Self-Confirming Racial Stereotypes in

<u>A Simple Investment Hiring Game</u>

(1) Players

■ One employer – decides whether to hire

■ Many workers – decides whether to invest

(2) Assume employer cannot observe workers investment, but can see "test" which is correlated with worker investment

(3) Investment costly to worker; getting hired always benefits to workers, but only benefits employer if worker has invested.

Thus,

<u>Payoff matrix</u>

		Employer	
		A=0	A=1
Worker	I=0	0,0	1,-2
	I=1	-c,0	1-c,1

c is distributed as uniform [0,1]

Payoff=(worker, employer)

These numbers are chosen for convenience

When will the worker invest?

- Let $q_1 \in (0,1)$ be the probability of getting hired in worker's mind, if he invests.

q_0= probability hired if not invest.

- Then :

q_1*1-c= expected net benefit if I=1
q_0*1-0 = expected net benefit if I=0

$\Rightarrow$ I=1 if and only if $(q_1-q_0)\geq c$

When will the employer hire ?

- Let $s\in(0,1)$ be the probability that worker has invested, in employer's mind.
- Then
  0= benefit to employer if A=0
  s*1+(1-s)*(-2) = expected benefit if A=1

  so,

  A=1 if and only if

  $s\geq 2/3$

What do workers and employers believe?

- Suppose test has 3 outcomes: Pass, fail, unclear

If worker passes, then employer knows I=1

If worker fails, then employer knows I=0

- Suppose

Probability [unclear/I=0]=1/3

Probability [unclear/I=1]=2/3

(numbers chosen for convenience)

- Let the employer think the fraction $\Pi \in (0,1)$ of worker population has invested.

then

$$s = \frac{\Pi*(2/3)}{\Pi*(2/3)+(1-\Pi)*(1/3)}$$

,if test unclear.

s=0, if fail

s=1, if pass

- For worker, beliefs depend on whether employer gives benefit of the doubt.

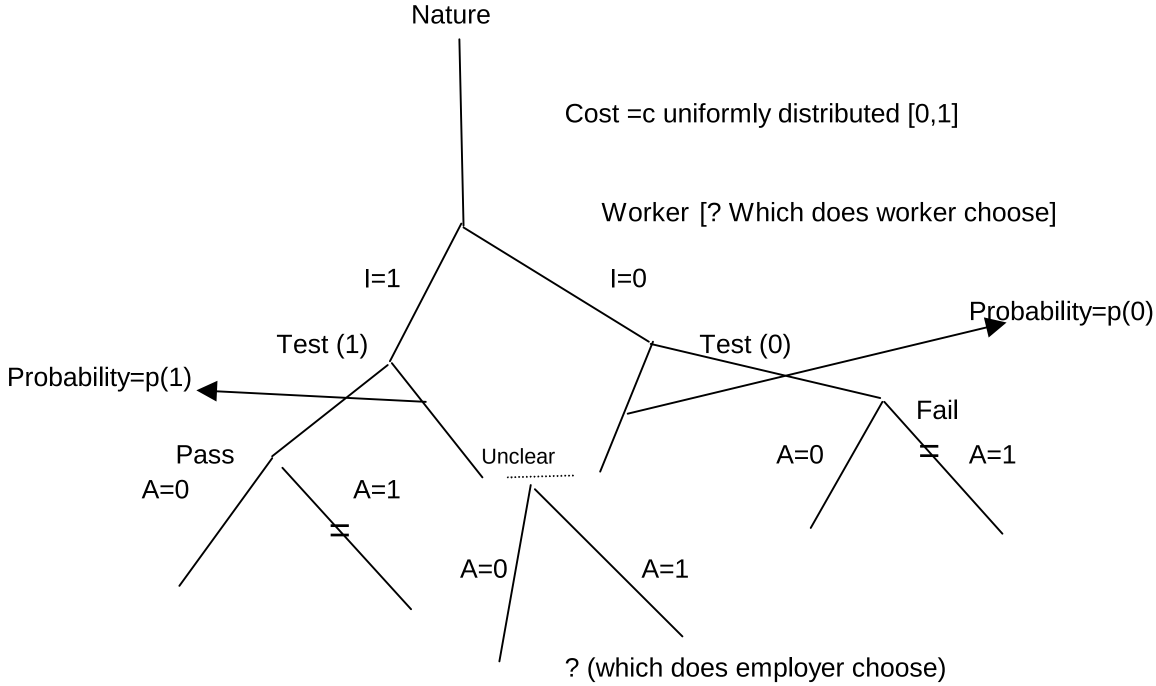
If he does:

q_1=1 and q_0 =1/3

If he does not:

q_1=1/3 and q_0 =0

Game Tree



(1) I=1 ⇒ worker invests

=0 ⇒ worker does not invest.

c= cost to worker of investing

(2)Test has 3 possible outcomes: pass, fail , unclear

No investor can fail; no non-investor can pass.

p(0) = Probability [unclear/I=0] ;p(1)= Probability [unclear/I=1]

(3) A=1 ⇒ employer hires

A=0 ⇒ employer does not hire

Equilibrium

Seek Π^* a fraction of workers investing such that if employers believe this is the fraction investing , then they will act in such a way that exactly this fraction of the workers find it desirable to invest

Notice that if workers expect benefit of doubt, then

$q_1 - q_0 = 2/3$

so $\Pi_H = 2/3$ will invest.

If they do not expect benefit of doubt , then

$q_1 - q_0 = 1/3$

so $\Pi_L = 1/3$ will invest.

Notice: Employer gives benefit of doubt if and only if :

$(2*\Pi)/(1+\Pi) \geq 2/3 \Leftrightarrow \Pi \geq ½$

Thus:

Main Result:

Both: $\Pi^* = \Pi_L = 1/3$, and

$\Pi^* = \Pi_H = 2/3$

are self-confirming equilibrium beliefs.

Implications:

(1) This is a theory of stereotypes – or, of rational statistical discrimination

(2) The equilibrium $\Pi^* = \Pi_L$ is less efficient then the equilibrium $\Pi^* = \Pi_H$.

(3) Group identity permits the existence of different stereotypes simultaneously.

(4) In $\Pi^* = \Pi_L$ equilibrium only 1/9 of workers get hired. In $\Pi^* = \Pi_H$ equilibrum , fully 7/9 of workers get hired.