



Speeded C-Test - a better predictor of oral proficiency?

Anastasia Drackert
Anna Timukova
Franziska Möller

04.07.2024

Funded by
DFG Deutsche
Forschungsgemeinschaft
German Research Foundation

project number 462766474

g.a.s.t.

C-Test & its construct

objective, reliable,
economical measure of
**global language
proficiency** (Grotjahn
2012)

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

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

fluid construct: amount
of text-level processing
depends on test takers'
proficiency and
characteristics of the
individual text (Sigott 2002;
2006)

modifications possible to
construction principles, scoring
and **time to** adjust to the target
group, language and purpose

Media, Please Leave Us Alone

Mainstream media continually rep

. At the

me that documents tell us about overview ,heart dis

, magazines and movies continue to fea

actr . When young girls go through pub

weight around their hips but there is a si

becoming a woman. The media tries to swi p the nat ional

process into a constant fight against it: we get bombarded with images of the perfect body everywhere we turn....

Construct of the Speeded C-Test

canonical C-Test: 5 min per text

amount of learners' **declarative & procedural knowledge**

speeded C-Test: 1:30 – 2:30 min
per text

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

(Grotjahn, 2010)



Hypotheses:

- **SC-Test** would **correlate higher** with measures of **listening comprehension** and **speaking** skills (both under **time pressure**);
- SC-Test would correlate weaker with learners' writing and reading skills if measured under generous time conditions than a canonical C-Test (p. 289).

Practical
implications
for SL
research

Objective of the study

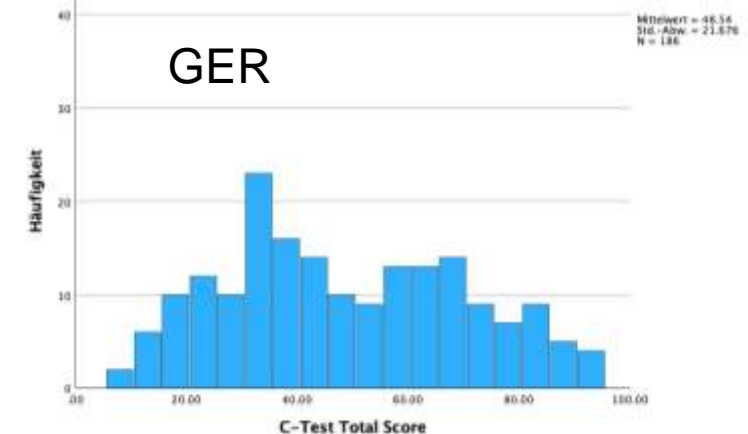
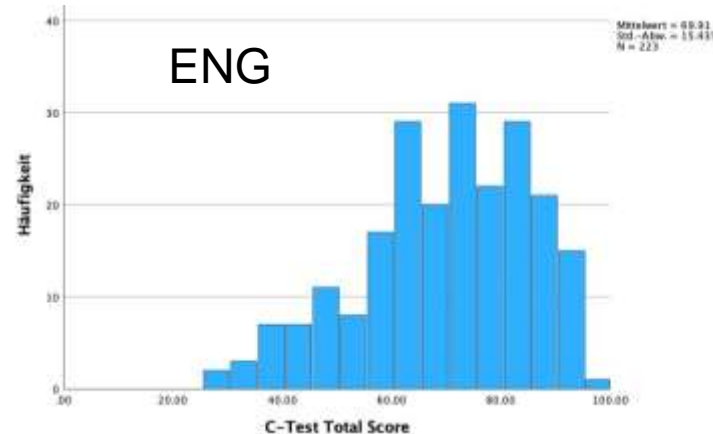
Using **different methods** gather **various types of evidence** to answer a range of questions about **the role of the time variable** in the C-Test construct in a **comprehensive** way to allow for a higher degree of **generalizability** of the results for learners of different levels of proficiency; multiple languages (English, German, Russian); computer-administered C-Tests.

RQ	Method(s)
1. How does the time variable influence the reliability of computerised C-Tests?	IRT analysis; Cronbach's alpha
2. How does the time variable influence learners' scores depending on their proficiency level and text difficulty ?	ANCOVA
3. Which components of L2 proficiency (declarative, procedural knowledge and automaticity) are better predictors of differently timed C-Tests?	Linear regression analysis; SEM
4. How does the time variable influence the correlations between a C-Test and an integrated measure of oral proficiency ?	Correlation; regression
5. How does the time variable influence the strategies deployed by learners?	Video-based analysis

Main study

- Data collection **online** (*Moodle; testable*) August – October 2023
- **Participants:** English ($N = 229$); German ($N = 191$); Russian ($N = \text{ca. } 60$)
- Instruments: **10 tests per language** (2 C-Tests; Oral Elicited Imitation Test (OEIT); test of typing speed; 6 tests of declarative and procedural knowledge)
- Fixed order of tests

	<i>N</i>	Age <i>M</i>	L1
ENG	229	25.25	42 different L1s: German ($n = 46$) Russian ($n = 26$) Turkish ($n = 25$)
GER	191	25.46	47 different L1s: Russian ($n = 30$) Turkish ($n = 23$) English & Spanish ($n = 14$)



RESULTS RQ1, RQ2 & RQ4

RQ1: HOW DOES THE TIME VARIABLE INFLUENCE THE RELIABILITY OF COMPUTERISED C-TESTS?

