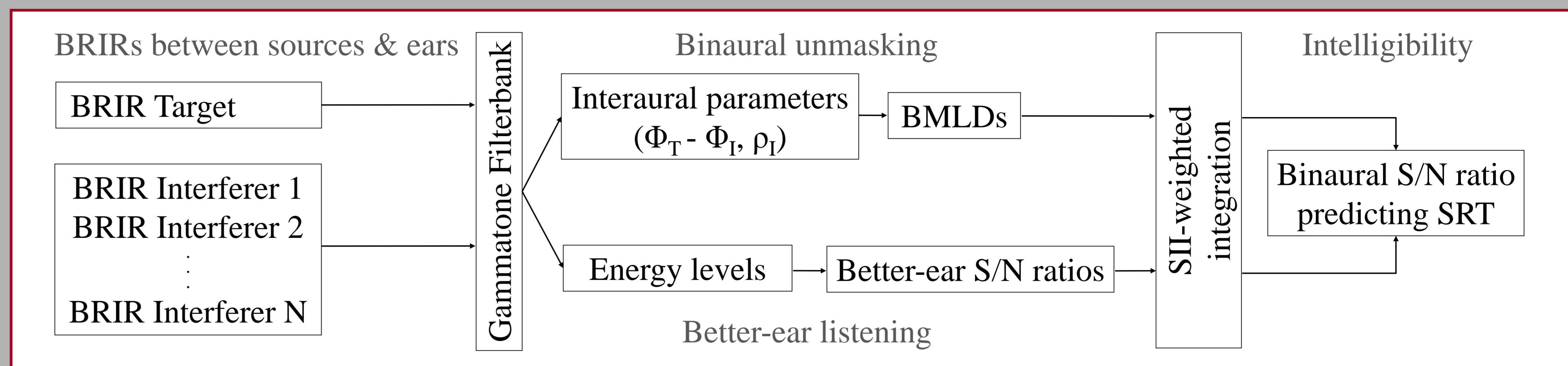


Model*

BRIR: binaural room impulse response
BMLD: binaural masking level difference
 Φ : interaural phase difference
 ρ : interaural coherence
S/N ratio: signal-to-noise ratio
SII: speech intelligibility index
SRT: speech reception threshold

* computationally efficient version of Lavandier & Culling (2010) model



Predictions in anechoic*

Noise interferers and frontal target sentences in all experiments

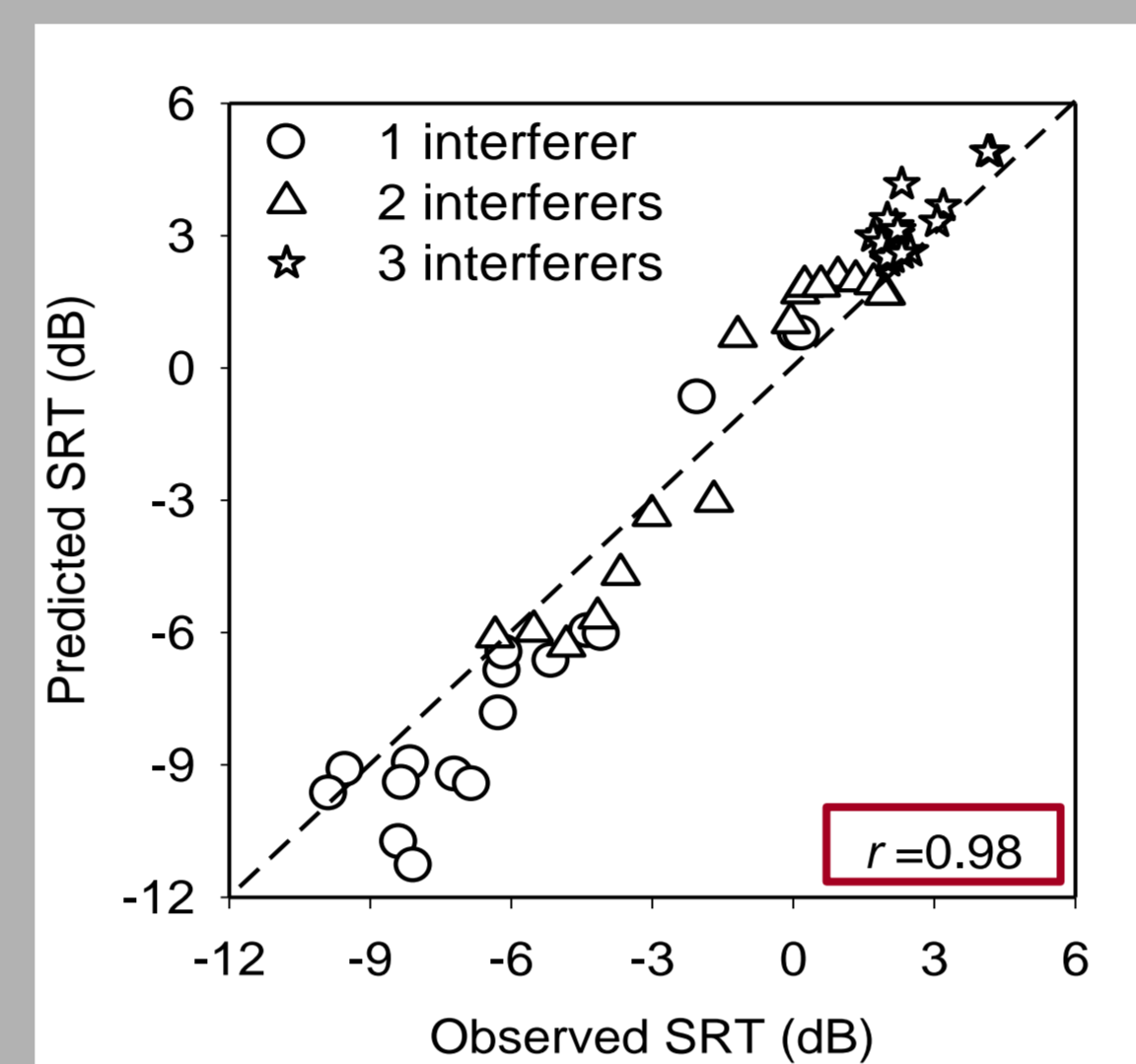
Anechoic => head-related impulse responses (HRIRs) instead of BRIRs for the predictions

