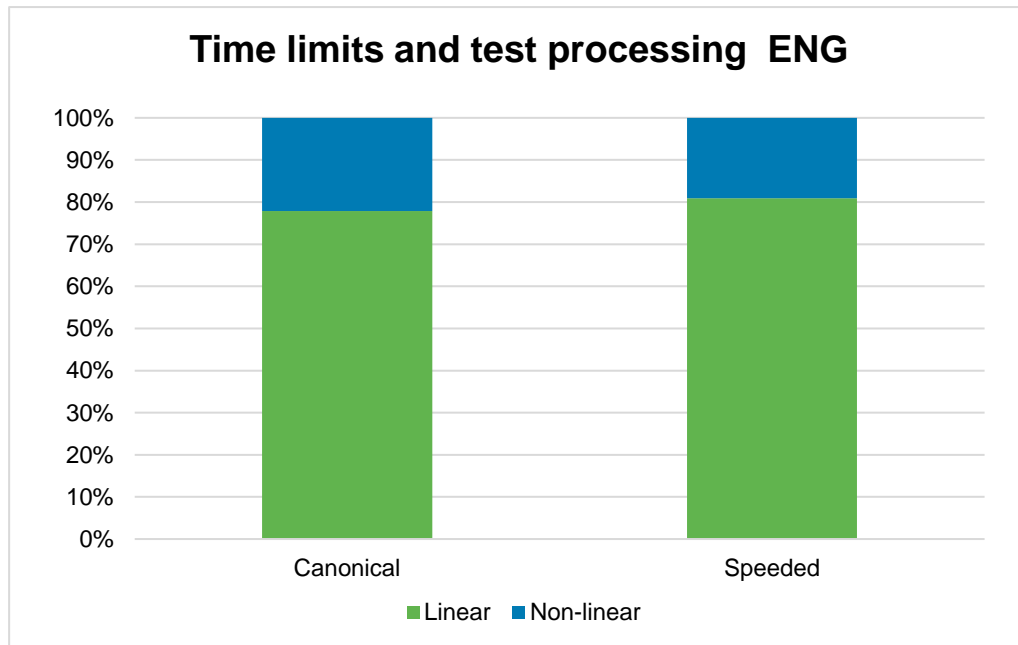
Text 1: Oscar Wilde (Variant A) Jump to... TEST 2: Typing Speed Test



## Research questions and findings

# Which time condition elicits more linear processing?\*

- **linear processing** dominates in **both** time **conditions** and in both **languages**
- **more** linear processing in **ENG** than in GER
- **more** linear processing in **speeded** than in canonical C-Tests in both languages (more so in GER)

