Reading in a new technology environment: Are reading assessments still in the ballpark?

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Overview…

- Introduction / Theoretical background
- Research questions
- Study 1
  - Methodological approach
    - Instruments
    - Sample
    - Data analysis
  - Results
- Study 2
  - Methodological approach
    - Instruments
    - Sample
    - Data analysis
  - Results
- Conclusion and outlook

Introduction / Theoretical background

- Reading habits and use of digital devices
  - Nature of what and how we read has changed / is changing with the increasing use of, and advance of new technology (cf. Stavanger declaration, 2019)
  - « Digital reading »: → adolescents' and adults' typical reading habits (Duncan et al., 2016; Gilleece & Eivers, 2018; Pfost, Dörfler & Artelt, 2013)
  - In assessment: increasing use of digital devices

Introduction / Theoretical background

- Reading on digital devices: Do reading processes differ? Do we assess what we want to assess / do we assess what we should assess?
  - Poorer reading performance for reading linear narrative and informational texts on computer screen as compared to paper-based reading (Mangen, Walgermo, Brønnick, 2013)
  - Delgado, Vargas, Ackerman & Salmerón (2018): Meta-Analysis
    - Higher comprehension outcomes within paper-based settings, especially
      - in time-constrained settings
      - in tests using informational texts or a mixture of informational and narrative texts
    - →"digital environments not always best suited to fostering deep comprehension and learning" (Delgado et al, 2018, p. 33)
  - Readers seem to adopt a shallower learning style in a digital environment (Lauterman & Ackerman, 2014)
  - Reading certain types of digital texts, such as social media texts seems to promote rapid, shallow treatment of information (Annisette & Lafreniere, 2017):

Introduction / Theoretical background

- Do « digital reading habits » affect the outcome of reading assessments?
  - "The more people use digital media for these shallow interactions, the less they will be able to use them for challenging tasks" (Delgado et al., 2018, p. 34)
  - correlations between reading habits and text comprehension (early + middle adolescence)
    - **Correlation between frequency of reading digital texts** (e.g. E-Mails, Online searching, online forums) and reading comprehension **tends to be negative**, but results are not always coherent
      - Negative for emails and forums (Pfost, Dörfler & Artelt, 2013)
      - No clear tendency for emails, negative for computer gaming (Duncan et al. 2016)
    - **Positive correlations / beta-parameter**:
      - Reading novels, stories or tales – reading comprehension (Pfost, Dörfler & Artelt, 2013)
      - Fiction book reading – reading comprehsion (Duncan et al., 2016)
    - **But**: In these studies, reading comprehension measured by referring to paper-and-pencil test

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Research questions

- Reading habits: Effects on reading comprehension measured in a digital test environment
  - Do “digital reading habits” have an impact on reading performance, when reading test is presented on digital device?
    - Students no more used to “deep reading” → negative impact to be expected
    - More familiar with digital devices → positive impact to be expected
  - Reading of narrative texts assumed to positively affect reading comprehension, even in a digital environment; but: reading on digital device assumed to be ”shallower” → link might be less pronounced?
- Implications for reading test construct?

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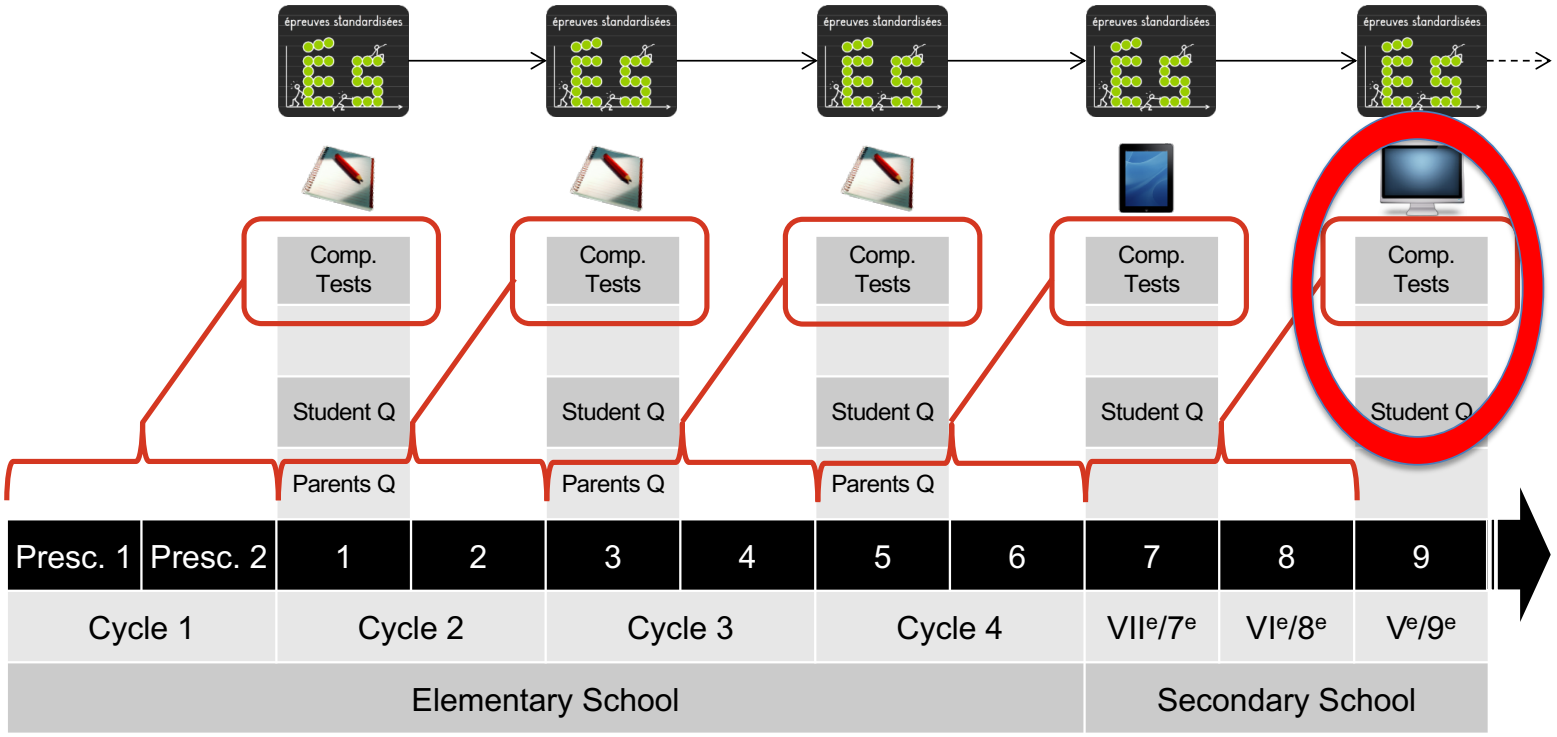
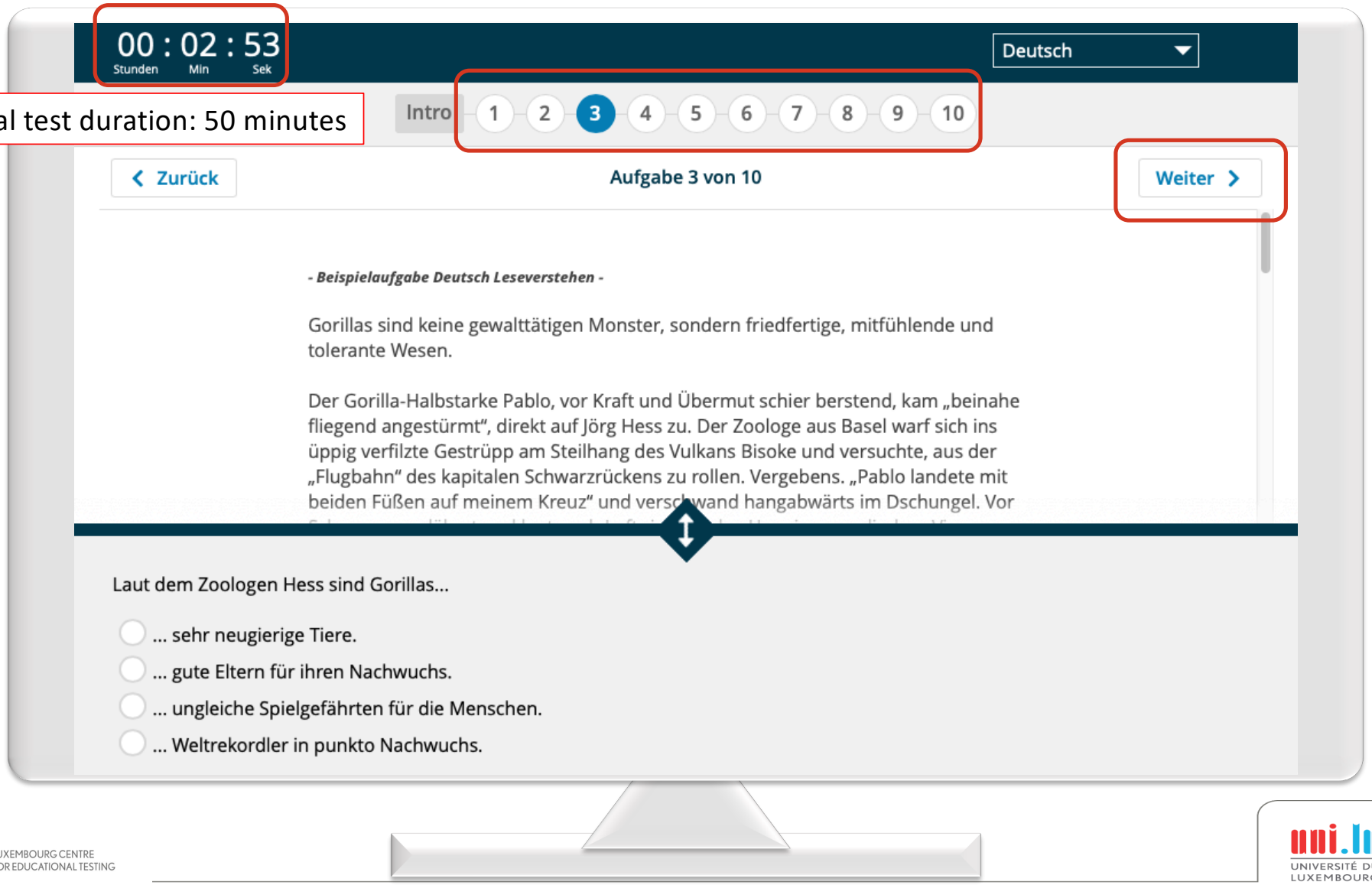
Study 1: *Épreuves Standardisées* (ÉpStan), Grade 9 - **2016**

