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# Computer-assisted language learning in old adulthood: How *Duolingo* can or cannot complement classroom-based learning

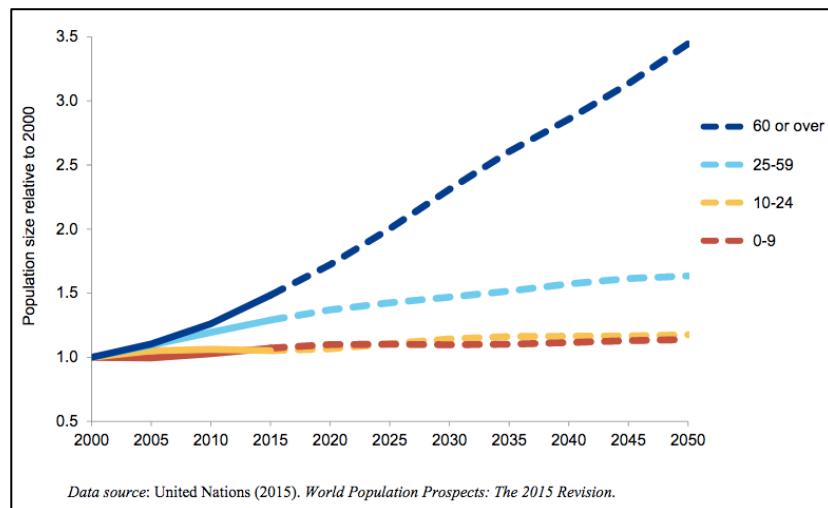


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## Third Age L2 Learners

- Aging societies: in fewer than 13 years the number of people in the worldwide population aged 60 or over will grow by 56%, reaching 1.4 billion people (United Nations, 2015)



3 main older adult  
multilingual profiles:

- (1) Newly arrived migrants
- (2) Migrants aging in place
- (3) Retirees undertaking new challenges



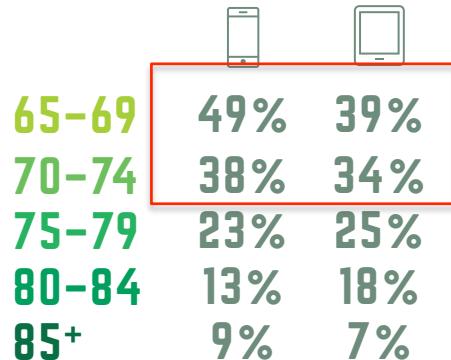
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### SMARTPHONE & TABLET

Die jüngeren Senioren besitzen Smartphone und Tablet häufiger.  
Ab 75 findet das Tablet aufgrund der Benutzerfreundlichkeit  
mehr Anklang.



### ONLINER NACH ALTER UND GESCHLECHT

¾ der Männer sind online. Der Online-Anteil der Frauen  
beträgt nur 53%.



Source: Seifert, 2015



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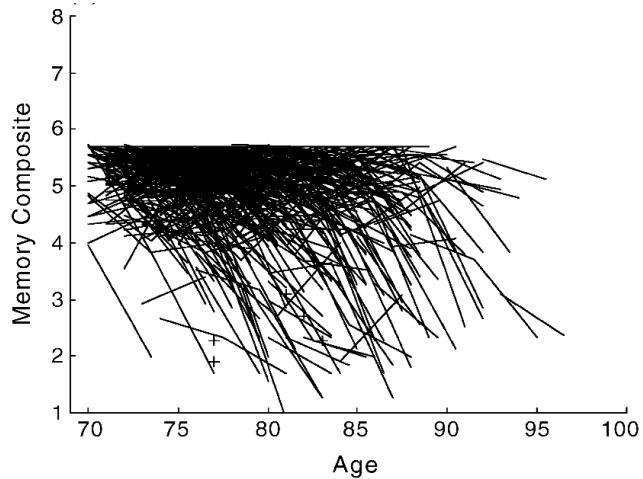