When original HRIRs not available (P&K1997, Hal.2004, B&P1988) => HRIRs from Gardner and Martin (1994)

* Jelfs et al. (2011), Hear. Res. (in press)

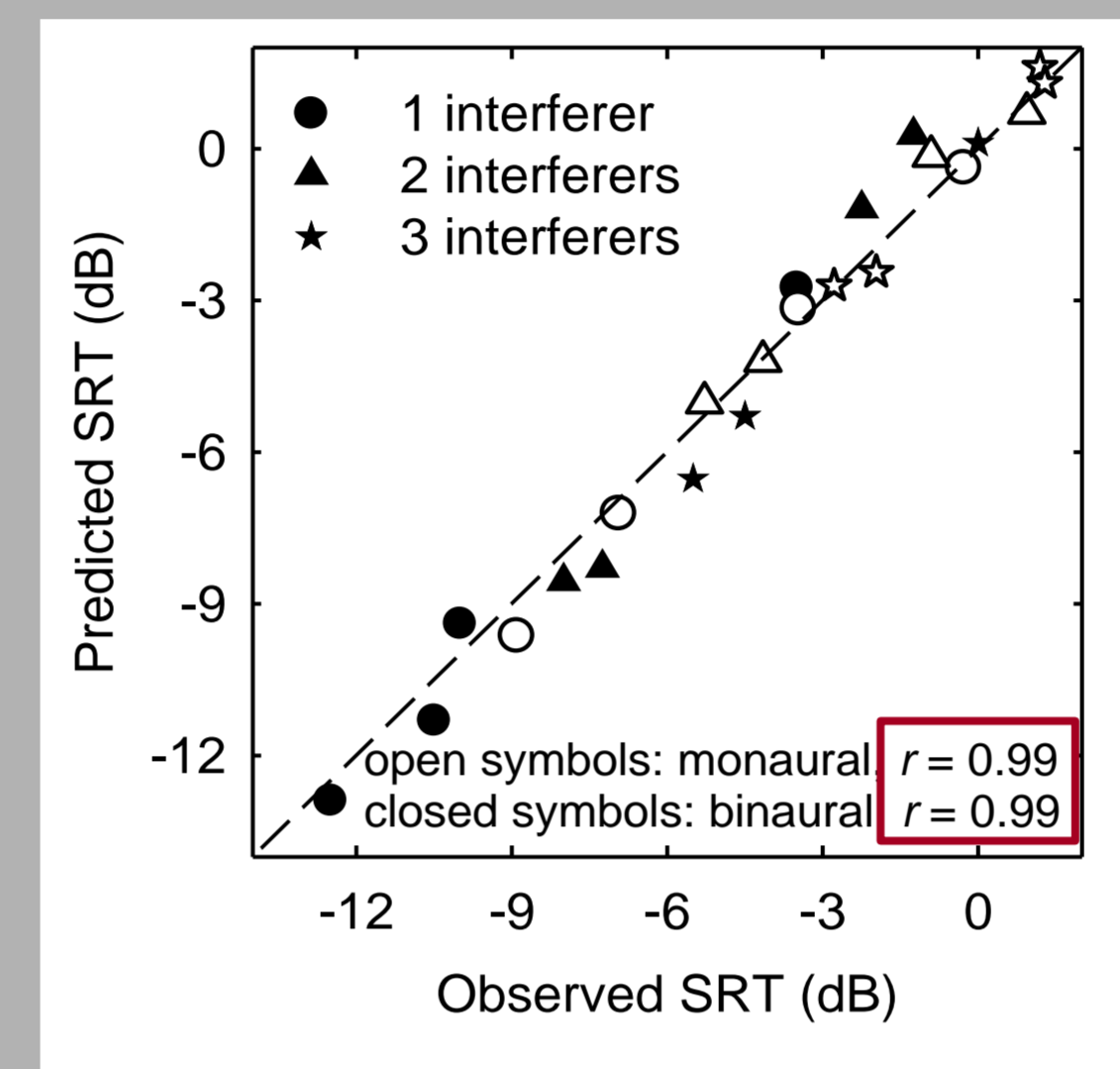
Peissig & Kollmeier (1997)

