Stratification Foundations: Institutional Payoff Maximization under Stratification (DRAFT)

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Abstract

This paper develops a formal framework for stratification economics that centers the role of identity and hierarchy in shaping economic outcomes. Rather than treating inequality as the result of random shocks or individual choices alone, the framework embeds group-conditioned endowments, identity-augmented preferences, stratified risks, and institutionally biased interactions directly into utility and game-theoretic structures. These features generate persistent inequality as the equilibrium outcome of stratified systems, not as an anomaly to be explained away. The framework also provides a compact parametric representation of the core stratification levers—choice breadth, information quality, constraint tightness, risk exposure, and payoff multipliers—that can be mapped into estimation-ready equations. This bridge connects theory to standard empirical methods (DiD, IV, QTE, field experiments), enabling systematic tests of stratification mechanisms and evaluation of equity-enhancing policies.

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These ideas are inspired by, and build on, the robust existing stratification economics literature, to which the author is indebted. This includes, but is not limited to, foundational and ongoing contributions from Nina Banks, Herbert Blumer, Glen G. Cain, Kerwin Kofi Charles, Grieve Chelwa, Lisa D. Cook, William A. Darity, Jr., John B. Davis, Timothy M. Diette, W.E.B. Du Bois, Juliet U. Elu, Nancy Folbre, Dania V. Francis, Mwangi wa Gĩthĩnji, Arthur H. Goldsmith, Darrick Hamilton, Bradley L. Hardy, Damon Jones, John Komlos, Trevon D. Logan, Ray Marshall, Patrick L. Mason, Douglas S. Massey, Kyle K. Moore, Samuel L. Myers, Jr., Franklin Obeng-Odoom, Orlando Patterson, Anita Alves Pena, Luke Petach, Michael J. Piore, Gregory N. Price, James B. Stewart, T. Jerome Utley, Jr., and Robert B. Williams.

This work also draws on foundational contributions in economics and related fields that inform the study of group-based inequality, including Kenneth J. Arrow, Gary S. Becker, Marianne Bertrand, Eduardo Bonilla-Silva, Michel Foucault, Glenn C. Loury, Karl Marx, Devah Pager, Barbara Reskin, Donald Tomaskovic-Devey, and Max Weber, among others. While these contributions are not always situated within the stratification economics tradition, they provide important conceptual and empirical foundations that this framework engages with, builds on, and in some cases challenges.

A full bibliography will be developed in future drafts.

The author used generative AI as an aid for editing, refinement, and consistency checking. All ideas originate with the author, and any AI-suggested text was carefully reviewed for accuracy and alignment with the author's voice and original text. Final content decisions and any errors remain the sole responsibility of the author.

1 Institutional Payoff Maximization under Stratification

Notes 1 and 2 established how individuals face identity-conditioned endowments and make decisions within those constraints. This note extends the framework to institutions, which play a central role in allocating resources and shaping outcomes. I formalize institutional payoff maximization under stratification, where decision-makers face identity-conditioned risks, hierarchy-preserving pressures, and potential taste or status-based preferences. This provides the mechanism through which stratification is reproduced through institutional behavior.

Setup

Institutions $k \in \mathcal{K}$ (e.g., schools, lenders, employers, firms, law enforcement, courts, governments) make decisions $x_k \in K(\kappa_k)$ that affect individual outcomes and institutional returns. As with individuals, institutional behavior is shaped by the power structure Υ, which stratifies choice, information, and constraint sets, risk environments, and payoff schedules.

Intuition: In the individualist view, institutions are identity-neutral optimizers of material payoffs. In the structuralist view, institutional decision makers also face identity-conditioned risks and hierarchy-preserving pressures, embedding stratification into their objective functions.

