



Working Paper No. 443

Personality and Earnings

By

Kaye K. W. Lee

February 2006

The Levy Economics Institute Working Paper Collection presents research in progress by Levy Institute scholars and conference participants. The purpose of the series is to disseminate ideas to and elicit comments from academics and professionals.

The Levy Economics Institute of Bard College, founded in 1986, is a nonprofit, nonpartisan, independently funded research organization devoted to public service. Through scholarship and economic research it generates viable, effective public policy responses to important economic problems that profoundly affect the quality of life in the United States and abroad.

The Levy Economics Institute
P.O. Box 5000
Annandale-on-Hudson, NY 12504-5000
<http://www.levy.org>

Copyright © The Levy Economics Institute 2006 All rights reserved.

Acknowledgements

Special thanks are due to Dimitri B. Papadimitriou and The Levy Economics Institute of Bard College for their support and sponsorship of this work. I am also indebted to Anupam Saraph, Geoff Harcourt, and Greg Hannsgen for their invaluable advice and comments.

ABSTRACT

This paper studies personality as a potential explanation for wage differentials between apparently similar workers. This follows initial studies by Jencks (1979) that suggest that certain personality traits, such as industriousness and leadership, have an impact on earnings. The paper aims to provide a theoretical framework within which these effects may be analyzed.

The study begins by outlining four issues as a backdrop to the model: rationality, the industry, firms, and workers. A crucial factor to the model is the meme—a mental gene that affects personality. Taking these four factors into consideration, the Contested Exchange model from Bowles and Gintis (1990) is used. Then, it is adapted to study memetic effects on the wage rate. This is followed by an analysis of how memes may affect personality and thus earnings. The issues that require further study and resolution are 1) which traits create wage differentials, and 2) two-way causality: does personality affect the wage, or does a wage premium become an incentive for a person to adopt new memes?

PERSONALITY AND EARNINGS

It is generally accepted that wage differentials between apparently similar workers exist. Interest has recently been regenerated in this due to studies by Krueger and Summers (1987, 1988) and Katz and Summers (1989). While this fact is generally undisputed, explanations for it have evolved drastically. In the 1950s and 1960s, the focus was on industry factors such as degree of concentration, degree of unionization, level of profits and so on. However, this initial concentration on purely demand factors changed in the 1970s, when economists began to also consider the impact of labor supply features in the form of human capital models. By the 1980s, studies were considering firm and industry characteristics to explain wage differentials, but also controlling for supply-side factors.

In this study, personality is considered as a potential explanation for wage differentials. Initial research in this area was conducted by Jencks (1979), who found that, controlling for human capital variables, behavioral traits, e.g. industriousness, perseverance, and leadership showed statistically significant influences on labor market success. This has been an area of research which has been relatively ignored. Bowles, Gintis, and Osborne (2001a) suggest that this is because:

1. Economic theory does not predict which personality or behavioral traits will influence earnings. Furthermore, it is unlikely that these traits will remain the same across jobs.
2. Personality traits could well be the result of labor market success as much as the cause of them. Thus, there is a causality identification problem.

The purpose of this paper is to build on their work in order to clarify how behavioral or personality traits may affect employer responses in different workplaces.

METHOD OF ANALYSIS AND FACTORS FOR CONSIDERATION

By Karl Popper's rationality principle, social processes should be analyzed assuming that agents act appropriately or reasonably, given the situation. This approach of situational analysis is adopted as the guiding principle for the purpose of this study. In addition to this, there is a trade-off between generality and depth-of insight to be considered. As Loasby (1967) points out,

“...the extension of a general conclusion has to be paid for by the shallowness of its intention; it is possible to say something about all firms only by saying little about any particular firm.” In order to attain generality, standard economic analysis typically uses representative firms and workers. Unfortunately, this also means that insights relevant to more specific determinants of a worker’s wages are ignored.

Thus, in order to provide a suitable backdrop for this analysis, four key factors are considered:

1. Rationality
2. The industry
3. The firm
4. The workers

The assumptions made regarding the above four factors and their interactions will determine the predictions of a theory of wage differentials.

