COMPETITIVENESS AND STRESS

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for Frontiers of Behavioral Economics
Stress

- Stress is ubiquitous in modern living.
- Stress is higher than what people believe to be healthy.
- Stress is one of the leading causes of heart disease and cancer.
- Stress is difficult for people to manage.
Stress

- Threat
  - Attack
  - Importance for survival

- Brain
  - Amygdala
  - Hypothalamus

- Hormone
  - Cortisol
  - Adrenaline

- Physical Effect
  - Heartbeat
  - Shaking
  - …
Stress Hormone: Cortisol

- Acute stressor elicits cortisol response when the tasks are uncontrollable or characterized by social-evaluative threats.

*from* Kirschbaum et al., 1993

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Cortisol awakening response has been shown to be associated with work-related stress.

*from* Schlotz et al., 2004

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Competition

- Competition in the daily life
  - Siblings
  - School
  - Labor market
  - Marriage market
- Competition in the evolution
Research Question

- Whether more competitive environment induces higher stress response.
  - Tournament versus piece-rate

- Whether more competitive individuals have higher stress response.
  - Choosing tournament over piece-rate

- A laboratory study with 200 student subjects

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### Experimental Design

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Experimental Design

piece-rate
SG$1.5
5 minutes

→

tournament
SG$6
5 minutes

→

choice:
piece-rate
or tournament

→

confidence
risk attitude
...

40 minutes for cortisol response

40 minutes for cortisol response
Observation 1: cortisol response is higher for the tournament task than for the piece-rate task.
Observation 2: cortisol response is higher for those choosing tournament than for those choosing piece-rate.

![Graph showing cortisol response over time for two groups: Choosing Tournament and Choosing Piece-rate.](image)
Observation 3: cortisol awakening response is higher for those choosing tournament than for those choosing piece-rate.
Robustness Checks

- A number of variables, including performance, confidence, risk attitude, age, and gender, are controlled.
- Competitiveness is also associated with salivary alpha-amylase response, another biomarker for the stress system.
- Competitiveness is not associated with baseline testosterone and self-reported stress.
Summary

- Whether more competitive environment induces higher stress response. YES
- Whether more competitive individuals have higher stress response. YES
Discussion

- Institution and stress
  - Public health
- Preference and stress
  - Career choice
- Acute stress and chronic stress
  - Filed experiment
- Stress management
  - Mindfulness training
Collaborators

- Idan Shalev: Department of Biobehavioral Health, Pennsylvania State University
- David Koh: Department of Epidemiology and Public Health, National University of Singapore.
- Richard P Ebstein: Department of Psychology, National University of Singapore.
- Soo Hong Chew: Department of Economics, National University of Singapore.

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