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Introduction

Since workers are often well hidden inside of the capital-labor ratio by economic models, it is refreshing to see the emphasis of Akerlof and Kranton [2000, 2005] on "identity." Identity is a fairly new issue for economists, but it is a rather old one in sociology, social psychology and management, having grained great significance with the development of the assembly line and the feared consequence of such workplace innovations in the form of "alienation" and rejection of capitalism. It is not necessary, however, to consider identity as a problem to be overcome; it may also be considered to be a positive feature of social action; and the work of Akerlof-Kranton orients us in that direction.

At the risk of some oversimplification, one can say that Akerlof-Kranton introduce identity into the indivdiual's utility function and measure identity by reference to the extent to which individuals accept and act in terms of a set of "ideals" that customarily apply to particular socially recognized categories. And they "incorporate identity into a general model of behavior and then demonstrate how identity influences economic outcomes" (p. 716). We shall accept the idea that normative coherence may be particularly foundational to certain forms of identity. However, we shall argue that behaviors and characteristics that fully qualify individuals to be members of social categories may not suffice to provide salience to those categories for defining the self or personal identity, even though they may fully enable sociologists and demographers to mark appropriate boxes in questionnaires. Moreover, our focus is on the dynamics of identity that may flow from modifications in "ideals" advanced by innovators.

Identity is most effectively associated with (actual or anticipated) achievement relative to others within a category, buttressed to some degree by performance that corresponds to the norms of that category. In this paper we argue that it is precisely the breaking of expectations and the extension of personal possibility beyond the normal level of achievement in a social category that give the strongest foundations for identity, provided that individuals can anticipate social rewards for these achievements.

For example, for the citizens of International Falls, Minnesota, nicknamed the "Nation's Icebox," their city is officially and very proudly the coldest city in the continental United States; and people have reacted fiercely to competitive claims made by people in another cold city. Similarly, other cities, such as San Francisco, New Orleans and New York are perceived to possess a uniqueness on some dimension that defines their identity. These "unique" qualities need not correspond to ideals that are sought by other cities, as is quite clear in the International Falls example. And the same could be said about San Francisco. On the other hand, the ideal city could be characterized by features that imply that the place is really a city, such as having at least one traffic light, two gas stations and a Starbucks. That is *my* list, and your probable rejection of it is precisely the point. There is no subset of standards, or ideals, that the citizens of most cities actually seek to establish as a basis for local identity. However, they are likely to seek one or more arguably exceptional characteristics of their cities as being critically identifying. Similar considerations apply to other elements within the structure of personal identity.

While our focus is principally on manifestations of self-identity, it would appear that the process by which individuals arrive at self-identity is not so different from that which they use in positing identity for other individuals, groups or entities. In each case they locate characteristics that appear to be expressed with exceptional, if not unique, effectiveness as a basis for imputing identity to that entity. Our analysis considers this issue in a dynamic context, with a presumption that a distinguising characteristic of an entity, even if unchanging in its general form, requires continuing re-invention and re-invigoration.

Given that personal identity is strengthened by the possession of uniqueness in role performance or uniqueness in individual characteristics, this discussion of identity may contribute to the microfoundation of social innovation and social change. A dynamic of social change can arise from the fact that uniqueness is often highly rewarded and consequently (with some probability) replicated by others, thereby destroying the uniqueness of the original attribute but generating a broader process of change. Even the initial source of innovation is likely to change in the face of replications by others–generating the non-linear, positive feedback in social transformation that G. H. Mead (1934) perceived to be foundational to human progress.

The most important implication of this analysis is that the promotion of effective change in characteristics of social roles cannot be advanced simply by providing rewards to innovators. Even if rewards appear to be satisfactory to innovators themselves, those rewards might still be insufficient to promote a desired dynamic of innovation over time in a given category of achievement. We find that when individuals promote innovation in the performance of a social role, the formal rewards to those

innovators must be more than proportional to the significance of the innovation as perceived by *other* role-incumbents. If those formal rewards are less than proportional to the significance of the innovation, a general disapprobation of the *innovators* may arise that potentially vitiates the benefits to innovators, retards the diffusion of the innovation and frustrates further innovation.