Method: Cronbach's alpha

	Cronbach's alpha ENG	Cronbach's alpha GER	<i>N</i> of items
C-Test	.903 (<i>N</i> = 223)	.954 (<i>N</i> = 188)	5
Speeded C-Test	.911 (<i>N</i> = 226)	.954 (<i>N</i> = 189)	5

Summary & interpretation RQ1:

reliability values almost same

both C-Test versions highly reliable

RQ2: HOW DOES THE TIME VARIABLE INFLUENCE LEARNERS' SCORES?

Hypothesis 1: All learners' scores will **decrease** with **reduced time** irrespective of their typing skills and proficiency.

Hypothesis 2: All learners' scores will decrease with reduced time. The **amount of loss** in the scores will depend on learners' **level of proficiency**.

Hypothesis 3: Reduced time will play a different role depending on the **difficulty** of the **C-Test texts**.

RQ2: HOW DOES THE TIME VARIABLE INFLUENCE LEARNERS' SCORES? **ENG**

Descript.	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Min.</i>	<i>Max.</i>	RM Within-Subjects ANCOVA (CVs: typing skills & proficiency)
C-Test	222	70.10	15.21	28	96	<i>N</i> = 201 <i>F</i> = 29.327 <i>Part. Eta Sq.</i> = .129 <i>p</i> < .001
Speeded C-Test	222	66.37	17.67	13	95	

	Medium Profic. (<i>N</i> = 51)	Higher Profic. (<i>N</i> = 59)	RM Mixed Between-Within-Subjects ANCOVA (prof. group; typing skills as a CV)
C-Test	<i>M</i> 62.6 (<i>SD</i> 13.3)	<i>M</i> 83.3 (<i>SD</i> 8.2)	<i>N</i> = 110 <i>F</i> = 22.326 <i>Part. Eta Sq.</i> = .173 <i>p</i> < .001
Speeded C-Test	<i>M</i> 56.6 (<i>SD</i> 17.1)	<i>M</i> 81.8 (<i>SD</i> 8.7)	

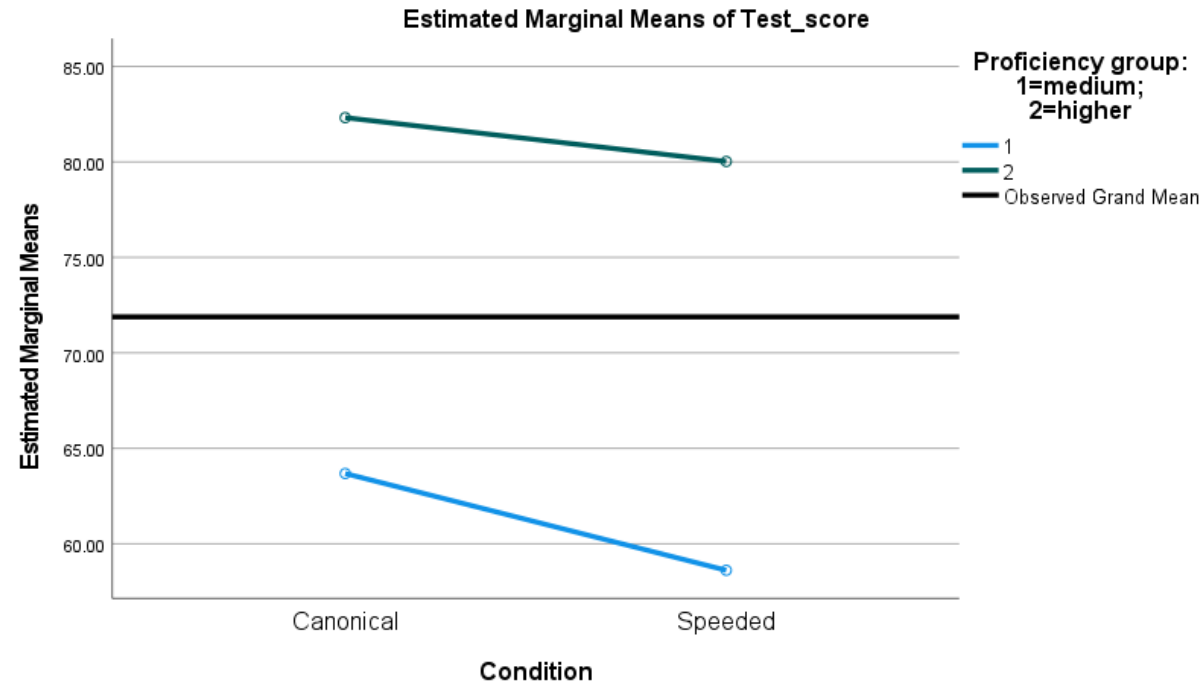
H1: All learners' scores will **decrease** with **reduced time** irrespective of their typing skills and proficiency.

