# Positive Self-Image in Tournaments

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# INTRODUCTION

- According to Myers (1996):

  *"On nearly any dimension that is both subjective and socially desirable, most people see themselves as better than average."*

## CAR DRIVERS

- A comprehensive study on driving behavior in Europe (SARTRE 2004) asked car drivers:

- “Compared to other drivers, do you think your driving is……..... dangerous?"

- Drivers could pick one out of five answers to fill the gap: “much more”, “a bit more”, “equally,” “a bit less,” and “a lot less”.

## CAR DRIVERS

| | % who think to be less dangerous drivers than others | % who think to be as dangerous drivers as others | % who think to be more dangerous drivers than others |
|---|---|---|---|
| Italy | 77 | 19 | 4 |
| Ireland | 74 | 24 | 2 |
| Portugal | 73 | 24 | 3 |
| Germany | 72 | 24 | 4 |
| Hungary | 70 | 26 | 4 |
| Croatia | 70 | 25 | 5 |
| Estonia | 67 | 28 | 5 |
| UK | 66 | 31 | 3 |
| Denmark | 65 | 33 | 2 |
| Switzerland | 64 | 32 | 4 |
| Austria | 64 | 23 | 3 |

## CAR DRIVERS

| | % who think to be less dangerous drivers than others | % who think to be as dangerous drivers as others | % who think to be more dangerous drivers than others |
|---|---|---|---|
| Slovenia | 63 | 31 | 6 |
| France | 61 | 36 | 3 |
| Poland | 60 | 33 | 7 |
| Slovakia | 59 | 30 | 11 |
| Netherlands | 59 | 36 | 5 |
| Spain | 56 | 39 | 5 |
| Greece | 56 | 39 | 5 |
| Czech Rep. | 56 | 38 | 6 |
| Belgium | 53 | 41 | 6 |
| Sweden | 53 | 44 | 3 |
| Finland | 46 | 50 | 5 |

## MANAGERS, FUND TRADERS, INVEST. BANKERS, ENTREPRENEURS HAVE POSITIVE SELF-IMAGE

- 90 percent of business managers rate their performance as superior to their average peer (French, 1968).

- Only 1 percent of GE company employees rate their performance as below the median (Meyer, 1975).

- In Australia, only 1 percent of people rate their job performance as below average (Headey and Wearing, 1987).

- Fund Traders: Brozinsky et al. (2004); Invest. Bankers: Glaser et al. (2005); Entrepreneurs: Fraser and Greene (2006).

## EXPERIMENTAL ECONOMICS EVIDENCE

- Camerer and Lovallo (1999) show that entry in markets is higher when the distribution of prizes depends on relative skill.

- Park and Santos-Pinto (2005) find that players in poker and chess tournaments overestimate their relative performance.

- Some experiments suggest that PSI is reduced with economic incentives (e.g., Hoelzl and Rustichini, 2002), while others do not (e.g., Camerer and Lovallo, 1999).

## MAIN RESEARCH QUESTION

- What is the impact of workers' perceptions of skill on the employment relationship?

## ESPECIFIC RESEARCH QUESTIONS

- Does worker positive self-image change the firm's choice of optimal incentive scheme?

- Is worker positive self-image favorable or unfavorable to the firm?

- Does heterogeneity in workers' self images have interesting implications for the composition of the workforce?

## RELATED RESEARCH

- Two approaches:

  – Worker beliefs about skill are **endogenous** to the model

    Bénabou and Tirole (2003, RES)

    Moscarini and Fang (2005, JME)

  – Worker beliefs about skill are **exogenous** to the model

    Hvide (2002, JEBO)

    Gervais and Goldstein (2004)

    De la Rosa (2005)

    Santos-Pinto (forthcoming in EJ)

## POSITIVE SELF-IMAGE IN TOURNAMENTS

- A tournament is an incentive scheme where the firm pays prizes to workers according to their relative performance (rank).
- Example: Promotions in organizations.
- Main finding:
  - Firms can benefit from worker positive self-image if they wisely structure prizes in tournaments.

## TIMING OF A TOURNAMENT GAME

- Lazear and Rosen (1981), Nalebuff and Stiglitz (1983):

1. The firm chooses the winning and losing prizes;

2. Workers observe prizes and the realization of a common shock;

3. Workers choose simultaneously their effort level (effort choices are unobservable to the firm);

4. The output of each worker is a function of effort, ability, the realization of the common shock, and of an idiosyncratic shock;

5. The firm observes the workers' rankings in terms of output and awards prizes to workers according to their ranking.

## ASSUMPTIONS

- Two workers $i=1,2$ and two prizes $y_L < y_w$

- The firm maximizes profits

$$\pi = (Q^1(a^1) + Q^2(a^2)) - (y_L + y_W)$$

- Worker's utility function

$$U^i(y^i, a^i) = u^i(y^i) - c^i(a^i)$$

## ASSUMPTIONS

- A worker exhibits positive self image if he overestimates his productivity of effort.

