Stereotypes, Inequality, and Identity Choice

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Contents

Section 1. Motivating Examples

*"There are many situations in which **identity choice** and **group stereotypes** operate in tandem."*

Examples of Identity Choice: "Redemption of Ham"

MODESTO BROCOS: *Redenção de Cã*, 1895.
Óleo sobre tela, 199 x 166 cm.
Rio de Janeiro, Museu Nacional de Belas Artes.

Examples of Identity Choice: Anitta (The Guardian, 2013)

Brazilian funk star Anitta sparks new debate about skin whitening and race

Anti-discrimination campaigners say singer appears paler since signing record deal

Anitta pictured when she was a relative unknown and on stage in Brazil last month. Photograph: Mauricio Santana/Corbis

Brazil's latest funk sensation, Anitta, has won millions of fans by taking the favela sound into the mainstream, but she is now front and centre in a resurgent debate about skin colour.
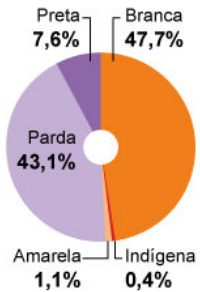
Examples of Identity Choice: Neymar (Brazil Football Star)

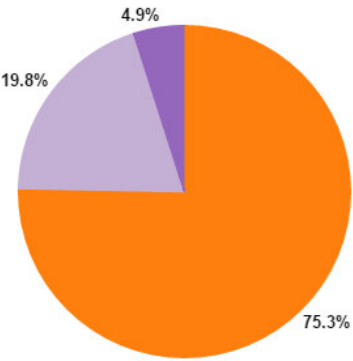# Examples of Identity Choice: Sensus 2010 in Brazil

Como é no Brasil

Preta 7,6% Branca 47,7%

Parda 43,1%

Amarela 1,1% Indigena 0,4%

Fonte: Censo 2010

Selecione uma categoria

Senadores

Senadores
Atuais senadores brasileiros

4.9%

19.8%

75.3%

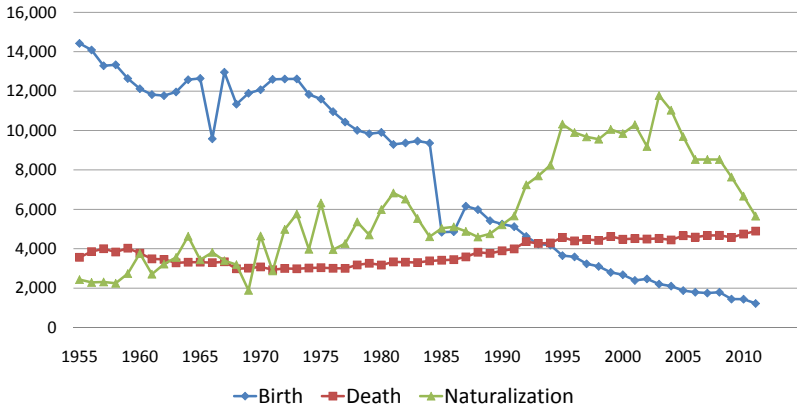**Examples of Identity Choice: "Zainichi"**

- Korean descendants (about one million) in Japan, from forced laborers (Fukuoka, 1998)
  - About 10,000 out of 600,000 descendants holding Korean Nationality **choose to be naturalized** every year.
  - Giving up their Korean names!
  - Concealing their Korean ethnicity!

Examples of Identity Choice: "Zainichi"

- The naturalization trend of "Zainichi" in Japan:

Number of Birth, Death and Naturalization of Koreans in Japan (1955~2011)

Examples of Identity Choice: Style/Attitude/Language

- "Bling": **Conspicuous Consumption** among the Blacks (Charles et al., 2009)
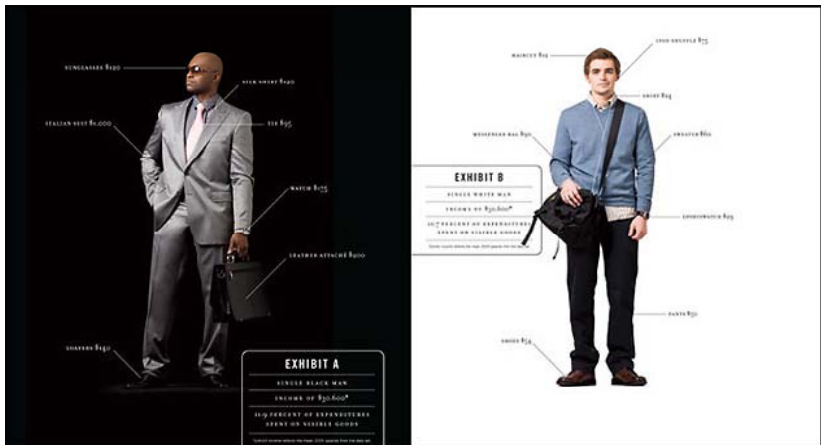
Examples of Identity Choice: Style/Attitude/Language

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  - Earning 12 percent less than whites **when distinctly identified as black** (Grogger, 2011)

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- So called "Partial Passing" practices

Endogenous Stereotyping Equilibria (ESE)

- **Standard Statistical Discrimination Literature**: The favored group faces great human capital investment incentives (Arrow, 1971; Coate and Loury, 1993).

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Motivation ○○○○○○○○● | Model with Identity Choice ○○○○○○○○○ | Endogenous Stereotyping ○○○○○○○○○○○○○ | Applications ○○○○○○○○○ | Conclusion

Basic Framework

Endogenous Stereotyping Equilibria (ESE)

- **Standard Statistical Discrimination Literature**: The favored group faces great human capital investment incentives (Arrow, 1971; Coate and Loury, 1993).
- When group membership is endogenous (**by relaxing the immutability assumption**),
- the favored group also consists disproportionately of low human capital investment cost types, who gain more from joining a favored group (**positive selection**).
- As a result, human capital cost distributions between groups **endogenously diverge...**
- Inequality deriving from stereotyping of *endogenously constructed* social groups is **at least as great as the inequality** that can emerge between *exogenously given* groups.

