The gradient of Shannon's Entropy as an Intrinsic Target Property.

Results:

We invited five experienced receivers (i.e., experiment participants) to contribute 15 trials each. The target pool consisted of 300 carefully chosen digital images from a set of 20,000 pictures from the Corel Stock Photo Library of Professional Photographs. The trial protocol was controlled by email and feedback was provided on the World Wide Web. A figure of merit, was based upon a fuzzy-set encoding of the targets and responses.

The primary hypotheses were that a significant correlation would be seen between the figure of merit quality assessment and the gradient of Shannon's entropy for the associated target, and that the correlation using the rating assessment would be consistent with earlier findings.

A secondary hypothesis was that the figure of merit quality would not correlate with the entropy of the associated target. All hypotheses were confirmed. The correlation of the figure of merit with the entropic gradient was significant (Spearman's $\rho = 0.212$, $df = 73$, $p = 0.034$). The Spearman's ρ for the correlation with the entropy was 0.042, $df = 73$, $p = 0.361$. The combined correlation using the rating assessment for the static targets in the previous studies led to a Spearman's $\rho = 0.161$, $df = 41$, $p = 0.152$; where as in this study $\rho = 0.183$, $df = 24$, $p = 0.188$.

The consistency with our earlier rating correlation and the robustness with the figure of merit assessment are surprising given that there was little evidence overall in the study for AC as measured by the rank-order method (i.e. mean rank = 2.93, ES = -0.005, $z = -0.041$, and $p = 0.484$.

Published Work:

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Researcher's Contacts:

Edwin May
Laboratories for Fundamental Research,
415 Cambridge Ave., Suite 3
Palo Alto, CA 94306 US.

Phone: +1 (650) 473-0817
Fax: +1 (650) 618-1926
E-mail: may@lfr.org