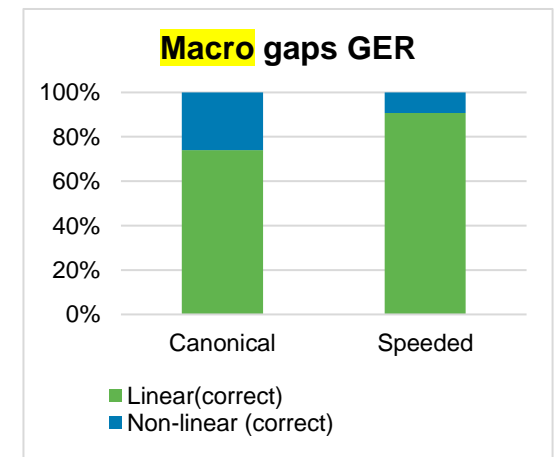
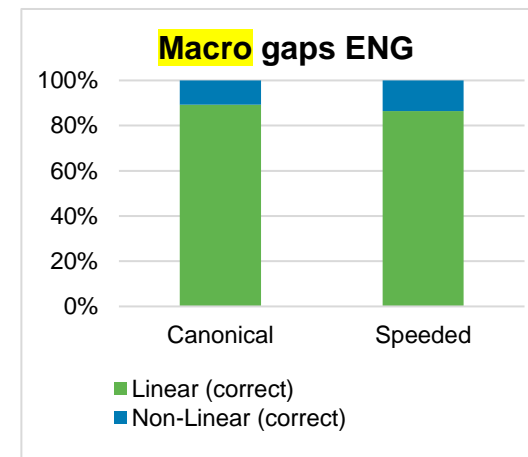
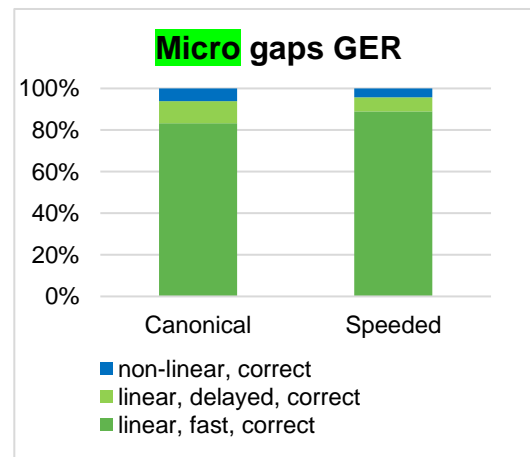
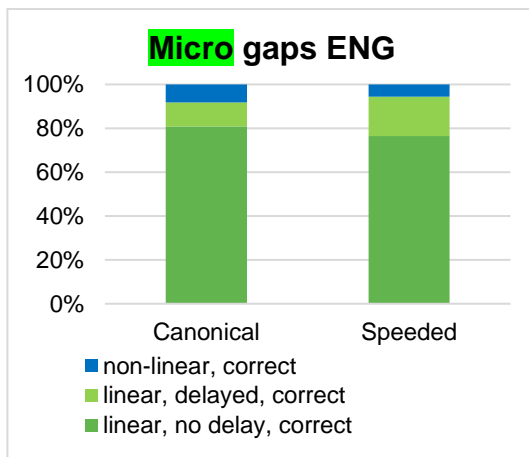


\*Counted: **all instances** of processing (correct and incorrect responses)



# Do gap properties influence response processes?