Section 2. Model with the Identity Choice

Motivation   **Model with Identity Choice**   Endogenous Stereotyping   Applications   Conclusion
○○○○○○○○○   ●○○○○○○○○   ○○○○○○○○○○○○○   ○○○○○○○○○

Basic Structure

Workers' Affective/Expressive Behavior

- Agents choose affect A or B: $i \in \{A, B\}$.

Motivation
○○○○○○○○○

Model with Identity Choice
●○○○○○○○○

Endogenous Stereotyping
○○○○○○○○○○○○○

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Conclusion

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- Agents choose whether to be skilled or not: $e \in \{0, 1\}$.
- The cost of obtaining a skill is c with its CDF $G(c)$.
- We impose that c and k are **independently distributed**: (unlike Spence 1973.)

  [Also, we assume Identity Cost Symmetry: H(k)=1-H(-k).]

Employers' Wage-setting Behavior

- We adopt "statistical discrimination" framework proposed in Coate and Loury (1993).

Employers' Wage-setting Behavior
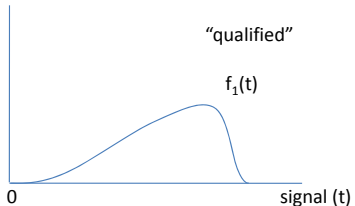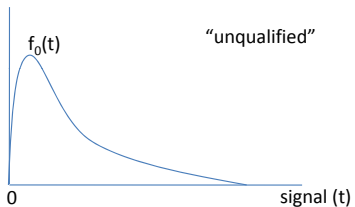
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Employers' Wage-setting Behavior

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- Skill acquisition e is not fully identified.
- Employers pay wages **based on group identity and a noisy signal $t \in R^+$ distributed conditional on e.**
- PDF of the signal conditional on e is $f_e(t)$ and its CDF is $F_e(t)$.

Basic Structure

Job Market Signals and MLRP Condition

- Employers' noisy information about agents' skills:

Employers' Wage-setting Behavior

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- The employers' posterior belief about the likelihood that an agent who presents the test score t is in fact skilled: (**using Bayes Theorem**)

$$\rho(\pi, t)(\equiv Pr[e = 1|\pi, t]) = \frac{\pi f_1(t)}{\pi f_1(t) + (1 - \pi)f_0(t)}. \quad (1)$$

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- Assume that the wage is proportional to the expected skill level:

$$W(\pi, t) = w \cdot \rho(\pi, t), \text{ for some } w > 0. \quad (2)$$

Workers' Payoffs

- Given this framework, the expected reward from acquiring skill level e is denoted by $V_e(\pi)$ for any $e \in \{0, 1\}$:

$$V_1(\pi) = \int_0^1 f_1(t) W(\pi, t) \, \mathrm{d}t, \tag{3}$$

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- $R(0) = R(1) = 0$ and $R''(\pi) < 0$: $R(\pi)$ is concave.

Basic Structure

Phenotypic Stereotyping Equilibria (PSE)

- Panel A displays skill acquisition incentives $R(\pi)$.

Panel A. Expected Rewards Given π
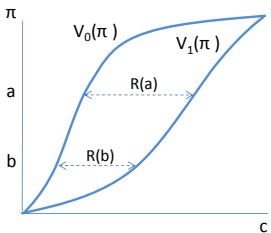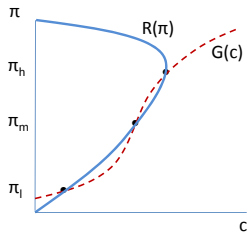
Panel B. Multiplicity of Equilibria

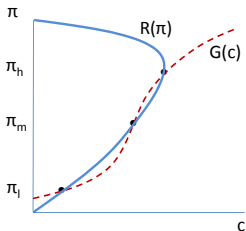# Phenotypic Stereotyping Equilibria (PSE)

- Panel A displays skill acquisition incentives $R(\pi)$.
- Panel B shows that multiple equilibria (Ψ_{CL}) create the possibility of **Phenotypic Stereotyping (PS)**: though groups are equally endowed, they fare unequally in the equilibrium.
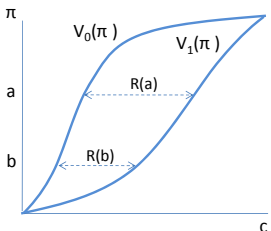
Panel A. Expected Rewards Given π Panel B. Multiplicity of Equilibria

The Logic of Self-Confirming Beliefs:
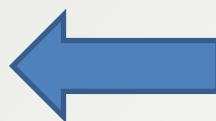
Employer's belief about the group on average = π

→

Employer's treatment of agents in group = W(π,t)

So, belief π confirmed in Equilibrium iff
π = π' = G(R(π))

Resulting in mean group behavior π', where π' = G(R(π))

←

Incentives for agents in group to become skilled = R(π)

Identity Choice Behavior

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$$U(\pi, c) = \max\{V_1(\pi) - c; \ V_0(\pi)\}. \tag{6}$$

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- Define a function $\Delta U(\pi_A, \pi_B; c)$ as **the payoff difference between a *A*-type worker and a *B*-type worker** given their skill acquisition cost level *c*:

$$\Delta U(\pi_A, \pi_B; c) \equiv U(\pi_A, c) - U(\pi_B, c). \tag{7}$$

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- An agent with the cost set (c, k) chooses affective behavior $i = A$ **if and only if** $\Delta U(\pi_A, \pi_B; c) > k$.
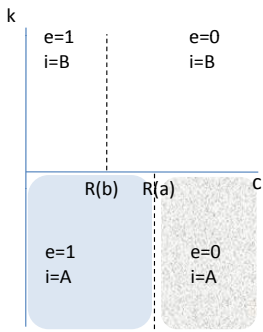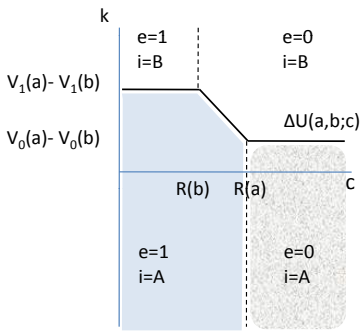
- Otherwise, chooses affective behavior $i = B$.