- This factors into the problem through the worker's **perceived** probability of winning the tournament:

$$P^i(a^i, a^j, \lambda^i) = P(Q^i(a^i, \lambda^i) > Q^j(a^j))$$

- Thus, the worker's **perceived** expected utility is

$$V^i = u(y_L) + P^i(a^i, a^j, \lambda^i)\Delta u - c(a^i)$$

## WORKERS' EFFORT CHOICE PROBLEM

- Worker *i*'s effort choice problem is given by:

$$\max_{a^i \geq 0} u(y_L) + P^i(a^i, a^j, \lambda^i)\Delta u - c(a^i)$$

- If positive self-image is not too excessive the solution to this problem implies a strictly positive effort level given by

$$\boxed{P_{a^i}(a^i, a^j, \lambda)\Delta u = c'(a^i)}$$

## FIRM'S EFFORT IMPLEMENTATION PROBLEM

- The firm chooses the winner's and the loser's prizes such that

$$\begin{aligned} \min_{v_L, v_W} \quad & \frac{1}{2} h(v_L) + \frac{1}{2} h(v_W) \\ \text{s.t.} \quad & P_a(a, \lambda)\Delta v = c'(a) \qquad \text{(IC)} \\ & v_L + P(a, \lambda)\Delta v \geq \overline{U} \qquad \text{(IR)} \end{aligned}$$

## SELF-IMAGE AND WILLINGNESS TO TAKE PART IN THE TOURNAMENT

- In a tournament, by definition, the workers' wage-incentive scheme is increasing with output.

- Thus, for a fixed effort level, the impact of PSI on workers' willingness to take part in the tournament is favorable to the firm.

- However, positive self-image may change effort provision.

## SELF-IMAGE AND EFFORT PROVISION

- The impact of self-image on effort provision is given by:

$$\frac{\partial a^i}{\partial \lambda} = -\frac{\partial^2 V / \partial a^i \partial \lambda}{\partial^2 V / \partial (a^i)^2} = -\frac{P_{a^i \lambda} \Delta u}{P_{a^i a^i} \Delta u - c''(a^i)}$$

- Two possibilities
  - Effort and self-image are substitutes: $P_{a^i \lambda} < 0$
  - Effort and self-image are complements: $P_{a^i \lambda} > 0$

## RISK NEUTRAL WORKERS

- **Proposition 1**: If workers are risk neutral then the firm is better off with a positive self-image workforce.

- **Intuition**: Worker risk neutrality implies that the firm can change the prize spread to implement any effort level at a lower compensation cost:

$$C(a,\lambda) = \overline{U} + c(a) - \frac{P(a,\lambda) - \frac{1}{2}}{P_a(a,\lambda)} c'(a)$$

## RISK AVERSE WORKERS
## EFFORT AND SELF-IMAGE SUBSTITUTES

- **Proposition 2**: If workers are risk averse, effort and self-image are substitutes, and the impact of self-image on effort is not too large, that is,

$$-P_{\lambda}P_{a^i}/(1-P) < P_{a^i\lambda} < 0$$

then the firm is better off with a positive self-image workforce.

## RISK AVERSE WORKERS
## EFFORT AND SELF-IMAGE SUBSTITUTES

- **Intuition**:
  - The firm must increase the prize spread to counter the unfavorable impact of positive self-image on effort.
  - Worker risk aversion implies that workers must be compensated for the increase in the prize spread.
  - However, worker positive self-image makes participation in the tournament attractive to workers and allows the firm to reduce prizes.

## RISK AVERSE WORKERS
## EFFORT AND SELF-IMAGE COMPLEMENTS

- **Proposition 3**: If workers are risk averse and self-image and effort are complements, that is $P_{a^i\lambda} \geq 0$ , then the firm's welfare is higher with a positive self-image workforce.

- **Intuition**: For fixed prizes the firm gets more expected output with PSI workers than with accurate workers.

## CONCLUSION

1. The paper finds that, under a variety of circumstances, firms can benefit from worker positive self-image if they wisely structure prizes in tournaments.

2. The finding is consistent with the idea that some parties involved in a contract might gain when other parties are not fully rational.

3. The workers are made worse off by positive self-image beliefs.

4. Overall welfare is reduced when workers are risk neutral. Overall welfare may increase when workers are risk averse.

# THANK YOU!