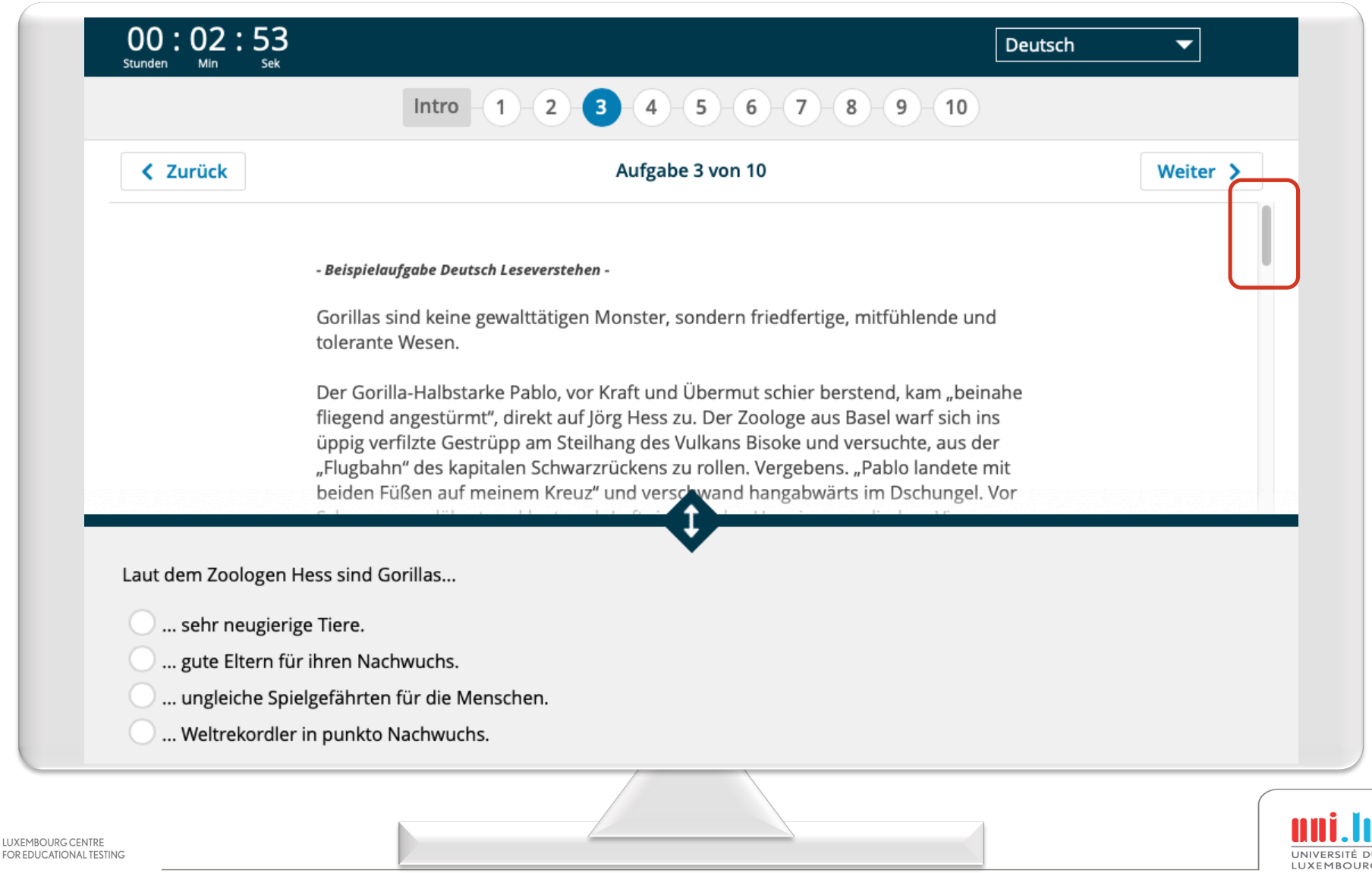


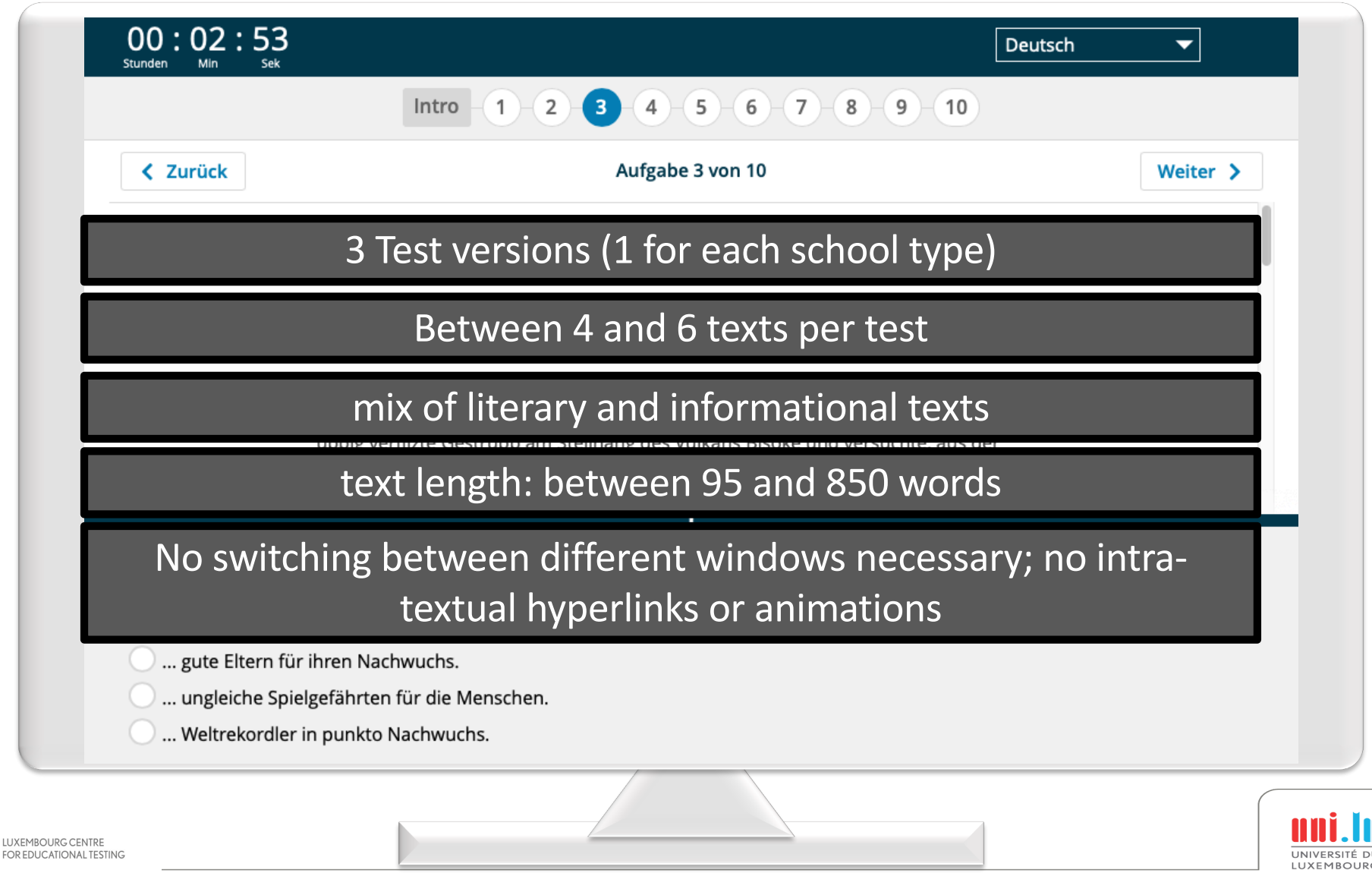
http://epstan.lu

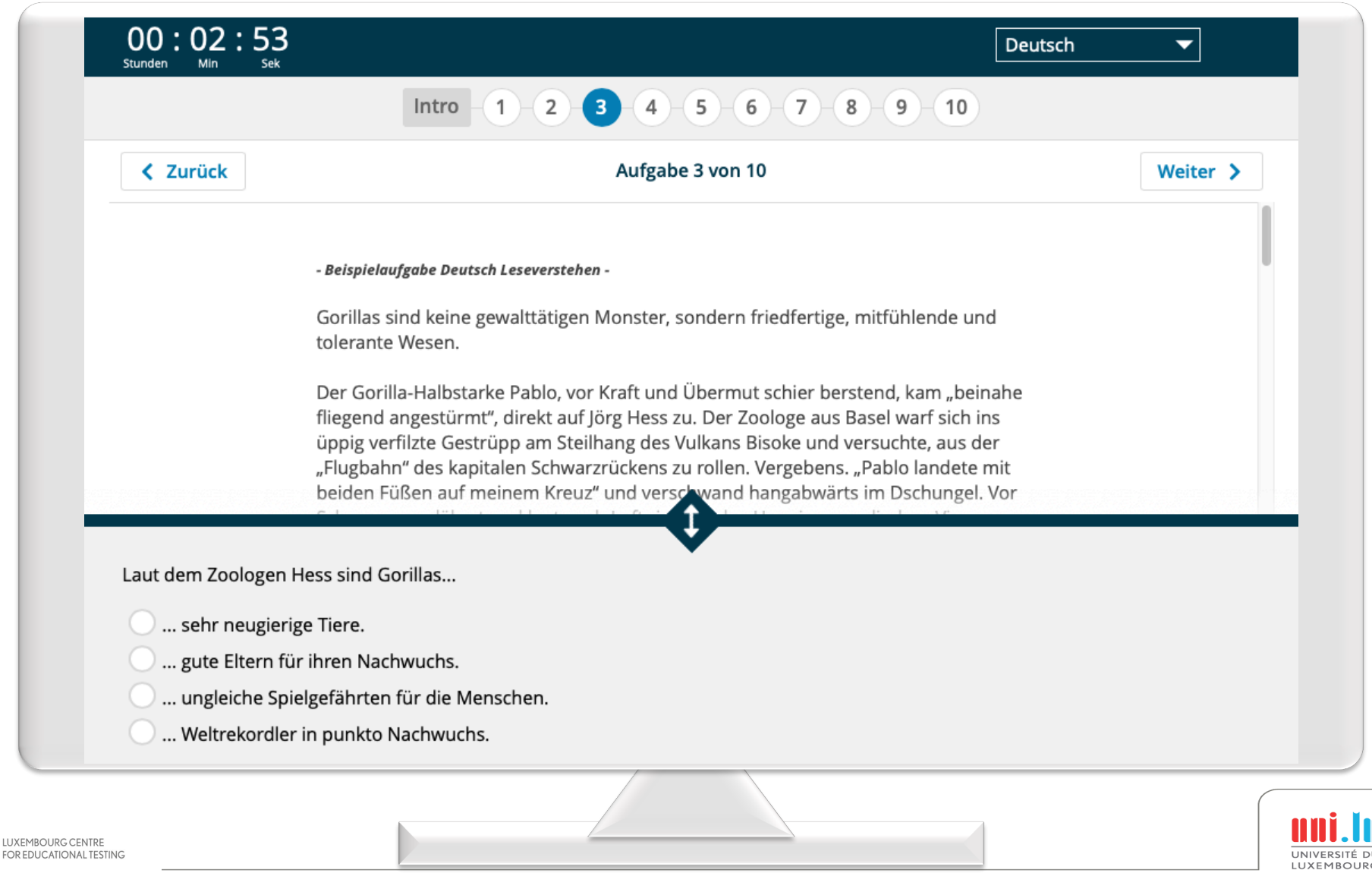
Study 1: *Épreuves Standardisées* (ÉpStan), Grade 9 – **2016**
The German reading comprehension test

total test duration: 50 minutes




00 : 02 : 53
Stunden Min Sek
Deutsch
Intro 1 2 3 4 5 6 7 8 9 10
Zurück
Aufgabe 3 von 10
Weiter
- Beispielaufgabe Deutsch Leseverstehen -
Gorillas sind keine gewalttätigen Monster, sondern friedfertige, mitfühlende und tolerante Wesen.
Der Gorilla-Halbstarke Pablo, vor Kraft und Übermut schier berstend, kam „beinahe fliegend angestürmt", direkt auf Jörg Hess zu. Der Zoologe aus Basel warf sich ins üppig verfilzte Gestrüpp am Steilhang des Vulkans Bisoke und versuchte, aus der „Flugbahn" des kapitalen Schwarzrückens zu rollen. Vergebens. „Pablo landete mit beiden Füßen auf meinem Kreuz" und verschwand hangabwärts im Dschungel. Vor
Laut dem Zoologen Hess sind Gorillas...
... sehr neugierige Tiere.
... gute Eltern für ihren Nachwuchs.
... ungleiche Spielgefährten für die Menschen.
... Weltrekordler in punkto Nachwuchs.