# Computerised L2 Learning in Third Age

- On children and younger adults: hundreds already in 2013  
(Sung, Chang & Yan, 2015; Burston, 2013)
- On older adults (as subjects): 1  
(Ware et al., 2017)
- No apps or software targeted at older adults
- Implementation of technology for old adults one of EU's top priorities  
(<https://ec.europa.eu/research/sam/index.cfm?pg=ageing>,  
[https://ec.europa.eu/growth/industry/policy/digital-transformation\\_en](https://ec.europa.eu/growth/industry/policy/digital-transformation_en))



## Why CALL/MALL?



Individual trajectories  
of memory (Christensen, 2001)

→ Personal and learner-centered learning opportunity with ubiquitously accessible  
and flexible practices

L2 aptitude →

“umbrella-term for a number  
of cognitive factors creating a  
composite gauge regarded as  
the general capacity to master  
a foreign language”  
(Biedron, 2015)

Experiential factors

Developmental factors

Affective reactions  
stored in memory



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## The Present Study

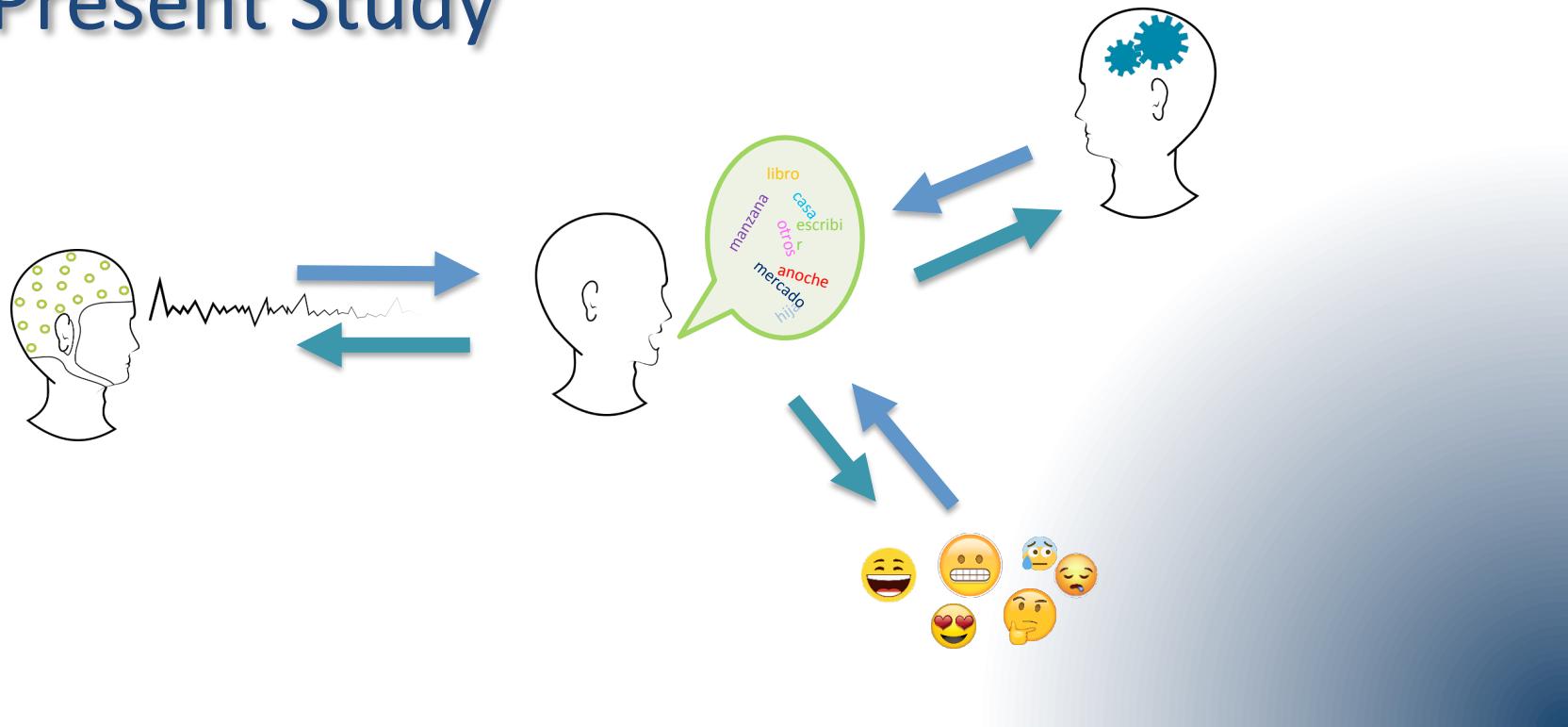


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## The Present Study





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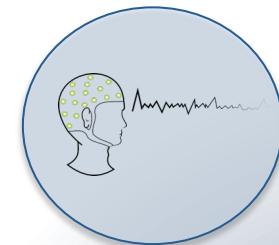
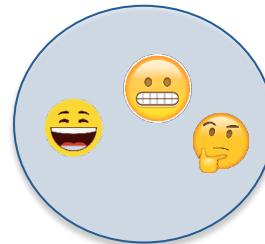
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# Study Design



duolingo

- N = 30
- Ages 64-74
- 2h/week classroom-based L2 instruction in small groups
- ~ 3h *Duolingo* at home



Week 1

Week 30



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## Why Duolingo?

- Free
- Multimodal, broad and ecologically valid
- Available for PC, Mac, Tablets & Smartphones → flexible learning
- Gamification
- *Duolingo Schools* → monitoring and homework assignment
- *"The study estimated that a person with no knowledge of Spanish would need between 26 and 49 hours (or 34 hours on average) to cover the material for the first college semester of Spanish."* (Vesselinov, 2012)



