Voting, Success, and Superstars

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Outline

Where do superstars come from?

"The economics of superstars"
S. Rosen,
Am. Econ. Rev., **71**, 845–858, 1981. [5]

Examples:

- Full-time Comedians (≈ 200)
- Soloists in Classical Music
- Economic Textbooks (the usual myopic example)

- Highly skewed distributions again...

Voting

Evidence from the web suggestions (Huberman et al.)

1. Easy decisions (yes/no) lead to bandwagoning
   - e.g. jyte.com
2. More costly evaluations lead to oppositional votes
   - e.g. amazon.com

- Self-selection: Costly voting may lower incentives for those who agree with the current assessment and increase incentives for those who disagree.

Superstars

Rosen's theory:

- Individual quality q maps to reward $R(q)$.
- $R(q)$ is 'convex' ($\mathrm{d}^2R/\mathrm{d}q^2 > 0$).
- Two reasons:
  1. Imperfect substitution:
     A very good surgeon is worth many mediocre ones
  2. Technology:
     Media spreads & technology reduces cost of reproduction of books, songs, etc.
- Joint consumption versus public good.
- No social element—success follows 'inherent quality'.

Superstars

"Stardom and Talent"
Moshe Adler,
American Economic Review, **75**, 208–212, 1985. [1]

- "Consumption capital": "Appreciation [of music] increases with knowledge. But how does one know about music? By listening to it, *and discussing it with other persons who know about it.*"
- Assumes extreme case of equal 'inherent quality'
- Argues desire for coordination in knowledge and culture leads to differential success
- Success can be purely a social construction
- (How can we measure 'inherent quality'?)

Dominance hierarchies

"Individual differences versus social dynamics in the formation of animal dominance hierarchies"
Chase et al.,
Proc. Natl. Acad. Sci., **99**, 5744-5749, 2002. [3]

- The aggressive female Metriaclima zebra:

- Pecking orders for fish...

Voting

Score-based voting versus rank-based voting:

"A theory of measuring, electing, and ranking"
Balinski and Laraki,
Proc. Natl. Acad. Sci., **104**, 8720–8725, 2007. [2]

Voting

"Aggregating partial, local evaluations to achieve global ranking"
Laureti, Moret, and Zhang,
Physica A, **345**, 705–712, 2004. [4]

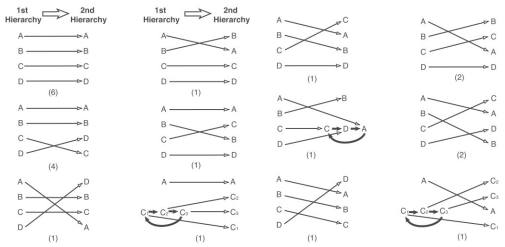
- Model: participants rank n objects based on underlying quality q
- Assume evaluation of object i is a random variable with mean q_i
- Choose objects based on votes:

$$p_i(t) \propto v_i(t)^\alpha \text{ or } p_i(t) \propto q_i v_i(t)^\alpha.$$

- If $\alpha < 1$, correct quality ordering is uncovered
- If $\alpha > 1$, some objects are never evaluated and mistakes are made...
- Related to Adler's approach

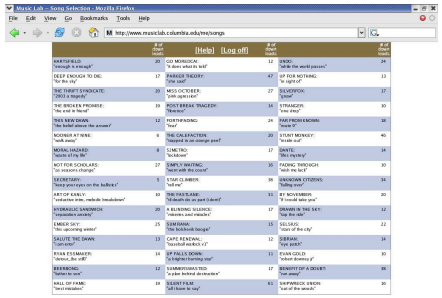
Dominance hierarchies

Fish forget—changing of dominance hierarchies:



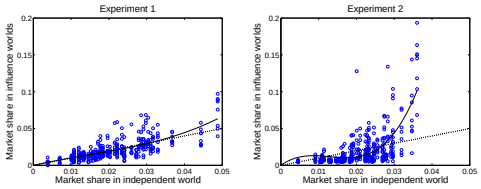
- 22 observations: about 3/4 of the time, hierarchy changed

Music Lab Experiment



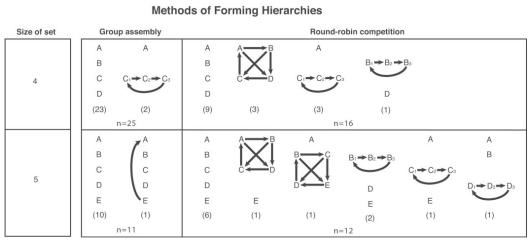
"An experimental study of inequality and unpredictability in an artificial cultural market"
Salganik, Dodds, and Watts,
Science, **311**, 854–856, 2006. [6]

Music Lab Experiment



- Variability in final number of downloads.

Dominance hierarchies

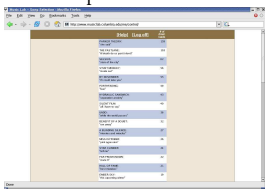


- Group versus isolated interactions produce different hierarchies

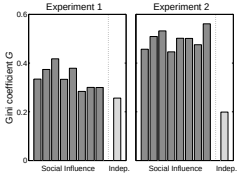
Music Lab Experiment

Experiment 1

Experiments 2–4



Music Lab Experiment



- Inequality as measured by Gini coefficient:

$$G = \frac{1}{(2N_s - 1)} \sum_{i=1}^{N_s} \sum_{j=1}^{N_s} |m_i - m_j|$$

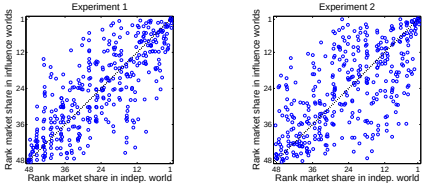
Music Lab Experiment

48 songs
30,000 participants

multiple 'worlds'
Inter-world variability

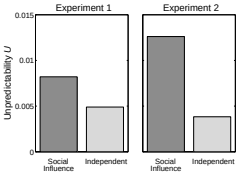
- How probable is the world?
- Can we estimate variability?
- Superstars dominate but are unpredictable. Why?

Music Lab Experiment



- Variability in final rank.

Music Lab Experiment



- Unpredictability

$$U = \frac{1}{N_s \binom{N_w}{2}} \sum_{i=1}^{N_s} \sum_{j=1}^{N_w} \sum_{k=j+1}^{N_w} |m_{i,j} - m_{i,k}|$$

Music Lab Experiment

Sensible result:

- Stronger social signal leads to greater following and greater inequality.

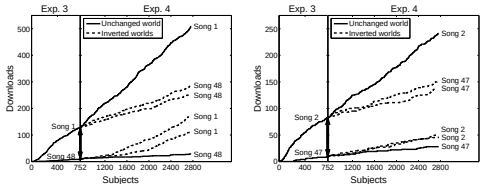
Peculiar result:

- Stronger social signal leads to greater unpredictability.

Very peculiar observation:

- The most unequal distributions would suggest the greatest variation in underlying 'quality.'
- But success may be due to social construction through following. (so let's tell a story... [8, 9])

Music Lab Experiment—Sneakiness [7]



- Inversion of download count
- The pretend rich get richer ...
- ... but at a slower rate

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Stardom and talent.
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[2] M. Balinski and R. Laraki.
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