Rationality

The rationality of players in the labor market is a factor that is not given much attention in developing theories of wage differentials. This appears to be a mistake, since the actions and reactions of a given worker, firm, and industry would be governed by rationality. In the standard neoclassical model, there are four rationality assumptions: self-interest, omniscience, conscious deliberation, and the representative agent. Yet, while many regard Popper’s approach as the method of neoclassical economics, there are obvious differences (Langlois 1988). For example, while Simon (1955, 1959) implicitly agrees that it is easy for an agent to comprehend a situation he is in, he points out that there may be a tendency to satisfice, i.e. to select a solution that is, while not the best, good enough. This is due to a boundedness, not in their rationality, but in their computational ability to solve a problem. Thus, they may act as though they follow certain rules for dealing with situations.

In this paper, it is argued that Simon’s problem of limited computational ability is compounded by limited rationality. Players in the labor market do not necessarily behave rationally because they are indeed “programmed” to follow certain behaviors. This can be better understood with a concept introduced by Dawkins (1976)—a meme. A meme may be regarded

as a mental gene—it represents a pattern of thought or consciousness, such as a catchy tune, an idea, or a catch-phrase. Weeks and Galunic (forthcoming) use the word meme “...to refer collectively to cultural modes of thought—ideas, beliefs, assumptions, values, interpretive schema, and know-how... .” Memes, like genes, replicate from person to person. Each interaction of a person with a culture, whether in the form of another person or of environmental effect, provides a platform through which the modes of thought encapsulate within a meme to be transmitted. The brain of each individual is then the host for the meme. Blackmore (1996) admits that we do not know how memes work, even “though we may speculate in terms of synaptic potentiation or variations in weights in neural networks.” However, the concept is an intuitively satisfying one, and could be usefully employed in developing a clearer description of the labor market.

Memetic structures exist at a cognitive level. They are usually regarded to impact on individuals’ actions through habitual thoughts and responses. For example, an individual who has found a strategy for overcoming a given problem in the past is likely to use it again by rote, even though it may not be optimal. Loasby (1967) argues that continuous marginal adjustment is too costly. Changing a practice to optimize the derived utility imposes various costs, psychological and physical, on the individual. This is the reason why human beings develop habits—in order to free themselves of the burden of making and re-making daily choices (e.g. what brand of cereal to buy) which are unlikely to yield much, if any, extra utility. Like a map, habits act to encourage and preserve the status quo. They may be regarded as memetic patterns which have become so entrenched that they may be difficult to dislodge (for better or for worse), sometimes even against the individual’s will.

However, memes do not only affect the decision-making process. They may also act to limit an individual’s awareness. A typical Cambridge undergraduate walking to the Economics Faculty may well come to ignore the King’s Chapel along the way, even though tourists gawk at the landmark. The travel pattern has become so ingrained and automatic that the undergraduate may actually miss a significant change if the building were renovated or changed in some way, even though that might mean he could take a shorter route. By the same token, an economic player may become so accustomed to playing his economic game in a certain way that he may well ignore certain aspects of the economic game. In short, memes affect both the perceptions and the thought patterns of their hosts, thus having a significant impact on the way an economic situation plays out.

Thus, the introduction of memes acts to further limit the scope of normal optimization within economic theory. It may be insightful to solve Lagrangean functions for representative individuals, but this cannot be regarded as universally applicable to every individual. Instead, the specific situation and memetic influences must also be accounted for, a la Popper.

The Industry

Within this analysis, the industry is regarded as the environment within which a firm functions. It provides broad parameters which firms are forced to survive, such as the size of the market, the degree of competition and the historical development of the industry. Industry conventions (e.g. oligopolistic practices) also affect firms, and may be regarded as industry-wide memes.

The Firm

Firms have traditionally been regarded to fulfill a function. Theories of the firm have been designed in this functionalist vein. For example, the first theory was by Coase (1937), who suggested that firms are organized by individuals in order to minimize transaction costs. An alternative to the transaction cost economics view is the knowledge-based theory of the firm, which argues that firms exist because they integrate and apply knowledge to business activity more effectively than markets. (Kogut and Zander 1992, Conner and Pralahad 1996, Grant 1996)

An alternative view of the firm is one of cultural evolution, as proposed by Weeks and Galunic (forthcoming). They suggest that a firm is a social entity, which may not only have transaction cost advantages and knowledge-bearing properties, but also works to bear culture. Culture includes shared knowledge, but also the specific habits and thought patterns encoded in memes. This view provides a robust explanation for the origins and persistence of firms.