00 : 02 : 53
Stunden Min Sek
Deutsch
Intro 1 2 3 4 5 6 7 8 9 10
Zurück
Aufgabe 3 von 10
Weiter
3 Test versions (1 for each school type)
Between 4 and 6 texts per test
mix of literary and informational texts
text length: between 95 and 850 words
No switching between different windows necessary; no intra-textual hyperlinks or animations
... gute Eltern für ihren Nachwuchs.
... ungleiche Spielgefährten für die Menschen.
... Weltrekordler in punkto Nachwuchs.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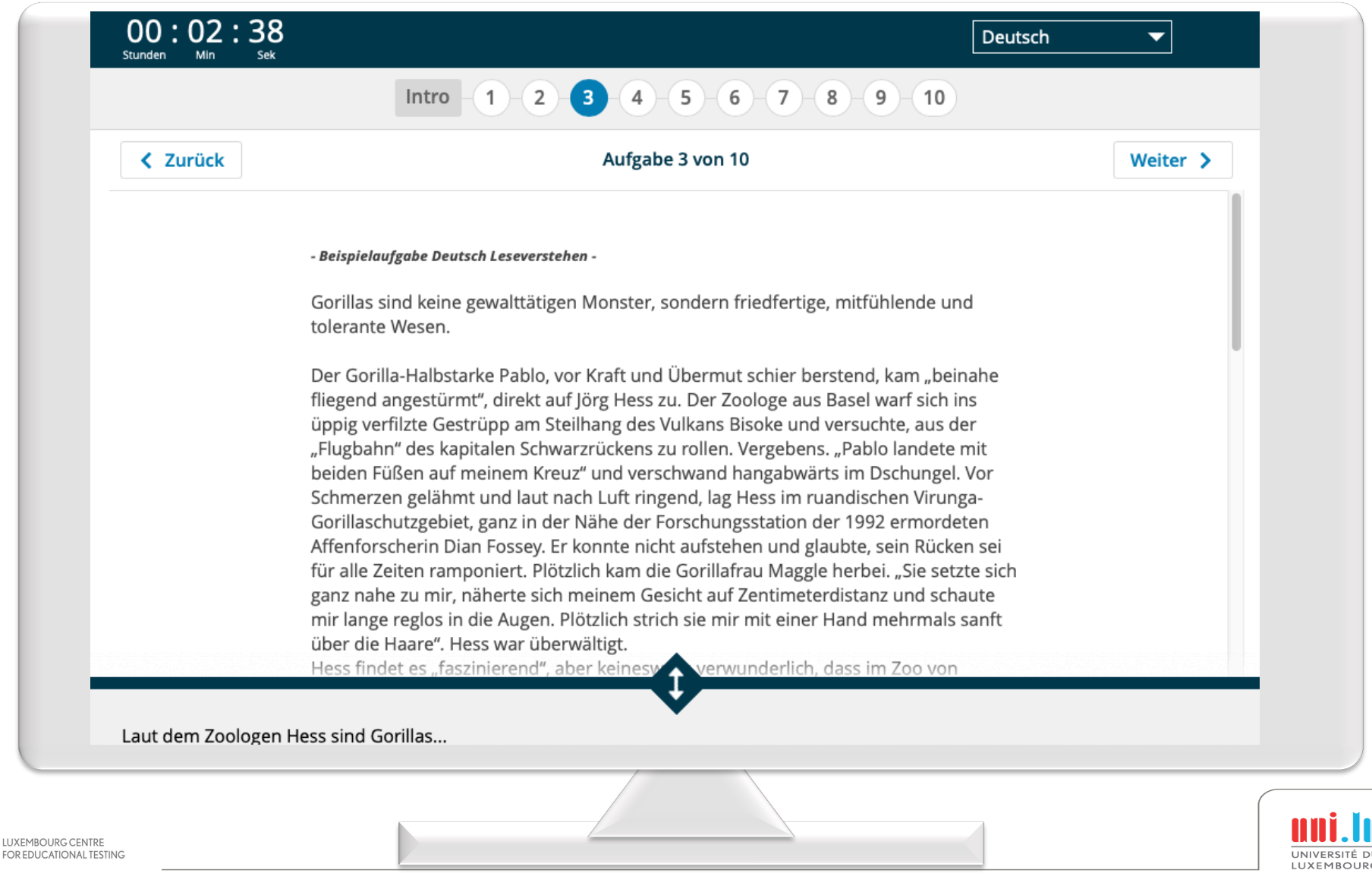
00 : 02 : 38
Stunden Min Sek
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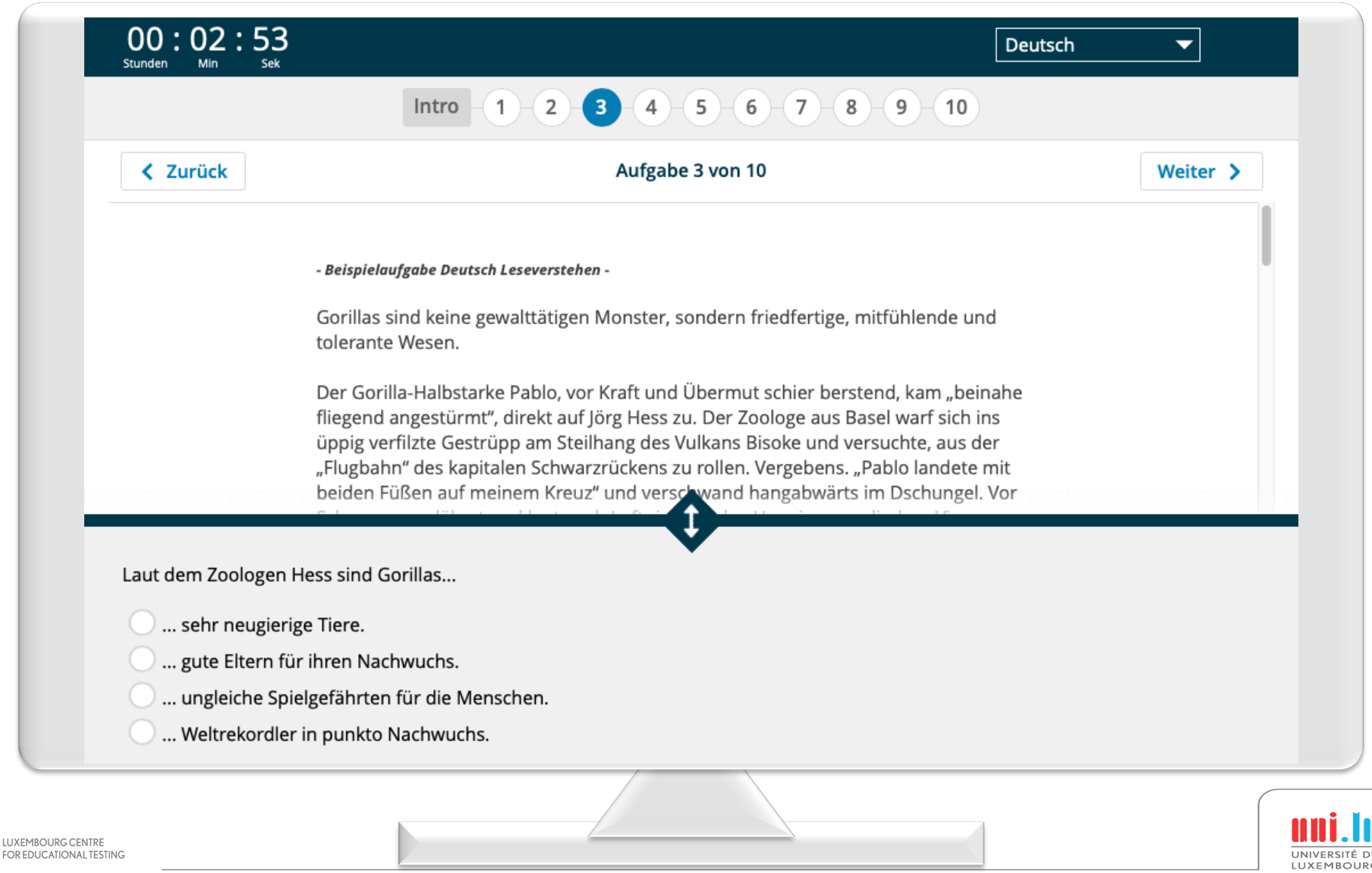
Hess findet es „faszinierend", aber keineswegs verwunderlich, dass im Zoo von
Laut dem Zoologen Hess sind Gorillas...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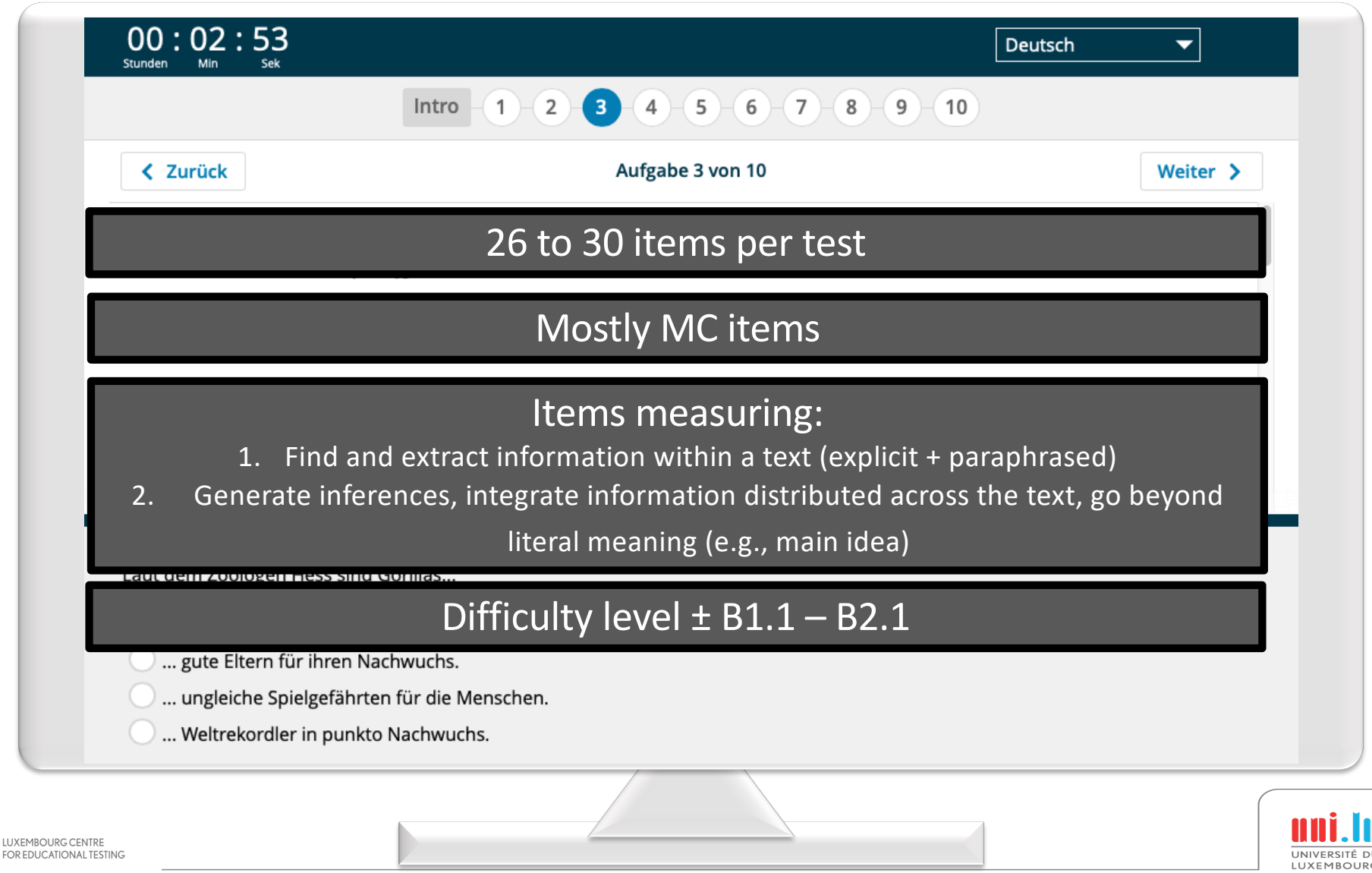