RQ2: HOW DOES THE TIME VARIABLE INFLUENCE LEARNERS' SCORES DEPENDING ON THEIR PROFICIENCY LEVEL? **ENG**

H2: All learners' scores will decrease with reduced time. The **amount of loss** in the scores will depend on learners' **level of proficiency**.

Profile plots for group comparison

Group allocation based on IRT person measures derived from OEIT scores as produced by Winsteps 5.2.3.0. (medium: 0 to +2.0 logits; higher: +2.55 to +4.55 logits)

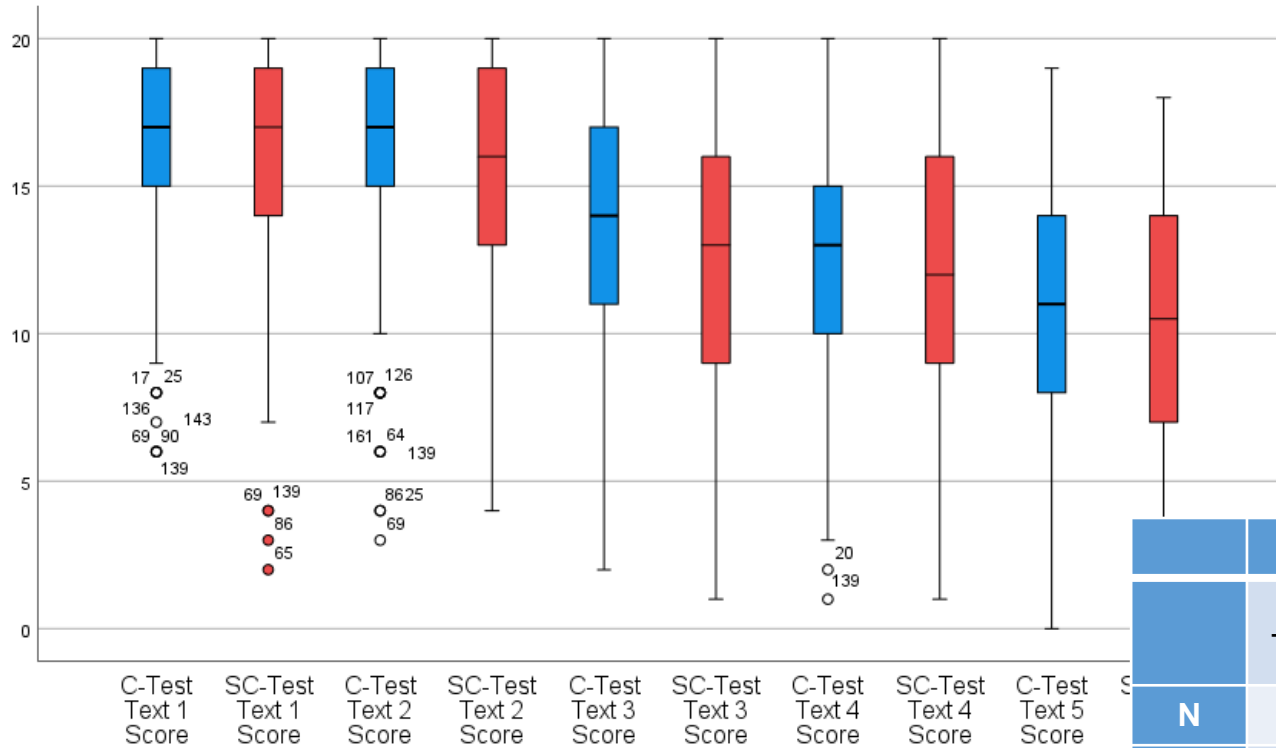


1.5 pts
av.
difference

6.0 pts
av.
difference

Covariates appearing in the model are evaluated at the following values: Typing Speed (words per minute) = 46.53

RQ2: HOW DOES THE TIME VARIABLE INFLUENCE LEARNERS' SCORES RELATED TO THE TEXT DIFFICULTY? **ENG**



Text pair	N	F	p	Part. Eta Sq.
1	199	11.119	<.001	.063
2	197	15.195	<.001	.073
3	197	21.562	<.001	.100
4	196	5.115	.025	.026
5	196	0.015	.902	.000

	Text 1		Text 2		Text 3		Text 4		Text 5	
	C-Test	SC-Test	C-Test	SC-Test	C-Test	SC-Test	C-Test	SC-Test	C-Test	SC-Test
N	229	229	228	228	227	228	225	228	225	228
Mean	16.6	15.8	16.3	15.6	13.5	12.3	12.3	11.7	10.7	10.3
SD	3.06	3.66	3.39	3.83	4.17	4.84	3.85	4.52	4.55	4.19

H3: Reduced time will play a different role depending on the **difficulty** of the **C-Test** texts.

