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MOTIVATION

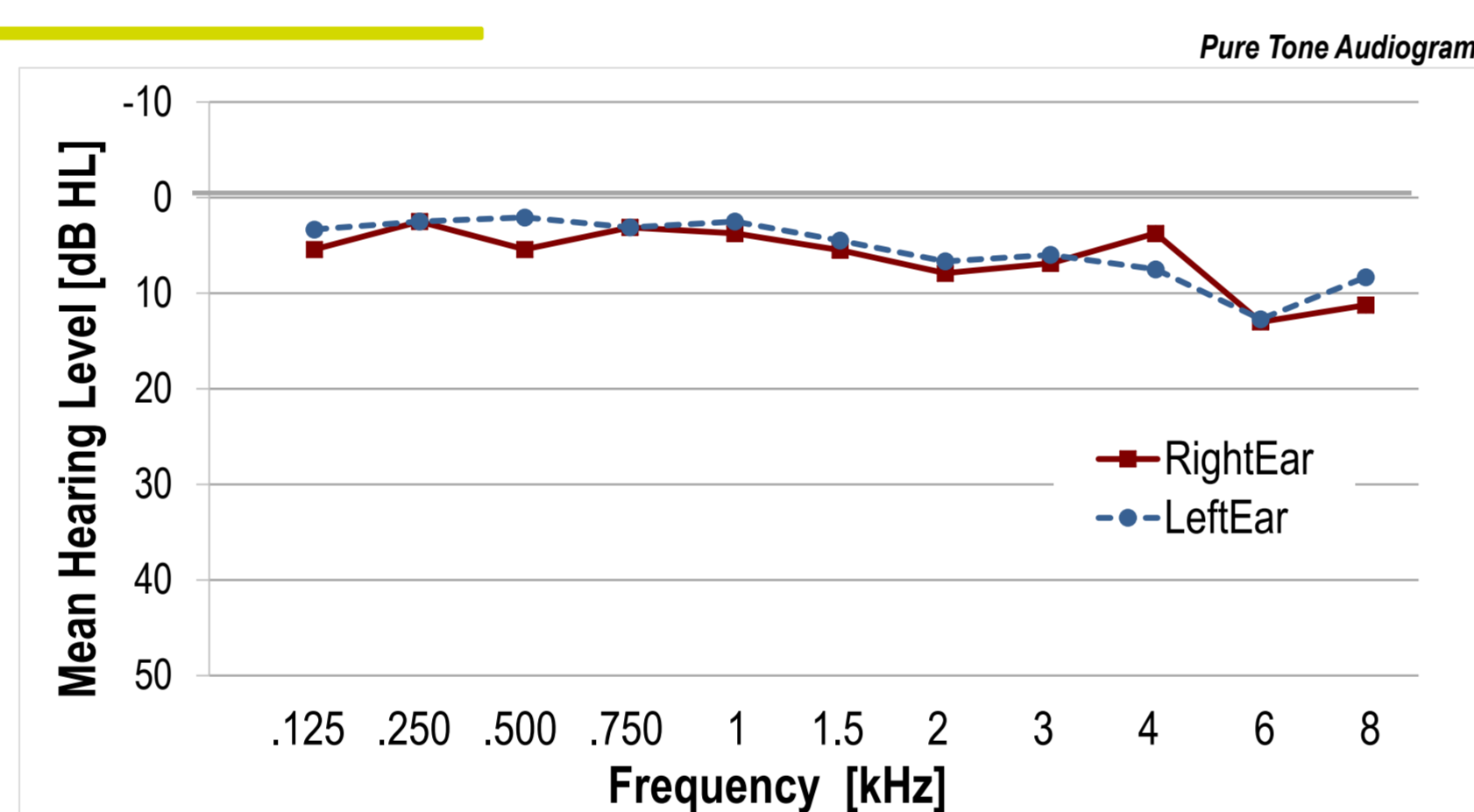
- **Vocabulary size** has been considered a useful measure of linguistic skills, and a **strong predictor** for speech intelligibility scores. **Benard et al. (2014)**, for instance, found significant correlations of lexical knowledge (PPVT) and intelligibility scores of Dutch Versfeld sentences (Versfeld et al., 2000).
- One **reason** for such a correlation: A large lexicon requires more fine grained **discriminatory knowledge**, both semantic and phonetic.
- **Word recognition** and **lexical access** should be more efficient, and consequently **faster**.
- **Research Questions:**
 - I. Is vocabulary size and lexical knowledge **equally correlated** with speech intelligibility scores **in different acoustical settings**?
 - II. Is **word recognition time** a sensible correlate for speech in noise scores?
 - III. Can the correlations of vocabulary size and interrupted speech observed by **Benard et al. (2014)** be replicated in a **German setting**?