- Subjective adjustment procedure in **German**
 - **Interferers: one** (17 azimuths between 0° and 360°), **two** (17 az.+105°), or **three** (17 az.+105°+255°)



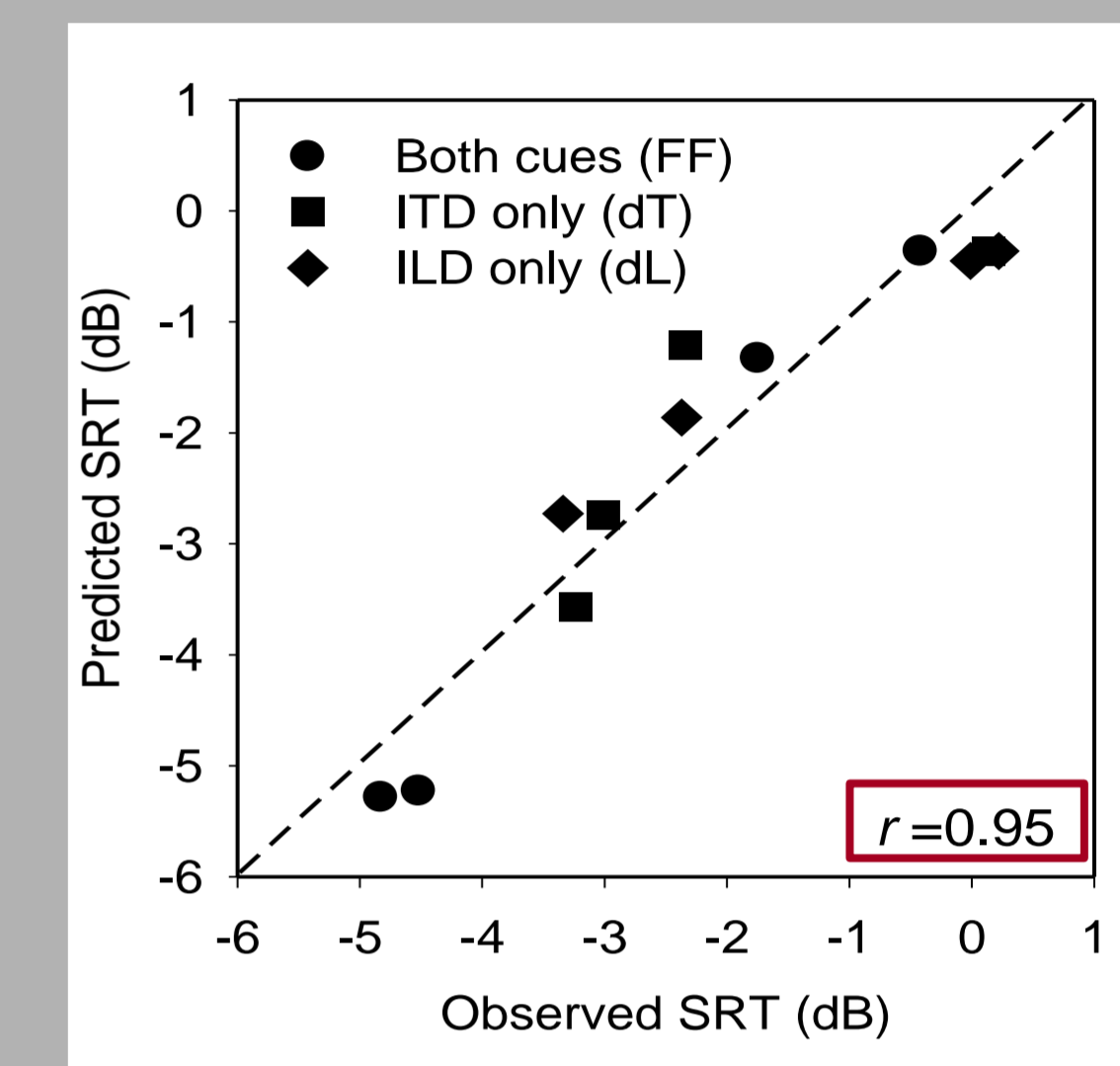
Hawley et al. (2004)

- Adaptive procedure in **English**
 - **One, two or three interferers** at one, two or three of a range of azimuths (-30°, 0°, 30°, 60° and 90°)
 - **Binaural and monaural listening**