RQ2: HOW DOES THE TIME VARIABLE INFLUENCE LEARNERS' SCORES? GER

Descript.	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Min.</i>	<i>Max.</i>	RM Within-Subjects ANCOVA (CVs: typing skills & proficiency)
C-Test	183	48.74	21.37	8	93	<i>N</i> = 161 <i>F</i> = 18.783
Speeded C-Test	183	43.57	21.87	4	89	<i>Part. Eta Sq.</i> = .106 <i>p</i> < .001

	Lower Profic. (<i>N</i> = 41)	Medium Profic. (<i>N</i> = 50)	RM Mixed Between-Within-Subjects ANOVA (prof. group; CV: typing skills)
C-Test	<i>M</i> 28.8 (<i>SD</i> 9.13)	<i>M</i> 59.0 (<i>SD</i> 16.5)	<i>N</i> = 91 <i>F</i> = 42.190 <i>Part. Eta Sq.</i> = .322 <i>p</i> < .001
Speeded C-Test	<i>M</i> 22.5 (<i>SD</i> 8.23)	<i>M</i> 54.4 (<i>SD</i> 16.6)	

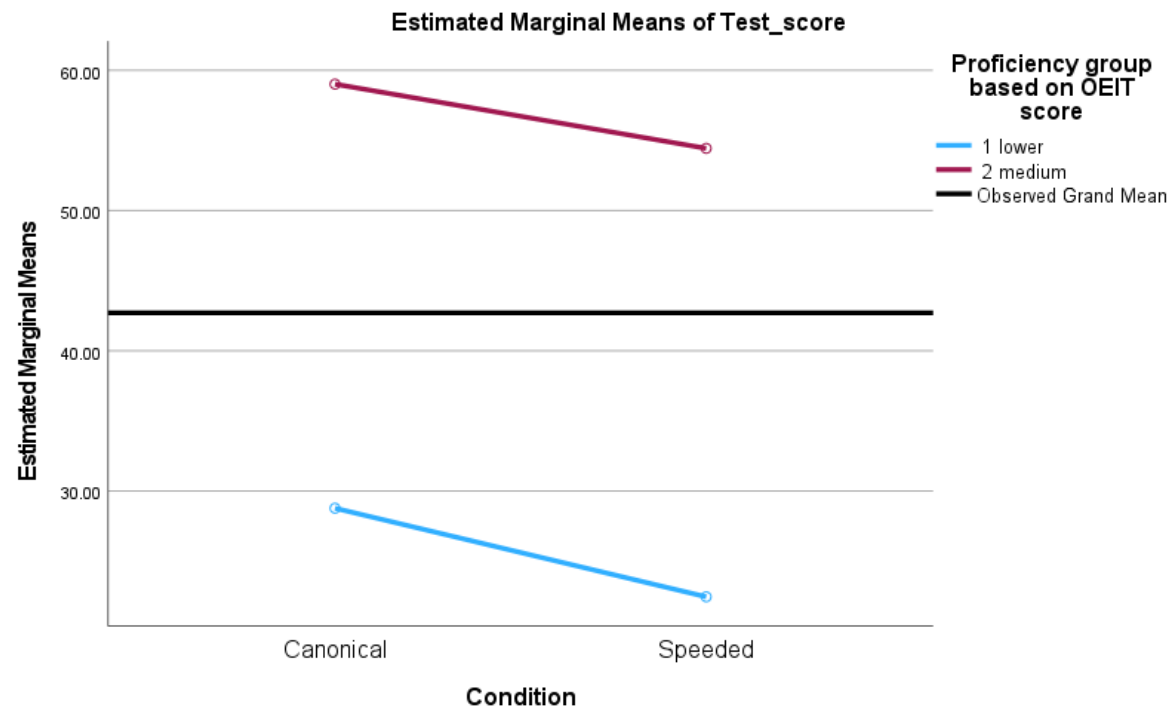
H1: All learners' scores will **decrease** with **reduced time** irrespective of their typing skills and proficiency.

RQ2: HOW DOES THE TIME VARIABLE INFLUENCE LEARNERS' SCORES DEPENDING ON THEIR PROFICIENCY LEVEL? GER

H2: All learners' scores will decrease with reduced time. The **amount of loss** in the scores will depend on learners' **level of proficiency**.