00 : 02 : 53
Stunden Min Sek
Deutsch
Intro 1 2 3 4 5 6 7 8 9 10
Zurück
Aufgabe 3 von 10
Weiter
26 to 30 items per test
Mostly MC items
Items measuring:
1. Find and extract information within a text (explicit + paraphrased)
2. Generate inferences, integrate information distributed across the text, go beyond literal meaning (e.g., main idea)
Difficulty level ± B1.1 – B2.1
... gute Eltern für ihren Nachwuchs.
... ungleiche Spielgefährten für die Menschen.
... Weltrekordler in punkto Nachwuchs.

Study 1: Methodological approach - Instruments

- Questionnaire on background variables (socio-economic background, language spoken at home, etc.)
- **questionnaire on extra-curricular reading habits** (based on Pfost, Dörfler & Artelt, 2011)

How often do you read…?

- stories, novels, tales
- journals/newspapers
- magazines
- non-fiction books
- comics
- texts in online encyclopedias
- e-mails
- online forums
- short messages
- texts in video games

6-point scale:

1 (almost never/never) – 2 (once a month) – 3 (several times a month) – 4 (several times a week) – 5 (once a day) – **6 (several times a day)**

Study 1: Methodological approach - Sample

- 6261 students from grade 9
- among which 5177 have attended public schools from kindergarten on
- For 3014 students, German reading comprehension score from grade 3 available
  - 49% girls
  - 47.3% with migration background
  - attending 3 school types :
    - ES (42%)
    - EST (47.7%)
    - EST-préparatoire (10.3%)

Study 1: What do young people read? Descriptive results

Study 1: What do young people read? Descriptive results

classical texts			*digital texts*		
	mean	**SD**		**mean**	**SD**
magazines	1,85	1,2	e-mails	3,2	1,7
journals	2,22	1,4	short messages	5,25	1,5
comics	1,89	1,3	online forums	4,94	1,7
stories, tales	2,38	1,5	online encyclopedia	3,07	1,6
non-fiction books	1,88	1,3	texts in video games	3,6	1,9

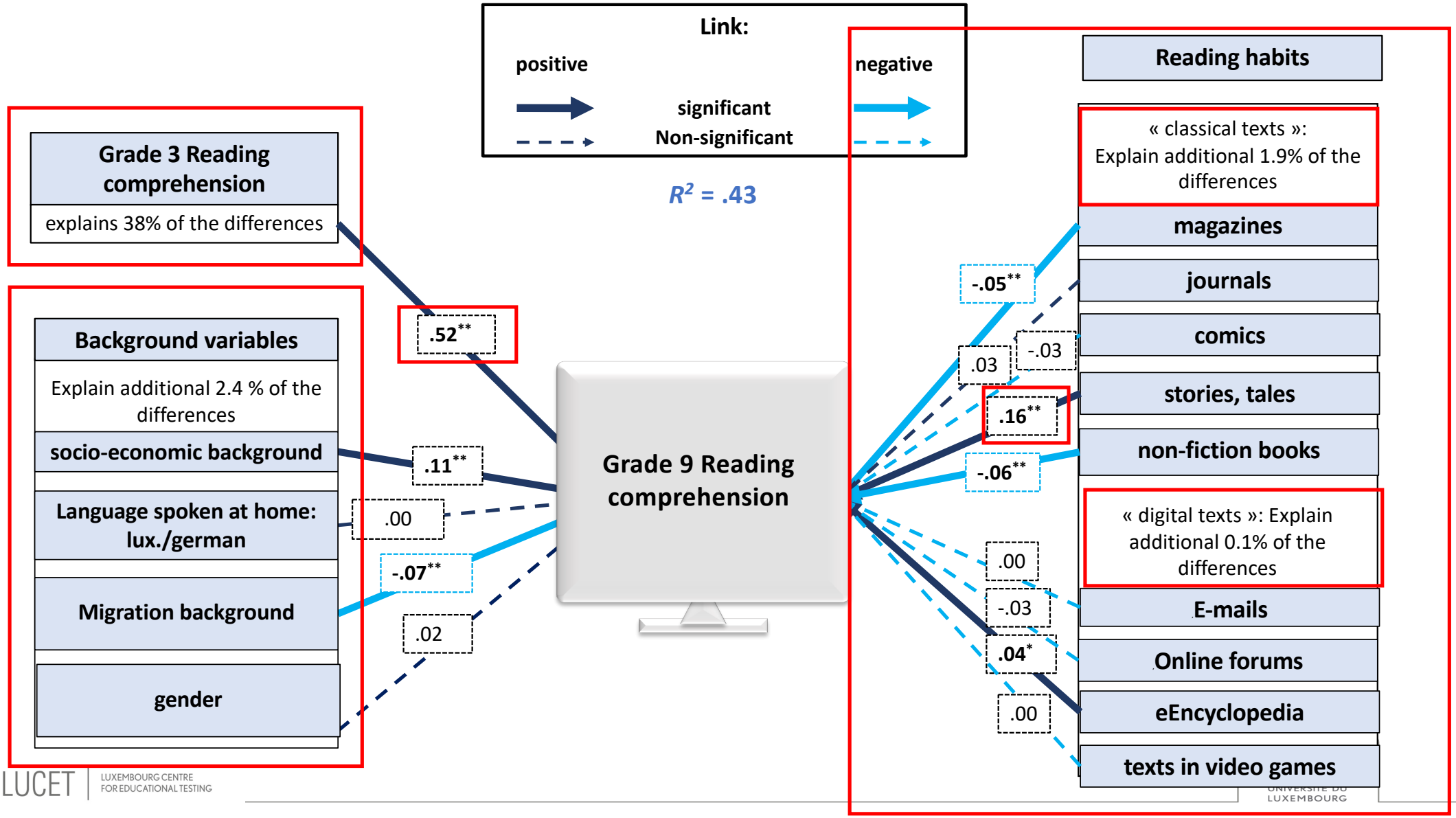
6-point scale:

1 (almost never/never) – 2 (once a month) – 3 (several times a month) – 4 (several times a week) – 5 (once a day) – **6 (several times a day)**

Study 1: Methodological approach - Analysis

Analysis of the differential effect of the different variables on reading comprehension

- linear regression, stepwise method
  - **dependent variable** : reading comprehension in **German**
  - background variables:
    - SES: HISEI (according to Ganzeboom, de Graaf, Treiman & de Leeuw, 1992)
    - migration background (student and/or (grand-)parent(s) born abroad)
    - language spoken at home (GER/LU)
    - Gender
  - reading habits, with regard to different types of texts
  - Grade 3 Reading comprehension score


Link:
positive
negative
significant
Non-significant
R^2 = .43
Grade 3 Reading comprehension
explains 38% of the differences
Background variables
Explain additional 2.4 % of the differences
socio-economic background
Language spoken at home: lux./german
Migration background
gender
.52**
.11**
.00
-.07**
.02
Grade 9 Reading comprehension
Reading habits
« classical texts »: Explain additional 1.9% of the differences
magazines
journals
comics
stories, tales
non-fiction books
« digital texts »: Explain additional 0.1% of the differences
E-mails
Online forums
eEncyclopedia
texts in video games
-.05**
.03
-.03
.16**
-.06**
.00
-.03
.04*
.00

