

What 50 Million Drawings Can Tell Us About Shared Meaning

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How to interrogate shared meaning?



Drawings as a window into meaning



50M drawings across 345 categories ($N = 15M$)

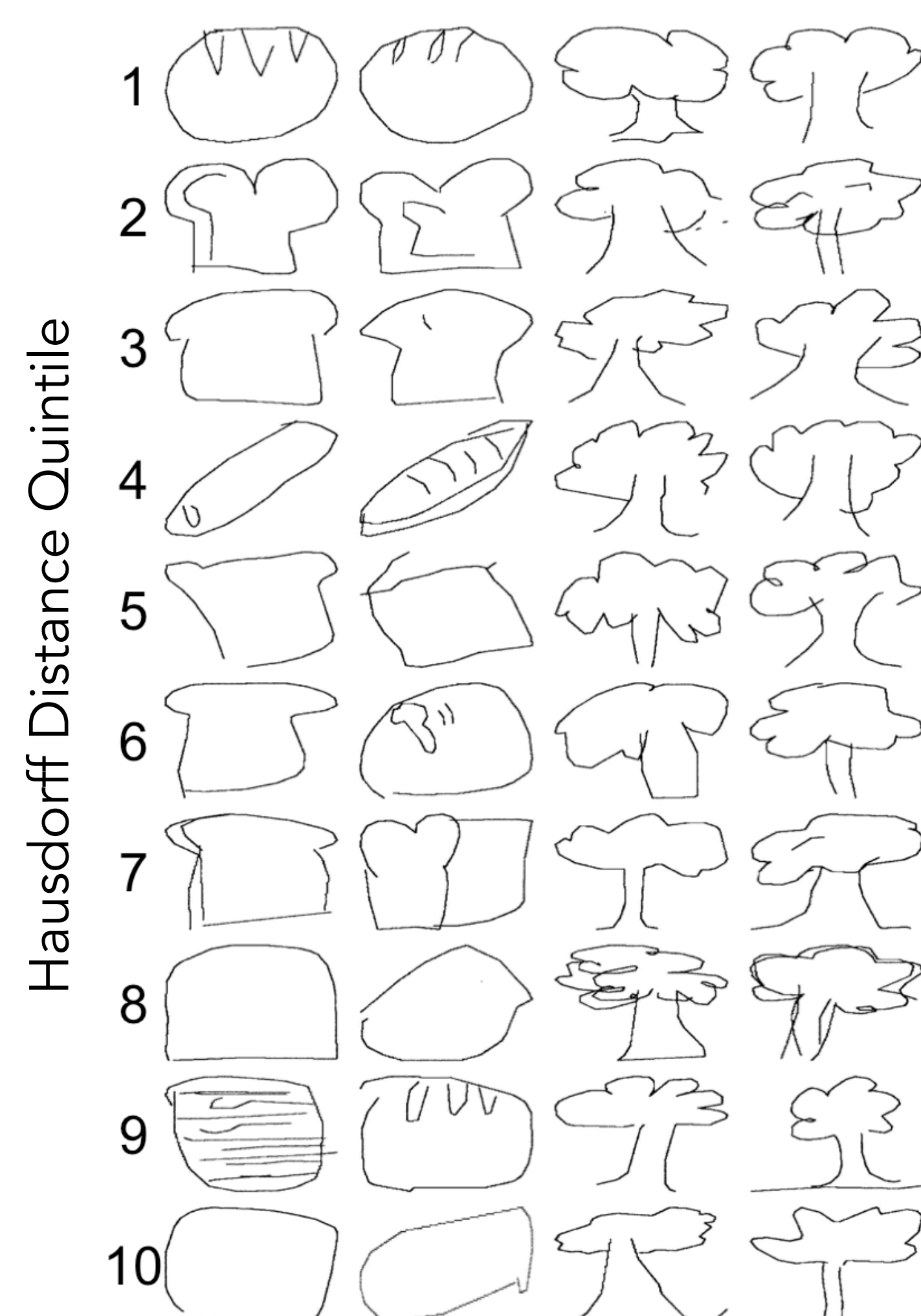
quickdraw.withgoogle.com

Quantifying Similarity

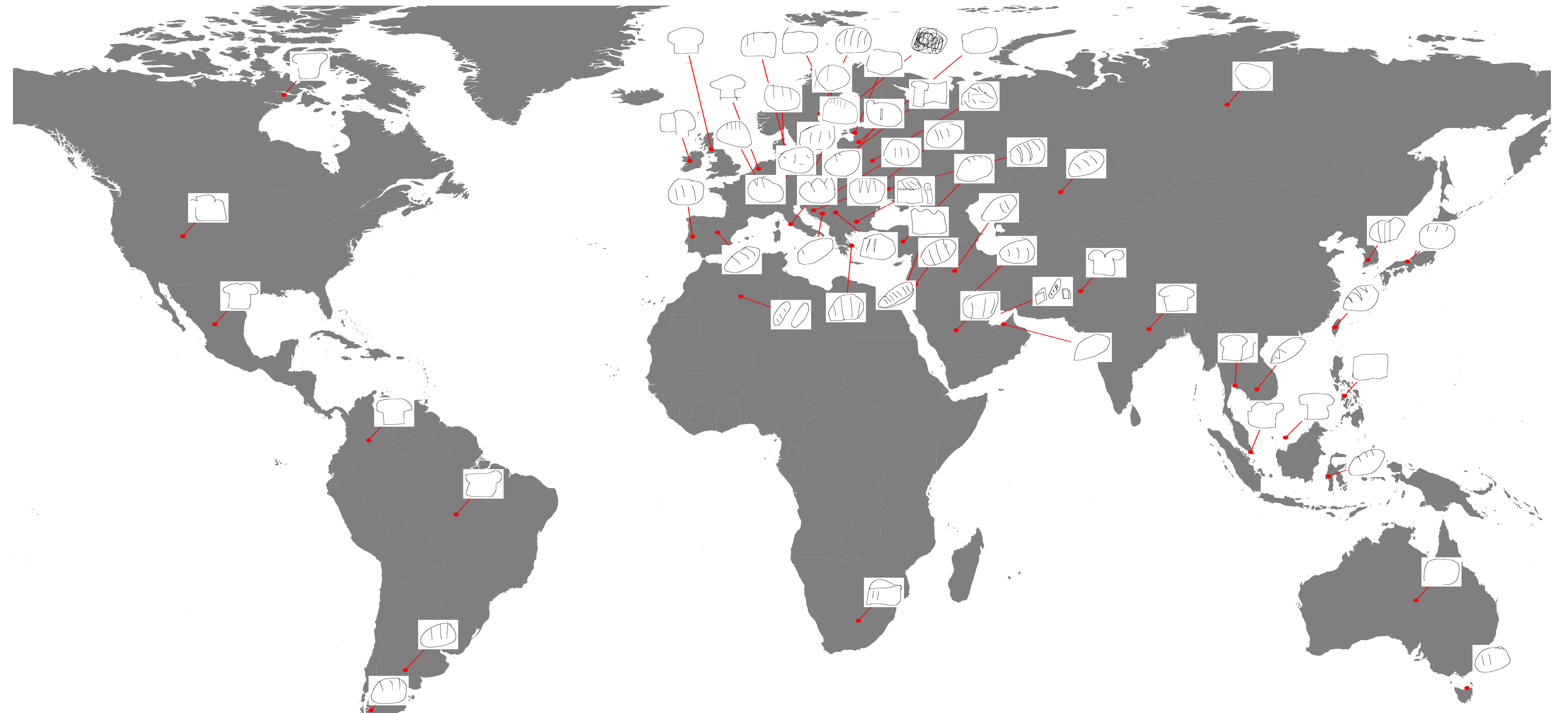
Hausdorff Distance — drawing similarity as the minimum Euclidean distance between two sets of points (Huttenlocher, Klanderman, & Rucklidge, 1993).

Measure Validation:

- 1500 drawing pairs from two categories
- 20 pairs from each decile of similarity/item
- Rated for similarity on 7-pt. Likert Scale
- Each participant ($N = 100$) rated 50 drawing pairs
- Human judgements highly correlated with Hausdorff Distance ($r = .29$; $p < .001$)



Cross-Cultural Variability in Drawings



Predicting Drawing Variability with Language

Drawing Similarity:

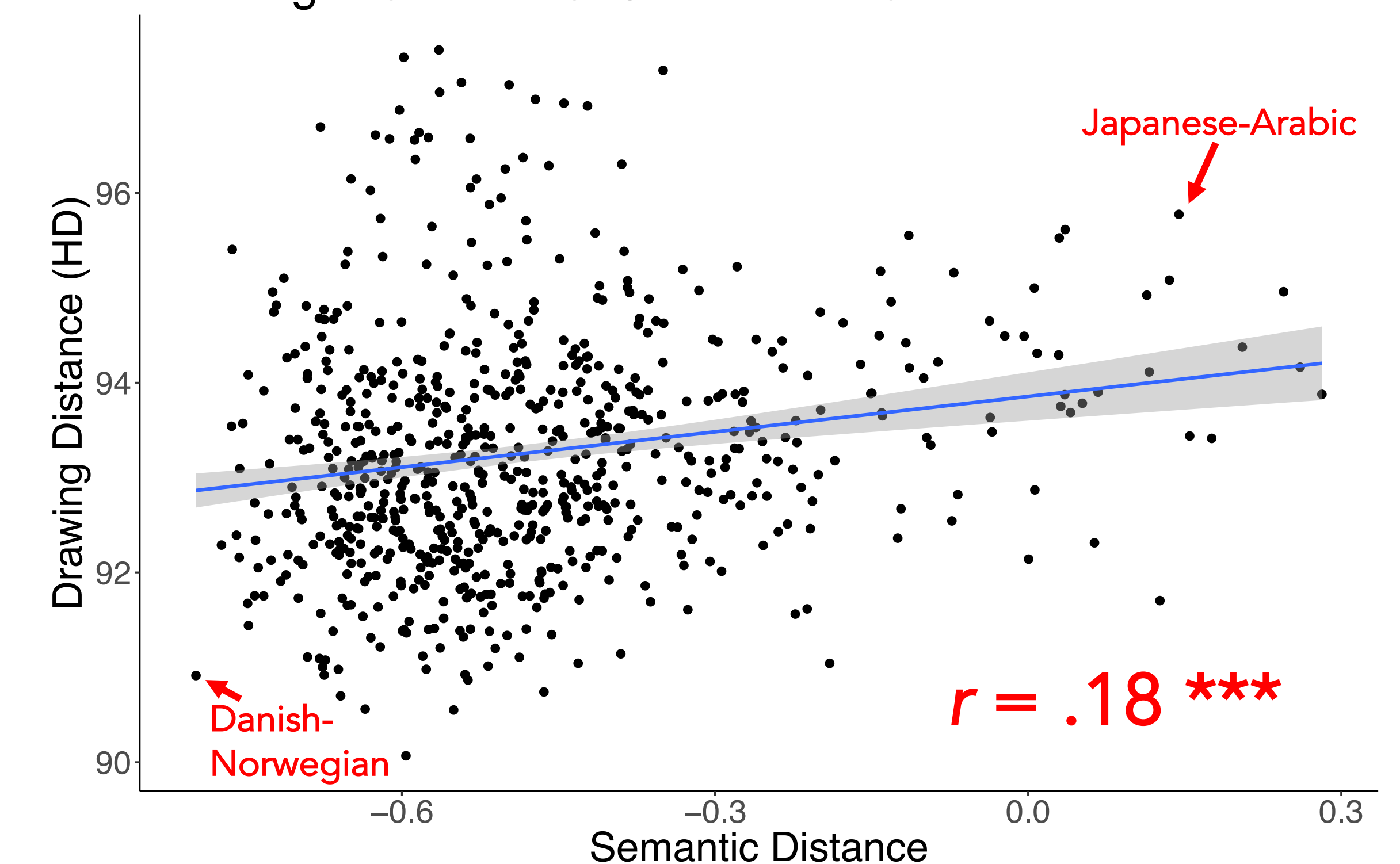
- 50 drawings from each of 39 countries
- Items from 4 categories: food (e.g., "cake"), weather ("cloud"), artifact (e.g. "key"), place (e.g. "jail")
- For each country pair, calculated mean drawing similarity for each category.

Independent Cultural Similarity Measures:

- Lexical semantics – Alignment from word embedding models (Bojanowski et al., 2016)
- Lexical forms – ASJP distance (Bakker, et al., 2009, Dediu, in press)
- Grammar – WALS distance (Dediu, in press)
- Physical distance

Lexical semantics predicts independence variance in drawing distances, suggesting speakers of languages with more similar semantics have more similar non-linguistic representations.

Drawing Distance vs. Semantic Distance



What predicts drawing similarity?