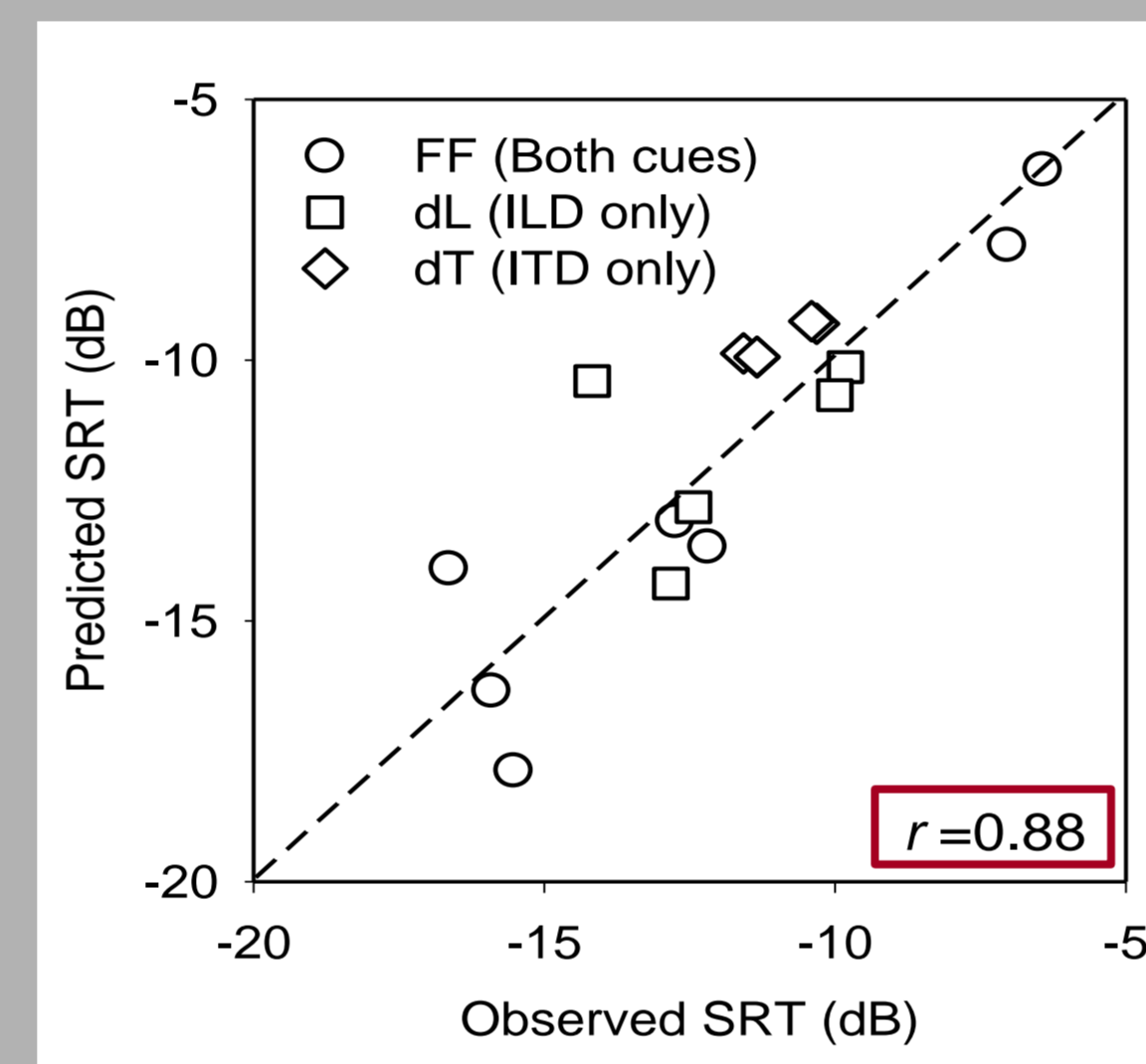
Culling et al. (2004)

- Same as Hawley et al. (2004) with **three interferers**
 - Conditions with both cues (FF), **no binaural unmasking** (ILD-only) or **no better-ear listening** (ITD-only)

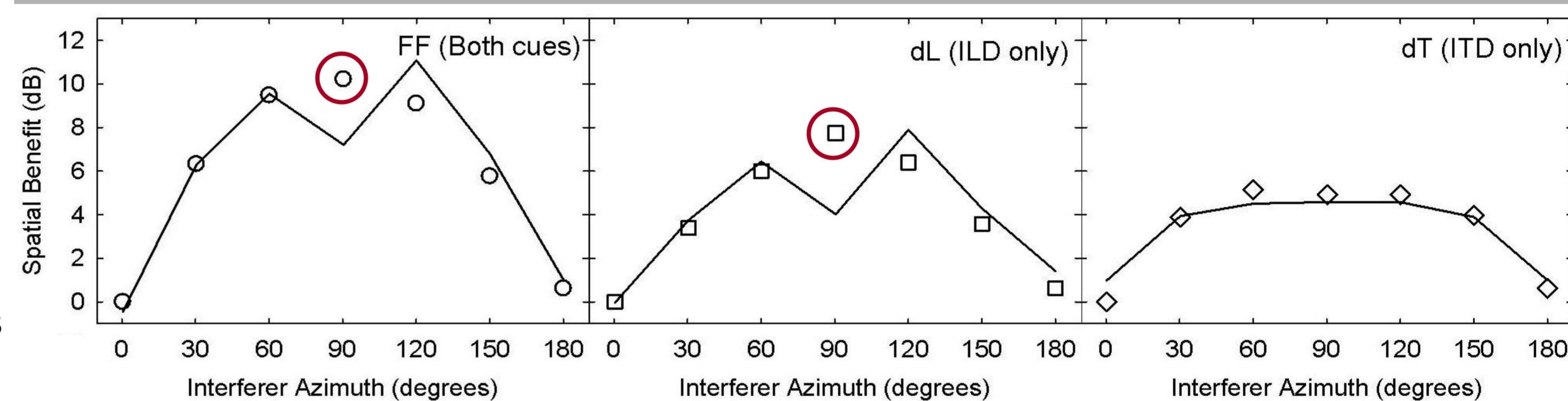


Bronkhorst & Plomp (1988)