More importantly, the memetic view of the firm has implications for how we may model a firm. It may no longer be regarded as a purely profit-maximizing entity, or even a satisficing one. There have been arguments regarding what a firm's actual objective may be, particularly in the area of principal-agent theories. In addition to deciding whatever objective function the firm needs to solve, consideration must now be given to three additional factors:

1. The memetic structure of the employer may well blind him to certain objective-enhancing (whatever his objective is) opportunities.
2. The habitual memetic thought patterns, embodied by his personal history, will cause the employer to consider certain solutions (or aspects of solutions) more than others. Thus, he is unlikely to be the all-knowing, far-sighted decision-maker of neoclassical theory.
3. Even when a decision is reached, it may not be successfully implemented within the firm because of the firm's specific culture.

Thus, these considerations complicate the process of developing a model of wage-setting even more.

The Workers

The additional dimension to the traditional view of workers due to memetic considerations is similar:

1. They may not be aware of certain aspects and possibilities of the labor market game because their perceptions are colored.
2. Some strategies will occur to, and appeal more readily to, each worker depending on his memetic make-up.
3. They may be unable to negotiate for their ideal outcome even if they managed to calculate it, because that would go against the culture of the workplace.

The above is not a comprehensive list of memetic effects, but rather used to illustrate the significant impact they have in economic situations. Another example would be the Keynesian notion that workers will resist individual wage cuts because they perceive that this will lower their purchasing power relative to their colleagues. This would not be the case if purchasing power dropped uniformly through inflation. (Keynes 1936, Galbraith and Darity 1993)

IMPLICATIONS FOR A LABOR MARKET MODEL

The point, then, is that memes have a great deal of influence in the market place. In order to illustrate their importance, a model from Bowles and Gintis (1990) is used.

The Simple Labor Market Model

There are two players in this world: A, the employer, and B, the employee. A is said to have a credible threat for dismissing B when

$$v(w) > z \tag{1}$$

where w = real wage rate

$v(w)$ = the value of employment to B. This is the discounted present value of the worker's future income, taking account of the probability that the worker will be dismissed

z = B's fallback position. This is the present value of B's future income if his job is terminated.

B will work provided his wage is above a certain reservation wage w^{bar} . A has a monitoring system that will cause him to judge B's performance as adequate with probability f . f will vary positively with the level of effort, e , which B exerts. If A finds B's level of effort inadequate, there is a probability p that B will be fired. e^{bar} is the level of effort that B's personal optimization will lead him to provide, given the link between the probability of dismissal and his level of effort. Since e is costly for B to provide, A has to increase w in order to raise B's level of effort beyond the minimum, e^{bar} . The increase in w increases the cost of job loss to B.

Since z is exogenous, B's best response to w may be written as

$$e = e(w) \tag{2}$$

This is called the labor extraction function. It is assumed that $e_w > 0$ and $e_{ww} < 0$.

Since A knows the labor extraction function, it can act as the Stackelberg leader in this game, setting the wage, w , to elicit the level of effort that will suit its purposes. If A maximizes profits (or minimizes costs), then he will set w so that the marginal effect on effort of an increase in wages equals the average effort provided per unit cost i.e. where

$$e_w = e/w$$

(3)

The graphical solution is shown in Figure 1. $(e/w)^*$ is an isolabor cost locus. All points on this line have the same effort per wage dollar. Thus, the employer is indifferent among them. Steeper isolabor cost lines elicit a higher level of effort per wage dollar, and are hence preferred by the employer. Note that $e^* > e^{\text{bar}}$ and $w^* > w^{\text{bar}}$. In other words, the optimal level of effort exceeds the minimum level of effort that the worker would exert. Thus, the wage rate needed to induce that level of effort is also higher than the reservation wage, w^{bar} .