METHOD

- Speech intelligibility scores using Göttingen Sentence Test (GÖSA; Kollmeier & Wesselkamp, 1997)
- Presentation via Earbox 3.0, RME Fireface UCX, Sennheiser HDA 200 circumaural headphones in sound attenuated booth
- 3 Tests of lexical knowledge

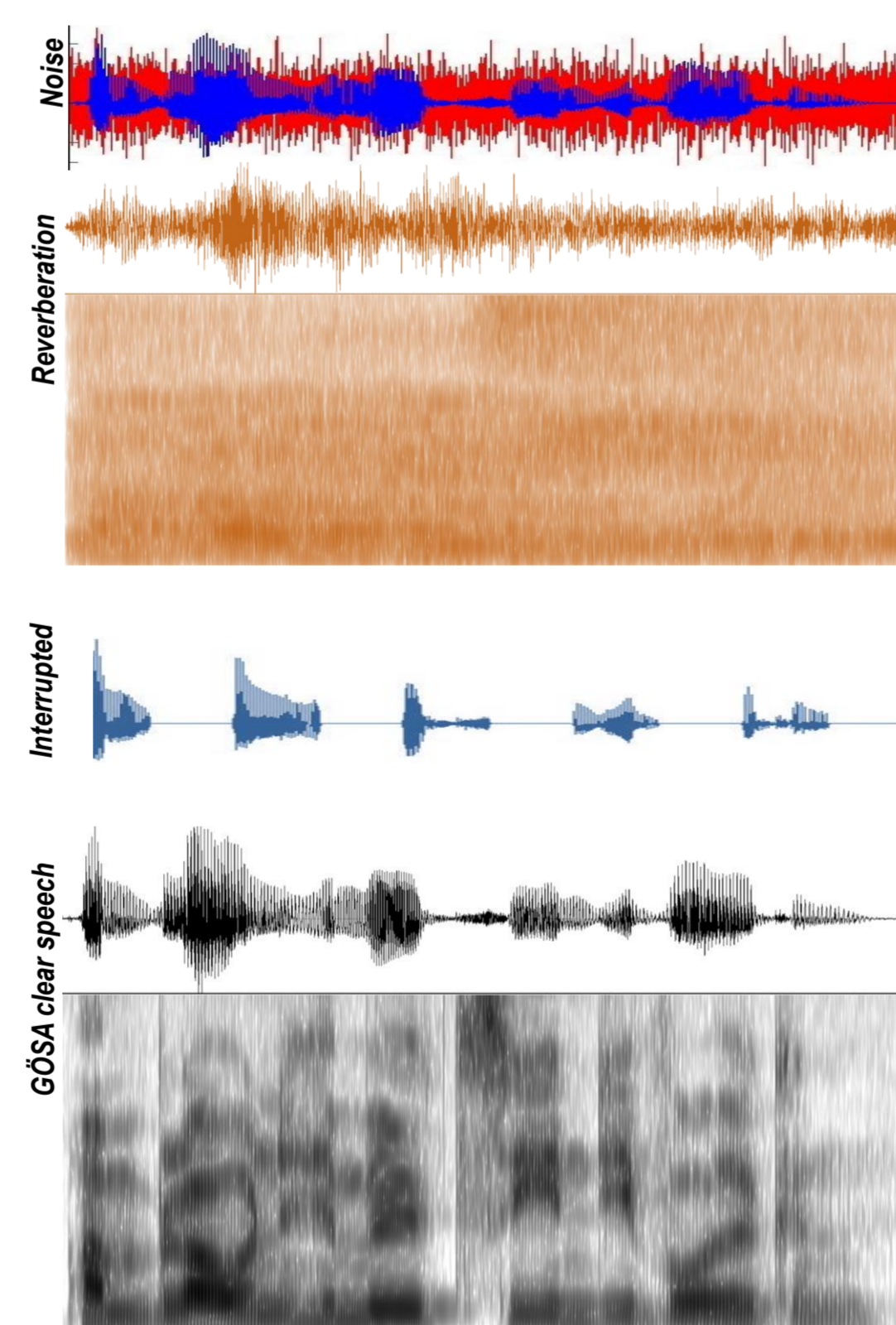
Participants

- 12 Listeners
- 20-34 yrs (ø 26.6); 9 ♀ 3 ♂
- Native speakers of German
- Normal pure tone hearing thresholds



