Stratification Foundations: Identity and Utility (DRAFT)

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Abstract

This note continues laying out a formal framework of stratification economics: how group identity shapes individual utility that contributes to persistent group inequality. I contrast this structuralist view with the individualist perspective and formalize identity, rank preferences, group-conditioned utility inputs and parameters, and utility maximization.

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This note is part of an ongoing project to formalize a stratification economics framework to connect theory and empirics. Feedback welcome at davis@upjohn.org. Please do not cite without permission.

These ideas are inspired by, and build on, the robust existing stratification economics literature, to which the author is indebted. A full bibliography will be developed in future drafts.

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1 Group Identity and Individual Utility

This section follows Stratification Foundations: Groups and Endowments. It outlines the stratification economics perspective (i.e., structuralist perspective) on how group identity alters the individual's utility maximization problem, contrasting it with the traditional individualist view.

Setup

Each individual i is characterized by private prefernces and utility weights:

- Private tastes θ_i,
- Group utility weight $\alpha_i \geq 0$ (weight on group's welfare),
- Group status weight $\beta_i \geq 0$ (weight on group's relative position in social hierarchy),
- Individual rank weights $\gamma_i \geq 0$ (weight on individual position amongst others),
- Institutional deviance weight $\delta_i \geq 0$ (weight on institutional sanctions),
- Identity norm deviation weight $\eta_i \geq 0$ (weight on the deviation from identity norms).

Self- and Perceived Identity

Each individual i has a **self-identity** $g_i \in G$, while others may hold beliefs $\hat{g}_i \in G$ about i's group identity. These beliefs need not coincide with i's self-identity.[1]

Intuition: Identity matters not just in how individuals see themselves, but how others classify them. Differences between self- and perceived identity influence opportunities and constraints when individuals interact with other individuals or institutional agents.

Individual Rank Preferences:

Let Y denote the scalar outcome (e.g., income, wealth, education).

Define absolute and within-group relative outcome percentiles as

$$l_i^{\text{abs}} \;=\; F_Y\left(y_i\right) \in [0,1]\,, \qquad l_i^{\text{within}} \;=\; F_{Y|g_i}\left(y_i \mid g_i\right) \in [0,1],$$

where $F(\cdot)$ represents percentile functions.

For cross-group rank, evaluate the individual against the reference group's distribution using the *percentile gap*

$$l_i^{\text{cross}} \;:=\; F_{Y|g^\star}\left(y_i\right) \;-\; F_{Y|g_i}\left(y_i\right),$$

which compares where i would rank in some reference group g^* to where i ranks in their own group g_i.
Individual rank utility, or how much individuals care about "keeping up" with others, may be represented as

$$\Xi_i\left(l\right) \;=\; \gamma_i^{\text{abs}}\,\xi\Big(l_i^{\text{abs}}\Big) \;+\; \gamma_i^{\text{within}}\,\xi\Big(l_i^{\text{within}}\Big) \;+\; \gamma_i^{\text{cross}}\,\xi(l_i^{\text{cross}})\,,$$

[1] Later sections on strategic interaction will build on $\hat{g}_i$, since perceived identity influences direct discrimination in market settings.

where $\xi(\cdot)$ is increasing in l. The weights $\gamma_i = \left(\gamma_i^{\text{abs}}, \gamma_i^{\text{within}}, \gamma_i^{\text{cross}}\right)$ may depend on group identity g and institutional context Υ, which determine whether absolute, within-group, or cross-group standing is most salient.[2]

Intuition: Individuals value, not only absolute outcomes, but also their standing amongst others. Absolute rank reflects position in the overall distribution, within-group rank captures peer-relative standing, and the cross-group percentile gap shows how one's rank compares against a reference group. This captures how individual rank matters in addition to group status.

Individual utility:

Information and expected outcomes. For a choice vector x_i, the unrealized payoff/outcome is drawn from a group-conditioned distribution:

$$\tilde{y}_i(x_i; \Upsilon, \Pi_{g_i}),$$

where Π_{g_i} is the payoff schedule allocated to group g_i by the power structure Υ. Payoffs are group-conditioned: Π_{g_i} centers around average group payoffs π_{g_i}.