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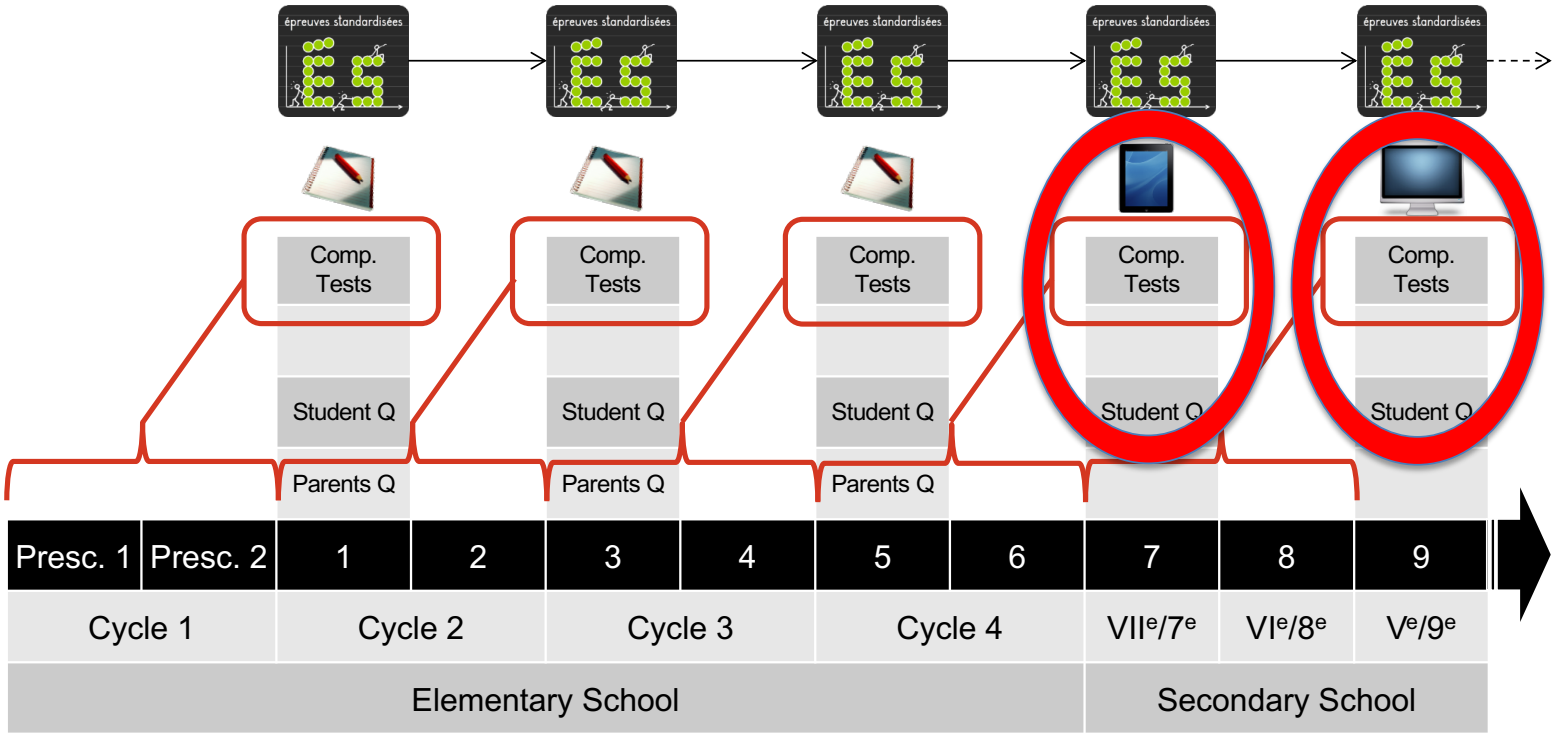
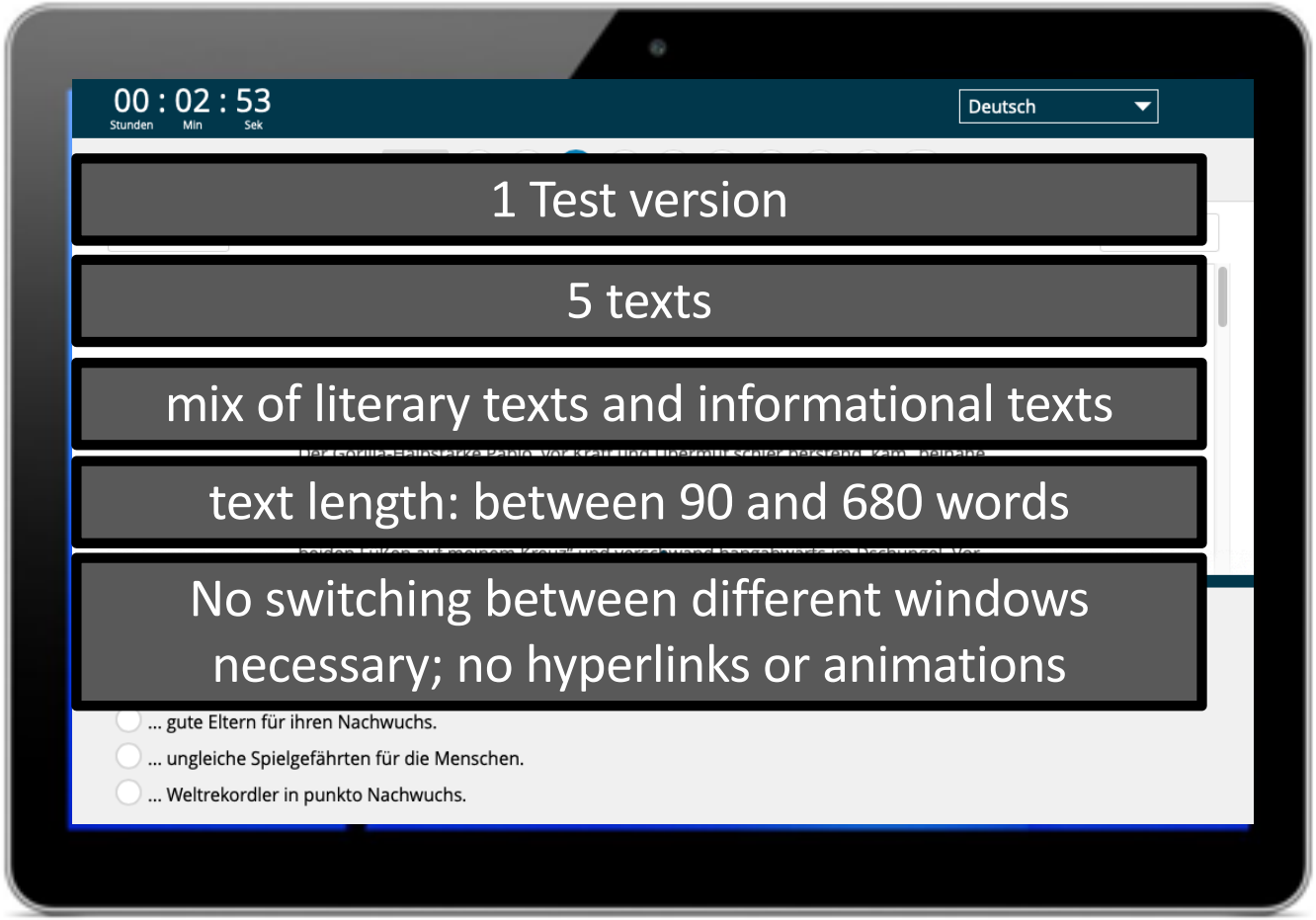
Study 2: *Épreuves Standardisées* (ÉpStan), Grade 7 and 9 - **2018**

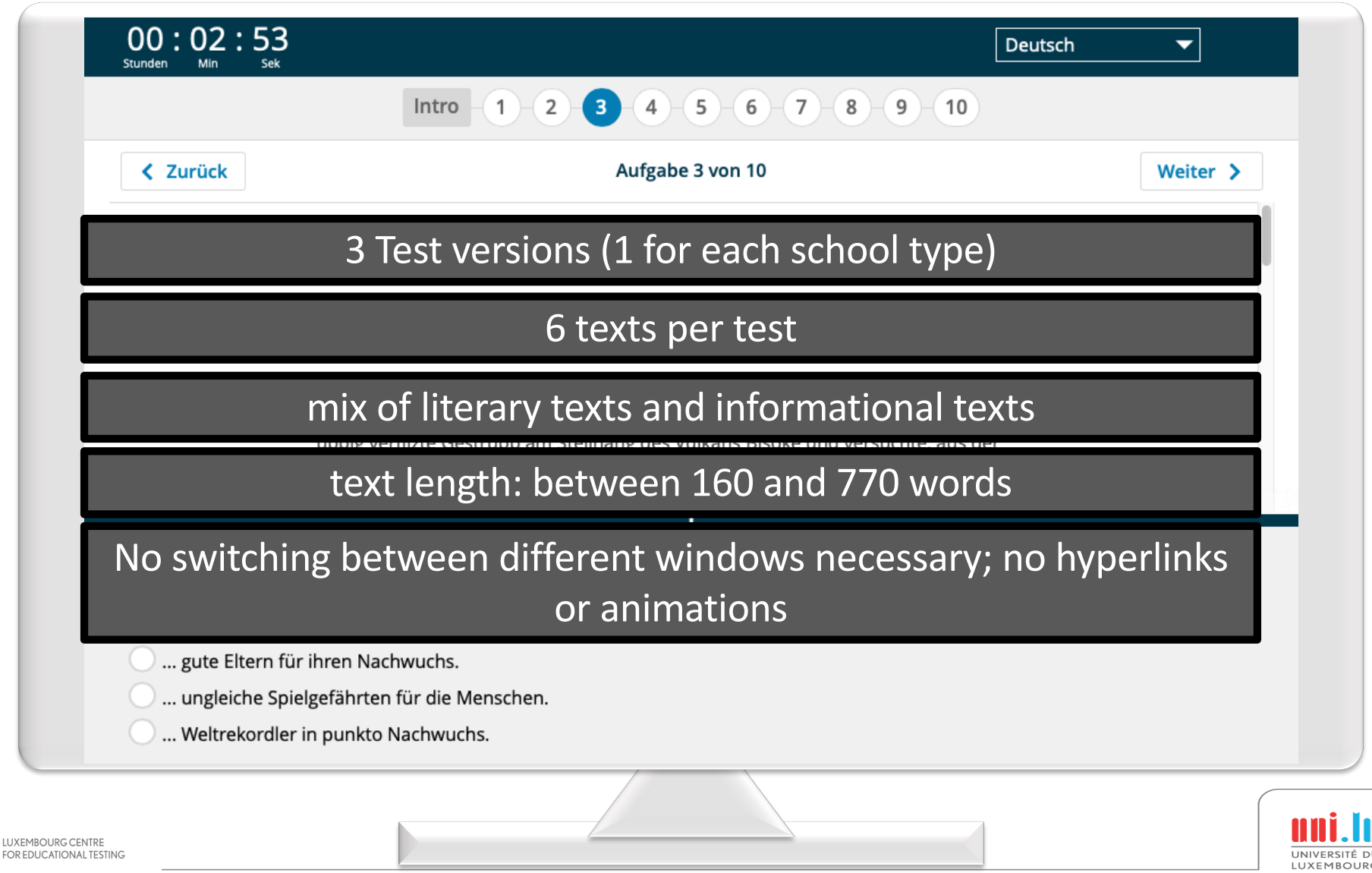


http://epstan.lu

Study 2: *Épreuves Standardisées* (ÉpStan): Grade 7


00 : 02 : 53
Stunden Min Sek
Deutsch
1 Test version
5 texts
mix of literary texts and informational texts
text length: between 90 and 680 words
No switching between different windows necessary; no hyperlinks or animations
... gute Eltern für ihren Nachwuchs.
... ungleiche Spielgefährten für die Menschen.
... Weltrekordler in punkto Nachwuchs.

Study 2: *Épreuves Standardisées* (ÉpStan): Grade 9


00 : 02 : 53
Stunden Min Sek
Deutsch
Intro 1 2 3 4 5 6 7 8 9 10
Zurück
Aufgabe 3 von 10
Weiter
3 Test versions (1 for each school type)
6 texts per test
mix of literary texts and informational texts
text length: between 160 and 770 words
No switching between different windows necessary; no hyperlinks or animations
... gute Eltern für ihren Nachwuchs.
... ungleiche Spielgefährten für die Menschen.
... Weltrekordler in punkto Nachwuchs.

Study 2: Methodological approach - Instruments

- Questionnaire on background variables (socio-economic background, language spoken at home, etc.)

- **Question on "reading for pleasure"**

How often do you read for pleasure ? (6-point scale)

- **1 (I don't' read for pleasure)**
- 2 (once a month)
- 3 (several times a month)
- 4 (once a week)
- 5 (several times a month)
- **6 (daily**

Study 2: Methodological approach - Instruments

- **Question on preferred reading material**

« Analog texts »

What do you prefer to read ?

