

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

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

FIRM'S EFFORT IMPLEMENTATION PROBLEM

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

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

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:

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

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!