- **linear** processing dominates across languages, time conditions and **gap types**; more in **ENG**
- slightly **more non-linear** processing of **macro** gaps compared to micro gaps across languages
- **minimal differences** between **time conditions** (except for **macro** gaps in **GER**)

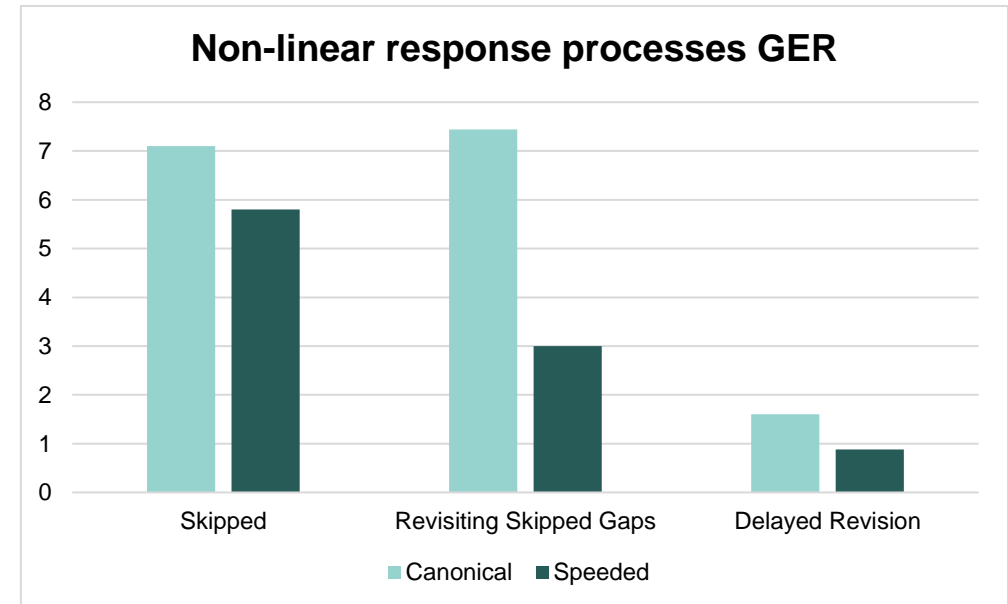
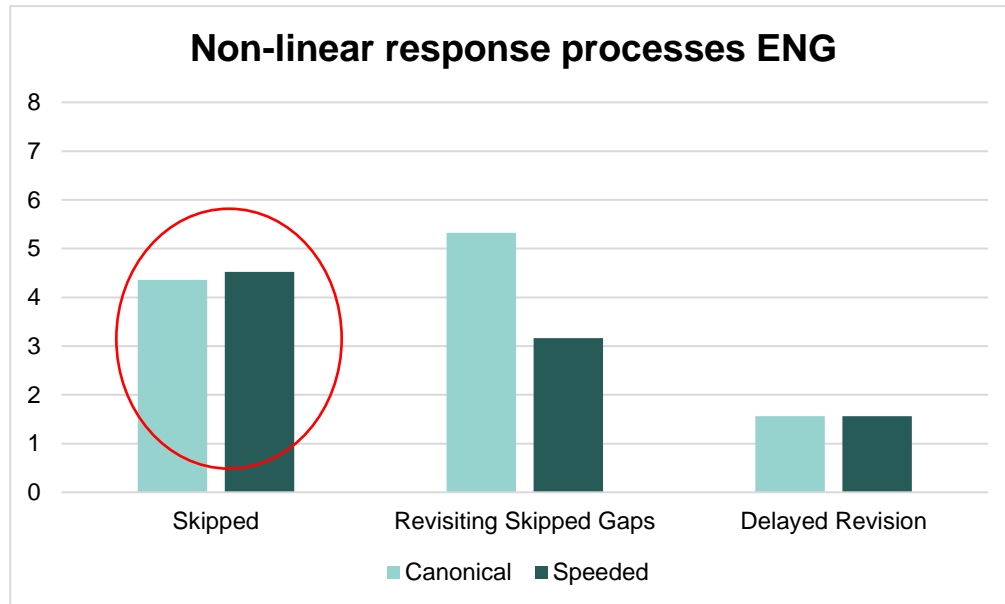