Institution's Payoff Maximization

Institutional Expected Payoff
The baseline expected payoff balances benefits and costs of action x_k given perceived ability/behavior $\hat{a}_i$, and identity-conditioned payoff schedules $\Pi_k(\Upsilon)$:

$$\tilde{\pi}(x_k; \hat{a}_i) = \mathbb{E}[B_k(x_k;\, \hat{a}_i,\, \Pi_k(\Upsilon)) \mid I_k, m_i] - C_k(x_k;\, \Pi_k(\Upsilon)),$$

where:

- $\hat{a}_i = h(\hat{g}_i, m_i; I_k, \bar{x}_g, \tilde{x}_g)$ is the institution's perceived ability/behavior of i, formed from observed signals m_i filtered through information I_k, group averages $\bar{x}_g$, and stereotypes $\tilde{x}_g$. This mapping allows identity to affect perceived ability through both statistical inference and stereotype-based distortions.
- $B_k(\cdot)$ captures domain-specific benefits (e.g., profits, graduation rates, safety outcomes).
- $C_k(\cdot)$ captures domain-specific resource costs (budgets, labor, capacity, error mitigation).

Institutional Risk Penalty
Institutions face exposure to volatility, liability, regulatory, and reputational uncertainty shaped by Υ. Let

$$\mathcal{R}_k(x_k; \Upsilon) = r_k(\rho_k)\, \sigma_k^2(x_k; \Upsilon),$$

where:

- $r_k(\rho_k)$ is institutional risk aversion, increasing in ρ_k (risk exposure under Υ),
- $\sigma_k^2(x_k; \Upsilon)$ is the variance of outcomes given x_k under Υ.

Examples: lenders fear default variance; police departments fear liability or unrest; employers fear turnover risk.

Social Hierarchy Deviation Penalty
Institutions incur costs when actions deviate from hierarchy-preserving norms (the status quo) under Υ. Let

$$\mathcal{P}_k(x_k; \Upsilon) = \eta_k \, \psi_k(\|x_k - \bar{x}_k(\Upsilon)\|) \,,$$

where:

- $\psi_k(\cdot)$ is increasing, convex, and satisfies $\psi_k(0) = 0$, capturing costs of deviating from the status quo $\bar{x}_k(\Upsilon)$,
- $\eta_k \geq 0$ is the institutional weight on hierarchy-deviation costs.

Examples: universities risk prestige loss; courts risk political backlash; firms risk patronage loss.

Institution's Payoff Maximization Problem
The institutional objective is therefore[1]

$$V_k(x_k \mid \Upsilon, m_i) = \underbrace{\tilde{\pi}(x_k; \hat{a}_i)}_{\text{expected payoff}} - \underbrace{\mathcal{R}_k(x_k; \Upsilon)}_{\text{risk penalty}} - \underbrace{\mathcal{P}_k(x_k; \Upsilon)}_{\text{hierarchy deviation}} + \underbrace{\beta_k(\nu_{\text{in}} \mathbf{1}\{\hat{g}_i = g_k\} + \nu_{\text{out}} \mathbf{1}\{\hat{g}_i \neq g_k\})}_{\text{taste/status term}}.$$

and k chooses:

$$x_k^* \in \arg \max_{x_k \in K(\kappa_k)} V_k(x_k \mid \Upsilon, m_i).$$

where:

- $\beta_k \geq 0$ measures how much group identity status matters to k,
- $\nu_{\text{in}} > \nu_{\text{out}}$ captures additional value placed on in-group relative to out-group matches.

The hierarchy-deviation term captures external institutional pressures to maintain existing social order, while the taste/status term captures internalized preferences or biases of decision-makers.