Profile plots for group comparison

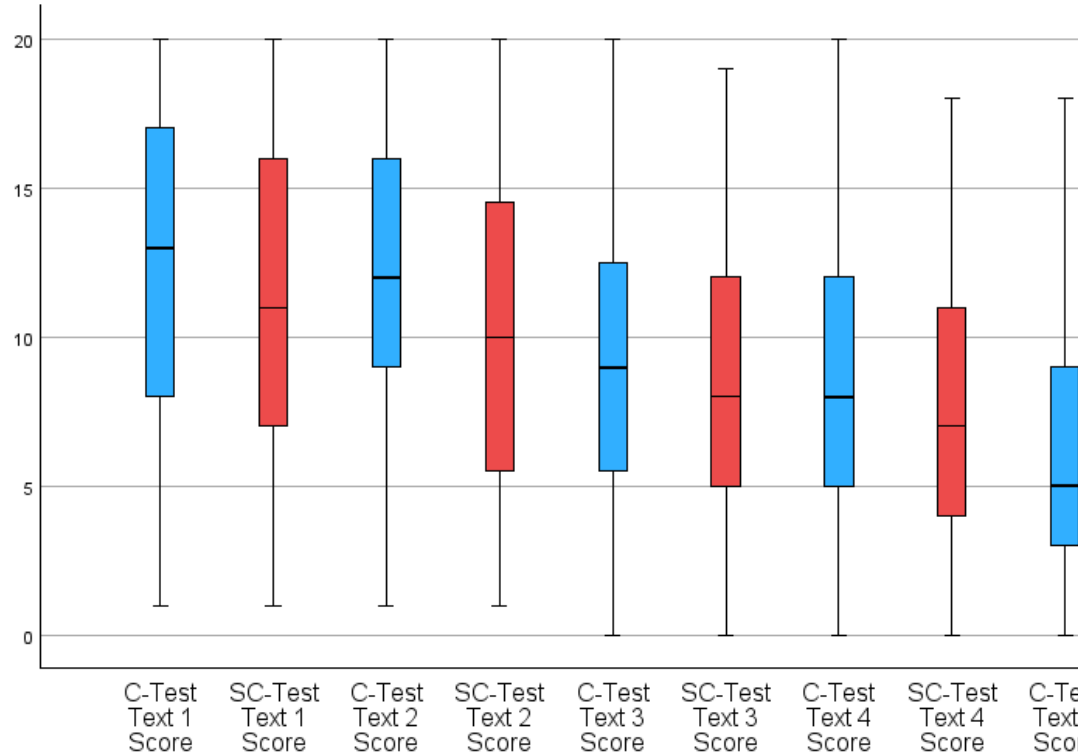
Group allocation based on IRT person measures derived from OEIT scores as produced by Winsteps 5.2.3.0. (lower: -4.0 to -0.9 logits; medium: -0.5 to +2.5 logits)



4.6 points
av.
difference

6.3 points
av.
difference

RQ2: HOW DOES THE TIME VARIABLE INFLUENCE LEARNERS' SCORES RELATED TO THE TEXT DIFFICULTY? GER



Text pair	N	F	p	Part. Eta Sq.
Text 1	162	3.099	.080	.019
Text 2	163	67.237	<.001	.295
Text 3	162	1.345	.248	.008
Text 4	159	0.120	.729	.001
Text 5	158	2.218	.138	.014

	Text 1		Text 2		Text 3		Text 4		Text 5	
	C-Test	SC-Test	C-Test	SC-Test	C-Test	SC-Test	C-Test	SC-Test	C-Test	SC-Test
N	187	188	187	188	187	187	184	185	184	185
Mean	12.2	11.1	12.2	10.1	9.2	8.6	8.5	7.8	6.5	5.7
SD	5.15	5.10	4.65	5.27	4.61	4.73	4.72	4.52	4.50	4.12

H3: Reduced time will play a different role depending on the **difficulty** of the **C-Test texts**.

Summary & interpretation RQ 2

- scores **decrease** with reduced time; difference **significant** with typing skills (ENG only) & proficiency adjusted for
- decrease consistent & statistically significant **across two proficiency groups** in ENG & GER
- decrease statistically significant for **Texts 1-4** but not Text 5 in **ENG**; only **Text 2** in **GER**
- **medium** proficiency learners lose considerably **more points** with reduced time **than higher** proficiency learners in **ENG**; only **slight difference** between **lower** and **medium** proficiency groups in **GER**
- possible mode effect (speed-ability trade-off)

RQ4: HOW DOES THE TIME VARIABLE INFLUENCE THE CORRELATIONS BETWEEN A C-TEST AND AN INTEGRATED MEASURE OF ORAL PROFICIENCY?

Method: Correlations with **Oral Elicited Imitation Test (OEIT)**

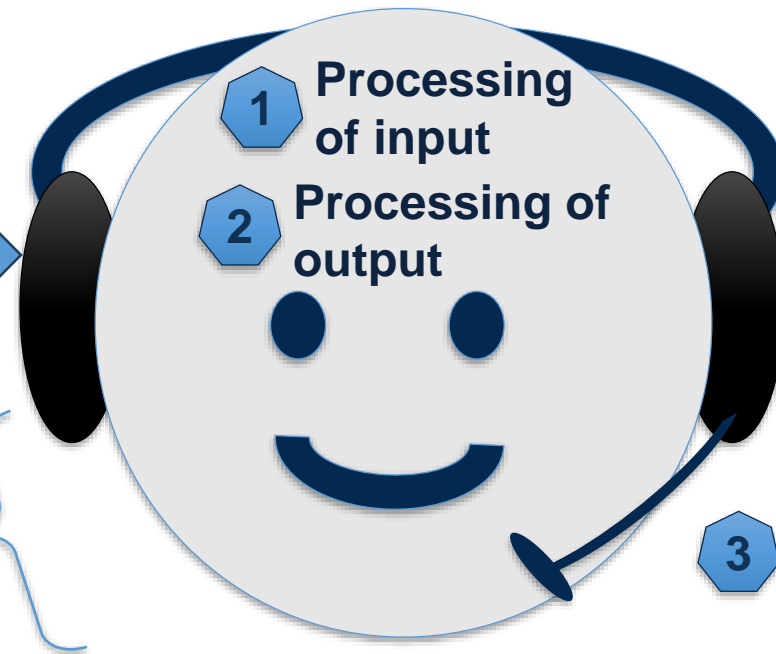
Hypothesis: Completion of a C-Test under time constraints will require learners to rely largely on their automatized knowledge. Therefore, the less time is available for a C-Test, the higher it will correlate with an EIT.