The Model

Consider an individual i with assigned social categories, $c_i = c_{ij}$, for each role $j \in J_i$. And assume that for each (categorical) role there is a socially recognized ideal level of effective performance, e_{pj}, so that for any individual i his or her actual level of performance is $e_{ij} \leq e_{pj}$. However, since it is difficult to conceive of performance levels in this absolute fashion, our model features the *relative* performance in role j by individual i: $x_{ij} \equiv e_{ij}/e_{pj}$.

In our discussion the effectiveness of performance builds upon that which has been conceptualized by Akerlof-Kranton. We too consider norms of behavior, dress and other demeanors as foundational to role performance; and ideal role performance is most honorific, as defined by the social benefits that accrue thereto. For a worker or manager, the ideal might be advancement along a career ladder to the "top" of the relevant category. For a city or state it might be some notable and unique characteristic that induces businesses or people to remain or transfer into it.

- *There exists a vector, π_j, that measures the net social valuation of ideal performance in category j. The elements of π_j provide an index of social status.* Since this measure of social status possesses a number of parameters, and since different observers of that category, as well as its incumbents, may give different weights to those parameters, there need be no generally agreed upon valuation for the category or for particular incumbents. In this model, differences in status are concretely created by differences in access to formal and informal social rewards that are premised on categorical differences. Indeed, the existence of social categories is arguably derived in part from their effectiveness in delineating differences in rightful access to social resources. These differences in access to social rewards are embedded in π_j. In particular, denote by π_j the set of extrinsic rewards (and penalties) associated with ideal performance of role j, so that the actual reward to person i is $\pi_j \cdot x_{ij}$. The social status of an individual is to be reckoned in terms of his or her effectiveness, relative to the ideal. This specification implies, for example, that frequently awarded Nobel Prizes to economists and the public claims regarding the importance of their

work have the effect of strengthening the market position of all economists in proportion to their apparent likelihood of receiving the prize. Although π_j will be characterized as a vector in the narrative, we shall simplify our mathematical presentation by treating it as a scalar.

- *Individual i has internalized the social valuation of x_{ij}.* This is a rather basic assumption of social psychology regarding the healthy social actor. It is assumed that individuals internalize the social norms of the culture or subculture that generates π_j. Given this assumption, we can use $\pi_j \cdot x_{ij}$ as a factor in an individual's j-identity.[1] In the event that an individual fails to fully internalize the social valuation of the many elements of j, we can expect a reduced level of effectiveness on some dimension.

  In a complex society there are many potential sources of applause and condemnation; and the relevant sources for evaluating x_{ij} vary across individuals and contexts. The primary source of a "social evaluation" need not be the "dominant" cultural group within a society. Within a criminal subculture, for example, the standards of behavior that must be met by group leaders are likely to be those which produce the longest prison sentences for those who are caught and convicted.

- *Individuals will identify with a category to the extent their performance (x_{ij}) has been mastered by only a few others, other things equal.* Among the many roles that are generated by a social system, some can be mastered rather easily by a great many persons and others can be mastered at an ideal level by relatively few. Let $G(x_{ij})$ be a strictly increasing and continuous function for the percentage of individuals who are perceived by i to be inferior to i in their performance of role j.[2] Then, $G(x_{ij})$ measures the self-perceived special characteristics of individual i as a member of category j. We shall refer to this factor as the intrinsic factor in the development of identity.

Combining extrinsic and intrinsic evaluations of a given category, we obtain the j-identity of person i.

Definition: $I_{ij} = (\pi_j \cdot x_{ij}) \cdot G(x_{ij})$.

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[1] There is may be some benefit to expressing $\pi_j \cdot x_{ij}$ in more general mathematical form. However, our results depend only on the existence of a function that is monotonically increasing in those arguments.

[2] If follows that $f(x_{ij})dx$ is the percentage of persons who, in the opinion of individual i, are able to perform role j at the level x_{ij}, so that $F(x_{ij} - \epsilon) \equiv G(x_{ij})$.

For a rare and socially recognized genius, I_{ij} may approach π_j. However, there need not be any individuals who actually satisfy the ideal of a category, unless it is rather narrowly defined. An ideal woman, for example, may consist of a combination of qualities that is found in no individual, even when there may be individuals who exemplify the ideal of each constituent characteristic.