- magazines, journals, books (in printed form)
- e-magazines, e-journals, e-books (in digital form)
- Texts in social media, online forums, blogs, articles in online encyclopedia, etc. (in digital form)

« Classical print texts »

« Digital texts »

« New media texts »

Study 2: Methodological approach - Sample

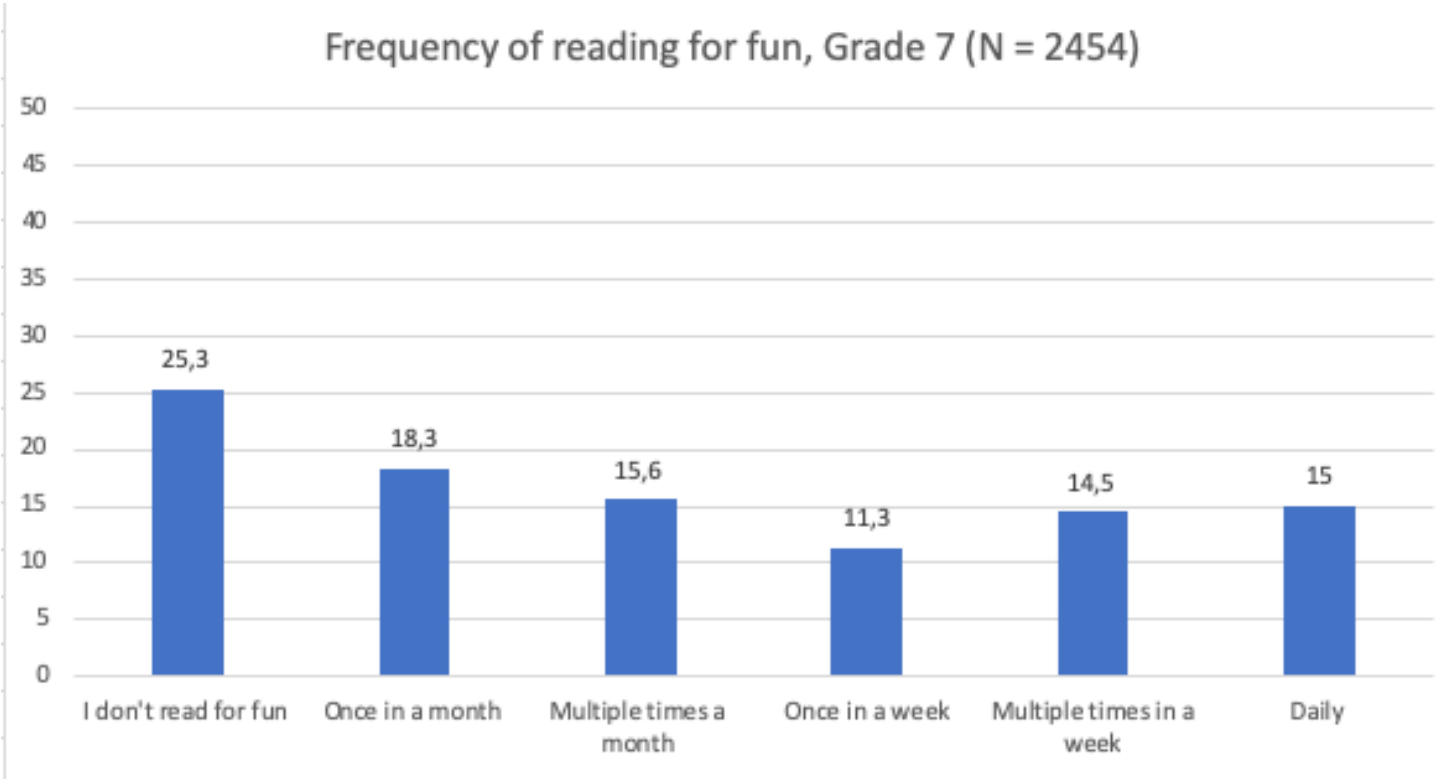
Grade 7:

- 2466 students
- 58.2% with migration background
- 47% girls
  - attending 3 school types :
    - ES (25.5%)
    - EST (58.3%)
    - EST-préparatoire (16.2%)

Grade 9:

- 6279 students
- 47.3% with migration background
- 48% girls
  - attending 3 school types :
    - ES (28.5%)
    - EST (61.6%)
    - EST-préparatoire (9.9%)

Study 2: Descriptive statistics – frequency of reading for pleasure among 7th and 9th grade pupils



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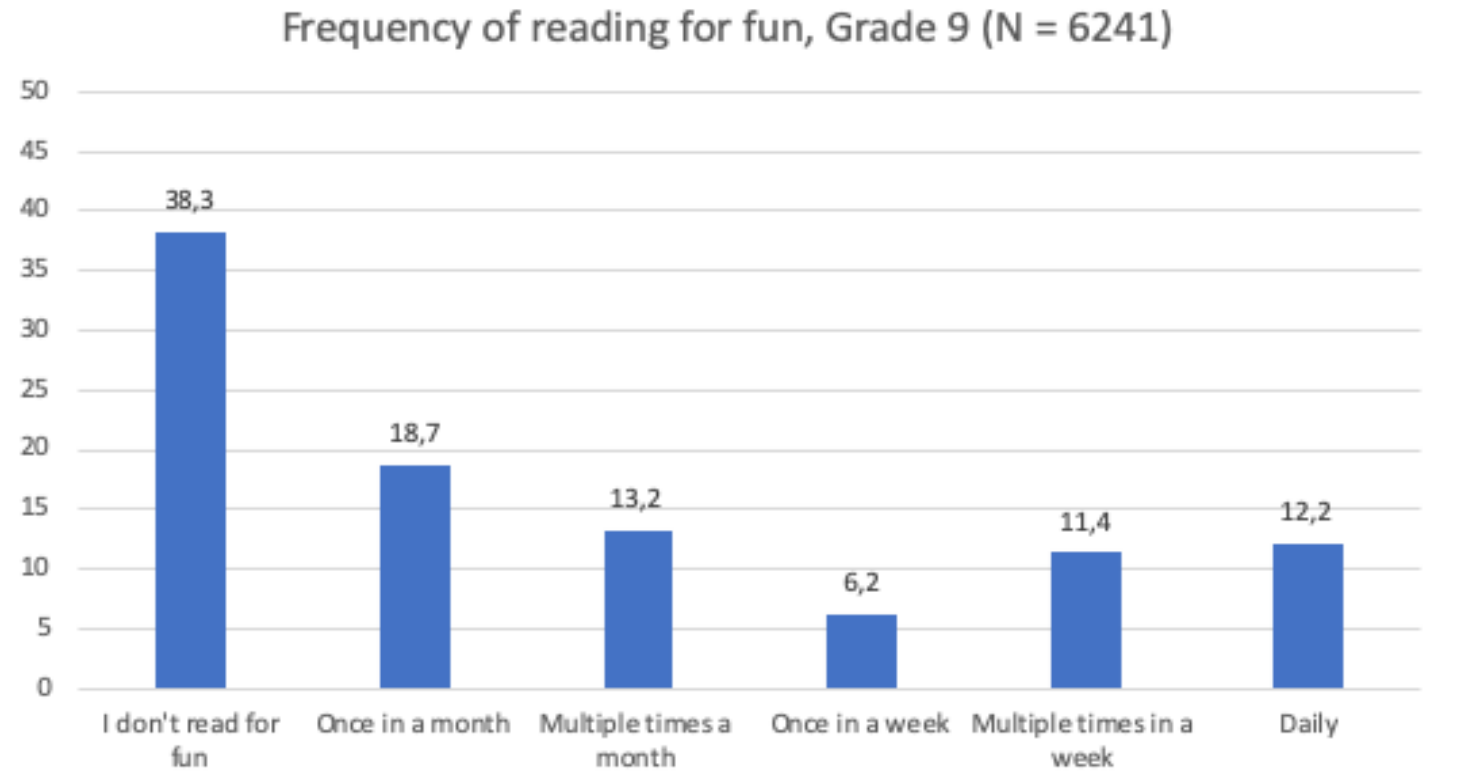
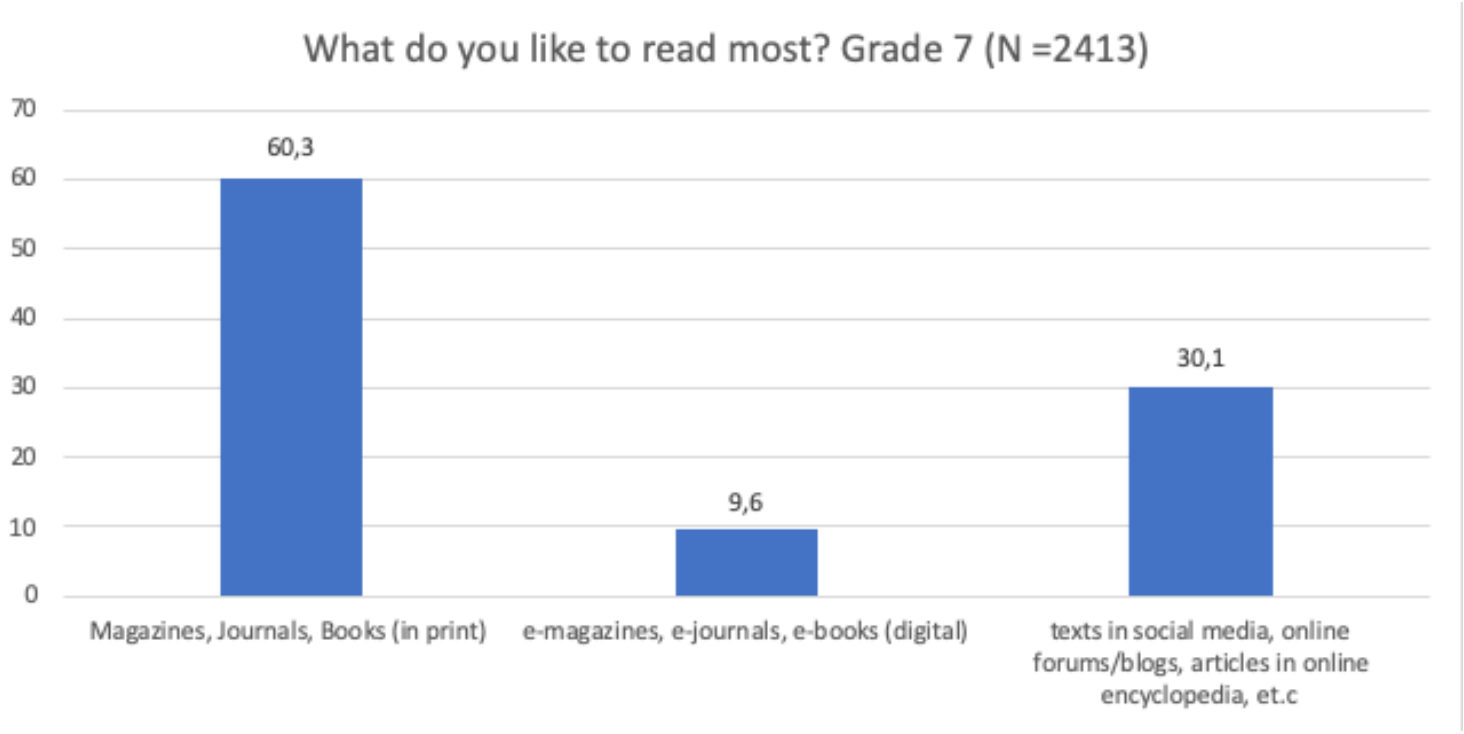


