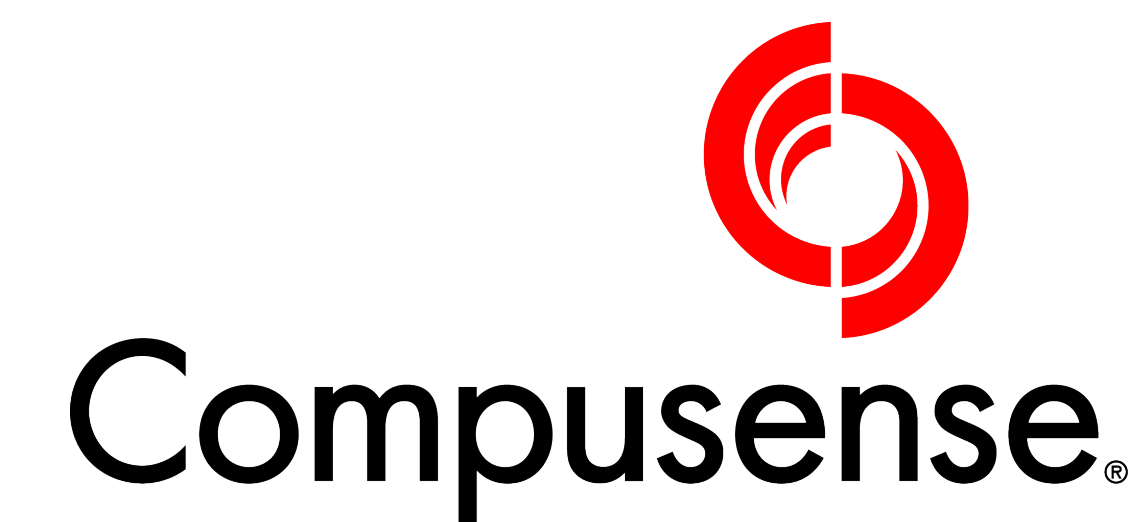# Equivalence Bounds for Sensory Applications Based on Consumer Product Evaluation