Input

- 20 stimuli;
- length (7- 23 syl.)

"You really enjoy listening to country music, don't you?"

2.5 Seconds



performance

RQ4: HOW DOES THE TIME VARIABLE INFLUENCE THE CORRELATIONS BETWEEN A C-TEST AND AN INTEGRATED MEASURE OF ORAL PROFICIENCY?

Correlation C-Test and Speeded C-Test with OEIT **ENG**

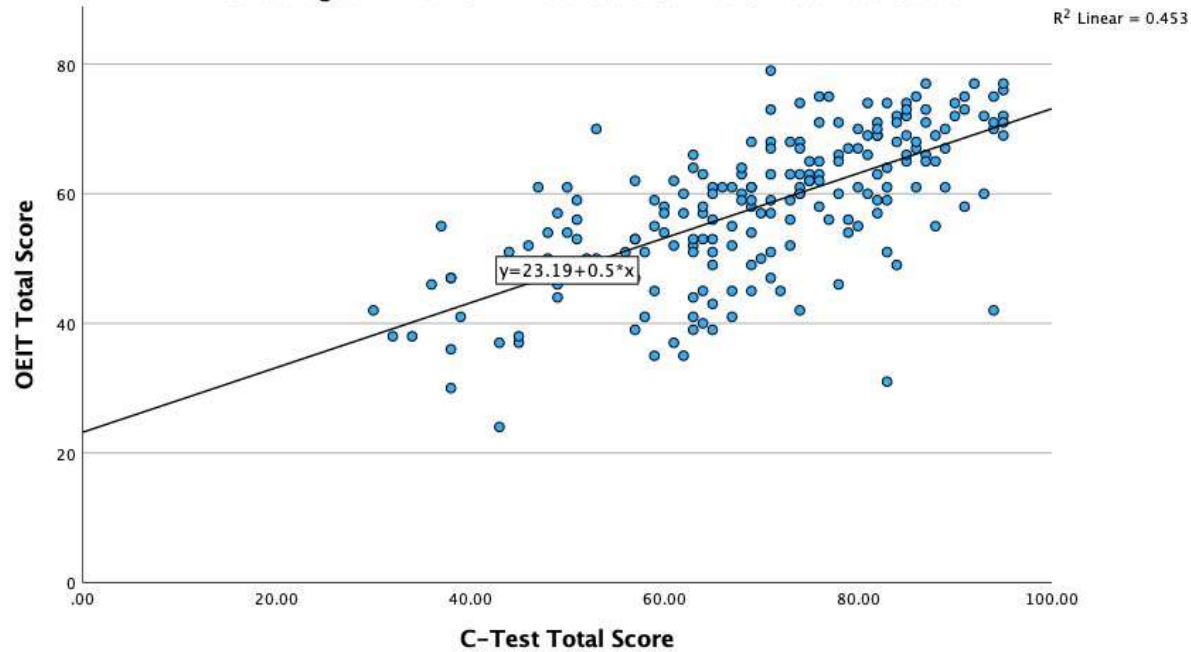
	<i>N</i>	Spearman's rho	<i>z</i>	<i>r</i> ²
C-Test	202	.695 (.614 - .762)	<.001	.483
Speeded C-Test	204	.726 (.651 - .786)	<.001	.527

Correlation C-Test and Speeded C-Test with OEIT **GER**

	<i>N</i>	Spearman's rho	<i>z</i>	<i>r</i> ²
C-Test	164	.864 (.817 - .899)	<.001	.747
Speeded C-Test	164	.887 (.848 - .917)	<.001	.787