- Adaptive procedure in **Dutch**
 - **One interferer** at 0°, 30°, 60°, 90°, 120°, 150°, or 180°
 - Conditions with both cues (FF), **no binaural unmasking** (dL) or **no better-ear listening** (dT)



Main discrepancy associated with a HRIR difference at 90°



Predictions in reverberation*

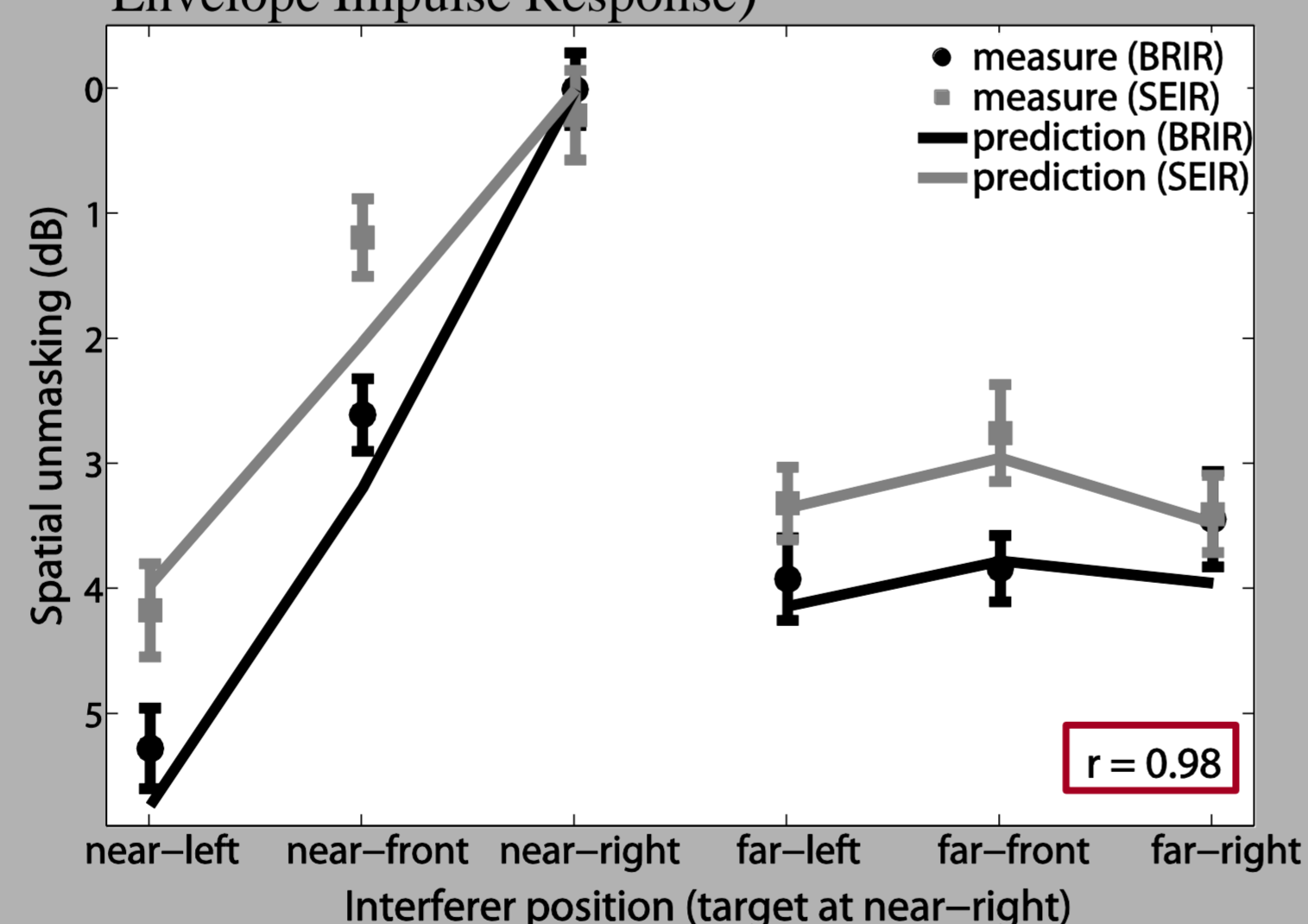
Noise interferers, target sentences and real-room BRIRs in all experiments

Adaptive procedure in **English** (except B&B2006)