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## Training with *Duolingo*: Weekly Investment

- According to *Duolingo*: 10 XP = 5 minutes
- In reality: 10 XP = 2-3 minutes
- Homework: 450 weekly XP ~ 2-3 hours per week
- Disadvantage: Not possible to actually measure time invested



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## Training with *Duolingo*



V: Präs. 3



V. Infinit



Pers. Pron



Zahlen



New lesson

At least 3 crowns,  
i.e. repetitions

Overall practice



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# Training with *Duolingo*: Task Types

**Wähle das Wort für "die Zitrone"**

An illustration of a brown potato with some brown spots.

la papa

1

An illustration of a yellow lemon with a green leaf at the top.

el limón

2

An illustration of a red tomato with a small green stem and leaf at the top.

el tomate

3



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# Training with *Duolingo*: Task Types

**Schreibe dies in Deutsch**

Él come una **papa.**

Er    isst    eine    Kartoffel

\_\_\_\_\_

Ein    trinkst             sie

tschüss

**Schreibe dies in Spanisch**

Die Bibliothek

Auf Spanisch schreiben

↓ Á É Í Ó Ü Ú Ñ ¿ i



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# Training with *Duolingo*: Task Types



**Schreib, was du hörst**

Auf Spanisch schreiben

↓ Á É Í Ó Ü Ý Ñ ï i

A screenshot of a Duolingo listening task. It shows the instruction "Schreib, was du hörst" and "Auf Spanisch schreiben". Below is a text input field with a microphone icon and a keyboard icon. At the bottom are additional character keys: ñ, á, é, í, ó, ü, ý, ï, i.

Mikrofon anklicken und ablesen:

A screenshot of a Duolingo listening task. It shows the instruction "Mikrofon anklicken und ablesen:". To the left is a blue microphone icon button. To the right is a text input field containing the Spanish sentence "Me gusta el tren azul." with a microphone icon next to it.