Benchmark PMP (Individualist View)

In the individualist benchmark, institutions are identity-neutral optimizers operating under non-stratified economic endowments:

$$V_k(x_k^{\text{pop}} \mid m_i^{\text{pop}}) = \big(\mathbb{E}[B_k(x_k^{\text{pop}}; \hat{a}_i^{\text{pop}}) \mid I_k^{\text{pop}}, m_i^{\text{pop}}] - C_k(x_k^{\text{pop}})\big) - \mathcal{R}_k(x_k^{\text{pop}}),$$

$$x_k^{*\,\text{pop}} \in \arg \max_{x_k^{\text{pop}} \in K(\kappa_k^{\text{pop}})} V_k(x_k^{\text{pop}} \mid m_i^{\text{pop}}).$$

In this benchmark:

- Endowments, risk exposures, and payoff schedules are drawn from a single non-stratified pool Ω^{pop},

[1] $\mathcal{P}_k$ reflects external institutional pressures to preserve hierarchy, whereas the taste/status term reflects the internalized preference/bias of the institutional agent.

- $\hat{a}_i^{\text{pop}} = h(m_i^{\text{pop}}; I_k^{\text{pop}})$ is the institution's perceived ability/behavior of i, based on observed signals m_i^{pop} formed on beliefs about information in I_k^{pop}.
- No hierarchy-deviation penalty $\mathcal{P}_k$,
- No taste/status term ($\beta_k = 0$),[2]
- Inequality is typically attributed to differences in ability, effort, or culture.

Intuition: Institutions maximize the benefits of their actions net of costs, but under stratification their objectives extend beyond neutral efficiency. They incorporate identity-conditioned risk exposures, penalties for deviating from hierarchy-preserving norms, and taste/status terms that value in-group matches more highly. Even when individuals have identical underlying ability, stratification tilts institutional choices so that dominant identities are systematically favored and subaltern identities disadvantaged. In the individualist benchmark, by contrast, institutions are modeled as identity-neutral optimizers of material payoffs, so persistent inequality must be attributed to differences in ability, effort, or cultural deficiencies, rather than to stratification.

Compact Intuition: Institutional PMP under Stratification

Setup/Inputs: Institutions act under stratified conditions. Benefits and costs (B_k, C_k) depend on perceived ability $\hat{a}_i$; risk penalties $(\mathcal{R}_k)$ and hierarchy-deviation penalties $(\mathcal{P}_k)$ reflect stratified exposures; institutions may also have agents who value group hierarchy via taste/status terms.

Choices/Interactions: Institutions choose x_k to maximize identity-augmented objectives, not just neutral payoffs. Their choices embed both structural pressures and identity preferences.

Outcomes/Solution: In equilibrium, dominant identities are systematically favored: subaltern identities face lower acceptance, approval, or resource allocation probabilities even with identical ability.

[2]Institututional agents may still act on their internalized identity preferences (taste-based discrimination), but this is assumed to be eliminated in the long-run via market forces

Table 1: Comparing Perspectives on Institutional PMP: Individualist vs. Structuralist

Dimension	**Individualist Perspective**	**Structuralist Perspective**
Power Structures	Identity-neutral background.	Define feasible actions, payoffs, risk, and hierarchy norms.
Group Identities	Irrelevant to institutional objectives.	Perceived identity $\hat{g}_i$ shifts payoffs, risks, and penalties.
Endowments/Inputs	Single endowment pool: risk environments, payoff schedules, and identity-neutral signals.	Endowments stratified (Ω_g) and signals systematically biased.
Decision Rules	Maximize expected material payoffs, net of identity-neutral risk, only.	Maximize payoffs net of risk and hierarchy costs, with taste/status bias.
Outcomes	Inequality only from ability differences or cultural deficiencies.	Inequality systematic: dominant identities favored, subaltern disadvantaged.

Bringing It Together

Note 1 showed stratified endowments, Note 2 stratified utility, and here Note 3 shows stratified institutional objectives. Together, they ensure inequality persists even when institutions are formally optimizing. Institutions, like individuals, do not operate neutrally: their objectives include identity-conditioned risks and payoffs, hierarchy-preserving pressures, and taste/status terms. Under stratification, institutions optimally make decisions that reinforce group hierarchy. Even absent misperception or explicit bias, unequal outcomes arise because institutions face stratified payoffs, constraints, and penalties.