It is a dead end job when most people are (potentially) able to perform it at the ideal level with an acceptable and realizable level of effort, that is, when $G(e_{pj}) \approx 0$.[3] The belief that a particular job is dead-end will be considered relative to the perceptions of specific individuals. For example, one person might believe that a particular task can be performed by anyone, when in fact many people would be challenged by it. It is for this reason that we refer to it as an "intrinsic" factor. $G(x_{ij})$ is essential to an understanding of the dynamics of identity. It constitutes the most important emendation that we can provide to the Akerlof-Kranton conception of identity. The problem emerges strongly in those cases where most individuals are commonly able to achieve e_{pj}. In this case, it is, we believe, a serious error to presume that achieving the ideal will produce a strong sense of self. A common achievement of e_{pj} can provide a sense of belonging to a group, but not a sense of self. Unfortunately, many social scientists make the mistake of defining human beings by reference to their internalized social norms and values [Blumer 1966].

Relationships between effectiveness and reward in the construction of identity.

Analytically, the arrival of a potentially new ideal in role j will produce increases in the value of e_{pj}, reflecting a higher level of effectiveness in ideal performance. However, since x_{ij} is defined relative to e_{pj}, an increased level of the ideal reduces x_{ij} for any given absolute level of effectiveness (e_{ij}).

For the moment, we will assume that the new ideal will receive a new, higher, value of π_j. The only issue is, how much? And we will look at the *initial* effect of a new ideal, prior to its possible imitation by others (so that $G(x_{ij})$ is unchanged). And given the equation for identity, $I_{ij} = (\pi_j \cdot x_{ij}) \cdot G(x_{ij})$, an increase in e_{pj} affects identity of non-ideal individuals positively with a real income effect, given the higher π_j, but negatively with a substitution effect, reflecting the lower x_{ij}. The net effect of these

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[3]Since $G(\cdot)$ is defined relative to those who are strictly inferior to i in their performance of role j, it is equal to zero when everyone is capable of performing at the ideal level. This fact motivates its definition.

two changes depends on the balance of forces. However, in the event that the reward for extending the ideal in role j is small relative to the change in e_{pj}, and the negative substitution effect is likely to overwhelm the income effect for those whose roles have remain unchanged.

All incumbents of j lose when ideal performance in j does not receive adequate compensation. Although, by assumption, the innovator receives a net positive reward, others in the category will lose from a leftward shift of x_{ij} that is not compensated by the limited increase in π_j. On the other hand, we can show that if a new ideal in j is more strongly rewarded, all members of j should benefit, giving rise to a dynamic of social change. We can demonstrate the following Propositions:

> **Proposition 1:** Even if there is a reward to those who manifest a new ideal level of effectiveness, all other members of j will suffer a loss of identity unless the increased benefit for ideal performance is at least proportional to the advancement in the ideal.

> **Proposition 2:** The immediate impact, positively or negatively, on individuals' identities of a new ideal level of effectiveness will be greater for those non-innovators whose initial status was higher.

Propositions 1 and 2 apply to the initial point in time, say t_0, before many individuals have had an opportunity to mimic the new behavior. In this special case, the value of $G(x_{ij})$ that applied to the pre-innovation period continues to be relevant. The effect of a change in e_{pj} upon identity can be shown to be:

(1)
$$\frac{\partial I_{ij}}{\partial e_{pj}} = \frac{\partial \pi_j}{\partial e_{pj}} \, x_{ij} \, G(\cdot) \; - \; \pi_j \, x_{ij} \, G(\cdot)/e_{pj} \; - \; \pi_j \, x_{ij}^2 \, G'(\cdot)/e_{pj}$$

Eq. 1 can be rewritten in terms of elasticities:

$$\frac{\partial I_{ij}}{\partial e_{pj}} = G(\cdot) \, x_{ij} \left(\frac{\pi_j}{e_{pj}} \right) \left\{ E_{\pi_j, e_{pj}} - \left(1 + E_{G, x_{ij}} \right) \right\}$$

