

# Running a conceptual replication of a Visual Word eye-tracking study online and offline

Probing effects in Özge et al. (2019, 2021) in German-Turkish  
heritage speakers

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# Slides available

You can download the slides at  
<https://talks.stuts.de/de/19staps/public/events/732>.

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# The predictive use of CASE



Figure 1: Experimental stimuli example

*Den Hund* wird *das Baby* bald            *lecken*.  
ART.ACC dog be.FUT ART.NOM baby soon lick.3SG  
'The baby will soon lick the dog.'

# The predictive use of CASE (cont.)

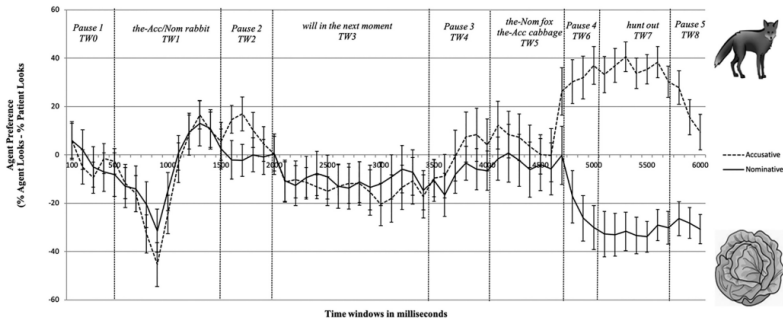


Figure 2: Gaze patterns of agent preference from Özge et al. 2021, p. 8

# The predictive use of CASE (cont.)

- 4-yo child and monolingual adult speakers of German and Turkish use CASE predictively (Özge et al., 2021; Özge et al., 2019)
- subject and object are assigned based on CASE-marking
- agent and patient are assigned based on CASE-marking
- case-marking facilitates reading times and accuracy (Ergin & Stromswold, 2022)

# The case of heritage Turkishes

- Languages change at a faster rate when they are in contact  
(Trudgill, 2020)
- Can heritage speakers use CASE predictively too?
- Maybe not because of
  - language contact effects
  - no standardized input (e.g., no formal education in the heritage language)
  - faster drive of language-internal dynamics

## Define *heritage language*

- A language acquired at home in a society where it is not the majority language (Lohndal et al., 2019)
- Language contact between heritage and majority languages is ubiquitous, in most cases, both in individual linguistic repertoires and in the speech community
- **We focus on Turkish as a heritage language in Germany (and the U.S.)**



# Predictions I

- 1 Based on Özge et al. (2019, 2021), we predict that our monolingual Turkish-speaking participants will use case-marking predictively to determine thematic roles in non-canonical sentences using the VWP.
- 2 Heritage speakers of Turkish will be also able to use case-marking predictively to determine thematic roles in incremental sentence-processing of SOV and OSV sentences.
- 3 Based on Özge (2021), heritage speakers of Turkish in Germany will be able to use case-marking predictively in their majority German to determine thematic roles in incremental sentence-processing of SOV and OSV sentences.

# Predictions II

- ④ Consequently, speaker group (monolingual vs. heritage) and language (German vs. Turkish) will not be significant predictors for speakers' capability to use case-marking to predict thematic roles.
- We further test whether the effects found in Özge et al. (2019) and Özge et al. (2021) can be replicated using online eye-tracking vs. in-lab eye-tracking.
- ⑤ With recent advances in webcam-based eye-tracking in mind, we expect a replication across elicitation modes although a less nuanced effect will show for online eye-tracking.

# Visual Word Paradigm

- "measure overt looking to multiple, clearly separable referents (represented as pictures or real objects)" (Sekerina et al., 2016, p. 3)

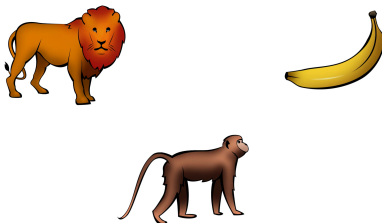


Figure 3: Experimental stimuli example

*Komik maymunu şuradaki aslan birazdan ısıracak.*  
funny monkey-ACC there lion.NOM soon bite

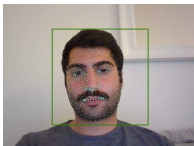
'The lion will soon bite the funny monkey over there.'

# Webcam-based eye-tracking I

- PCIBex (Schwarz & Zehr, 2021)
- Demo link for experiments:
  - German: <https://farm.pcibex.net/r/gcwFgV/>
  - Turkish: <https://farm.pcibex.net/r/TBYfaT/>



# Webcam-based eye-tracking II



I'm ready. Start calibration



Figure 4: Pre-calibration page for webcam-based eyetracker

# Webcam-based eye-tracking III



Figure 5: Calibration check page for webcam-based eyetracker

# Lab-based eye-tracking

- Hardware: Tobii Pro Fusion
- Software: Tobii Pro Lab
- Sampling frequency: 60 Hz (~every 17ms)

# Participants (target)

Language	Group	Webcam-based	Lab-based
German	Monolinguals	30	30
	Bilinguals	30	30
Turkish	Monolinguals	30	30
	Bilinguals	30	30

- Özge et al. (2021, 2019) had ~ 20-40 participants



# Analysis

- R (R Core Team, 2020)
- cleaning and preprocessing: tidyverse (Wickham et al., 2019)
- GLMM (Bates et al., 2015) or GAMM (Miwa & Baayen, 2021)
- Dependent variable: Agent Preference
- Independent variables:
  - Word order (SOV / NOM-ACC-V vs. OSV / ACC-NOM-V)
  - Language (German vs Turkish)
  - Mode (webcam-based vs lab-based)
  - Group (heritage vs monolingual)

# Preregistration

- Facilitates transparency, reproducibility (Mertzen et al., 2021)
- Avoid HARKing (Hypothesizing After the Results are Known) (Kerr, 1998)
- Different ways to preregister (Roettger, 2021)
  - Repository, e.g., OSF or AsPredicted
  - Registered Report, e.g., in Language Learning and Bilingualism: Language and Cognition
- Our non-peer-reviewed preregistrations:
  - Experiment 1: <https://aspredicted.org/8B7565>
  - Experiment 2: [https://aspredicted.org/JXF\\_D2V](https://aspredicted.org/JXF_D2V)
- Based on 9 Questions on AsPredicted.org
- More detailed on OSF Preregistration

# Ethics approval

- May be required by:
  - Funding agencies, e.g., DFG or ERC
  - Most journals
- For experimental linguistics in Germany:
  - Ethikkommission der DGfS (ethics committee of the DGfS)
- Options: Write out full protocol (for studies with children or invasive methods) or use form (for studies with healthy adults)
- Minimum requirements: Data protection statement, consent form, participant information, questionnaire(s)

# Replication crisis in linguistics I

- Replication crisis in linguistics (Sönning & Werner, 2021)
- Types of replication studies (Kobrock & Roettger, 2022)
  - Direct (0 variables change)
  - Partial (1 variable changes)
  - **Conceptual** (2 or more variables change)
- Replications in experimental linguistics are still rare
- Replication in non-English languages are even rarer

## Preliminary conclusions

- Drawing a bigger picture of all the requirements of a project at the beginning will save time, energy and resources in the long run
- Preregistration makes study design and analysis easier on the long term
- Replication is possible, publishable and can include *innovation*
- Online methods can facilitate replication

## Next steps





- Data collection in Germany and Turkey and in the Cloud
- Finish data analysis script
- Submit initial results to conferences

# Teşekkür ederim!

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