Each individual forms expectations and perceived risk based on their information set $I_i = I(\iota_i)$, but these are draws from group-conditioned pools (I_g):

$$\mu_i(x_i) \;=\; \mathbb{E}[\tilde{y}_i(x_i) \mid I_i, g_i]\,, \qquad \sigma_i^2(x_i) \;=\; \text{Var}[\tilde{y}_i(x_i) \mid I_i, g_i]\,.$$

Expectations μ_i and uncertainty σ_i^2 are formed over these distributions using individual information sets I_i.

Group identity status. Power structures Υ establish the hierarchy for social group G:

$$S(g; \Upsilon),$$

which captures the relative standing in the ordinal group identity ranking, or group identity status, for $g \in G$ under Υ. Higher S means greater social privilege or legitimacy for identity g_i.

Risk aversion and uncertainty. Individual risk aversion $r(\rho_i)$ is increasing in the amount of individual risk exposure in their environment, or the stakes tied to x_i, captured by ρ_i:

$$r(\rho_i)\, \sigma_i^2(x_i).$$

Risk aversion and uncertainty around expected outcomes interact to amplify the risk penalty associated with x_i. Individual risk exposure ρ_i is drawn from P_{g_i} centered around ρ_g, thus it is also group-conditioned.

Institutional deviance penalty. Power structures Υ may classify x_i as "deviant" in a group-dependent way:

$$d_i(x_i; g, \Upsilon) \;\geq 0,$$

which captures detection/sanction/stigma asymmetries tied to g under Υ. Higher d means greater deviance associated with identity g_i

[2] γ is distinct from β in that the former represents the importance of individual rank and the latter, group rank.

Identity norm deviation costs. Individuals may internalize identity norms, or face peer sanctions, that imposes psychic and social costs based on their group identity g_i:

$$\psi_i(\|x_i - x^*\|; g_i),$$

which captures penalties from deviating from the identity-norm vector x^* associated with identity g_i. The greater the deviation from norms, the higher the psychic/social costs.

Individual utility maximization problem. Given group identity g_i, endowments $\omega_i = (\kappa_i, \iota_i, \lambda_i, \rho_i, \pi_i)$, and preferences θ_i, the individual chooses x_i to[3]

$$\begin{aligned}\max_{x_i \in K(\kappa_i)} U_i(x_i) \;=\; & \underbrace{u(\mu_i(x_i))}_{\text{expected private payoff}} + \underbrace{\alpha_i\, U_{g_i}}_{\text{group welfare}} + \underbrace{\beta_i\, S(g_i)}_{\text{group status}} + \underbrace{\Xi_i(l_i\,(\mu_i(x_i)))}_{\text{individual rank}} \\ & - \underbrace{r(\rho_i)\,\sigma_i^2(x_i)}_{\text{risk penalty}} - \underbrace{\delta_i\, d_i(x_i)}_{\text{deviance penalty}} - \underbrace{\eta_i\, \psi_i(\|x_i - x^*\|)}_{\text{norm deviation costs}} \\ & \text{s.t.} \qquad a(\lambda_i) \cdot x_i \;\leq\; b(\lambda_i).\end{aligned}$$

where:

- $\omega_i \sim D_g\,(\mu = \Omega_g, \Sigma_g)$.
- $u\,(\cdot)$ is a concave utility function.
- Utility weights $(\alpha_i, \beta_i, \gamma_i, \delta_i, \eta_i)$ are applied to respective terms in utility function.
- $U_g = \frac{1}{|g|} \sum_{j:g_j=g} u\,(\cdot\,; \theta_j)$ or another group-utility aggregator depending on payoffs, group factors, or costs.
- $a(\lambda_i)$ is the price schedule/cost structure for x_i shaped by $\Lambda_i = \Lambda(\lambda_i)$
- $b(\lambda_i)$ is individual income/opportunity ceiling shaped by Λ_i