If we consider only the immediate effect of the new ideal on the identities of others (so that $G'(x) = 0$), the change in e_{pj} will have a positive effect on the identities of incumbents of j if:

$$(2) \qquad G(\cdot)\, x_{ij} \left(\frac{\pi_j}{e_{pj}} \right) \left(E_{\pi_j, e_{pj}} - 1 \right) \geq 0$$

We can see that for any value of x_{ij} an increase in the level of e_{pj} will have a positive effect on identity of others in j if and only if the elasticity of π_j with respect of e_{pj} is greater than unity—establishing Proposition 1. And we see that the effect of changing e_{pj} is greater when $G(\cdot)x_{ij}$ is larger, that is, when e_{ij} is larger—establishing Proposition 2—that is, there is a greater immediate (favorable or unfavorable) response of higher ranked individuals to changes in e_{pj}.

If the initial increased reward to the new ideal is more than proportional to the increase in effectiveness, others in j will applaud the innovators—providing them with additional social rewards. We can also expect that others in j will make efforts to develop capabilities required to mimic the new ideal. These positive responses will be most apparent among those of higher rank. However, when rewards to the new ideal fail to be commensurate with the innovation, those ranking individuals may be expected to be the most prominent among the detractors of the innovator and the most resistant to change.

Competitive interactions of elite and common role-incumbents in response to innovation

As a consequence of a more general effort of individuals to increase or maintain a given level of relative effectiveness, the value of $G(x_{ij})$ will tend to deteriorate for any value of x_{ij}, thereby exerting a depressing effect on j-identity, ceteris paribus.

It is not possible to trace the path of change that arises as individuals attempt to preserve their relative effectiveness. However, we can consider the "vulnerability" of individuals to being overtaken by those whose effectiveness is near but less than their own. We do so by examining the last term in Equation 1: the change in $G(x_{ij})$ that is consequential of an increase in e_{pj}. Taking the derivative of this term with respect to x_{ij} we seek to find the value of x_{ij} for which this term is maximal. We obtain:

$$(3) \qquad -\pi_j x_{ij} [2G'(\cdot) + x_{ij} G''(\cdot)] e_{pj}^{-1} = 0 \quad ?$$

This derivative can be evaluated only by reference to particular specifications of $G(\cdot)$; and after consideration, we have chosen to let $G(\cdot)$ be a cumulative Pareto distribu-

tion function. As many people are now becoming aware, the Pareto distribution is appropriate to describe phenomena where large events are rare, but small ones quite common, including the distribution of city sizes, earth quakes, website usage and income distributions. It seems only natural to presume the relevance of this form of probability density function for the distribution of effectiveness in the performance of social roles.

We can express the Pareto density function on the variable e_{ij} as: $\varphi(e_{ij}) = k e_m^k / e_{ij}^{k+1}$. In the literature on the Pareto distribution, one commonly encounters the variable "α" where $\alpha \equiv k + 1$. [4] This type of distribution is not defined at zero and, for simplicity, we set e_m, the lower bound on e_{ij}, equal to 1, so that $1 \leq e_{ij} \leq e_{pj}$. After normalizing, we have the variable, x_{ij} for which the corresponding probability density function is $g(x_{ij}) = k(1/e_{pj})^k / x_{ij}^{k+1}$.

> **Proposition 3:** Given a Pareto distribution of effectiveness within j, the "instantaneous" effect of a change in e_{pj} upon the relative superiority of any individual will be independent of her level of effectiveness, if k equals one.

When we set k to unity, the bracketed expression in (3) vanishes, so that (3) does not vary with x_{ij}. It is quite plausible that k is near unity, so that the pressure to preserve identity in the face of an advanced ideal will be felt quite generally among the incumbents of j, thereby reducing the likelihood of a divisive politics among them.

However, if $k > 1$, the immediate vulnerability to losses of identity in j as a result of advances in e_{pj} will be greater for individuals with less effectiveness in j. These result arise from the fact that the weight of population in j shifts to the left as k increases, so that improvements in performance by role incumbents will pose a greater threat to those with less effectiveness.[5] In general, then, common members and the elite members will differ in their reaction to an innovation to the extent that k exceeds unity. Quite plausibly, this condition would induce greater resentments from lower ranking incumbents of j or, alternatively, provide greater inducement for improved effectiveness among those individuals, or more realisticaly, a combination of both reactions. Clearly, this issue has important implications for the dynamics of social movements.[6]

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[4]It has been found that in natural systems, the value of α is commonly between 2 and 3. For an excellent discussion of this and related matters, see Clauset, Shalizi and Newman (2007).

