459.08 SS48 Dynamic Adaptation of Subjective Values during Repeated Bidding

NYU/CNS Center for Neural Science

M.W. Khaw, Louie, K., & P.W. Glimcher

IISDM NYU

1. Introduction

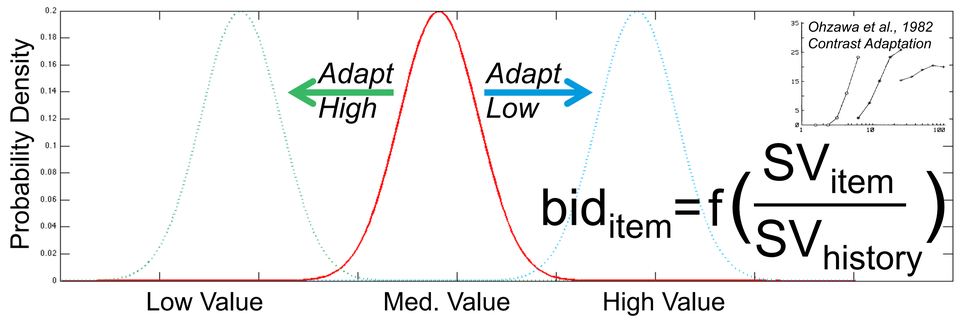
- ***Economics**: primes, contexts, and anchors have are widely known to bias preferences and pricing behavior.*
- ***Psychophysics**: a wide range of history-dependent adaptation effects are known to bias perceptual judgments.*
- ***Subjective values** and **perceptual properties** (e.g., contrast) are encoded as relative quantities by neurons [1,2,3]; normalization models of visual responses can explain value encoding as well as choice patterns [4].*

Are there psychophysical effects in economics?

Do the deviations of repeated auction bids reveal a history-dependent relative value code?

2.Predictions

- *A temporally-dynamic relative value code predicts that the subjective values of a set of goods will change – depending on the recent history of valuation.*

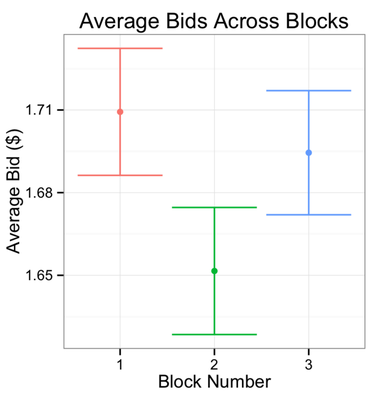


3. Method

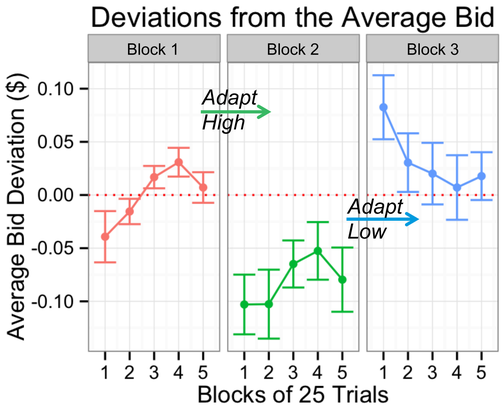
N = 44

nb: Bidding format was a BDM auction with a single trial selected after participation for actualization [5].

4a. Results – Bidding trials

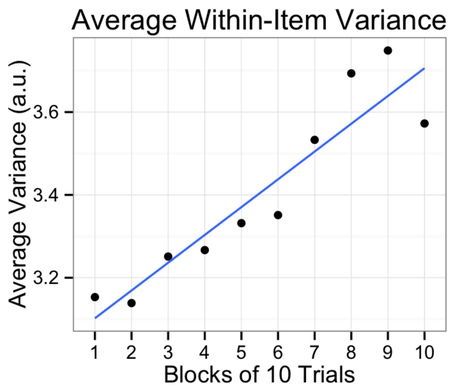


- *Average bids decrease and increase following adaptation blocks.*

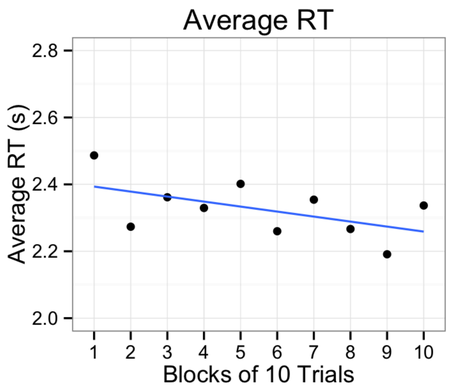


- *Deviations from the mean is modulated by both recent adaptation and bidding history.*

4b. Results – Rating trials



- *Within-item variance across good ratings increases with trials.*



- *Average RT does not vary with trials.*

5. Conclusions

- **There are psychophysical adaptation effects in the dynamics of repeated bidding behavior.**
- **The directionality of this effect is predicted by a history-dependent relative value code.**
- **Variance structure of ratings suggest that individuals are undergoing a value-based adaptation process.**

6. Future Directions

- **Fit normalization models [5; poster 555.22/ TT41] to the bid data in order to arbitrate between different forms of relative value code.**

References

1. Louie, K., Grattan, L. E., & Glimcher, P. W. (2011). Reward value-based gain control: divisive normalization in parietal cortex. The Journal of Neuroscience, 31(29), 10627-10639.

2. Rorie, A. E., Gao, J., McClelland, J. L., & Newsome, W. T. (2010). Integration of sensory and reward information during perceptual decision-making in lateral intraparietal cortex (LIP) of the macaque monkey. PLoS One, 5(2).

3. Ohzawa, I., Sclar, G., & Freeman, R. D. (1982). Contrast gain control in the cat visual cortex. Nature.

4. Louie, K., Khaw, M. W., & Glimcher, P. W. (2013). Normalization is a general neural mechanism for context-dependent decision making. Proceedings of the National Academy of Sciences, 110(15), 6139-6144.

5. Becker, G. M., DeGroot, M. H., & Marschak, J. (1964). Measuring utility by a single-response sequential method. Behavioral science, 9(3), 226-232.