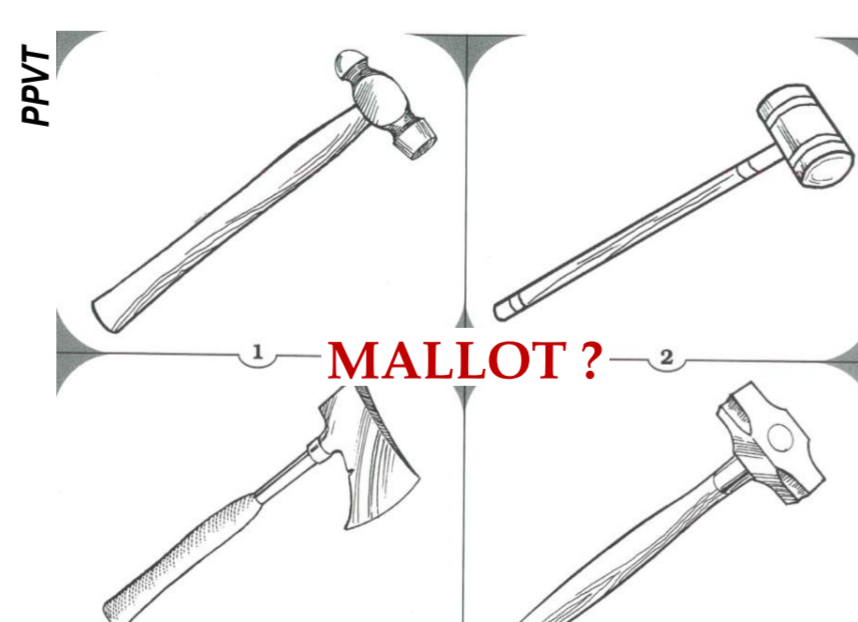
Acoustical Manipulations

- **GÖnoise:** GÖSA sentences with original noise, -6 dB SNR
- **Reverb:** GÖSA sentences with reverberation, 4.1 sec reverberation time
- **RevNoise:** GÖSA sentences with reverberation (3.25 sec) and noise (7 dB SNR)
- **Interrupted:** GÖSA sentences with an interruption rate of 2.5 Hz
- SNR & reverberation times set to provide comparable SRTs, based on STI (0.3)
- Interruption rate as used by Benard et al. (2014)



Lexical Knowledge Tests

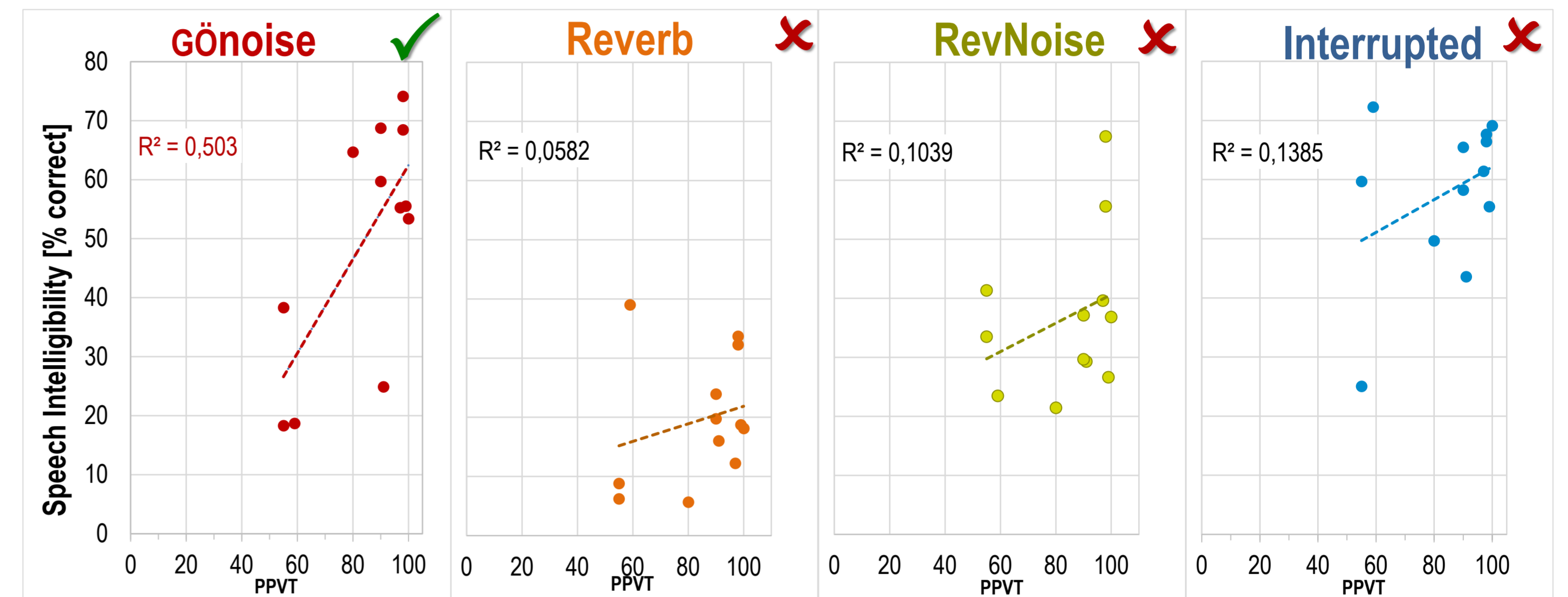
- **PPVT:** German version of Peabody Picture Vocabulary Test (Buhlheller & Häcker, 2003)
- **WST:** Standardized Vocabulary Test (Schmidt & Metzler, 1992)