RQ4b: WHICH C-TEST PREDICTS THE PERFORMANCE ON AN INTEGRATED MEASURE OF ORAL PROFICIENCY BETTER? **ENG**

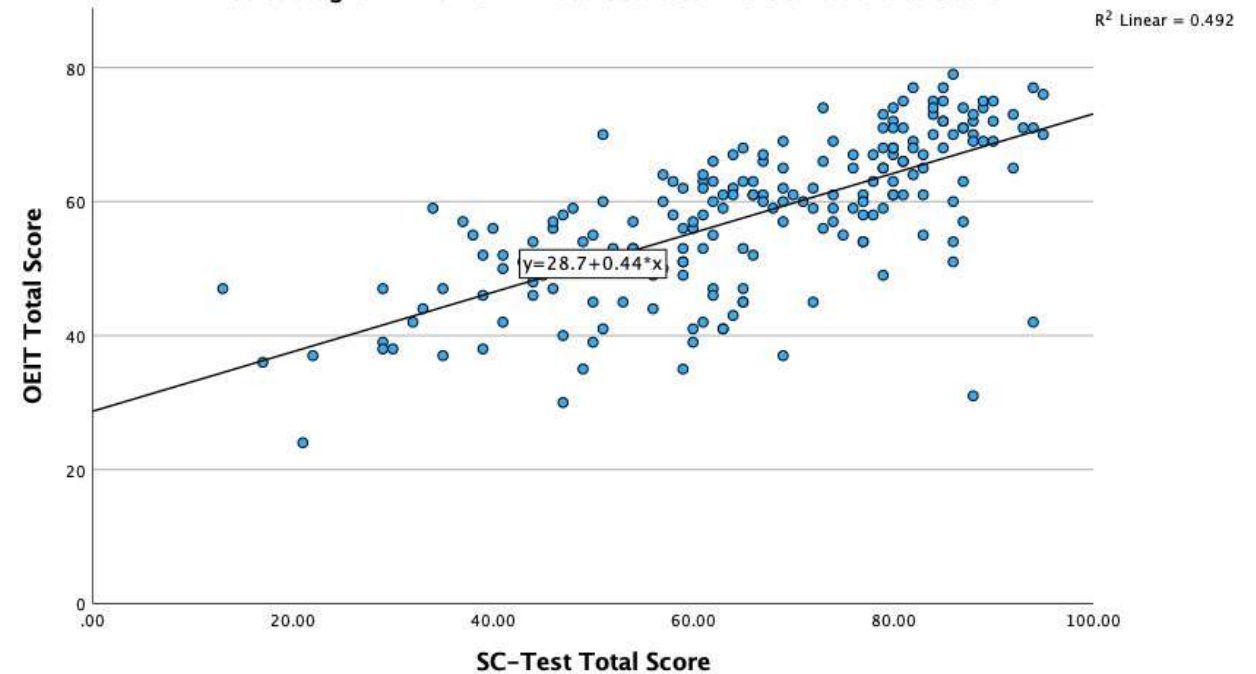
Streudiagramm von OEIT Total Score Schritt: C-Test Total Score



($F(1,201) = 166.218, p < .001, (f = .91)$)

45.3% of the variance on the OEIT is explained by the **C-Test Total Score**

Streudiagramm von OEIT Total Score Schritt: SC-Test Total Score

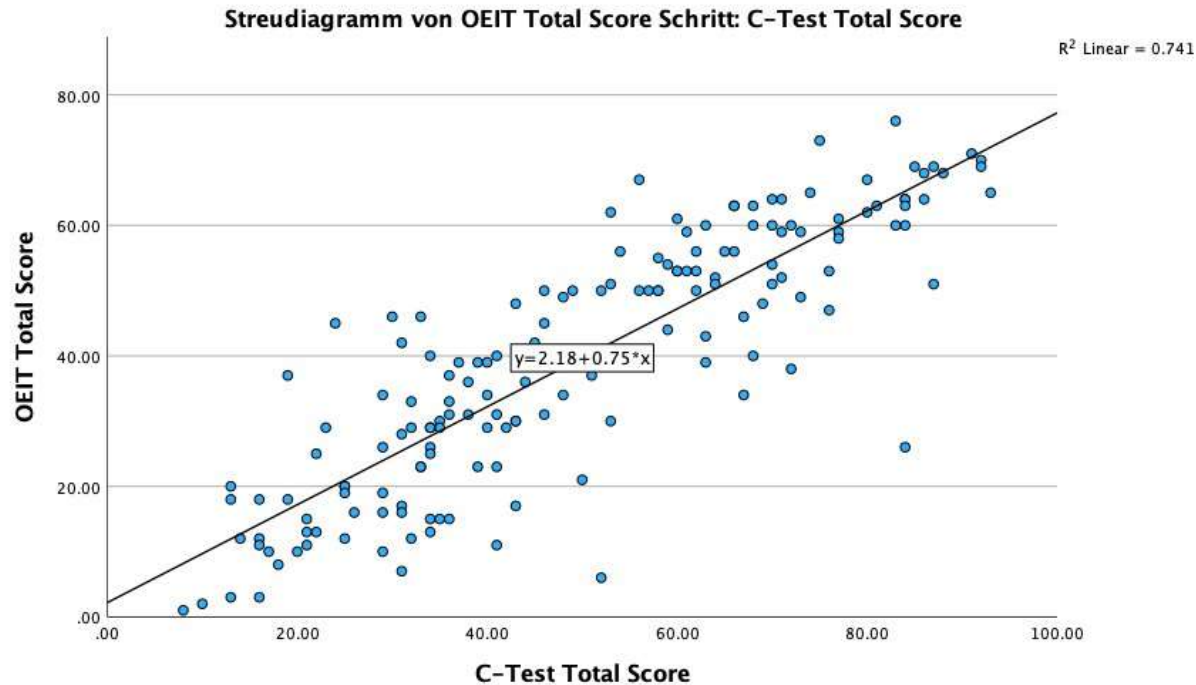


($F(1,203) = 196.633, p < .001, (f = .98)$)