Positive Selection

- Use **a** and **b** instead of π_A and π_B for notation simplicity

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- Use **a** and **b** instead of π_A and π_B for notation simplicity
- If group reputation and skill incentives are **complements** (i.e. $R(a) > R(b)$ given $a > b$), the low skill acquisition cost agents **disproportionately** elect to join group A.
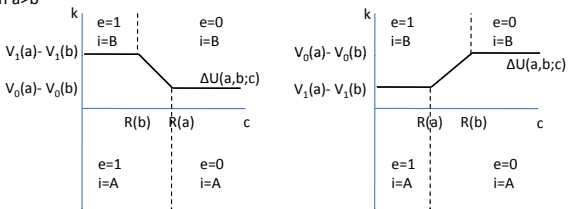
Motivation	**Model with Identity Choice**	Endogenous Stereotyping	Applications	Conclusion
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Endogenous Group Membership
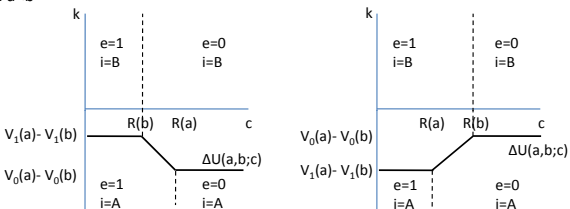
Identity Choice Behaviors in "Four" Distinct Cases

- Recall that $i = A$ if and only if $k < \Delta U(a, b; c)$:

Panel A. Case with a>b

Panel B. Case with a<b

We can now calculate the fraction of each group that will have acquired the skill when perceived identities are endogenous and when employers are anticipated to hold the beliefs (π_A, π_B):

Hence, given that c and k are independent, the fraction of agents choosing (i=A) is given by:

$$\int_0^\infty H\big(\Delta U(\pi_A, \pi_B; c)\big)dG(c)$$

And, the fraction of workers choosing (i=A) and (e=1) is given by:

$$\int_0^{R(\pi_A)} H\big(\Delta U(\pi_A, \pi_B; c)\big)dG(c)$$

Likewise, the fraction of agents choosing (i=B) is

given by (using affective symmetry):

$$\int_0^\infty \left[1 - \mathrm{H}\big(\Delta U(\pi_A, \pi_B; c)\big)\right] dG(c)$$

$$= \int_0^\infty \left[\mathrm{H}\big(\Delta U(\pi_B, \pi_A; c)\big)\right] dG(c)$$

And, the fraction of workers choosing (i=B) and

(e=1) is given by:

$$\int_0^{R(\pi_B)} \left[\mathrm{H}\big(\Delta U(\pi_B, \pi_A; c)\big)\right] dG(c)$$

- Given the employer belief about human capital investment rates (π_A, π_B), the actual investment rates for the affective groups are denoted by $\phi(\pi_A, \pi_B)$ and $\phi(\pi_B, \pi_A)$.

where the function $\phi(x, y)$ is defined as follows:

$$\phi(x, y) \equiv \frac{\int_0^{R(x)} H(\Delta U(x, y; c)) dG(c)}{\int_0^\infty [H(\Delta U(x, y; c))] dG(c)}$$

- An equilibrium with affective stereotyping (ASE) is defined as a pair of investment rates for the affective groups $(\pi_A^*, \pi_B^*) \in [0, 1]^2$ such that $\pi_A^* = \phi(\pi_A^*, \pi_B^*)$ and $\pi_B^* = \phi(\pi_B^*, \pi_A^*)$.

The set of all such equilibria is denoted by Ω_{KL}.

Note that:

1. $\pi^* \in \Omega_{CL} \iff (\pi^*, \pi^*) \in \bar{\Omega}_{KL}$

(I.e., every PSE corresponds to trivial ASE where differences in affect are uninformative.)

2. $(\pi_A, \pi_B) \epsilon \Omega_{KL}$ and $\pi_A > \pi_B$ only if $R(\pi_A) > R(\pi_B)$

(I.e., non-trivial ASE is possible only if improved reputation and HC investment are complements)

**Section 3. Characteristics of Endogenous
Stereotyping Equilibria (ESE)**

Definition of $\Gamma(a)$ **and** $\Gamma(b)$

- Given the employers' prior belief about human capital investment rates (a, b), **the actual investment rates** for the affective groups are denoted by $\phi(a; b)$ and $\phi(b; a)$ for each.