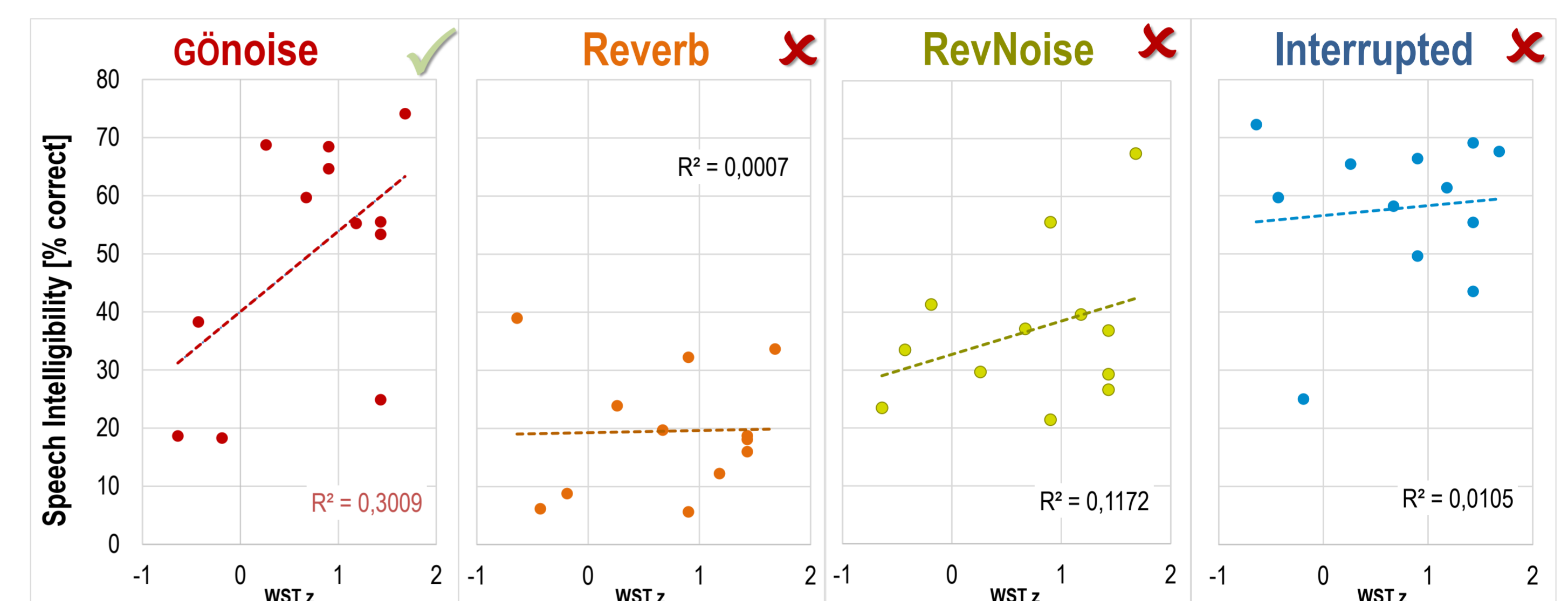
Example: ~~Tortur~~ - Rutsur - Torastal - Turtos - Korut - Tektorb