[5]Unfortunately, a measure of skewness is not defined for the Pareto distribution for values of k less than 3. However, for values of e_{ij} near to e_m, the value of the cumulative distribution function, $\Phi(\cdot)$, increases with k: $\Phi(\cdot) = [1 - (1/e_{ij})^k]$

[6]The case of $k < 1$ can be ignored as implausible; see Clauset et al (2007).

Emergence of social change from the activity of heterogeneous agents

An example of an individual who sought to extend the range of possibility for women is provided by Akerlof and Kranton [2000: 722] in their story of an attorney, called Rachel. Rachel was the subject of a skit performed by female secretaries of the firm in which a man was depicted as saying, "I'm such a busy man" and Rachel was depicted as saying "I'm such a busy man, I mean woman" But since this skit was the product of secretaries, it does not immediately raise questions about Rachel's identity as a woman. Rather, it should focus our attention on the effect of Rachel's professional performance on the identities of the secretaries. The skit was directly a manifestation of distress among the secretaries.

Although it is not mentioned by Akerlof-Kranton, we may postulate that at lunchtime the secretaries are likely to go out together and perhaps shop after work; and when there is a strict division of labor by gender, the separate activities and conversations of secretaries are marked as female. However, Rachel can not be part of that clan; she dines with colleagues or clients or is too busy and works at her desk. And, immediately, the women's collective is socially transformed into a group of lower status workers. By reclassifying Rachel as a man they can escape this threat to their identities. Comparable attacks have been reported by academically successful African-Americans whose peers have accused them of being "white."

It seems natural that individuals would resist new conceptions of any ideal that would greatly reduce their own effectivness relative to the ideal. However, as we have shown in Proposition 1, the extent to which such novelty generates widespread condemnation or imitation by others depends on the extent to which powerful elements of organizations or society provide rewards to new ideals.

We can now consider the circumstances that face innovators. Certainly, if innovations in j are socially recognized as being valuable extensions of j, then by definition there will be rewards for that behavior in the form of higher π_j. Also by definition, the innovator perceives herself to be exceptional and beyond the norm, $G(e_{ij}) = G(e_{pj}) \approx 1$, leading to a stronger self perception, other things equal. However, the general circumstances facing the innovator depend on other factors, as well. In the case of the attorney, Rachel, for example, the ridiculing skit by the secretaries, apparently without objection from colleagues (one can just hear those guys laughing), implies a hostile work environment. This is clearly a significant cost to her occupational choice, indicating a diminished value of elements in the *vector*, π_j. Indeed, in the event of an intolerable work environment, π_j may fail to meet Rachel's reservation

wage and she may simply quit when I_{ij} as an attorney falls below a salient alternative self conception. Our hypothesis (from Result 1) is that the skit would not have been performed had Rachel been receiving appropriate support from colleagues (in the form of salary, clients, working conditions, and so forth). Rachel's story illustrates clearly a *negative* feedback process that discourages the evolution of a new conception of womanhood.

As is the case with any individual, Rachel presents us with a host of identities. Here, we have considered her as a woman, but one may equivalently consider her as a mother, a wife, an active person in religious or social organizations, and as an attorney. These are roles that differ in their performance dimensions from that of "womanhood." And as a attorney, she could conceivably be recognized as an innovator, but only if it were recognized that women have the potential of bringing to the courtroom some valued attributes not available to men. However, the implication of the story about her is that she had not been so recognized. Moreover, we might suppose that some would question her effectiveness as a mother and wife, given the long hours that she now must spend at the office. Each of these issues can be represented in the vector of "rewards" that applies to her activity as an attorney and, hence, in her sense of wellbeing (her "utility function").