Definition of $\Gamma(a)$ **and** $\Gamma(b)$

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  (a^*, b^*) such that $a^* = \phi(a^*; b^*)$ and $b^* = \phi(b^*; a^*)$.
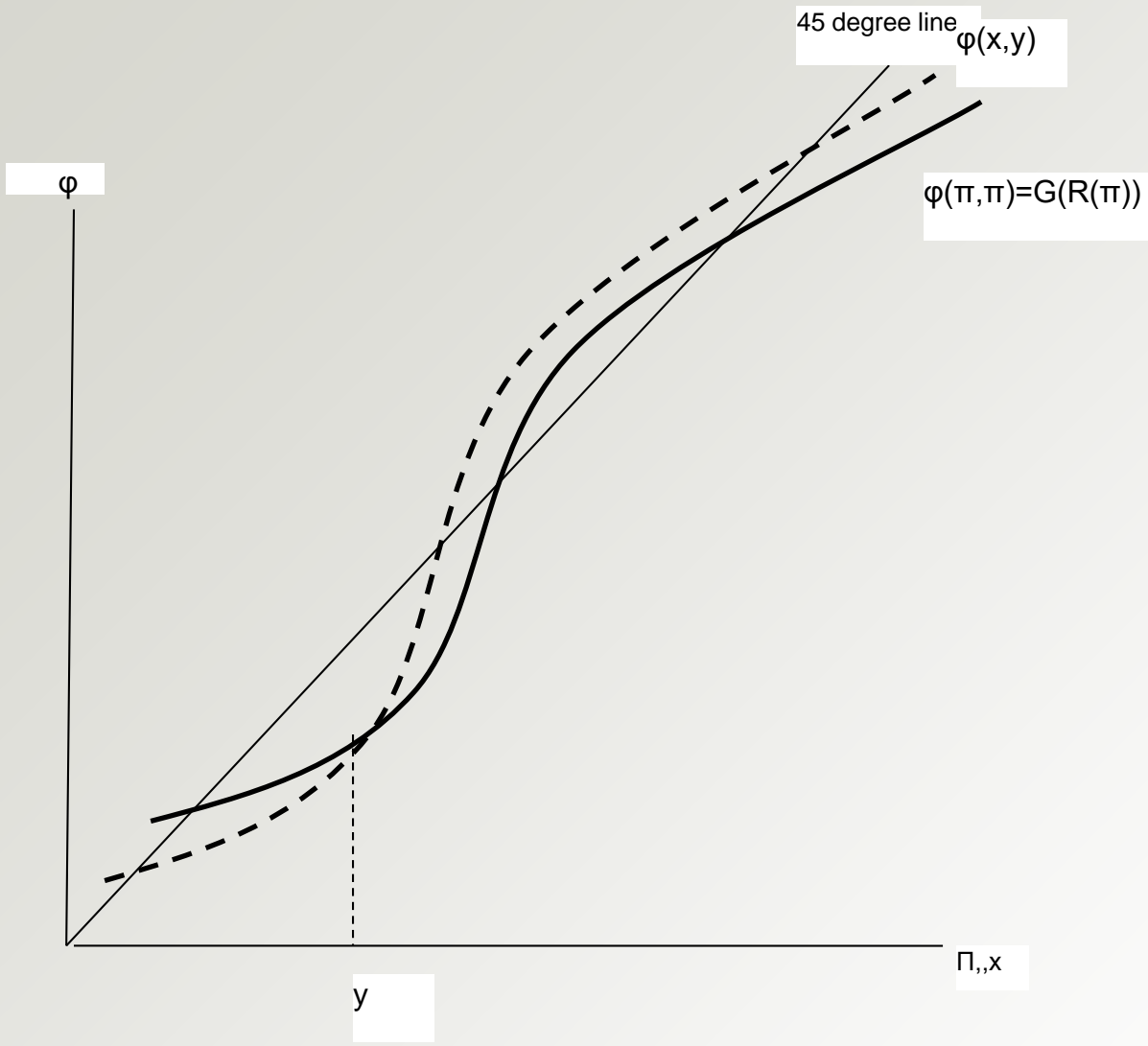
Definition of $\Gamma(a)$ and $\Gamma(b)$

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- Let us define correspondences $\Gamma(b)$ and $\Gamma(a)$ (Refer to the $\phi(a; b)$ curves) :