- **Word Recognition Time:** Lexical Decision Test I (RTΔ Non-word – Word)
- **Lexical Decision Test II:** Frequency effect: (RTΔ Low freq. – High freq. Words)

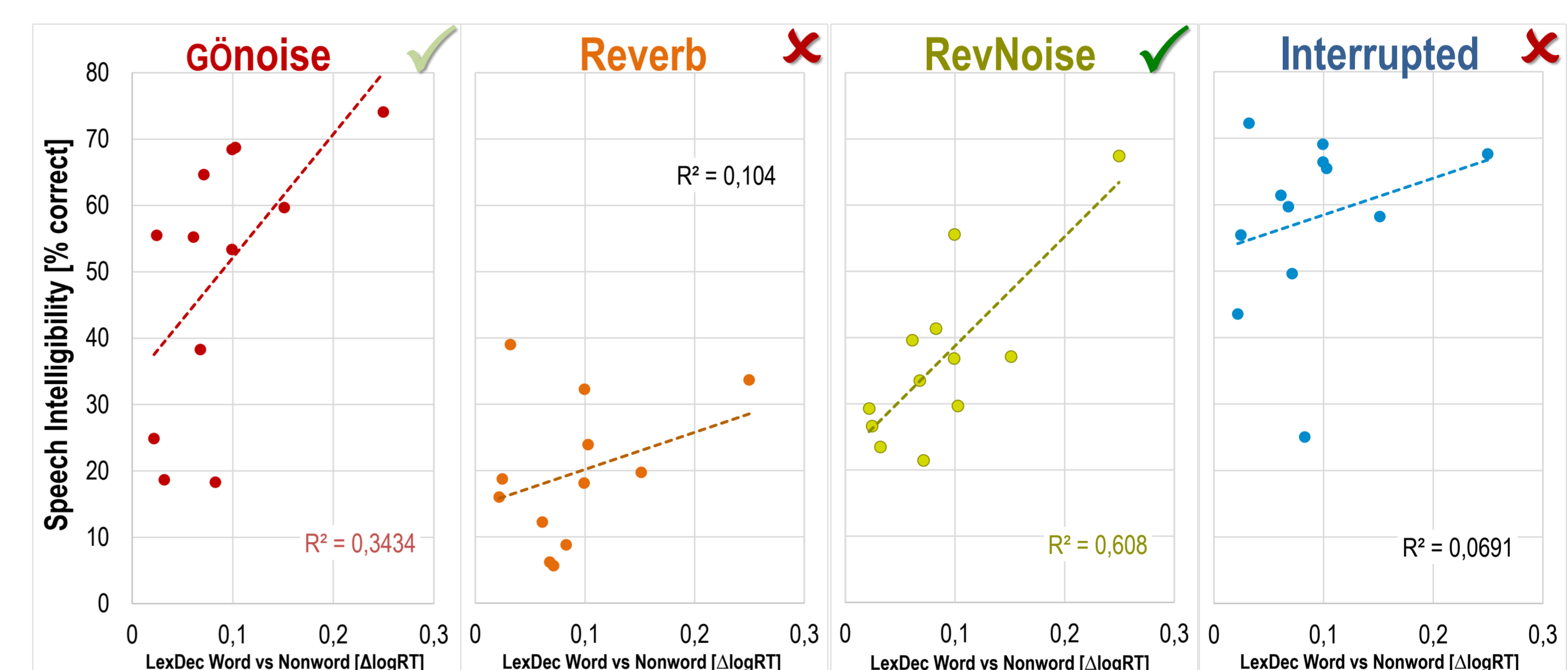
RESULTS I: PPVT



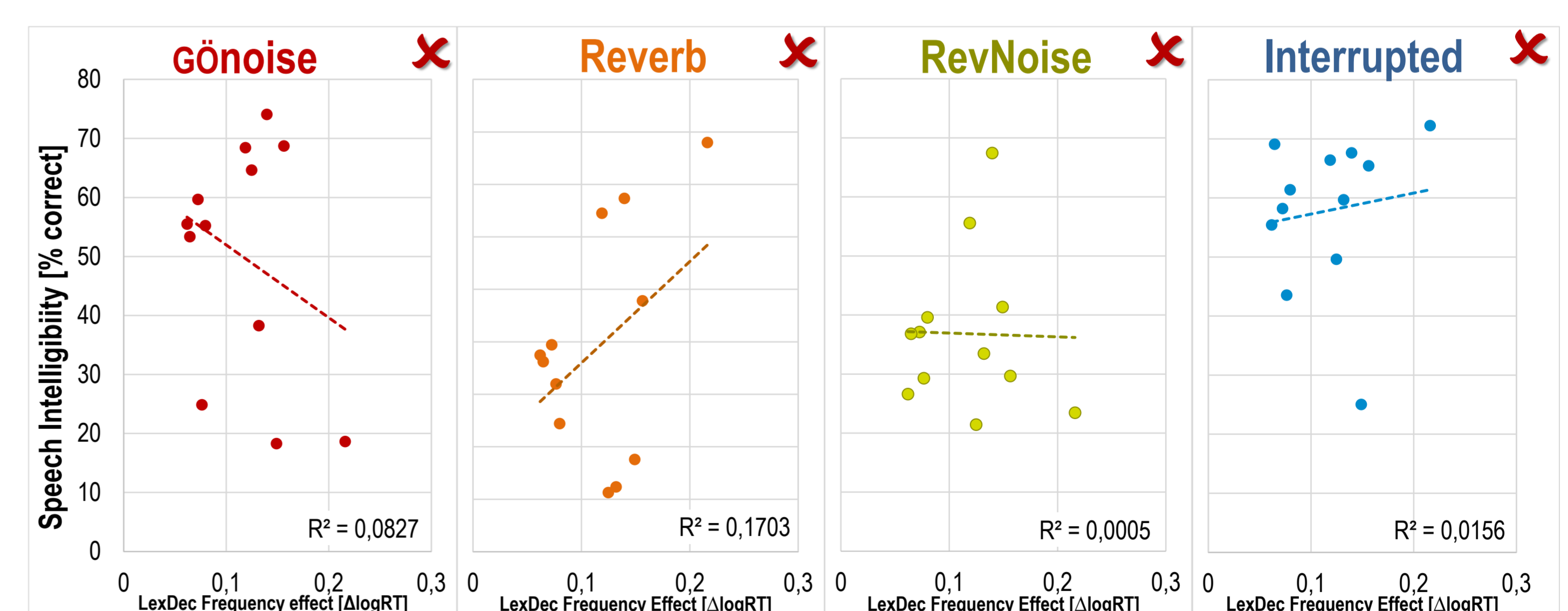
RESULTS II: WST



RESULTS III: WORD RECOGNITION TIME (LexDec)



RESULTS IV: FREQUENCY EFFECT (LexDec II)



SUMMARY

- I. Different acoustical **listening conditions** vary in their correlations with lexical knowledge
 - Correlations of GÖSA intelligibility scores with
 - ✓ **PPVT** – but only for original **gönoise condition**, NOT interrupted speech
 - ✓ **WST** – but only weak, for **gönoise condition**
 - ✓ **Word Recognition Time** (LexDec I) – **Positive (!!!)** correlation with **RevNoise** condition, weaker correlation for **gönoise** condition
 - II. **Word recognition time** appears to depend on acoustic situation
 - III. **No replication** of Benard et al.'s (2014) findings for interrupted speech in German
- **Listeners are differentially affected** by various acoustical conditions

REFERENCES

Benard, M.R., Mensink, J.S., & Baskent, D. (2014). Individual differences of interrupted speech: Links to linguistic and cognitive abilities. *J Acoust Soc Am Expr Letters*, 135, EL88-EL94.

Buhlheller, S., & Häcker, H.O. (2003). Deutschsprachige Fassung des PPVT-III für Jugendliche und Erwachsene. [German version of the PPVT-III for adolescents and adults]. Frankfurt: Swets Test Services.

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Schmidt, K.-H., & Metzler, P. (1992). Wortschatztest (WST). Weinheim: Beltz Test GmbH.

Versfeld, N.J., Daalder, L., Festen, J.M., & Houtgast, T. (2000). Method for the selection of sentence materials for efficient measurement of the speech reception threshold. *J Acoust Soc Am*, 107, 1671-1684.