An Information Sampling Account of Correlation Discrimination

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Abstract: Previous research indicates that when correlations are represented as scatter plots, people's ability to discriminate correlations increases as the strength of the correlations increase. For example, 0.9 is discriminated from 0.7 more accurately than 0.7 is discriminated from .5, despite the constant difference of 0.2. The present research identifies a similar phenomenon when the stimuli are columns of number-pairs rather than scatter plots. The results imply a cognitive model wherein the perceiver samples a subset of the data from each of two stimulus arrays, computes a correlation for each, then compares the two correlations. Statistically, when the correlations are strong, a sub-sample of data is likely to be highly linear, regardless of which random subset happens to be drawn. But for weak correlations, the correlation exhibited by a sub-sample will be highly unstable. Thus, sampling variability in the environment combines with incomplete psychological sampling to produce the observed behavior.