\*Counted: *instances* of processing resulting in correct *responses*

# How do non-linear responses differ across time conditions?

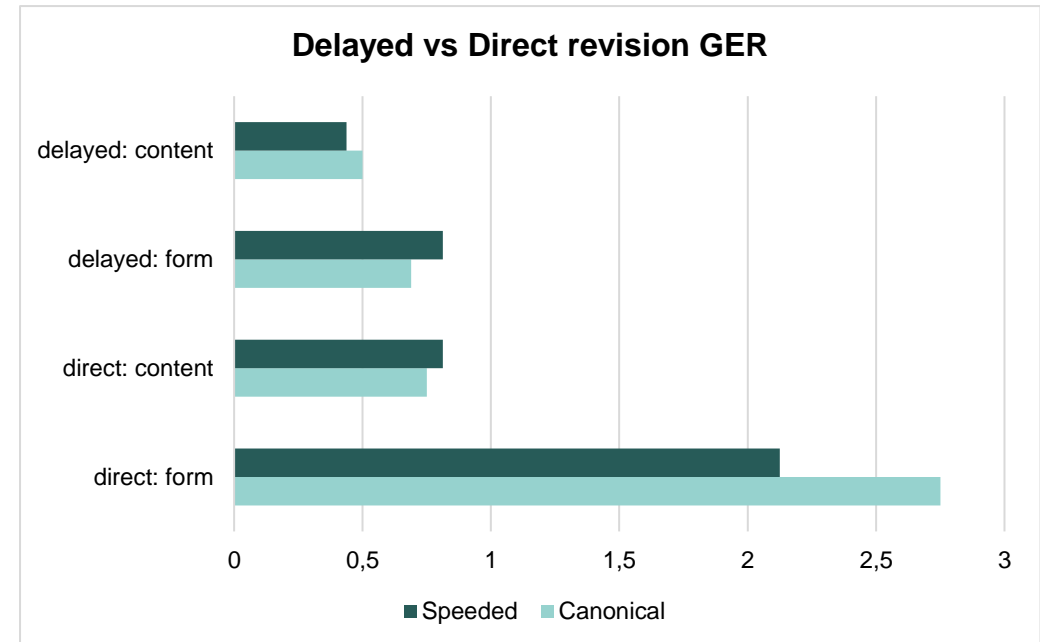
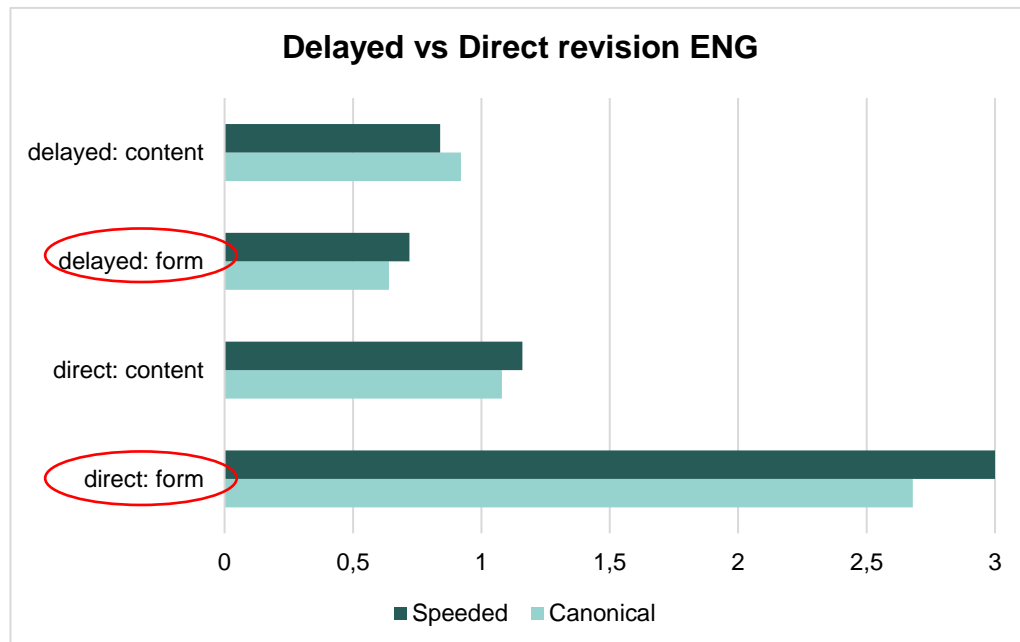
Non-linear processing around 20 - 30% (more in canonical C-Tests; most - in GER)