49.2% of the variance on the OEIT is explained by the **SC-Test Total Score**

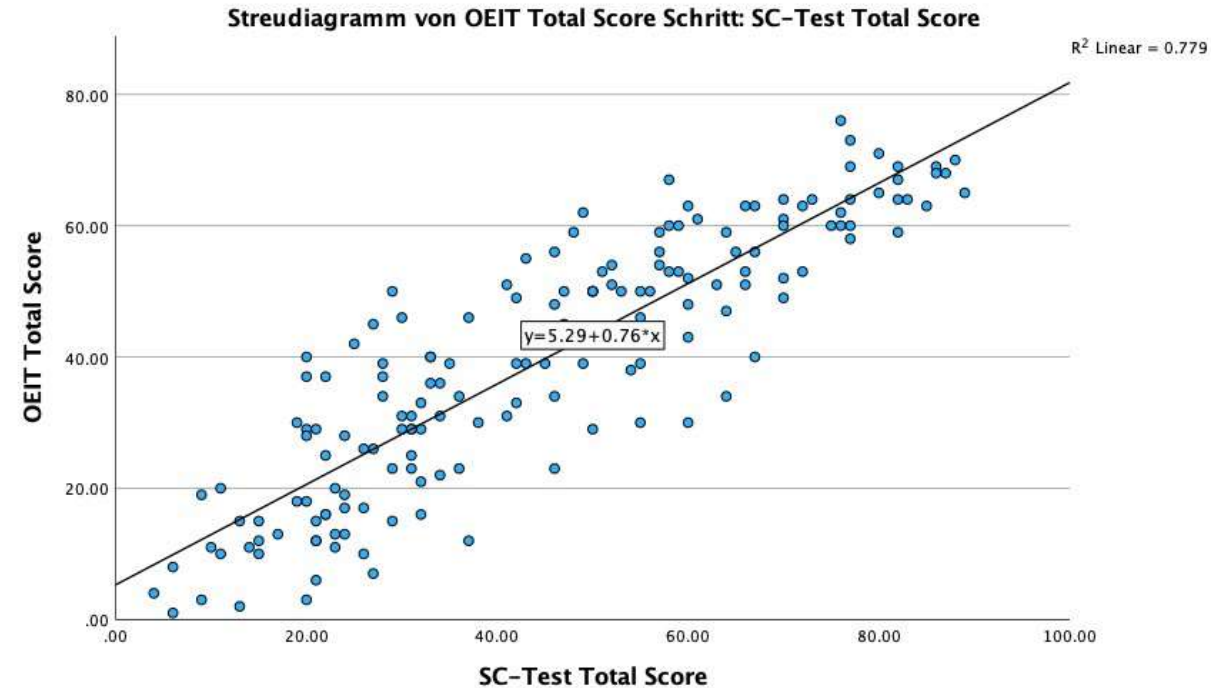
RQ4b:

WHICH C-TEST PREDICTS THE PERFORMANCE ON AN INTEGRATED MEASURE OF ORAL PROFICIENCY BETTER? GER



($F(1,162) = 462.620$, $p < .001$), ($f = 1.69$)

74.1% of the variance on the OEIT is explained by the **C-Test Total Score**



($F(1,162) = 570.118$, $p < .001$), ($f = 1.88$)

77.9% of the variance on the OEIT is explained by the **SC-Test Total Score**

Summary and interpretation RQ 4

- **ENG & GER:** SC-Test explains about **4% variance in OEIT more** than the canonical C-test
- Considerable **difference** between **ENG** and **GER**
 - Why do both C-Test versions explain ca **70%** of the variance in OEIT in **GER**, but only ca **45%** in **ENG**?
 - Difference between the languages?
 - Difference between the samples?
 - language profiles of the participants
 - ENG sample more proficient than GER sample
 - OEIT too easy for ENG sample? (longest item 23 syllables, not enough for higher prof.)
- Further **reduce times** for SC-Test

Overview regression C-Tests ~ Automaticity measures for RQ3

	<i>C-Test</i>			<i>SC-Test</i>		
	R ²	Std. Err.	<i>p</i>	R ²	Std. Err.	<i>p</i>
VST_A	.336	6.092e-02	.000*	.402	5.781e-02	.000*
GAJT_A	.256	6.445e-02	.000*	.377	5.899e-02	.000*
GCT_A	.384	5.869e-02	.000*	.499	5.289e-02	.000*
OCT_A	.118	7.022e-02	.000*	.222	6.595e-02	.000*
SPRT_A	.339	5.824e-02	.000*	.459	5.498e-02	.000*
WEIT_A	.385	5.863e-02	.000*	.569	4.906e-02	.000*



Thank you!
Vielen Dank!
Спасибо!

timukova@gast.de