Study 2: Descriptive statistics – preferred reading material among 7th and 9th grade pupils



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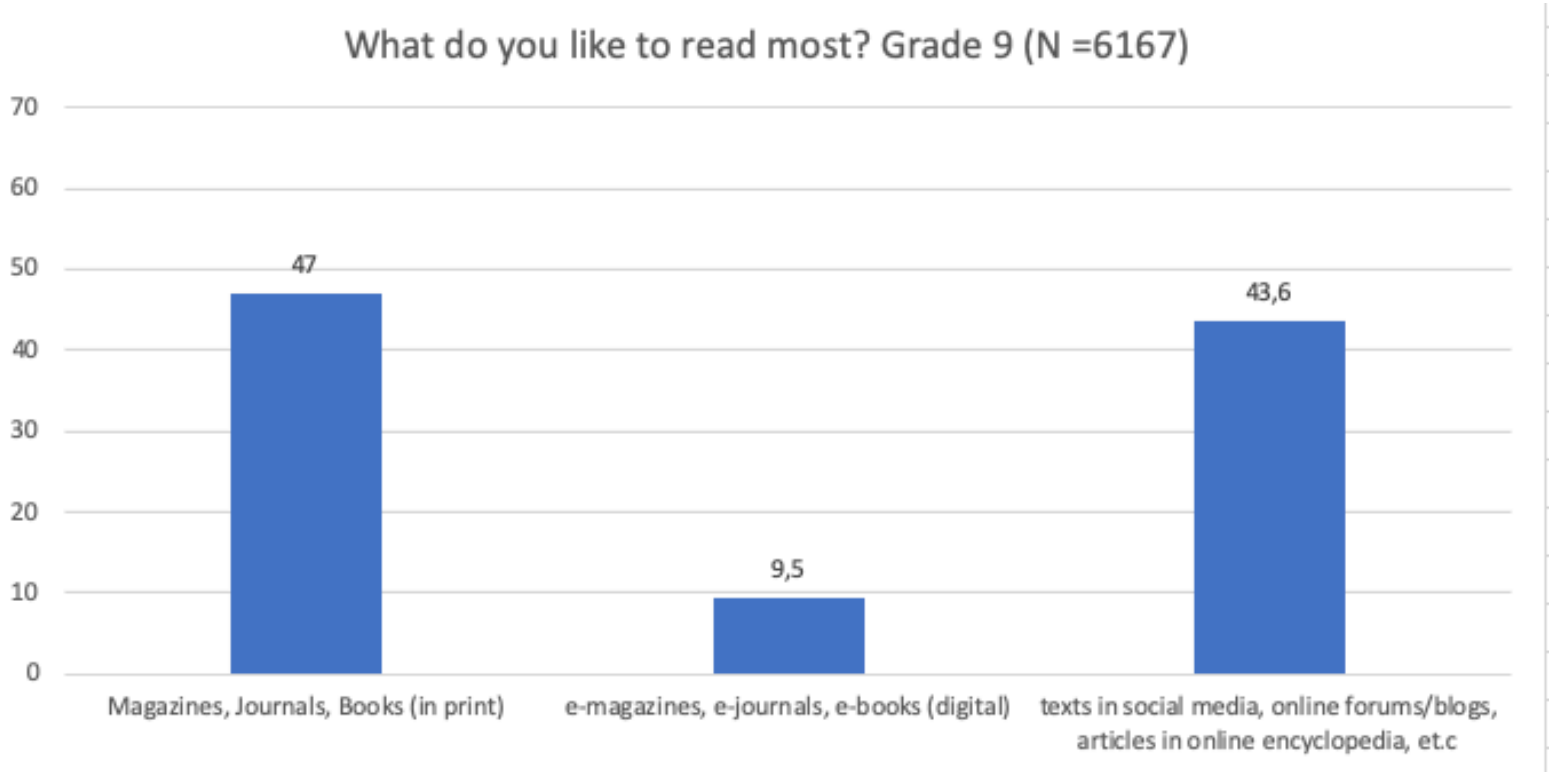
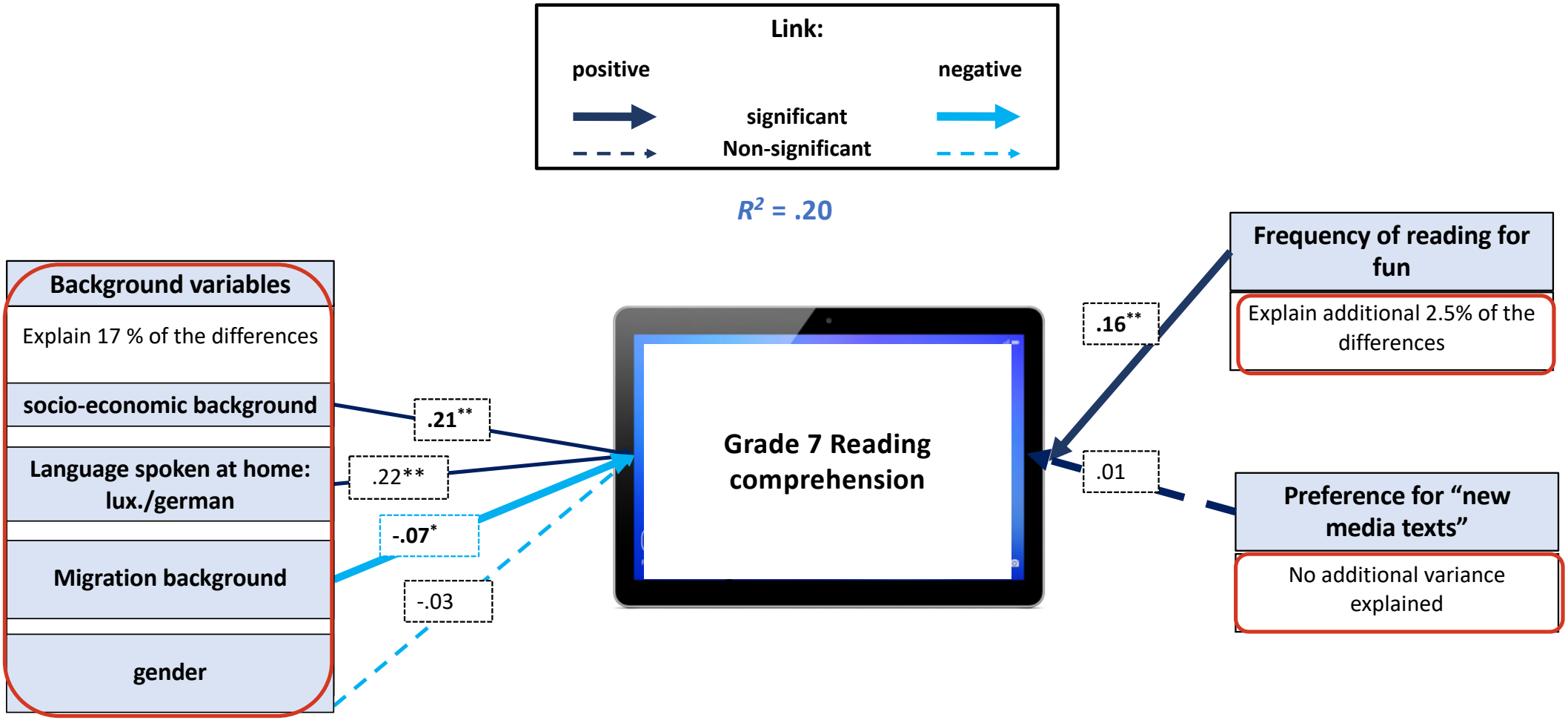
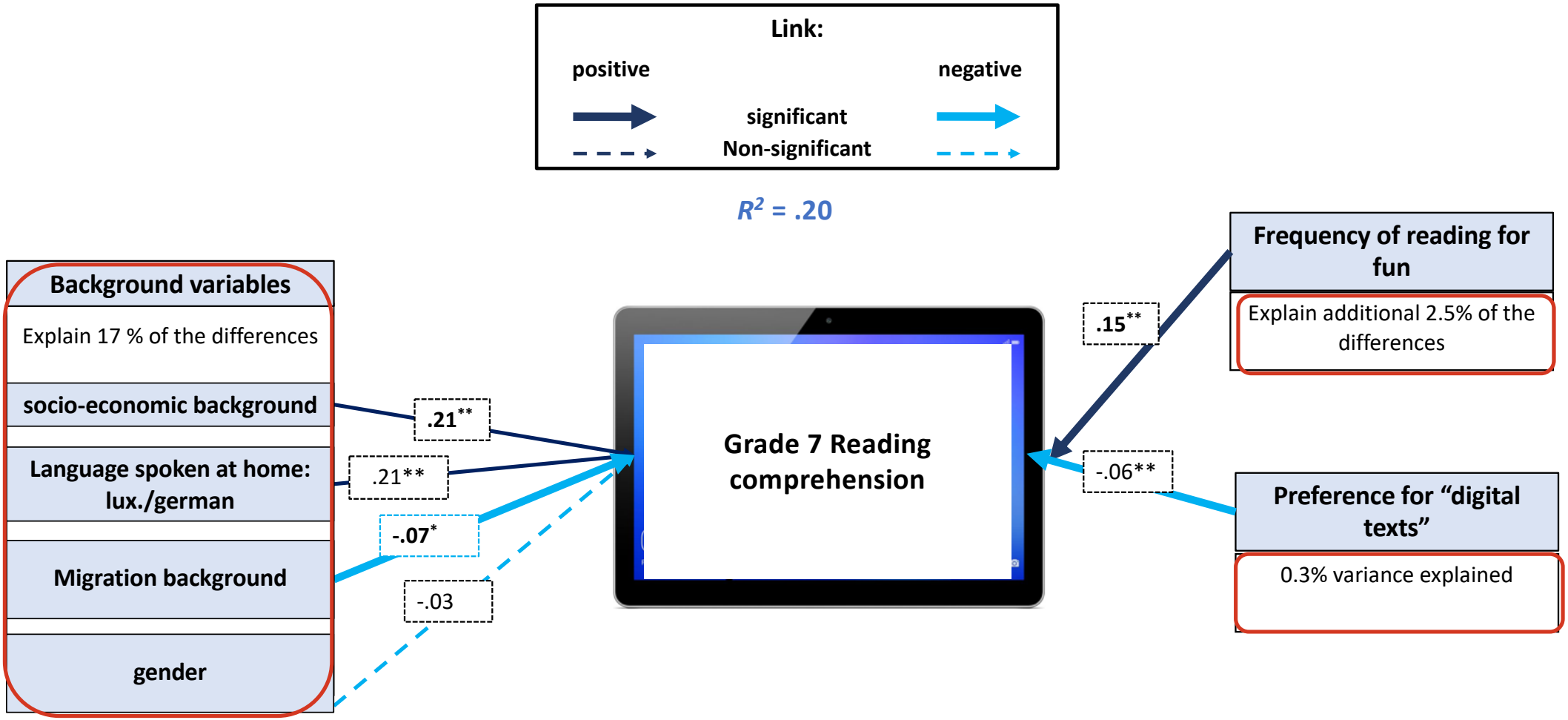