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Aim

Can the τ estimate obtained from Same-Different data serve as an equivalence boundary when conducting equivalence tests? If so, can it contextualize d' estimates obtained from the Tetrad test method?
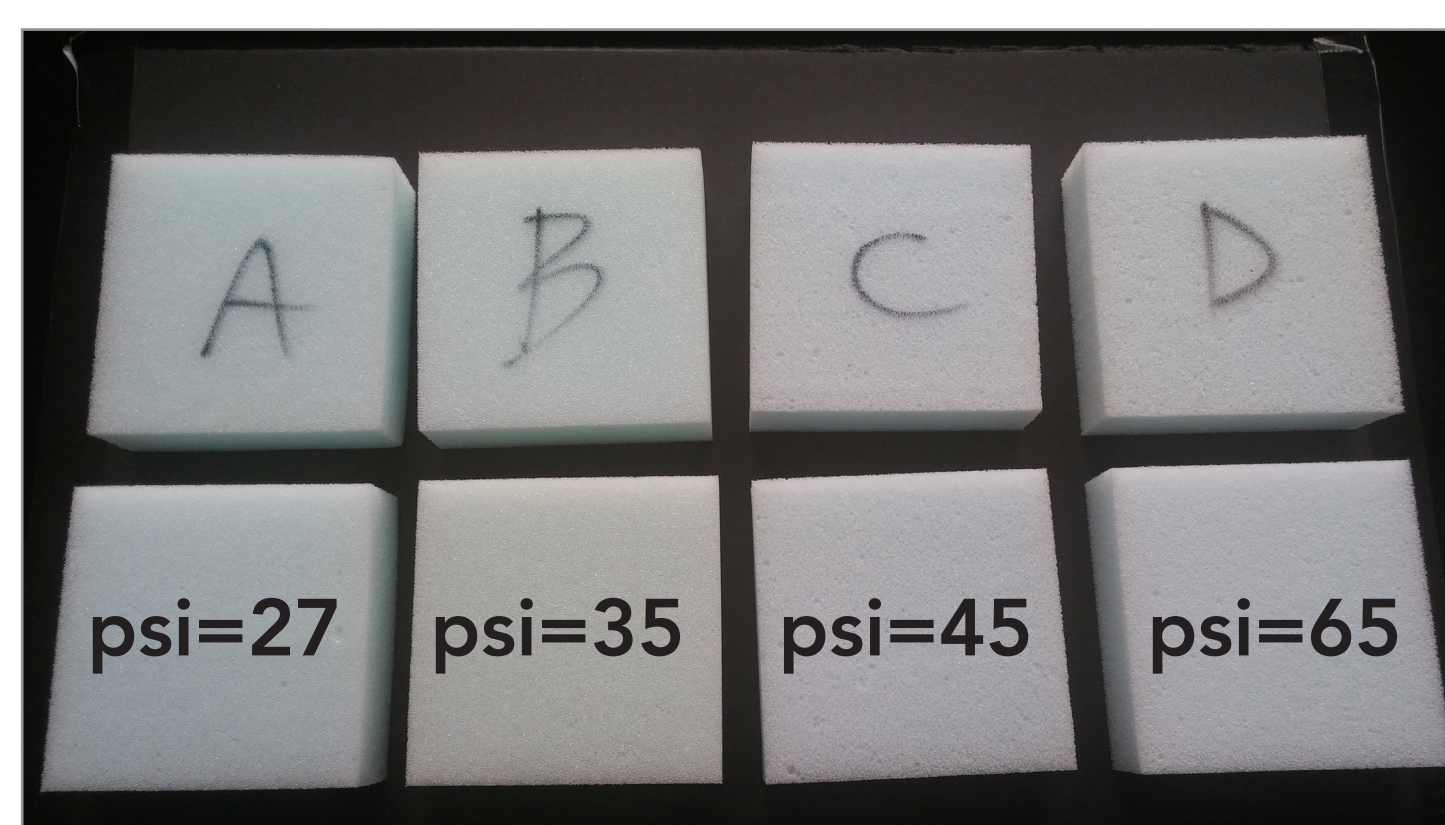
Method
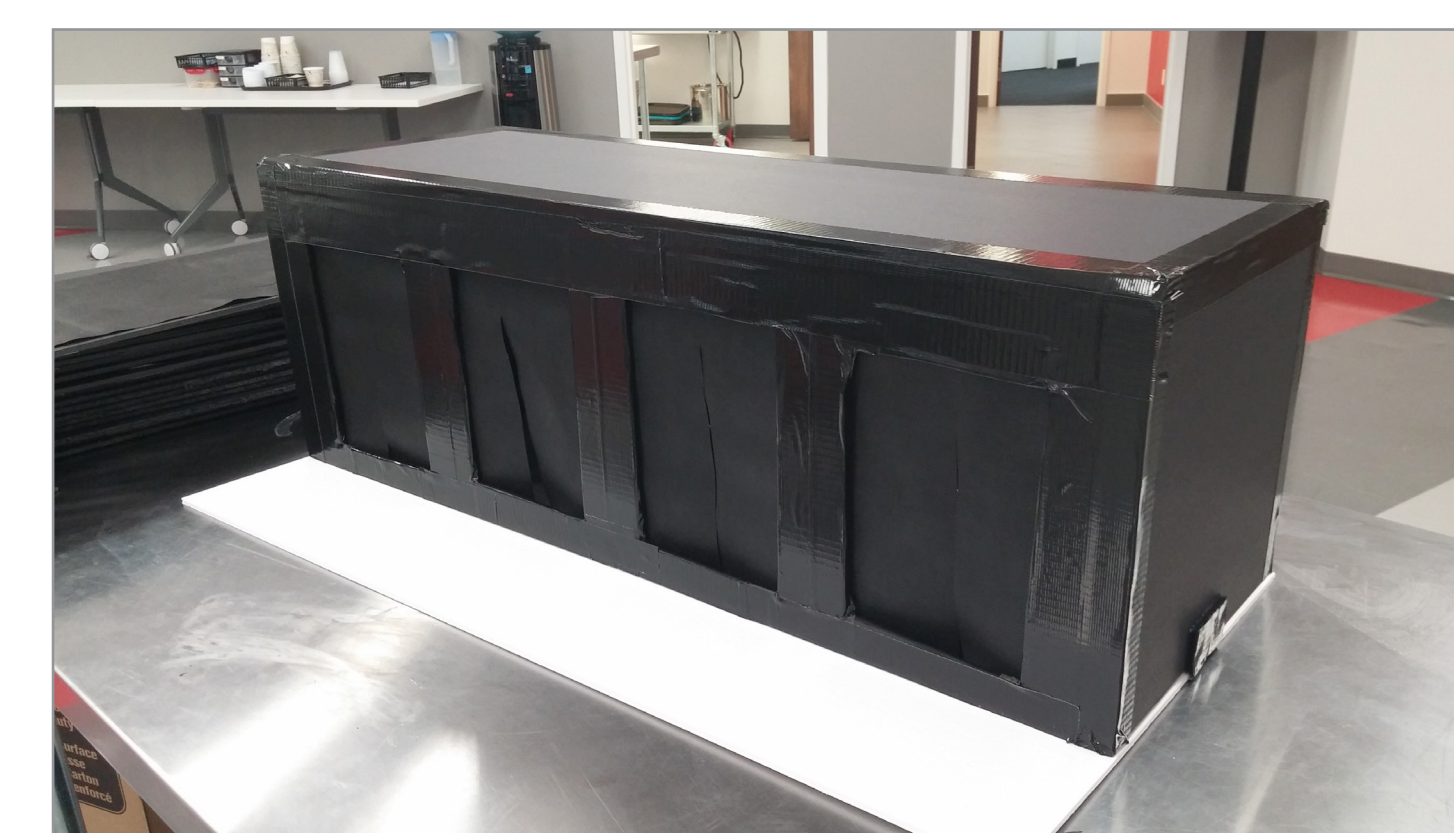
Assessors: 292 untrained consumers
Samples: 4 foam samples (all with the same density, but differing in compressions)