- gaps **skipped** and **revisited more** often in **GER**
- skipped gaps **revisited** more often in **canonical** C-Tests in both languages
- **similar** frequency of **skipping** in speeded and canonical in **ENG**
- **delayed revision** comparatively **rare** across languages and time conditions



# What do test takers correct and when?

- **direct revision** more frequent than delayed revision (both time conditions and languages)
- **revision of form** is more frequent than revision of content (both time conditions and languages)
- **more direct revisions** of form in **ENG** than in GER
- **no** clear-cut **differences** between canonical and speeded

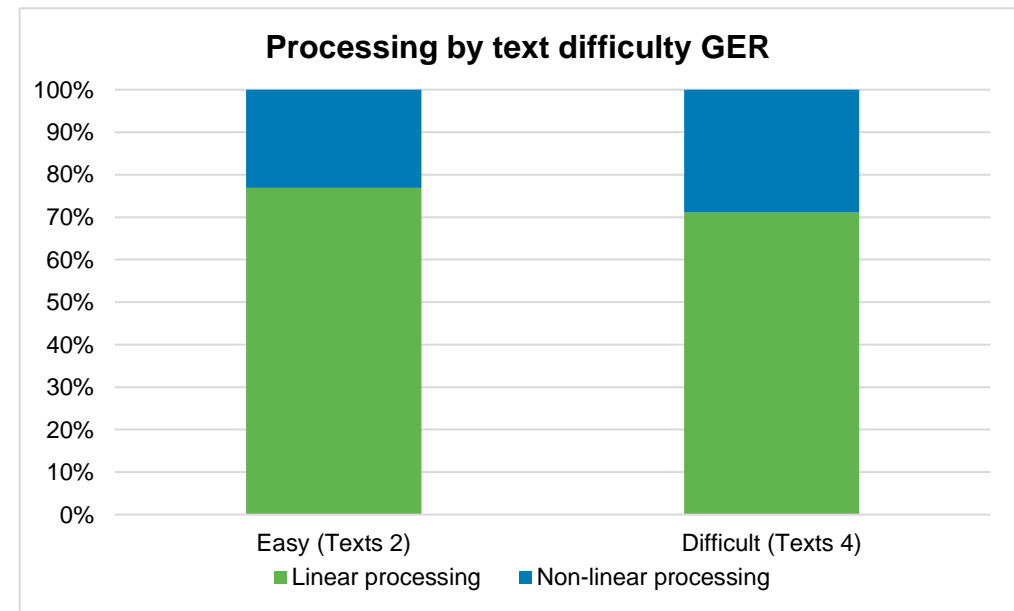
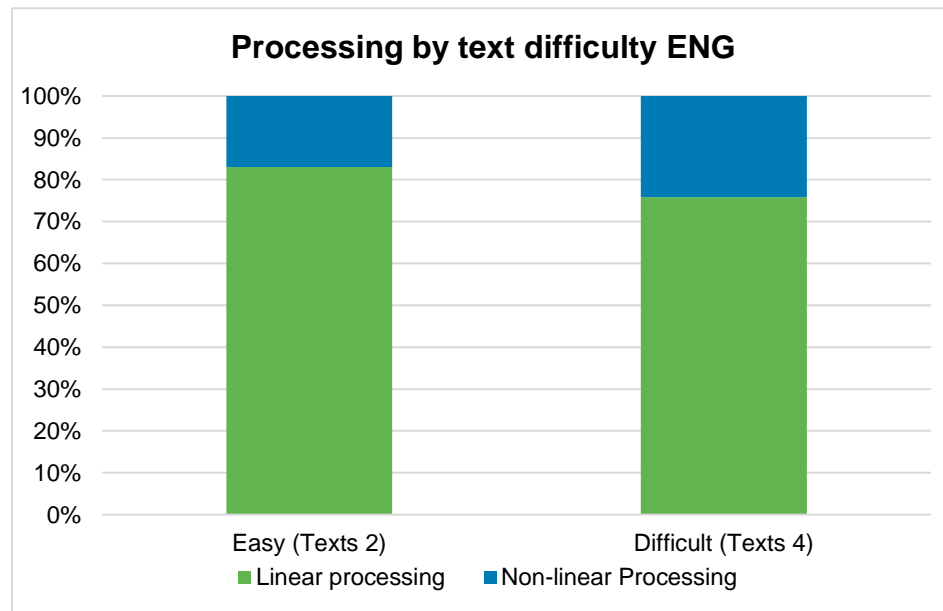


\*Counted: **all instances** of processing (correct and incorrect responses)

# How do response processes vary by text difficulty?

- **linear** processing dominates in **both text types** across time conditions and languages
- **more non-linear** processing in **more difficult** texts in both languages (most - Text 4 GER: around 30%)

NB: **more macro** gaps in **Texts 4** than in Texts 2 (ENG: 16 vs 11; GER: 16 vs 12)





# Summary and discussion

## What is clear:

- **linear** processing **dominates** across time limits, gap properties and texts of varying difficulty
- **more** often **direct** than delayed **revision**; **form** revised **more often** than content
  - C-Tests processed as texts (not language quizzes or puzzles); elicit procedural knowledge
- more **linear** processing in **speeded** than canonical C-Tests
- **difficult texts** and **gaps** requiring **broader context** elicit more **non-linear** response processes
  - reduced time encourages automatic processing
  - more time, gaps requiring broader context and more difficult texts elicit more deliberate, conscious processing (use of declarative knowledge?)

# Summary and discussion

## **Language specific observations, open questions:**

- more backtracking in GER
- similar frequency of skipping in speeded and canonical in ENG
- temporal data (time in the gap) – not included; picture not clear (e.g.: more frequent direct revisions – sign of automaticity?)

## **Important to consider:**

- proficiency and proficiency-related strategies
- language differences (syntactical features; 5 “lexical” gaps in ENG; 10 – in GER)

# Summary and discussion

## Limitations and further research:

- more & more **precise** observations (including accurate temporal data) of response behaviour (e.g. eye-tracking)
- **introspective methods** (e.g. stimulated recall) to explain the behaviour (whether observed through screen recordings or eye-tracking)
- systematic **response analyses** to take into account linguistic features
- **proficiency** included as a variable (but also personality traits)



Thank you!