$$\Gamma(b) = \{a : a = \phi(a; b)\}$$
$$\Gamma(a) = \{b : b = \phi(b; a)\}$$

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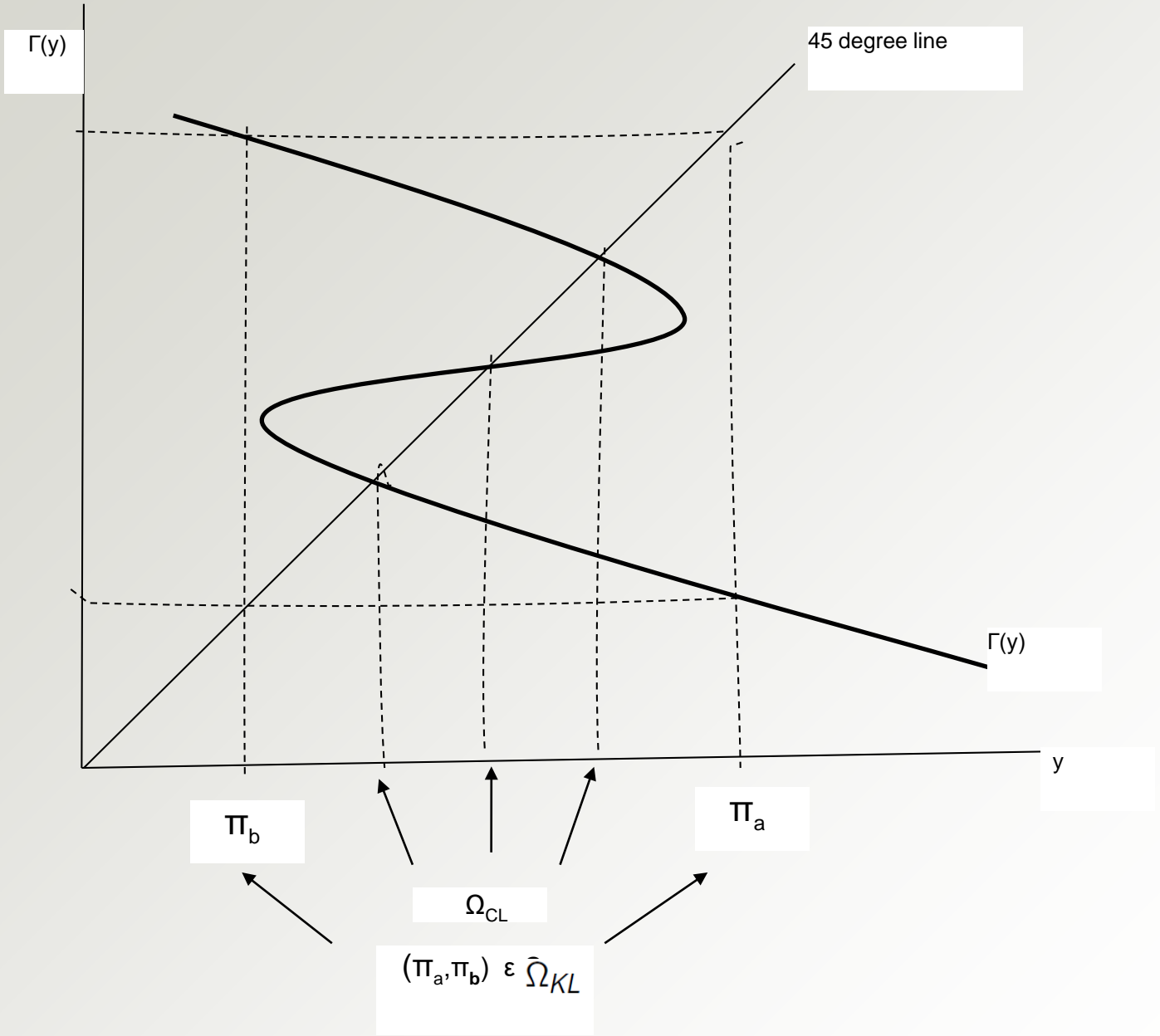- Let us define correspondences $\Gamma(b)$ and $\Gamma(a)$ (Refer to the $\phi(a; b)$ curves) :

$$\Gamma(b) = \{a : a = \phi(a; b)\}$$
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- The set of ESE can be expressed as

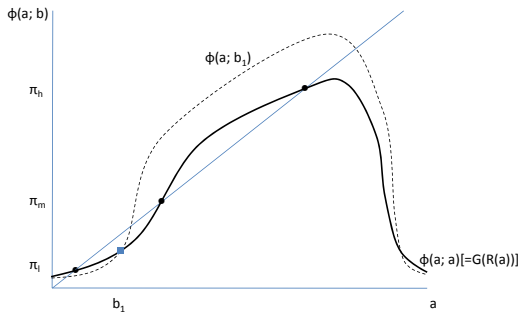 $\Omega_{KL} = \{(a, b) : a \in \Gamma(b) \text{ and } b \in \Gamma(a)\}.$

φ

45 degree line φ(x,y)

φ(π,π)=G(R(π))

Π,,x

y

$\Gamma(y)$

45 degree line

$\Gamma(y)$

y

π_b

π_a

Ω_{CL}

$(\pi_a, \pi_b)\ \varepsilon\ \bar{\Omega}_{KL}$

Existence of ESE

Locations of $\Gamma(b_1)^l$, $\Gamma(b_1)^m$ and $\Gamma(b_1)^h$

- Search for correspondences:
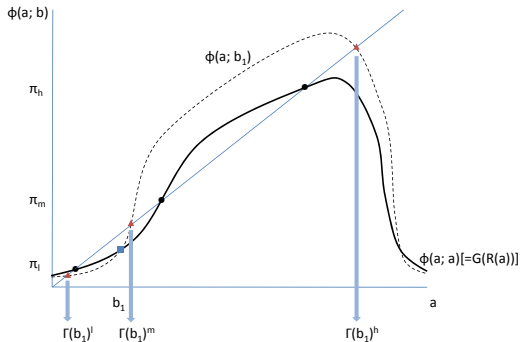
Locations of $\Gamma(b_1)^l$, $\Gamma(b_1)^m$ and $\Gamma(b_1)^h$

- Search for correspondences:

Locations of $\Gamma(b_2)^l$, $\Gamma(b_2)^m$ and $\Gamma(b_2)^h$
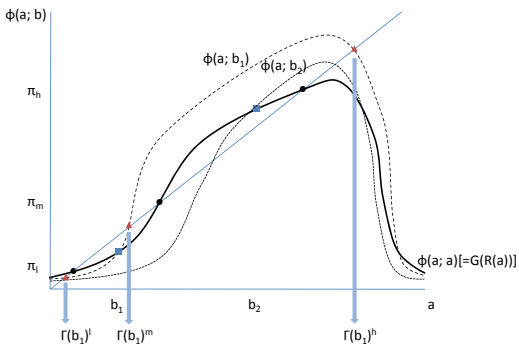
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Existence of ESE

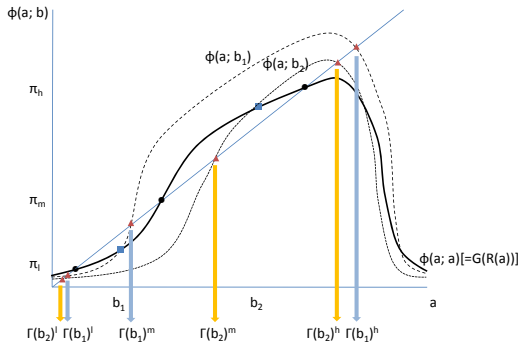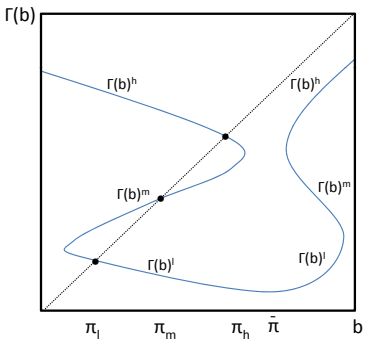# Locations of $\Gamma(b_2)^l$, $\Gamma(b_2)^m$ and $\Gamma(b_2)^h$