Tests:
• Same-Different test
  (6 tests/assessor)
• Tetrad test (6 tests/assessor)

psi=27   psi=35   psi=45   psi=65

• Assessors were instructed to compress samples by hand

Measures:
• d' is the sensory distance between two samples expressed as difference of means in standard deviation units.
• τ represents a decision-making criterion and boundary within which putatively identical samples are categorized as "same"

Results

τ from Same-Different data

τ = 1.84

(Tetrad d') − (Same-Different d') ≠ 0
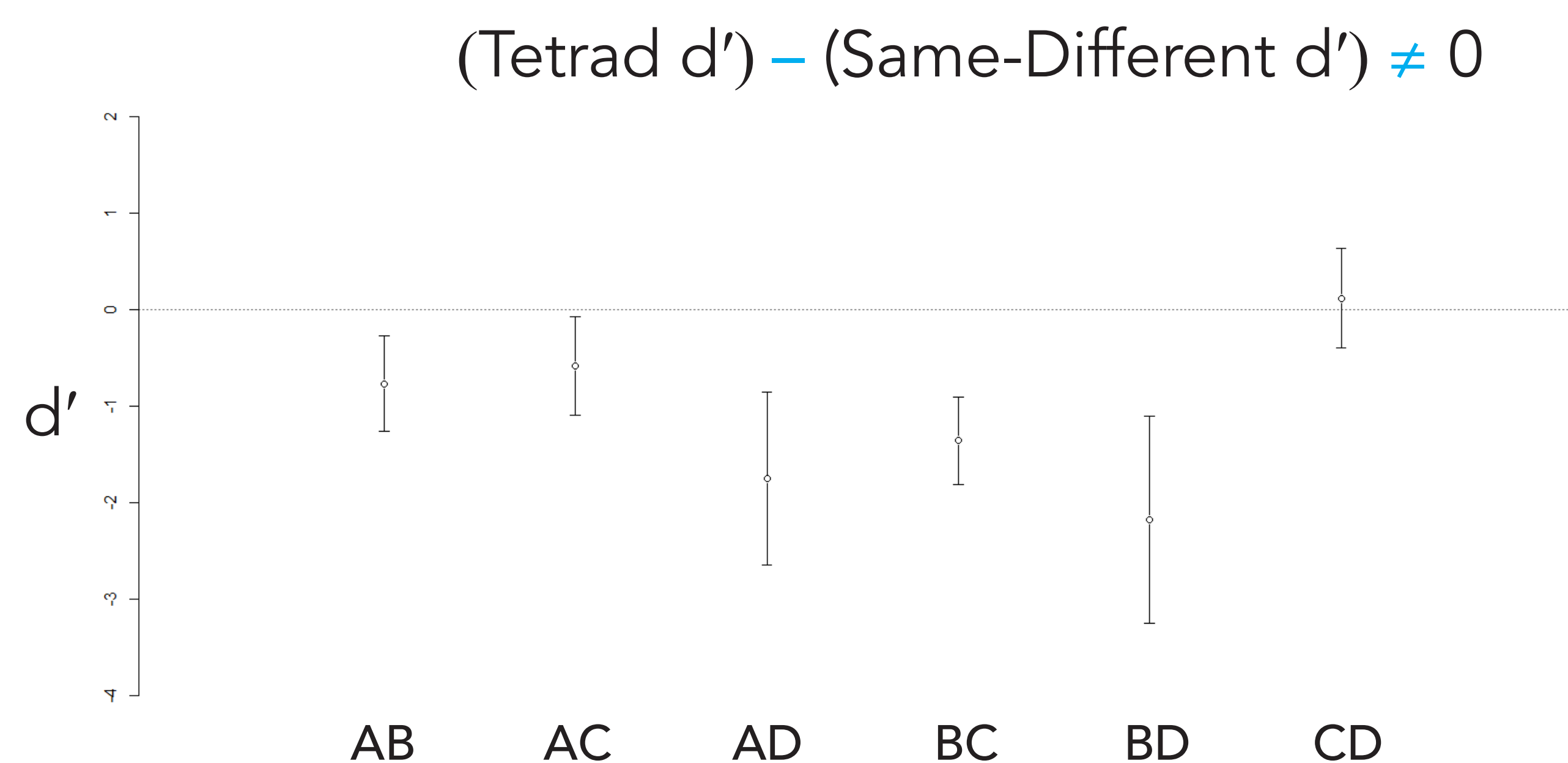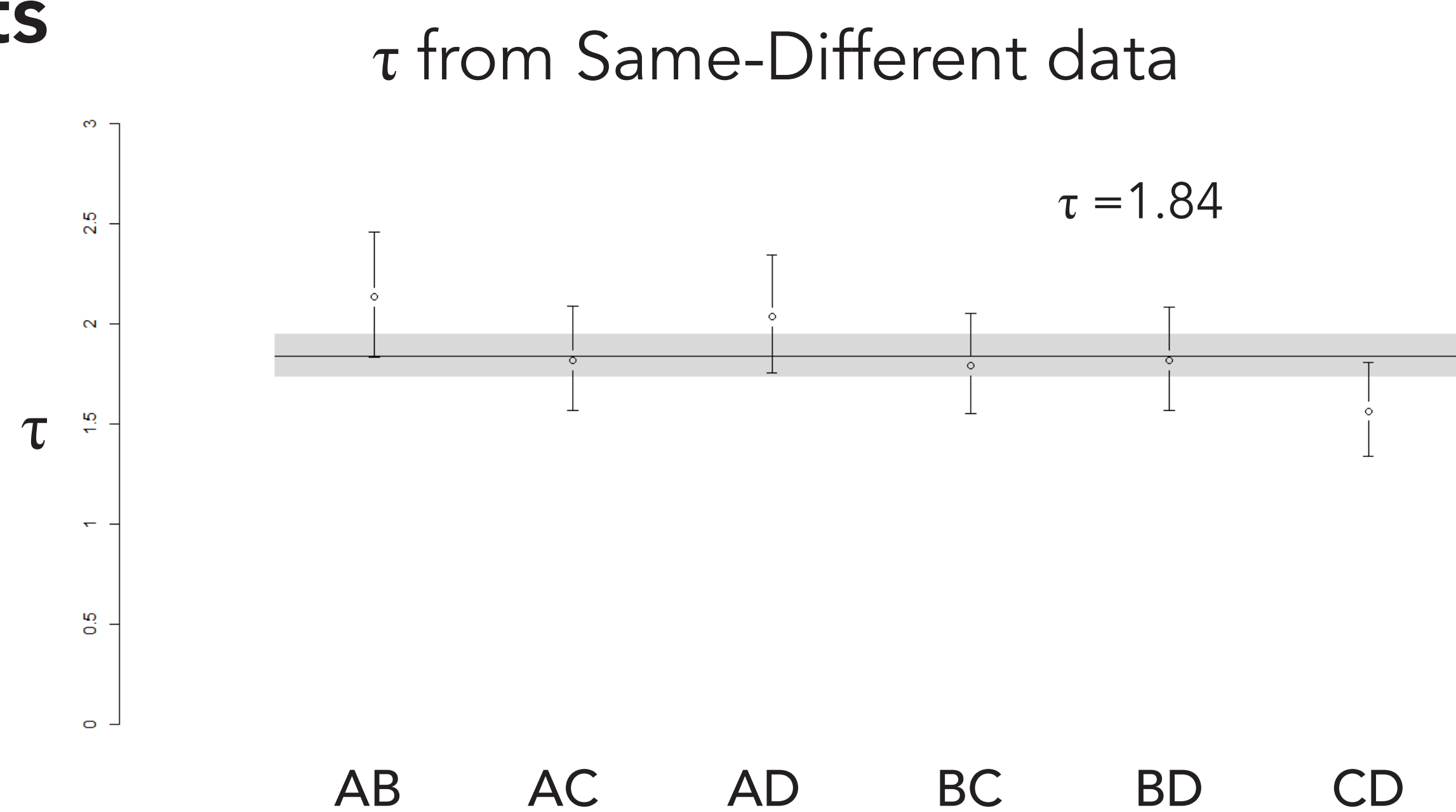
Pair	Same-different d'	Consumer relevant?	Tetrad d'	Consumer relevant?
AB	1.67	No	0.90	No
AC	3.32	Yes	2.74	Yes
AD	5.18	Yes	3.42	Yes
BC	2.77	Yes	1.42	No
BD	5.29	Yes	3.10	Yes
CD	2.95	Yes	3.06	Yes

• τ estimates were large compared to what is usually observed in sensory tests involving food products
• d' estimates were also large, indicating that many pairs were discriminated easily

Results and Conclusions

• Same-Different d' > Tetrad d'
• Scales are different, so perhaps these test methods measure different things (conceptual distance vs. discriminable distance)
• τ estimate from Same-Different test data cannot be used to contextualize d' from Tetrad test data (unless it is adjusted)