Rearranging terms to highlight the components of individual utility under stratification:

$$\begin{aligned}U_i(x_i) \;=\; & \underbrace{u(\mu_i(x_i)) \;-\; r(\rho_i)\,\sigma_i^2(x_i)}_{\text{private payoffs and risks}} \\ & + \underbrace{\alpha_i\, U_{g_i} \;+\; \beta_i\, S(g_i)}_{\text{group}} \\ & + \underbrace{\Xi_i(l_i(\mu_i(x_i)))}_{\text{individual rank}} \\ & - \underbrace{\delta_i\, d_i(x_i) \;-\; \eta_i\, \psi_i(\|x_i - x^*\|)}_{\text{social penalties}}\end{aligned}$$

Benchmark UMP (individualist view). Taking the individualist view, if we assume every individual draws from identical economic endowment pools and that group identity is irrelevant so

[3]For readability, I suppress dependence on g_i and Υ in the utility function.

group factors, individual rank, and deviation penalties do not exist, we are left with the benchmark utility maximization problem:

$$\max_{x_i^{\text{pop}} \in K(\kappa_i^{\text{pop}})} U_i(x_i^{\text{pop}}) \;=\; \underbrace{u(\mu_i(x_i^{\text{pop}}))}_{\text{expected private payoff}} \;-\; \underbrace{r(\rho_i^{\text{pop}})\,\sigma_i^2(x_i^{\text{pop}})}_{\text{risk penalty}}$$

$$\text{s.t.} \qquad a(\lambda_i^{\text{pop}}) \cdot x_i^{\text{pop}} \;\leq\; b(\lambda_i^{\text{pop}}).$$

Intuition: Individuals care about the private benefits and costs of their choices. They also care about group welfare, group status in the hierarchy, their absolute and relative rank, and the psychic costs of identity norm deviation. Stratification, by group-conditioning the given endowments with more or less favorable factors, influences the salience of these factors and how the decisions individuals make will benefit or harm them. Thus, average outcomes for members of dominant groups are set up to consistently outperform the average outcomes for members of subaltern groups.

Compact Intuition: Group Identity and Individual Utility

Setup/Inputs: Endowments are group-conditioned. Power structures define group hierarchies (S), shape payoff distributions (Π_g), and attach sanctions to group-dependent deviance. Individuals possess group identities, care about their absolute and relative ranks, and worry about peer sanctions from norm deviation.

Choices/Interactions: Individuals weigh (i) private outcomes and risk, (ii) group welfare and group status, (iii) individual rank (absolute, within-group, cross-group), and (iv) penalties from institutions and norms, subject to opportunity frontiers, to make decisions that balance private welfare with group-conditioned benefits and costs.

Outcomes/Solution: Inequality persists not only because endowments differ, but because the parameters and inputs to utility are stratified. Thus, individuals with identical private preferences, but different group identities, systematically face unequal outcomes.

Table 1: Comparing Perspectives on Individual Utility: Individualist vs. Structuralist

Individualist Perspective	**Structuralist Perspective**
Utility depends only on private tastes and expected material payoffs (with risk penalty).	Utility includes additional group-aware components: welfare ($\alpha_i U_g$), status ($\beta_i S(g)$), rank ($\Xi_i(l)$), and penalties (d_i, ψ_i).
Identity is irrelevant; all individuals draw from the same endowment pool.	Self-identity (g_i) and perceived identity ($\hat{g}_i$) alter opportunity sets, expectations, and penalties.
Relative position matters only indirectly through own consumption.	Rank utility is explicit and multi-dimensional: absolute, within-group, and cross-group.
Institutions are neutral arbiters, or are irrelevant, in the markets.	Power structures (Υ) shape utility by defining hierarchies (S), distributing unequal endowments (ω_g), and imposing asymmetric sanctions (d).

Bringing It Together

The structuralist framework generalizes the individualist UMP. Instead of assuming that identity is irrelevant and individuals maximize only private payoffs subject to prices and uncertainty, we recognize that identity and power structures shape the inputs and parameters of individual utility. Individuals weigh private outcomes alongside group welfare, group status, rank, and social penalties. Because endowments are group-conditioned, individuals with identical preferences θ_i but different group identities face systematically unequal outcomes.