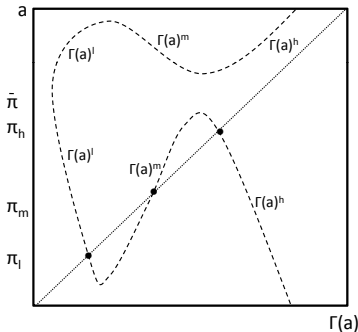- Search for correspondences:

Correspondence Curves

Then, we have the "*correspondence curves*", $\Gamma(b)$ and $\Gamma(a)$:
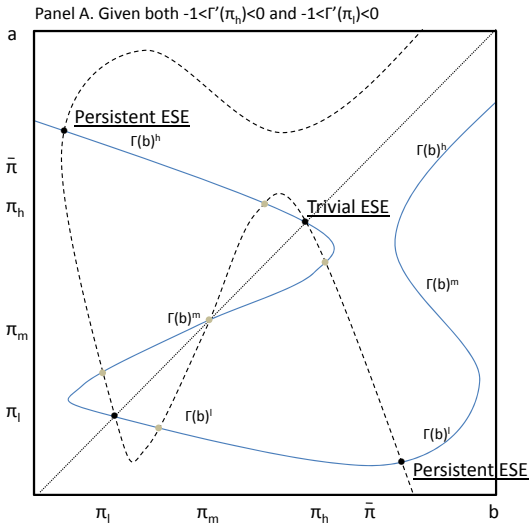

Panel A. Correspondence Curve $\Gamma(b)$

Panel B. Correspondence Curve $\Gamma(a)$

Existence of Endogenous Stereotyping Equilibria

Panel A. Given both $-1<\Gamma'(\pi_h)<0$ and $-1<\Gamma'(\pi_l)<0$

Motivation   Model with Identity Choice   **Endogenous Stereotyping**   Applications   Conclusion
○○○○○○○○○   ○○○○○○○○○   ○○○○○○○●○○○○○○   ○○○○○○○○○
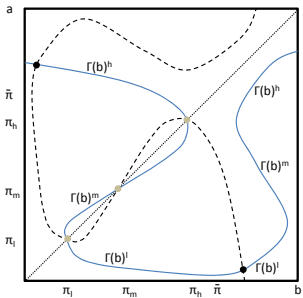
Existence of ESE

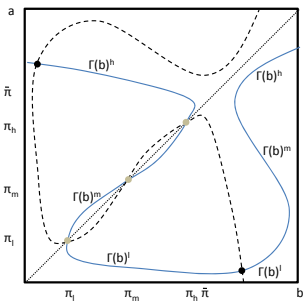# Existence of Endogenous Stereotyping Equilibria

Panel B. Given both $\Gamma'(\pi_h) < -1$ and $\Gamma'(\pi_l) < -1$

Panel C. Given both $\Gamma'(\pi_h) > 1$ and $\Gamma'(\pi_l) > 1$

Inequality between Endogenously Constructed Groups

- Inequality between endogenous groups in some ESE **can be greater than** inequality between exogenous groups in any PSE.

Theorem (Exacerbated Inequality)

Given multiple PSE (π_l, π_m and π_h), there always exist two "Persistent ESE", (π_H^*, π_L^*) and (π_L^*, π_H^*), which satisfy $\pi_L^* < \pi_l < \pi_h < \pi_H^*$.

Overlapping Generational Framework

- Consider an intergenerational population structure.

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- Every period, **the randomly chosen α fraction of the workers die** and the same number of agents are newly born.
- Employers compare **the actual skill acquisition rate of the newborns** who adopt the affect j, $\phi(\pi_j; \pi_{-j})$, and **the believed overall skill rate** π_j of the workers belonging to identity group j in order to update the prior belief π_j:

$$\dot{\pi}_j > (<) \, 0 \Leftrightarrow \phi(\pi_j; \pi_{-j}) > (<) \, \pi_j.$$

An Example: Direction Arrows $\dot{a}$ given b_1
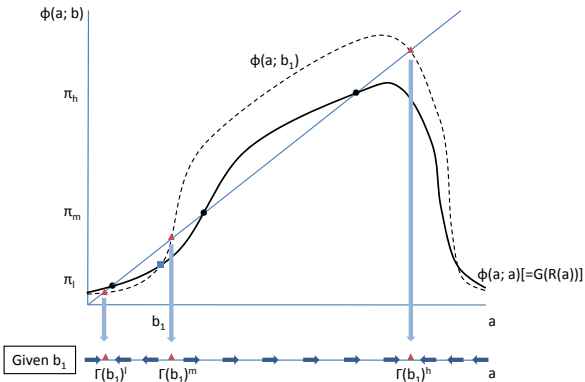
Stability of ESE with Multiple PSE