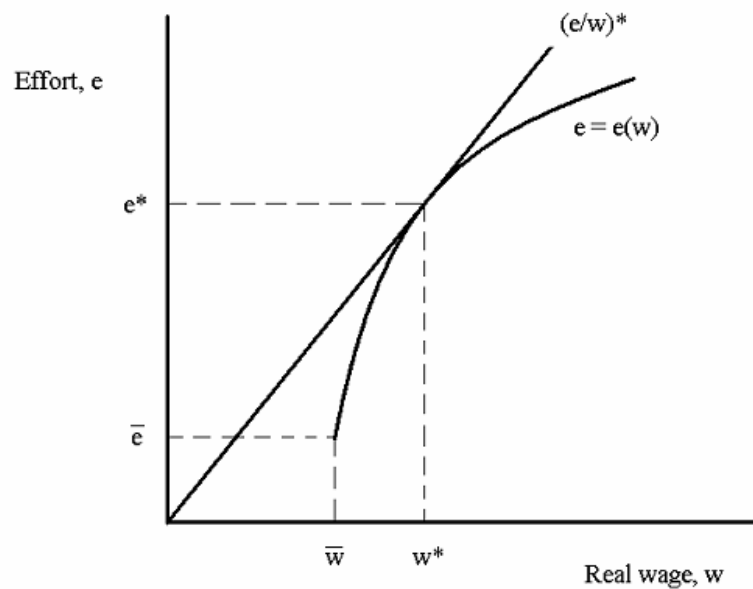


Figure 1. The Contested Exchange Model

Employer Memetic Effects

The contested exchange model above shows the employer’s solution if he correctly “calculates” the worker’s best response function. However, it is unlikely that the employer will have such detailed knowledge of the worker. Furthermore, the employer’s own preconceptions about the worker and the employer’s own memes (e.g. values about how much work is appropriate) may well enter the equation, causing the employer to mistakenly use the function e_2 instead of the correct one, e_1 , as in Figure 2.

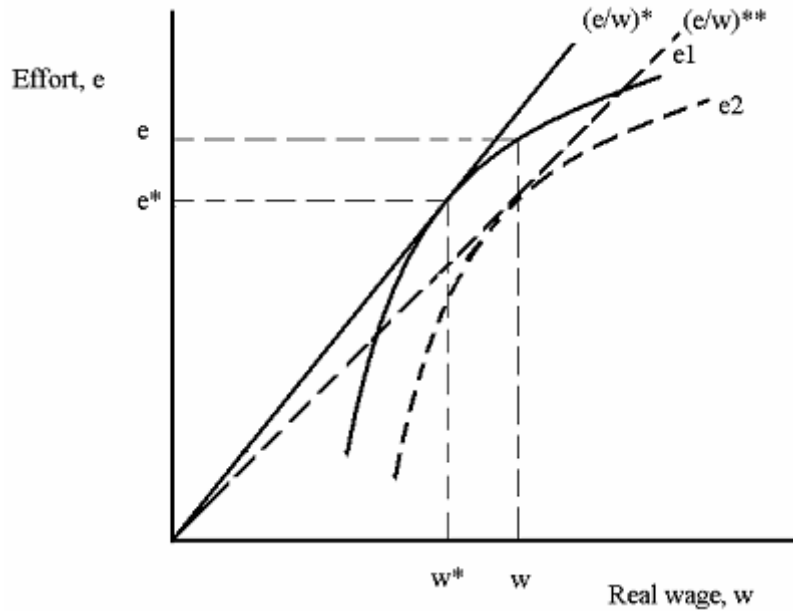


Figure 2. The Mistaken Labor Extraction Function

In Figure 2, the result of the employer's mistake is that he pays a higher wage rate, w , than the optimal, w^* . Although this extracts a higher level of effort, e , than e^* , it is less than optimal. Lowering the wage rate would lead to a higher average level of effort per wage dollar. Part of this mistake in identifying the labor extraction function may be arguably due to a simple misperception or signalling problem. However, it is also undeniable that the memetic effects on the employer's perception also are a potential source of error.

Even if the employer did not make a mistake in calculating the labor extraction function, he could still choose to take a non-optimal action, based on his memetic make-up. As an example, an employer may decide that a certain level of effort per wage dollar is fair, and elicit effort according to this, even though he could obtain financial gain from paying the optimal wage w^* . This is shown in Figure 3.