* Lavandier et al. (2011), J. Acoust. Soc. Am. (under review)

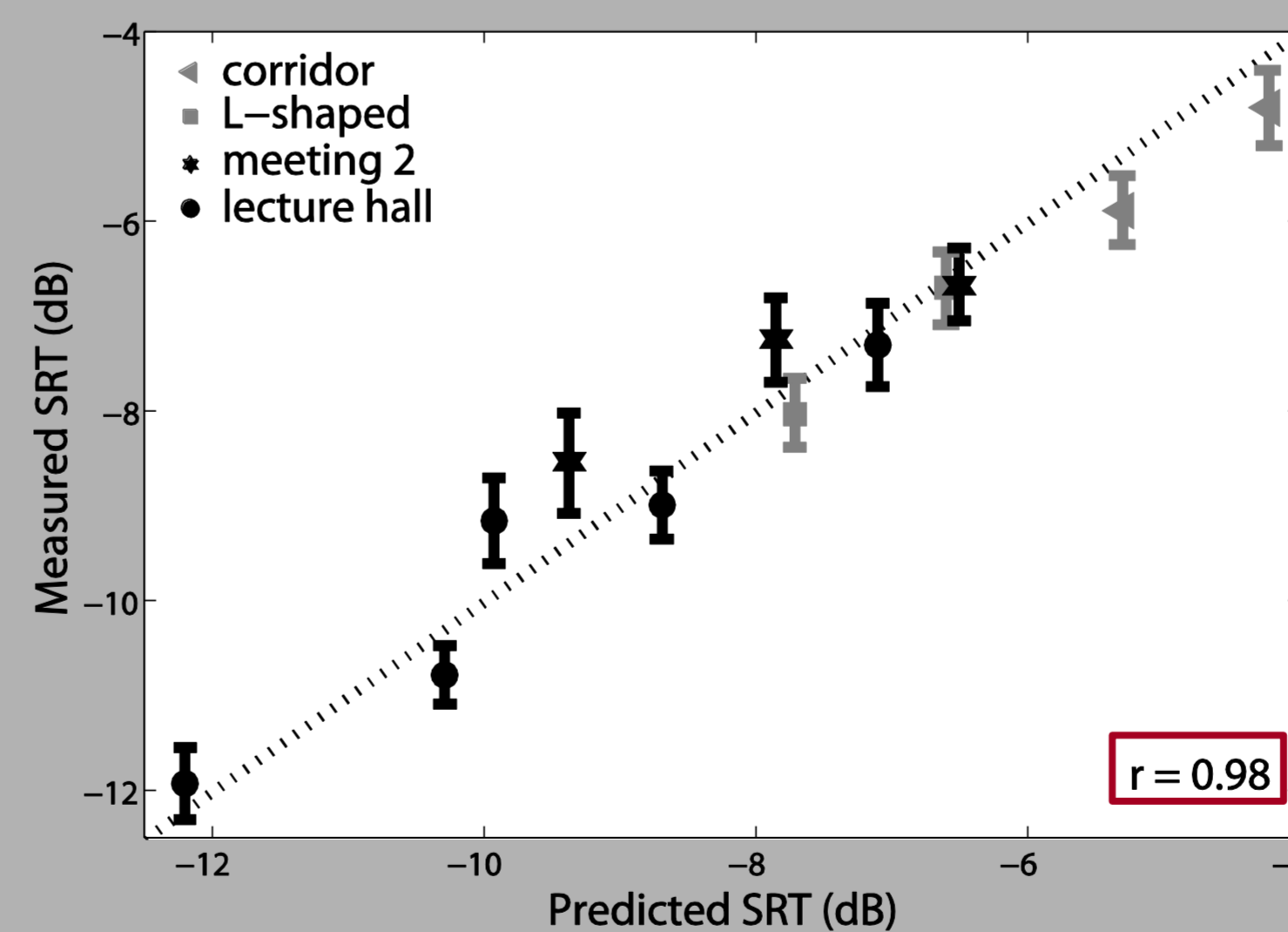
Experiment 1

- **One interferer** at three azimuths (-25°, 0° or 25°) and **two distances** (0.65 or 5 m), and a target at (25°, 0.65m)
 - Meeting room 1
 - Conditions with both cues (BRIR) or **no binaural unmasking** (SEIR for Spectral Envelope Impulse Response)