Panel A. Given both $-1 < \Gamma'(\pi_h) < 0$ and $-1 < \Gamma'(\pi_l) < 0$
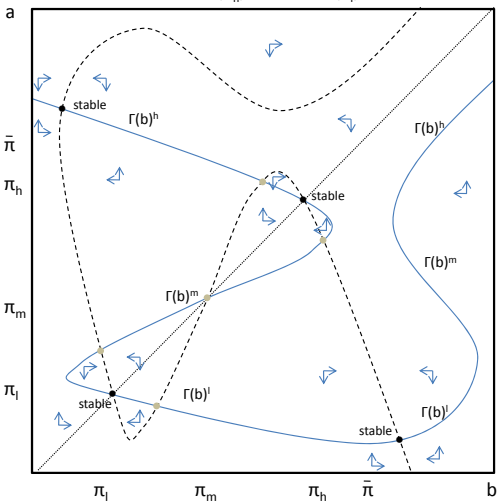
Stability of ESE with Multiple PSE

Theorem (Stability of "Persistent" ESE)

*Given multiple PSE (π_l, π_m and π_h), two "Persistent ESE",
(π_H^*, π_L^*) and (π_L^*, π_H^*), are stable and all other non-trivial ESE
are unstable.*

Stability of ESE with Multiple PSE

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*Given multiple PSE (π_l, π_m and π_h), two "Persistent ESE",
(π_H^*, π_L^*) and (π_L^*, π_H^*), are stable and all other non-trivial ESE
are unstable.*

- Equal state is not stable when the society has a critical
  fraction of members **whose identity choice cost is
  sufficiently low**:

Proposition (Convergence to "Persistent ESE")

*While "Persistent ESE", (π_H^*, π_L^*) and (π_L^*, π_H^*), are always
stable, all other ESE are unstable if and only if
$H'(0) > \frac{1-g(R(\hat{x}))R'(\hat{x})}{4R'(\hat{x})\hat{x}(1-\hat{x})}, \forall \hat{x} \in \{\pi_h, \pi_l\}$.*

Instability of Equal ESE States given Sufficiently Large $H'(0)$

- Given sufficiently large $H'(0)$, **even with strong egalitarian government interventions**, the between-group difference will never be vanished:

Panel B. Given both $\Gamma'(\pi_h) < -1$ and $\Gamma'(\pi_l) < -1$
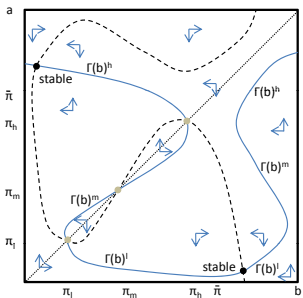
Panel C. Given both $\Gamma'(\pi_h) > 1$ and $\Gamma'(\pi_l) > 1$
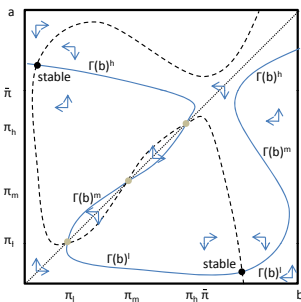
Section 4. Applications to Passing and 'Partial Passing' Behaviors

Implications of the Stereotyping Model: "Passing"

- "**Passing**" can be explained explicitly in the diagrams: e.g. Korean descendants in Japan.

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Implications of the Stereotyping Model: "Passing"

- "**Passing**" can be explained explicitly in the diagrams: e.g. Korean descendants in Japan.
- **The equal society would be harder to be achieved** because of the greater disparity between endogenously constructed social groups.
- When identity choice is easy enough (i.e., large $H'(0)$), **an equal society cannot be sustainable by nature**, implying that any egalitarian policies would not be successful in the long run.

Implications of the Stereotyping Model: "Passing"

Panel A. Korean Descendants in Japan
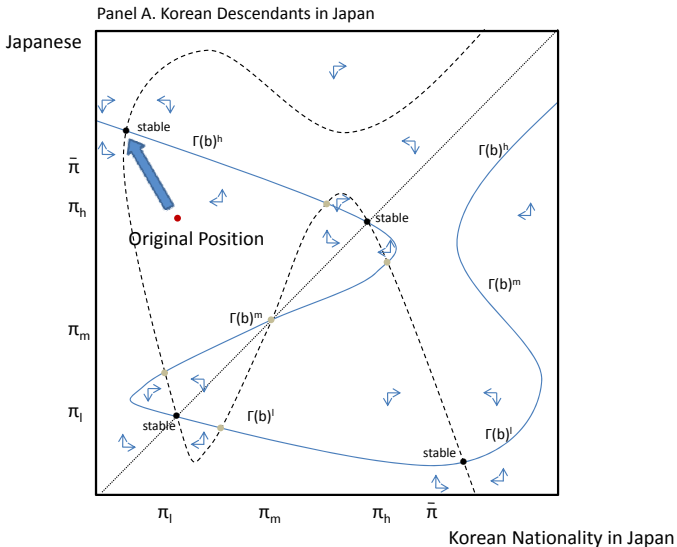
Who Lose and Who Win from Passing Activities: $\Delta W_{c,k}$?

Motivation Model with Identity Choice Endogenous Stereotyping **Applications** Conclusion
○○○○○○○○○ ○○○○○○○○○○ ○○○○○○○○○○○○○ ○○○●○○○○○

Passing Activities: Welfare Analysis
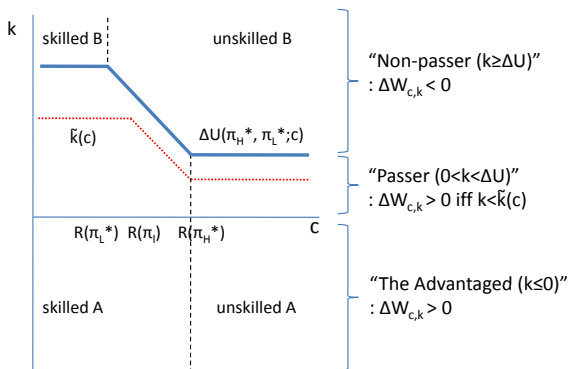
Reputational Externalities from Passing Activities
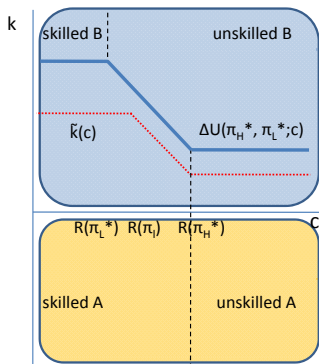
$\pi_l \Rightarrow \pi_L^*$: Negative Reputational Externality