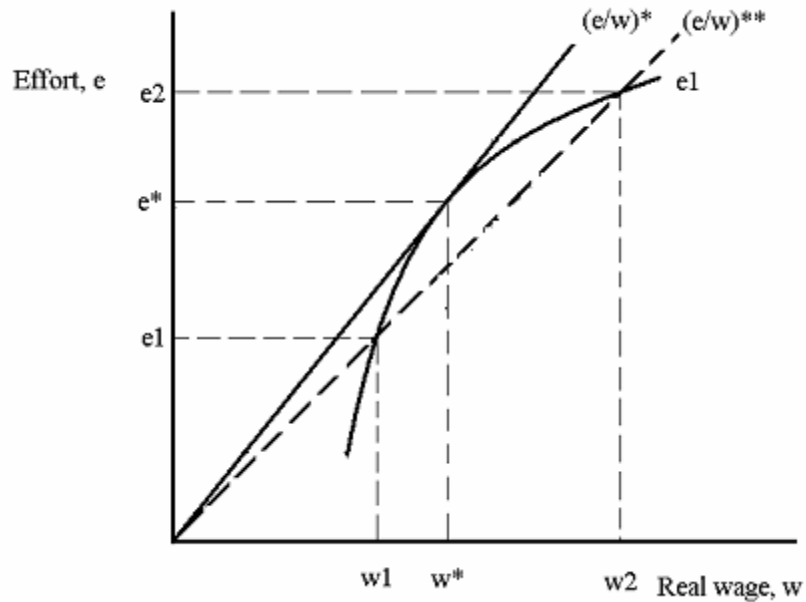


Figure 3. The employer regards $(e/w)^{**}$ as the fair effort to wage ratio.

In Figure 3 above, the employer can choose from $(w1, e1)$ and $(w2, e2)$ as possible solutions. All combinations along the labor extraction function above $(e/w)^{**}$ result in a higher effort level per dollar, and the employer's fairness prevents him from accessing that point. Note that in this variation of the model, the employer still attempts to maximize his profits. However, even though his primary objective has not changed, the memetic notion of fairness prevents him from exploiting a higher effort level per dollar.

A third possibility might be that, even if the employer did correctly identify his optimal solution, the labor market culture prevents him from doing this. For example, there may be an unspoken practice within the industry to extract a maximum level of effort per dollar $(e/w)^{**}$. Even though he may wish to attain solution point (w^*, e^*) , the employer will be forced to select either $(w1, e1)$ or $(w2, e2)$, as before.

Effects of Personality on Employees

Clearly, memes can have an influence on the results of economic games. Similar effects can be obtained by considering their effects on employees. However, the objective of this paper is not to provide an exhaustive catalogue of such situations. Thus, in this section, only the effects of worker personality are considered. To do this, consider the effects of what Bowles and Gintis (1990) term *incentive-enhancing preferences*.

They argue that economics often focuses on exogenous claim enforcement, where contracts are comprehensive and costlessly enforceable. However, as Becker (1964) observed, “any enforceable contract could at best specify the hours required on a job not the quality of the performance.” The employment relation can never be contractually complete—the employer may be able to secure a number of hours where a worker agrees to submit to his authority, but he does not necessarily secure a productive flow of labor services. Thus, given an asymmetric information problem, it may be in the employer’s best interests to pay a premium for certain behavioral traits, such as honesty, responsibility, and a low disutility of effort. Thus, we say that a preference is incentive-enhancing if it shifts up the best response function of the worker, as shown in Figure 3.