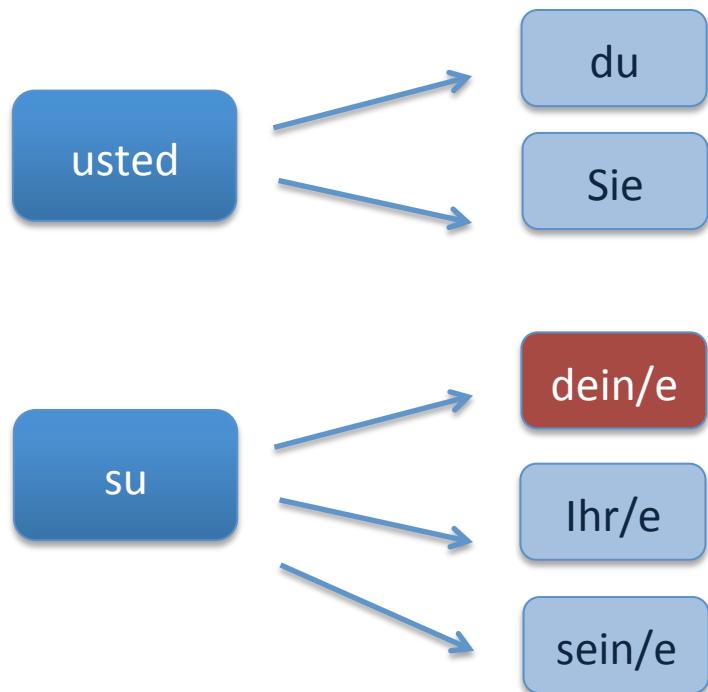


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Peninsular vs. Latin-American varieties → both treated as equal, but inconsistently



**Schreibe dies in Deutsch**

Yo llevo su vestido.

Auf Deutsch schreiben

↓ Ä Ö Ü ß



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## Measures of L2 Proficiency



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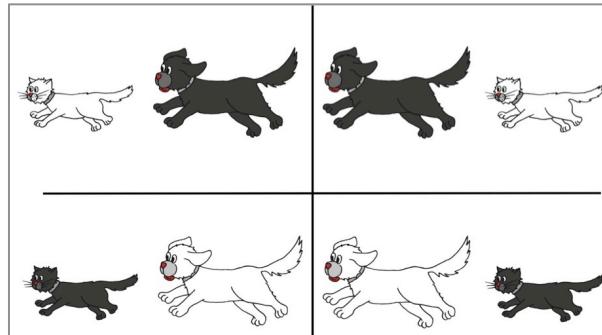
# Measures of L2 Proficiency

## Lexical receptive

venir (to come)  
entrar (to enter)  
**imaginar** (to imagine)  
ir (to go)  
volver (to return)

## Grammatical receptive

El perro que sigue al gato es negro.  
(The dog that chases the cat is black.)



## Written production (integrative)

Po\_\_\_\_ a po\_\_\_\_ el  
esp\_\_\_\_ se es\_\_\_\_  
posicionando  
fuert\_\_\_\_\_ en e\_\_\_\_  
país m\_\_ poblado d\_\_\_\_  
planeta co\_\_\_\_ la  
seg\_\_\_\_ lengua  
extra\_\_\_\_ más  
hab\_\_\_\_.

## Oral production



What were your highlights from last week?

Tell me something about a neighbour of yours.