$\pi_h \Rightarrow \pi_H^*$: Positive Reputational Externality
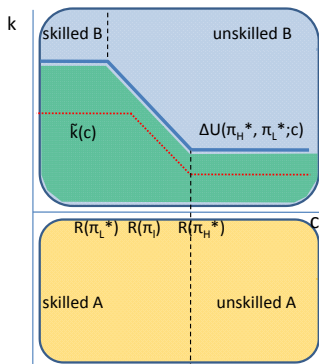
Passing Premium and Social Efficiency

$\pi_I \Rightarrow \pi_L^*$: Negative Reputational Externality

"$\Delta U(\pi_H^*, \pi_L^*; c) - k$" : Passing Premium

$\pi_h \Rightarrow \pi_H^*$: Positive Reputational Externality

Motivation | Model with Identity Choice | Endogenous Stereotyping | **Applications** | Conclusion
○○○○○○○○○○ | ○○○○○○○○○ | ○○○○○○○○○○○○○ | ○○○○○●○○○ |

Passing Activities: Welfare Analysis

Passing Premium and Social Efficiency

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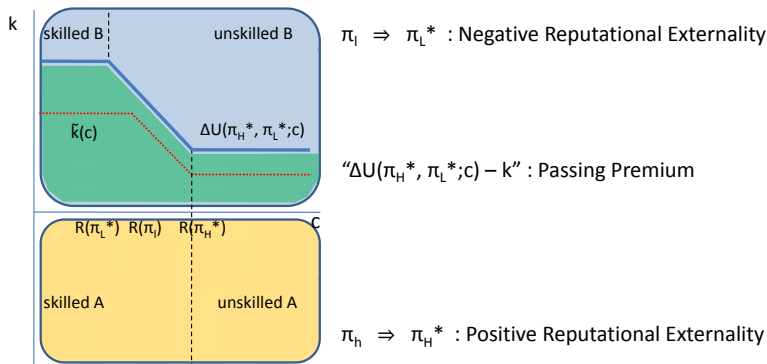
※ Socially Efficient if and only if

"Passing Premium + Positive Reputational Externality
> Negative Reputational Externality"

Passing Premium and Social Efficiency

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- Accordingly, the positive efficiency gain is more likely to be achieved **when identity manipulation is easier to undertake**.
- Given $\pi_I \approx 0$, we have

   "Passing Premium + Positive Reputational Externality $>$ Negative Reputational Externality (≈ 0)"

Proposition

*The selective out-migration from a severely stigmatized group (i.e., $\pi_I \approx 0$) is **Pareto-improving** without hurting the welfare of the left-behind.*

Implications of the Stereotyping Model: "Partial Passing"

- The "partial passing" behaviors provide **an explanation for "acting white" conflict**: the adverse impact on the left-behind may generate the resentment against the "partial passers."

Motivation   Model with Identity Choice   Endogenous Stereotyping   **Applications**   Conclusion
○○○○○○○○○   ○○○○○○○○○   ○○○○○○○○○○○○○○   ○○○○○○○●○

Partial Passing and "Acting White"

Implications of the Stereotyping Model: "Partial Passing"

- The "partial passing" behaviors provide **an explanation for "acting white" conflict**: the adverse impact on the left-behind may generate the resentment against the "partial passers."
- The given theory supports "partial passing" behaviors:

**Proposition (Efficiency Improved with "partial passing")**

When a minority population is in low skill investment trap
(π_I, π_I), *the endogenous stereotyping* **may help to improve the social efficiency** *as the skill composition of the population aggregate can move from the worst "reputation trap" to a "Persistent ESE* (π_L^*, π_H^*)".*

Motivation	Model with Identity Choice	Endogenous Stereotyping	**Applications**	Conclusion
○○○○○○○○○	○○○○○○○○○	○○○○○○○○○○○○○	○○○○○○○○●	

Partial Passing and "Acting White"

Implications of the Stereotyping Model: "Partial Passing"

Panel B. "Acting White" vs. Original Black
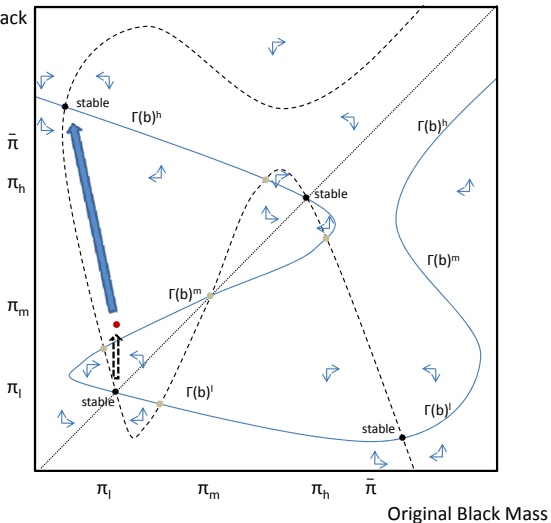
Section 5. Conclusion

Concluding Remarks

- Define Endogenous Stereotyping Equilibria (ESE) with **positive selection** into and out of the groups.

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- The model has the potential to illuminate other **identity choice related issues**: code switching, naturalization, political identity, racial profiling, brand strategy etc.

Thank You for Paying Attention!