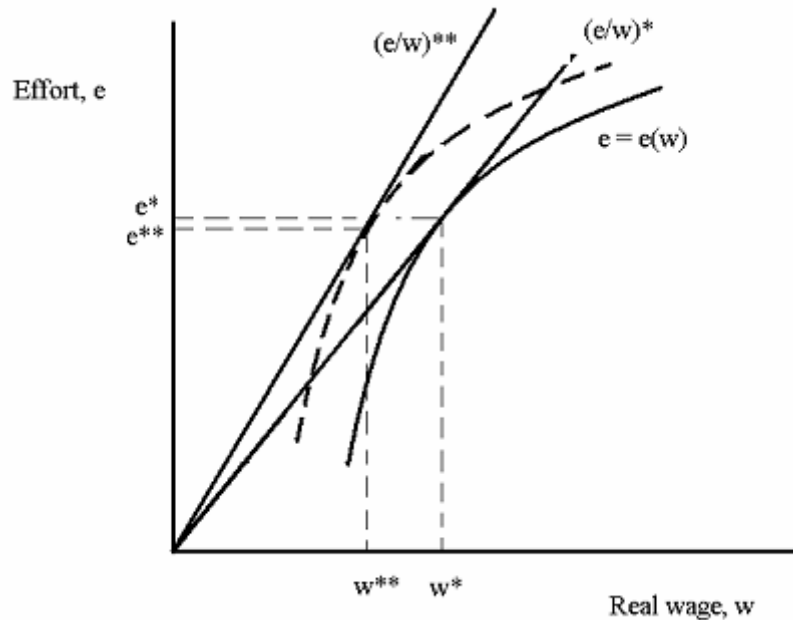


Figure 4. Incentive-enhancing Preference

One of the problems with analyzing personality is that incentive-enhancing preferences are likely to be heterogeneous. Furthermore, due to the different demands of jobs, these traits are likely to be rewarded differently in different workplace situations. This could well be the reason the link between personality and job performance was regarded to be tenuous prior to the late 1980s. One of the advances was the emergence of the Five Factor model of personality, also known as the “Big Five.” These traits are bipolar dimensions of personality which form the core

of most personality models. The traits are extroversion, conscientiousness, emotional stability, agreeableness and openness to experience. Barrick and Mount (1991) and Tett, Jackson and Rothstein (1991) presented evidence from over 200 studies that “conscientiousness” was strongly related to job performance and success. Within the context of an incentive-enhancing preferences model, this is what would be expected.

However, while personality-enhancing preference represents an important source of wage premiums, it still ultimately views the firm within a functionalist paradigm, i.e. that the only reason to reward a trait is if it contributes to production. If the firm is taken to be not just an entity of production, but also a culture-bearing entity, then it is possible to reward memes/traits that do not necessarily contribute to production, or may even detract from the production process.

MEMES AND THE INHERITANCE OF SOCIOECONOMIC STATUS

Early studies, such as that by Blau and Duncan (1967) found an approximate 0.15 intergenerational correlation for earnings among men in the U.S. This appears to contribute little evidence for the inheritance of socioeconomic status. However, Bowles and Gintis (2000) argue that this result could be blamed on two types of measurement error: (i) errors in income reporting and (ii) transitory components in current income uncorrelated with underlying permanent income. They claim that when this high degree of noise is corrected for, intergenerational correlations of economic status are substantial. This is further supported by studies of the similarity in the economic status of siblings. For example, for brothers aged 25-45 in the U.S., the correlation of the natural logarithm of earnings is 0.45. (Bjorklund, et al. 1999)

Bowles and Gintis (2000) conclude, from an examination of the evidence, that

“...recent evidence points to a higher level of intergenerational transmission of economics position than previously thought. Moreover, although the level of intergenerational IQ inheritance is also considerable, the latter accounts for little of the former. Indeed, some combination of environmentally and genetically transmitted noncognitive personality traits probably account for most of the correlation between the economic positions of parents and children. Personality differences, like group membership, affect earnings and display parent offspring similarity. They thus join the genetic and cultural inheritance of cognitive skills, property bequests, and other influences of wealth, and parent offspring similarity in schooling attainments as aspects of the process of intergenerational transmission of economic status.”

This makes a case for a closer study of memetic transmission and the evolution of a person's memetic make-up, since this will affect their noncognitive personality traits, and thus the intergenerational transmission of economic status. Because it is so easy to regard a meme as a "mental gene," it is useful to highlight Hamer's (2004) observations about the differences between memes and genes:

1. Genes are found in all living creatures, whereas memes only affect humans. This implies that behavioral experiments involving animals will exhibit the memetic effects. Thus, any insights drawn from such experiments must be tempered with considerations for distortion due to memetic effects.
2. There is a difference in the efficiency of reproduction between memes and genes. Genes can only be transmitted as quickly as the reproduction process involved can take place. Memes, on the other hand, pass rapidly on through each interaction or communication an individual has with others/the environment containing the meme.
3. Genetic evolution is slow. Memetic evolution, on the other hand, can be extremely rapid. A change in fad or fashion can occur overnight.

In light of the effect of personality, it may be argued that memes, as units of culture, are a useful conceptual tool (regardless of their actual existence) in formulating explanations for wage dispersion. In order to understand the process more completely, it is necessary to study the evolution of memes.

MEMES: SELECTION, VARIATION, AND RETENTION

Three processes function to affect the evolution of memes: selection, variation, and retention. (Weeks and Galunic, forthcoming)

Selection

A meme in a firm is said to be selected when a member internalizes that meme, consciously or unconsciously. There are three types of pressures that encourage this selection: Function, fit, and form.