Had she been properly rewarded by her colleagues, Rachel would have provided not only a "demonstration effect" but "real income" effects on other women (and men). In this social entanglement of selves, the interjection of Rachel's new ideal into the collectivity of other levels of performance would have produced a positive reaction upon Rachel in a dynamic whose outcome is not entirely predictable. Women like Rachel are mutants, many of whom may die without downstream consequence, but in the fortunate event of the domination of positive feedback within the collectivity of selves, social change emerges (the so-called "butterfly effect"). However, we can see that much depends on π_j; and π_j is controlled largely by her male superiors. Consequently, the process of social change, to the extent that it is promoted by initiatives of subordinates, can be allowed freedom to generate important social change or it may be throttled, depending on the perceived interests of superiors. Quite commonly, observers of social movements have suggested that the women's movement was the instrument of recent changes in status and opportunities of women. However, for social movements, context matters. The macro-system of incentives had to be cooperative; and it is necessary that the needs of this macro-system were perceived to be advantaged by novelty in gender roles.

An interesting and illustrative example from recent anthropological literature is provided by Yan Yunxiang (2005) from his long term research in a north China village:

...in 1984 a young woman in the village demanded that her betrothal gifts be converted into a lump sum [locally called *ganzhe*]; she then pocketed the cash and spent only a small proportion of the money to prepare for her wedding. This *unprecedented behaviour* was regarded by many as scandalous. (my emphasis)

...Although she too came from a poor and low prestige family, she was smart, confident, and quite individualistic by local standards. ...In the end, the groom's family complied with her demands because their son was afraid of losing her.

This new and strange settlement of the bridewealth deal between the bride and the groom's family, however, was the centre of village gossip for only a short while because villagers regarded this case as too abnormal to be taken seriously. What the villagers did not expect was that in the following year, 1985, rumour had it that no land would be allocated for house construction. Those planning marriages at that time worried about not being allocated a plot of their own; following the 1984 *ganzhe* model that was still fresh in their minds, many grooms suggested that their brides ask only for cash as betrothal gifts. This was then used by the couple to purchase construction materials. Once they had construction materials, the village office would allocate them a plot of land. Parents on both sides welcomed this plan because they too were worried about the impact of the new policies. As a result, converted bridewealth (*ganzhe*) rapidly became popular and has continued to this day. By the summer of 1997, most villagers with whom I spoke regarded converted bridewealth as a normal practice.

In this Chinese example, we see, once again, the importance of a seemingly fortuitous context as the precondition for the general adoption of an innovation. In this case most parents recognized the value of this new aggressive behavior on the part of brides (thereby augmenting elements of π_j).

During the early 1970s, under the good graces of new affirmative action programs, many universities opened their doors to black students who were otherwise not oriented toward university education. For many of these students there was a serious identity problem, much like the problem faced by Rachel. While attendance at the local community college was consistent with a high level of ethnically correct effectiveness, attendance at an "all-white" university was not. Most of these students claimed that their goal was to return to their communities and promote socio-economic developments therein. In this way they sought to define university education as a

mechanism for black empowerment; and they could present themselves as new ideals in black identity. It is unlikely that many of their promises were kept, and it is demonstrably clear that these pioneers failed to stimulate an increasing flow of black students into the univeristy (except for athletes). From our model, we must presume that π_j was not sufficiently augmented so as to generate the necessary positive feedback.

Dynamics, emergence and complexity

Our conception of identity is parallel with the conception of the *self* found in the seminal works of George Herbert Mead [1934]. As a social psychologist, he focuses on imputed constructs within the human mind and the relationships thereof to society. For him, the self arises from an internal conversation of the "I" with the "me," where the "me" is a socially perceived individual who acts and interacts with others within a set of cultural rules of behavior and who experiences the actions of others. The "I" on the other hand is a relatively autonomous and creative element within an individual's mind that has the capacity of instructing the "me" into perpetual novelty. In the absence of a powerful "I" the "me" can act only conventionally, controlled entirely by the forces that surround it—the "mob" being an extreme manifestation thereof. However, the "I" has the potential of independently reassessing the situation and the attendant social action. Hence, it is a source of innovation and social change as it acts upon the "me" and as it induces change in others who, in turn, change their behavior toward the "me", a process that we now call positive feedback.