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# Preliminary Results

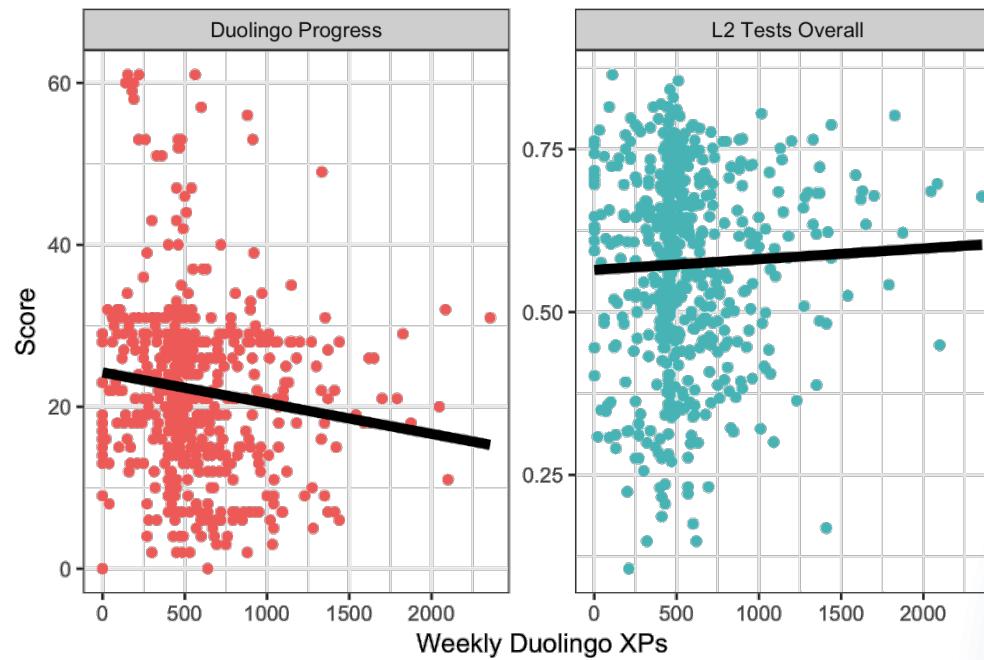


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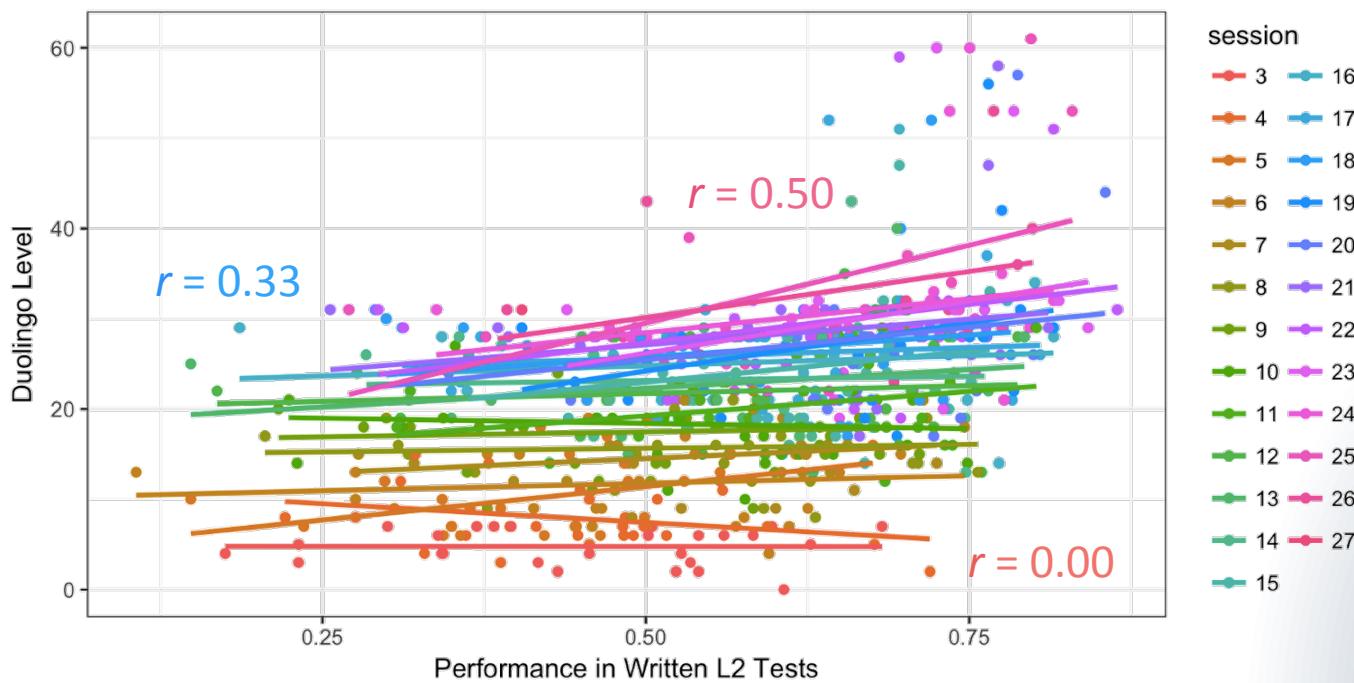
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# Weekly Investment