- (i) **Function:** There is a pressure to internalize a meme when it appears to serve some desired end. Two issues arise which complicate considerations. Firstly, a meme may be mistakenly judged to serve an end when it doesn't. In this case, feedback from the environment will likely eventually reveal this in the long run. The second is that individuals are as likely to select functional memes that serve their own ends as much as ones that suit the firm's ends.
- (ii) **Fit:** Memes that fit into the memetic ecology of a person (or firm) are more likely to be selected. In other words, a meme that supports dominant memes fits into the memetic paradigm more easily, and thus has a higher chance of transmission.
- (iii) **Form:** Certain memetic expressions may be selected more easily than others. An example of this would be a tune that a person cannot get out of his head.

Variation

Variation occurs as different memes are selected. There are another three processes here to be considered: Migration, mutation, and recombination.

- (i) **Migration:** Memes migrate when existing members of a firm communicate memes that they obtained outside the organization. They may also migrate when membership within the firm changes. As new memes are introduced into the firms, they become a source of variation.
- (ii) **Mutation:** There is the potential for copying error in the process of meme transmission. When this happens, the memes are said to mutate.
- (iii) **Recombination:** New memes are created from combining existing memes within the organization.

Retention

The retention of memes is affected by their longevity, fidelity, and fecundity.

- (i) **Longevity:** With memes, longevity is determined by their reproduction. Memes attain longevity when individuals in the firm reinforce (or replay) the memes by taking actions according to the current social norms and thought patterns.

- (ii) Fidelity: If memes are not copied correctly, then they are varied through the process of mutation. In order to retain a certain meme, it must be copied accurately.
- (iii) Fecundity: This is how diffused a meme is within the organization. Clearly, the more widely diffused a meme is, the more likely it is to be retained.

MEMES AND PERSONALITY

At this point, it may be useful to consider how much of personality may be the result of memetic influences inherent in the upbringing of a child. Certain thought patterns, such as values and beliefs, are likely to be consciously inculcated by a child's parents. Others are enforced by the environment that the child lives in. Since this environment is one that is memetically comfortable to the parents, there is a good chance that it reflects their memes as well. Thus, an ecology of response patterns is inculcated into each individual.

Thus, there may be some potential for regarding a group of heterogeneous individuals as each carrying a program that will cause them to react to each situation in a preset manner¹. However, problems arise with modelling this in a computer program. In particular, it is unreasonable to expect individuals do not go blindly throughout the day repeating actions day to day. At some point, variation in memetic effects is likely to occur, thus causing the system to evolve.

Furthermore, it is unlikely that individuals will optimize the same thing consistently. A worker may choose to optimize his earnings one day and his leisure the next. This inconsistency in optimization will cause his behavior to be erratic, given the memetic environment.

In addition, there is no reason to suspect that all memes will be active all of the time. It may be that memes inhabit the brain as a pattern of firing neural patterns. A meme might not be active until something occurs to trigger it off. Thus, even the memetic pattern within the individual is constantly changing as the individual continues throughout his day.

STABILITY OF PERSONALITY

¹ Special thanks to Dr. Anupam Saraph for pointing this out.

One of the potential arguments against founding economic theory on a variable as elusive as personality is its slippery nature. Thus, it is necessary to examine the evidence on the personality variability.

Measures and Methods in Personality Stability

Caspi and Roberts (1999) identify the various forms of personality stability. Of these, researchers have focussed on two different types of personality: (a) *Differential continuity* and (b) *Absolute continuity*. Differential continuity refers to rank-order consistency, i.e. how consistent an individual's placement is within a group over time. Absolute continuity refers to the stability of level of a personality trait over time. *Ipsative continuity*, which refers to intra-individual variability in personality over time, has been less studied until recently due to the rigorous statistical analyzes it demands. Alea, Diehl and Bluck (2004) note that it is possible that changes in mean level over time without much change in rank-order consistency if most individuals change in the same direction.

Personality Development

On the theoretical front, Morizot (2003) points to two major schools of thought on personality development:

1. Emphasizing relative stability of adult personality. For example, McCrae and Costa (2003) observe that there are no major personality structure changes in individuals over age 25-30.
2. Emphasizing plasticity or change in personality. Baltes (1987) and Caspi (1998) note that even though personality is largely consistent, the interactions between the individual and his environment result in changes throughout the individual's lifetime.