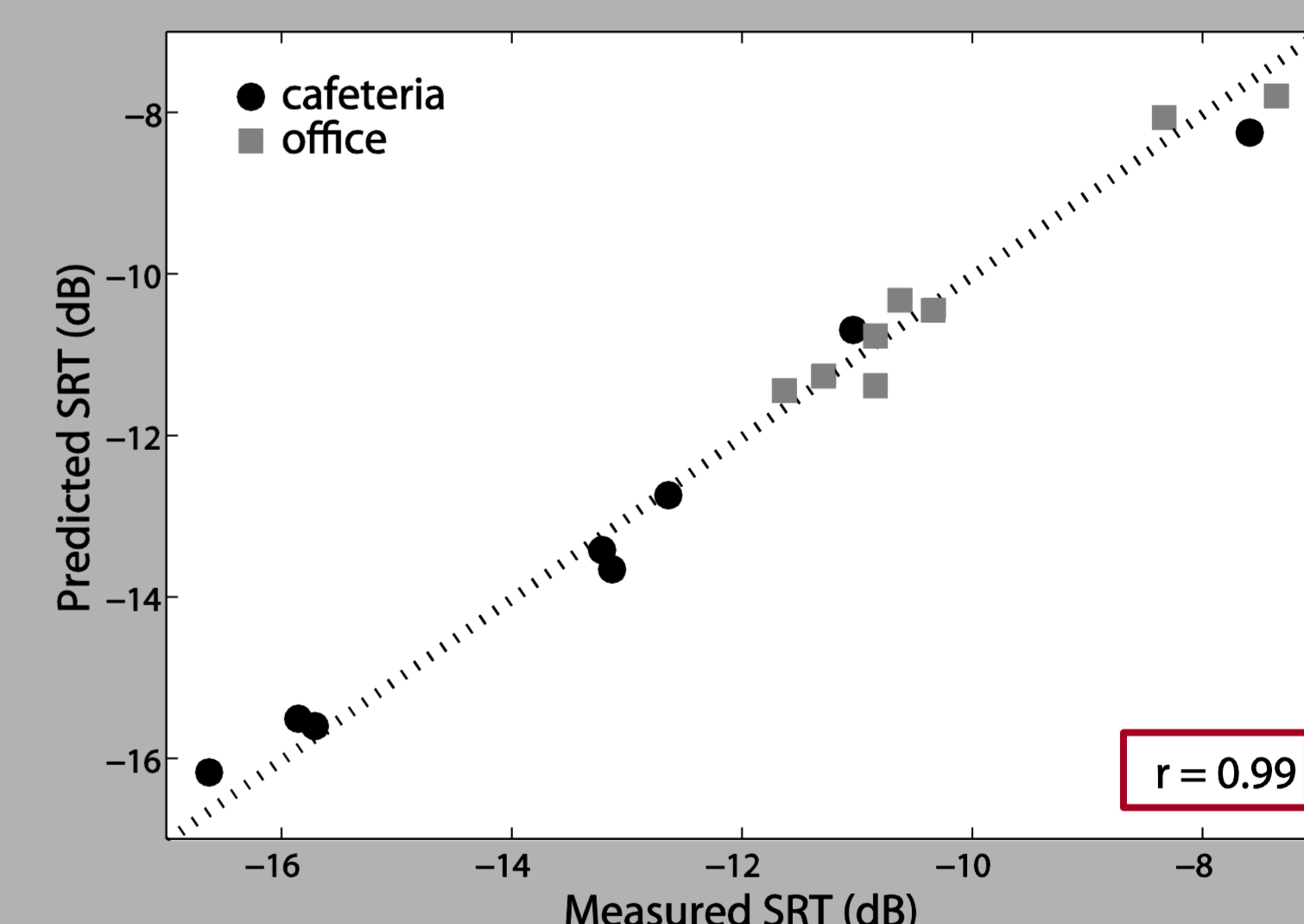
Experiment 2

- **One interferer** in 12 selected conditions involving three azimuths (-25°, 0° or 25°), **5 distances** (0.65, 1.25, 2.5, 5 and 10 m) and **4 rooms** (corridor, L-shaped, lecture hall, meeting 2)