Link:
positive
negative
significant
Non-significant
R^2 = .20
Background variables
Explain 17 % of the differences
socio-economic background
Language spoken at home: lux./german
Migration background
gender
.21**
.22**
-.07*
-.03
Grade 7 Reading comprehension
.16**
.01
Frequency of reading for fun
Explain additional 2.5% of the differences
Preference for "new media texts"
No additional variance explained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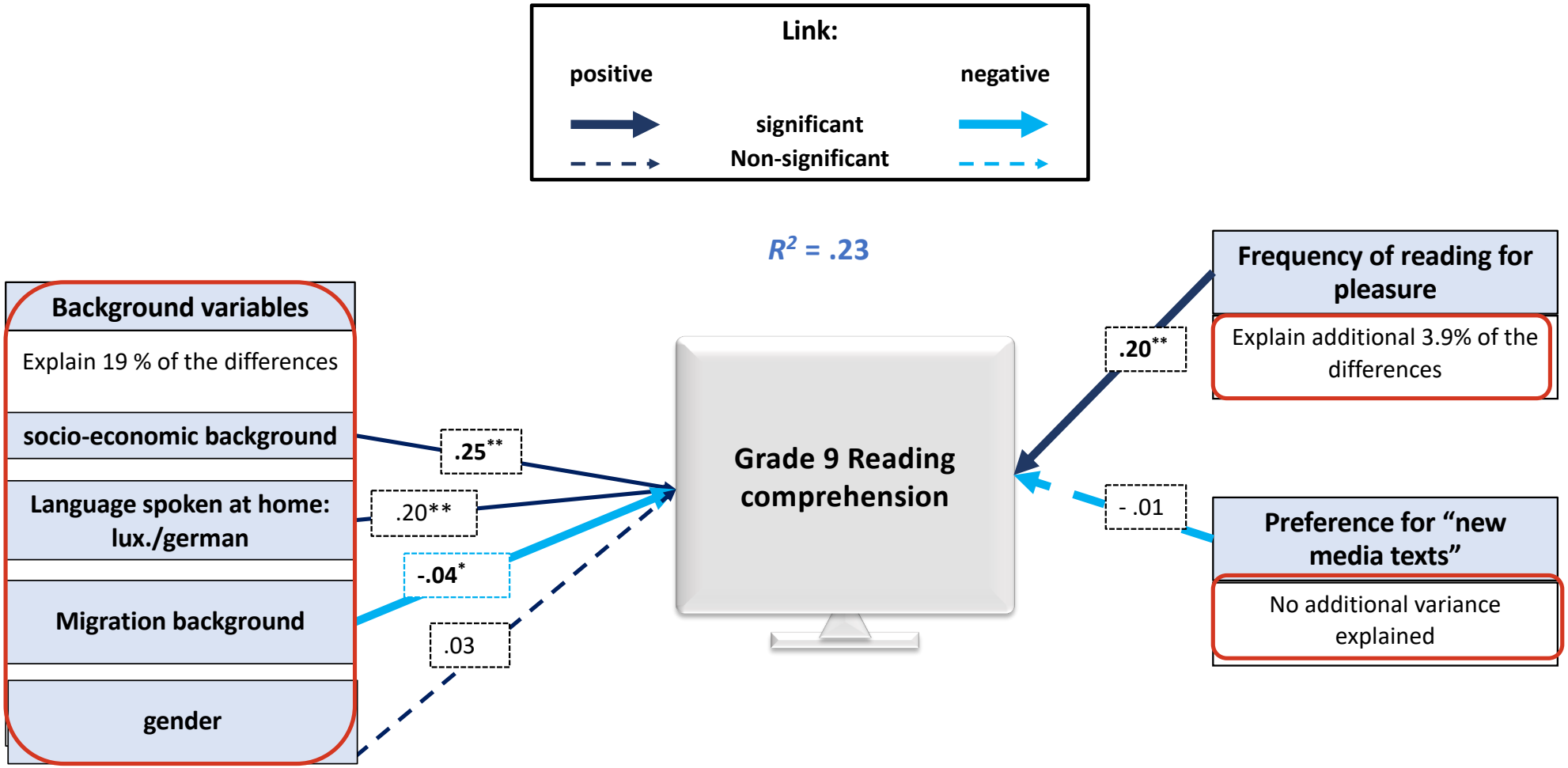
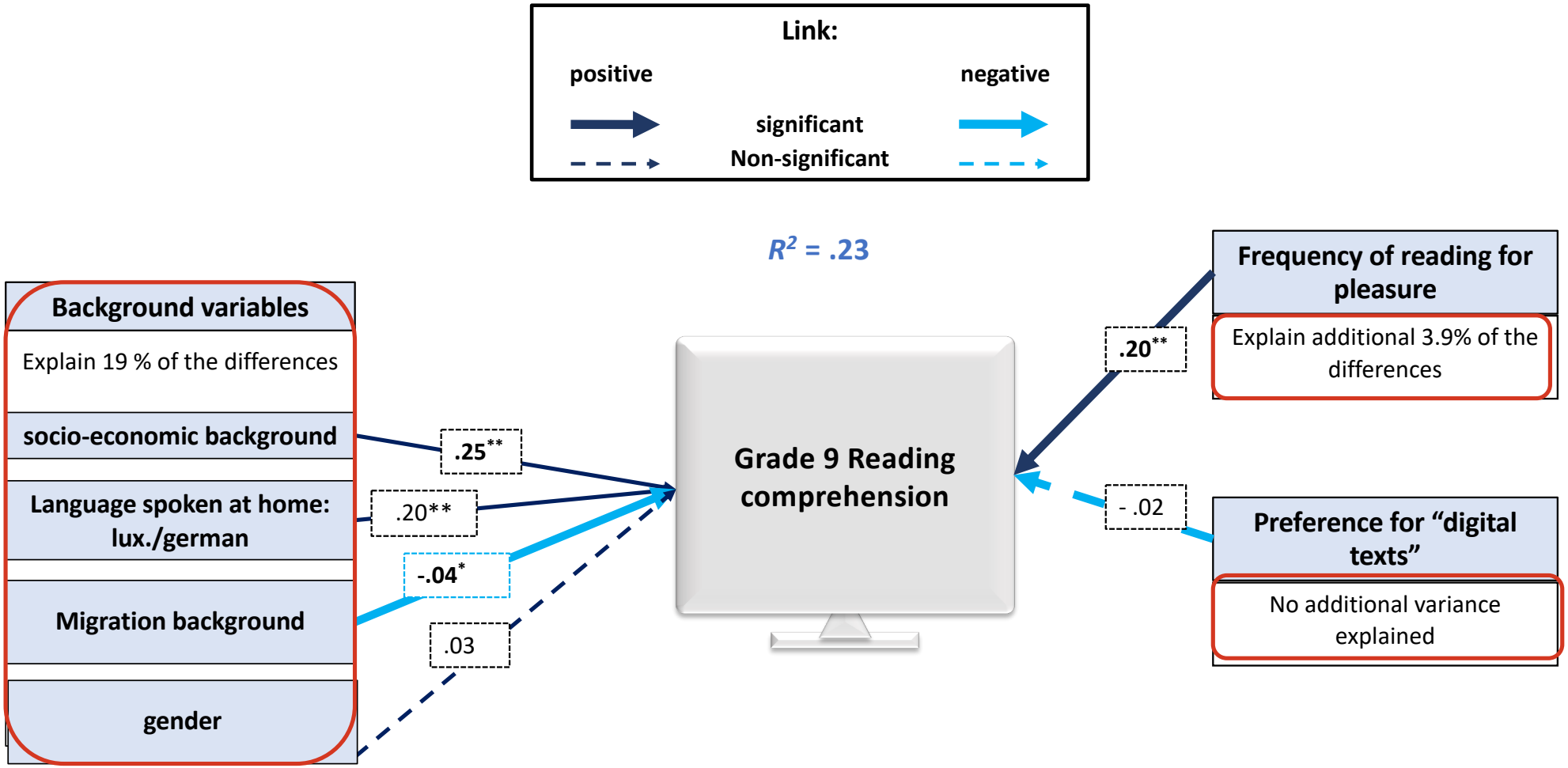
R^2 = .20
Background variables
Explain 17 % of the differences
socio-economic background
Language spoken at home: lux./german
Migration background
gender
.21**
.21**
-.07*
-.03
Grade 7 Reading comprehension
.15**
-.06**
Frequency of reading for fun
Explain additional 2.5% of the differences
Preference for "digital texts"
0.3% variance explained


Link:
positive
negative
significant
Non-significant
R^2 = .23
Background variables
Explain 19 % of the differences
socio-economic background
Language spoken at home: lux./german
Migration background
gender
.25**
.20**
-.04*
.03
Grade 9 Reading comprehension
.20**
- .01
Frequency of reading for pleasure
Explain additional 3.9% of the differences
Preference for "new media texts"
No additional variance explained


Link:
positive
negative
significant
Non-significant
R^2 = .23
Background variables
Explain 19 % of the differences
socio-economic background
Language spoken at home: lux./german
Migration background
gender
.25**
.20**
-.04*
.03
Grade 9 Reading comprehension
.20**
- .02
Frequency of reading for pleasure
Explain additional 3.9% of the differences
Preference for "digital texts"
No additional variance explained

Conclusion and perspectives

Conclusion and perspectives

- Reading habits: added value as compared to background variables
- Reading narrative/literary texts remains important for development of reading comprehension – a conclusion that is also true when reading assessed in a digital environment
- Reading digital texts or general preference for digital texts / new media texts: negligible effect, even with regard to reading comprehension as measured in a digital test environment.
- Reasons / explanations for these interrelationships remain unclear:
  - No (negative) effect because current test measures “shallow” reading only?
  - No (positive) effect because texts and items presented in a linear way, with no complex intra- and inter-textual links, navigation demands and animations?
  - Would there have been an even stronger relationship between the reading of narrative texts and reading comprehension in an “analog” environment?

Conclusion and perspectives

Questions for future analyses

- Distinguish between “deep” and ”shallow” reading by referring to the “expeditious” and ”careful reading” framework (Khalifa & Weir, 2009)
- Distinguish between different kinds of texts:
  - Long vs. short texts
  - Literary vs. informational texts

Conclusion and perspectives

- Digital texts / new media texts highly attractive for adolescents
- Reading in a digital environment is becoming one of the main ways in which individuals gather information, communicate and learn
- Need to consider that reading on digital devices is different from reading in an analog environment

→ implications for construct to be assessed

Conclusion and perspectives

→ assessment of 2 reading constructs – assessment of ”Bi-literacy”? (Wolf, 2018)

- assessing reading competence in a typical digital environment, ask test takers to, e.g.,
  - generate inferences across multiple texts and sources,
  - deal with conflicting intertextual information,
  - assess quality and credibility of different texts,
  - navigate through multiple texts, etc.

  (cf. OECD, 2019)

  AND
- Assessing “deep” and “higher-level” reading competence (in a digital or print environment?)

Thank you for your attention!

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