In our model the degree of novelty in an individual's behavior in role j is measured by $G(x_{ij})$. However, we must emphasize that $G(x_{ij})$ does not represent the intra-psychic "I" of Mead, but only its behavioral manifestation. If an individual adheres studiously to the norm, being indistinguishable from others in the relevant group, then $G(x_{ij}) \approx 0$, and this particular aspect of the individual's social activity would fail to constitute a source of personal identity. However, to the extent that a person is self perceived as being exceptional, relative to others in this category, $G(x_{ij})$ becomes larger and this particular role may become an element of the self.

Remarks

We already knew that people would respond positively to expectations of reward, so that attractive π_j would induce efforts to enter career paths on which such rewards

could be earned. And we also knew that those who are on such career paths, or who are considering doing so, will respond to the attitudes of peers. However, a consideration of identity suggests, further, that the responses of peers to efforts to extend the domain of the ideal will be affected by the extent to which the acceptance of this ideal will generate increased self esteem for those peers, *including those peers who must accept a position far from the ideal*. The necessary condition for this effect was established as Proposition 1: the increase in π_j must be more than proportional to the increased effectiveness of the ideal. Given an initial reward for novelty of sufficient magnitude, additional rewards that flow directly from the social approbation of peers can contribute significantly. And most importantly, given that there is a positive social valence to the ideal, it is more likely to be mimicked by others, thereby generating a non-linear increasing flow of individuals toward greater effectiveness.

Akerlof-Kranton [2005] consider the advantages to organizations of having workers who identify with a constituent work group or with the organization as a whole. Their principal suggestion is that by investing in identity-inducing factors of some kind, the firm will be able to reduce wages. Intrinsic benefits associated with identity would compensate for losses in money income; and firms may obtain greater net revenue if the cost of increasing work incentives is less than the wage reduction. In our view, however, this suggestion is consistent with Fordist notions of cost minimization that are inimical to innovation within firms and industrial clusters (Iansiti and Levien 2004).

In our model, it is assumed that relatively few workers are able to achieve ideal levels of performance. This is because the ideal lies at the end of a successful career path in an occupational setting. If all workers can achieve the ideal, simply by deciding to do so, the job is "dead end," as defined herein; and workers will not identify with it. Hence, one salient method for increasing intra-firm identity is to create a set of integrated task structures that allow for mobility within j and/or that provide opportunity for the effective expression of the individual novelty. In this way, a perpetually evolving sequence of ideal workers becomes feasible, with corresponding values of e_{pj} and π_j. And, as we have shown, if π_j is sufficient, there should be increased wages for all members of category j; and both the firm and its employees can be better off. Implicit recognition of this fact can be seen in the continuing and striking innovations at Apple and Google, ranked in both 2006 and 2007 by BusinessWeek (February 11, 2008) as the most innovative companies in the world. In these companies the relevant "career paths" have been heterogeneous teams of employees who are jointly rewarded for new ideas.

References

Akerlof, George A. and Rachel E. Kranton, 2000, Economics and Identity, *Quarterly Journal of Economics, CXV*, pp 715-753.

Akerlof, George A. and Rachel E. Kranton, 2005, "Economics and Organizations," *Journal of Economic Perspectives,* 19, 9-32.

Arthur, W. Brian., Steven N. Durlauf David A. Lane, 1997, *The Economy as an Evolving Complex System.* Proceedings of the Santa Fe Institute, Vol. XXVII. Reading, MA: Addison-Wesley.

Baldwin, John D., 1986, *George Herbert Mead: A unifying theory for sociology,* Sage Publications, Newbury Park.

Blumer, Herbert, 1966, "Sociological implications of the thought of George Herbert Mead," *The American Journal of Sociology*, 71 (5): 535-544.

Clauset, Aaron, Cosma Rohilla Shalizi and M. E. J. Newman, 2007, "Power-law distributions in empirical data, 26 pages, in review for publication. http://www-personal.umich.edu/ mejn/pubs.html.

Iansiti, Marco and Roy Levien, 2004, Strategy as ecology, *Harvard Business Review*, March: 68-78.

Mead, George Herbert, 1934, *Mind, Self, and Society.* Chicago: University of Chicago Press.

Yan Yunxiang, 2005, "The individual and transformation of bridewealth in rural north China," *Journal of the Royal Anthropological Institute 11*, 637-658.