## Correlation with L2 Tests



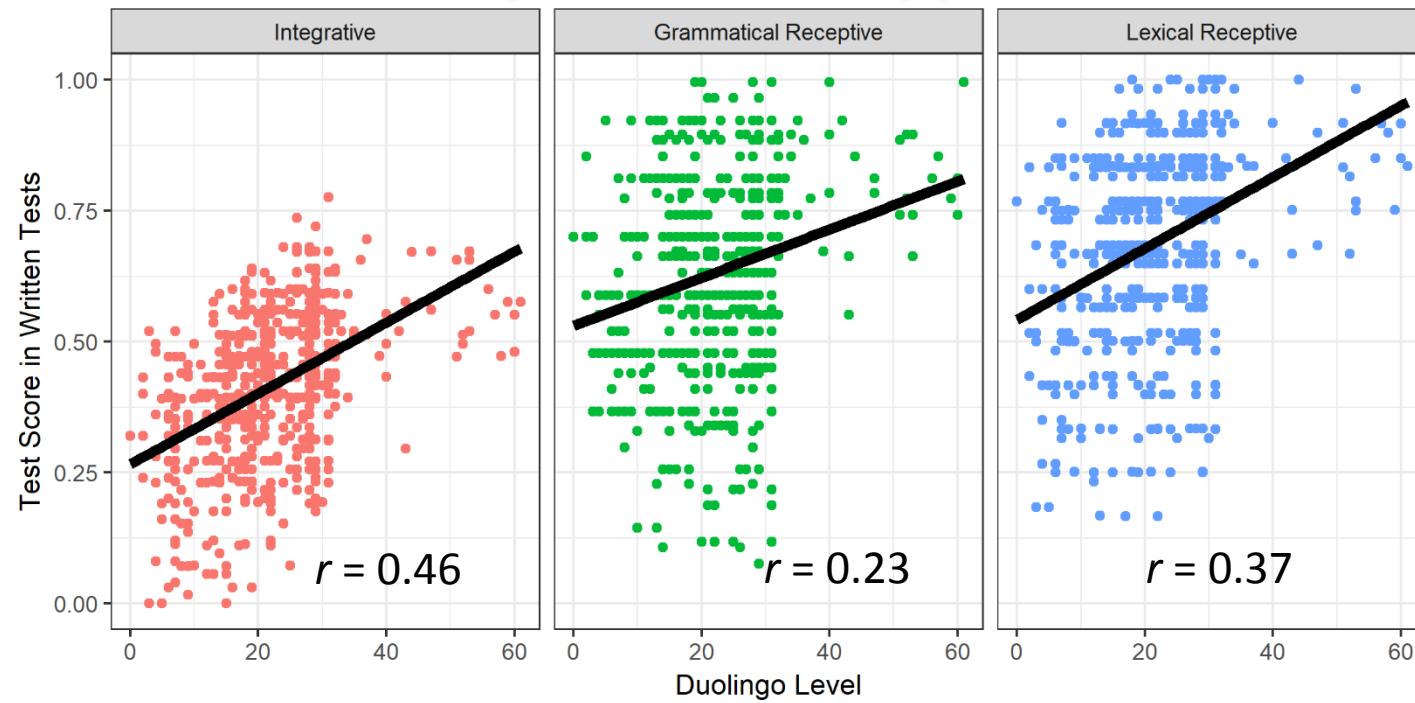


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## Correlation per Test Type





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## Teacher Feedback

Advantages	Disadvantages



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## Conclusions

- CALL is perfectly feasible with older learners
- Individual progress due to CALL
- Individual advantages of CALL increase with increasing L2 level
- *Duolingo* is motivating and facilitates multimodal learning
- Curriculum does not match that of typical classroom-based curricula
- Mix of varieties is commendable but confusing
- Appears to tap more into lexical skills than grammar



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## Appendix



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## Linear L2 Development?