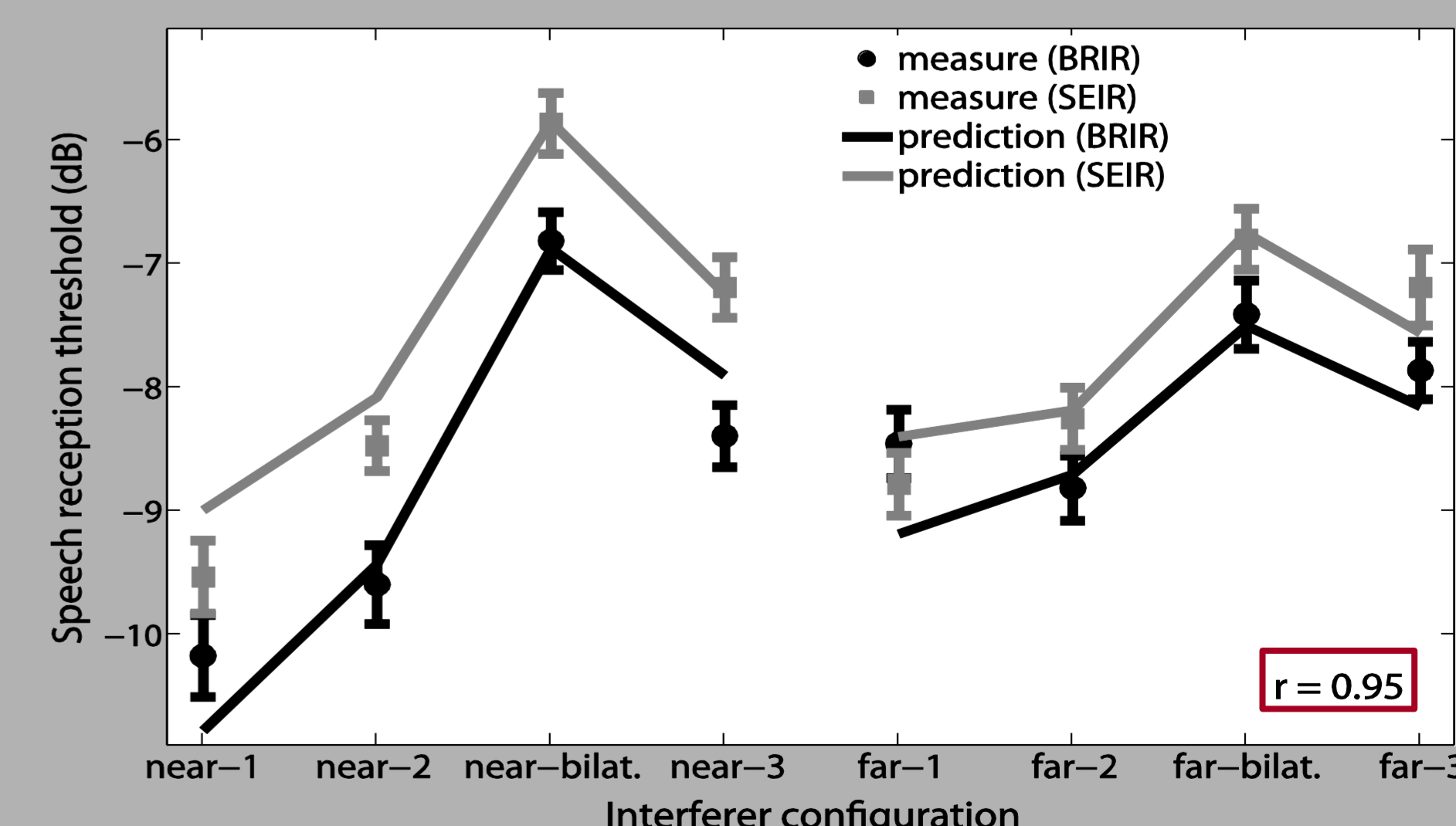
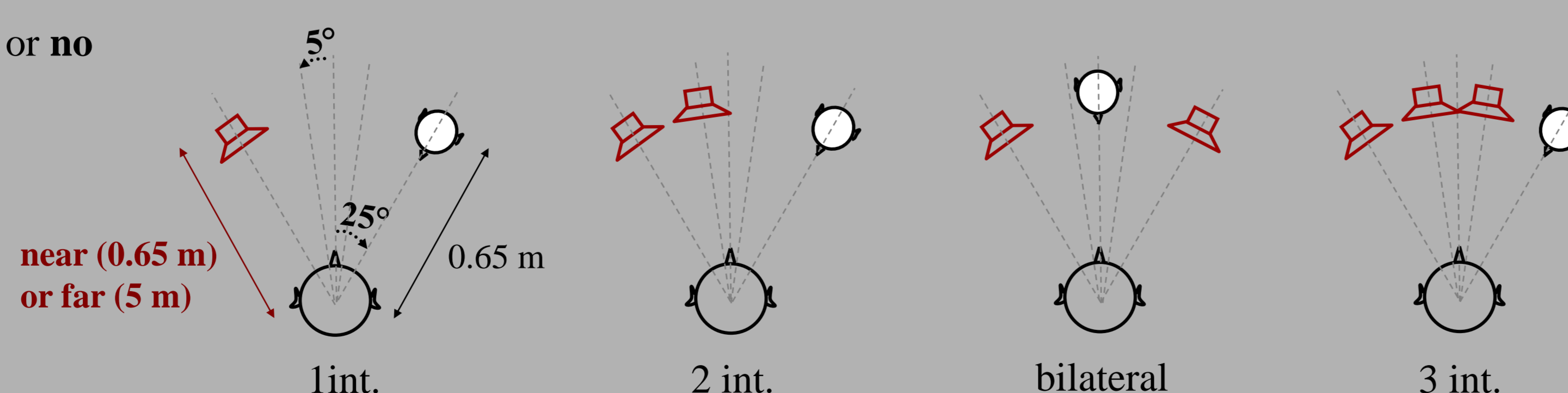
Beutelmann & Brand (2006)

- Adaptive procedure in **German**
 - **One interferer** (8 azimuths between -140° and 180°) and a frontal target
 - **Two rooms** (cafeteria, office)



Experiment 3

- **One, two or three interferers** in 4 configurations (see below) at **two distances** (0.65 or 5 m)
 - Meeting room 1
 - Conditions with both cues (BRIR) or **no binaural unmasking** (SEIR)



Conclusions

- model predicting **speech reception thresholds** in combined noise and reverberation
- accounts for the effects of **binaural unmasking**, **head-shadow** and **room colouration**
- for **multiple interfering sources** and **real-room** acoustics
- reproduces a **range of data sets** from the literature (≠ languages and procedures)
- **without parameter fitting**