Evidence on Personality Stability

Based on the evidence, there may be a case for basing at least a part of wage theory on personality, at least on account of its stability. Johnson, McGue, and Krueger (2005) note a large body of evidence for personality stability in adulthood, particularly in the case of differential stability (e.g. Roberts and DelVecchio 2000). McCrae and Costa (2003) produced the Baltimore Longitudinal study of approximately 1000 individuals aged 20 to 96. Based on NEO Personality

Inventory measuring the “Big Five” basic personality traits, they found moderate to high rank-order consistency for personality traits across time intervals of 5-6 years.

However, while it is generally believed that there are no significant personality changes in differential stability upon reaching adulthood, it may well be that absolute stability has been overestimated. For example, Helson, et al. (2002) note significant intra-individual changes during adulthood. In the Mills College Longitudinal Study, Ravenna Helson found changes in adult women’s personalities across a 30-year time period, becoming more assertive from ages 20-30 and more compassionate approaching mid-life. (Alea, Diehl, and Bluck 2004)

Thus, although there is a large body of evidence pointing to continuity of personality, at least two precautions must be taken in linking personality to earnings:

1. The studies in continuity of personality are based in adulthood and mid-life. It is thus invalid to assume that studies of very young wage-earners (especially under 20 years of age) using personality-earnings theories will be effective.
2. There may be a case of gradual change, where there is differential stability but not absolute stability. In the case of a gradually changing personality, it might be considered that there may well be a cultural meme that resists downward shifts in income due to personality changes.

SOME PRELIMINARY CONCLUSIONS

It may now be possible to reach some preliminary conclusions with regard to the two points that began this paper:

Which Traits?

Bowles, Gintis and Osborne (2001b) make a case for considering personality traits that are incentive-enhancing, i.e. contribute to production in some way. They base their argument around the asymmetric information problem that surrounds a labor market contract. Based on this paradigm, it is easy to see why a trait such as conscientiousness may be strongly correlated with labor market success. This is a trait that is probably universally desired by employers, and thus one that will be rewarded, regardless of job type. However, there is still likely to be variation in the inter-job premiums for this trait.

The incentive-enhancing argument relates to the function pressure in meme selection. It is arguable that individuals are selected into the firm by virtue of the fact that they exhibit a trait (meme) useful to the company. However, the memetic paradigm of the firm introduces two other pressures in selection. A meme carrier (worker) may well be selected based on fit. In other words, he may be employed and paid a premium based on how well he fits into the company culture. Also, his particular memetic expression is likely to affect how likeable he is to the wage-setter within the company, and thus introduce another memetic bias, causing him to earn a higher wage.

The presence of fit and form further lower the probability of successfully identifying personality traits which are rewarded because they are almost unique to each firm, and thus the usual econometric methods would not apply.

Two-Way Causality

As a person enters a firm, he also absorbs the culture of the firm, based on the pressures of function, fit, and form that are directly applicable to him as an individual. Thus, the longer he stays in the firm, the more likely he is to exhibit the personality traits shared by employees of the firm. It may be argued that, if he is paid a high wage, he might be more motivated to accept certain memes and behave to fit the company norm. Thus, in this case, the wage would have caused an effective change in personality. This backward causality will cause further problems for normal regression methods. It may well be that in order to detect further personality-earnings research, case studies (as opposed to regressions) would have to be conducted.

Finally, because of the two-way causality, it is possible to make one further prediction. It is likely that an individual who finds memetic change easy and is able to do it quickly will command a higher wage. In other words, an individual who is able to flexibly conform to the organization which he is hired into will be able to absorb the dominant company memes more easily, thus putting him in a favorable position for a higher wage.

FURTHER RESEARCH

The study of memes within a firm is clearly a complicated task. In order to better understand their interaction and effect on wage distribution, it may well be rewarding to employ the use of systems theories. One that is particularly useful might be Syslogic, which is a theory of the logic

of the behavior of systems. It is uniquely suited because of its ability to model both groups and individuals.

Within Syslogic, it is possible to define a firm as a collection of people or “actors.” They have relationships with one another, and have “reactivities.” These reactivities may be regarded as software programs that become functional when an event triggers them. The actors may be instilled with different reactivities. Inheritance from their past and current experiences from within (and without) the firm can program the actors’ inscripts (reaction to events within the firm). With Syslogic, reactivities may be regarded as memes. It is then possible to decide the earnings of the individual based on the inscripts the actors develop. Thus, it provides the ideal platform for further research into the propositions made here.

REFERENCES

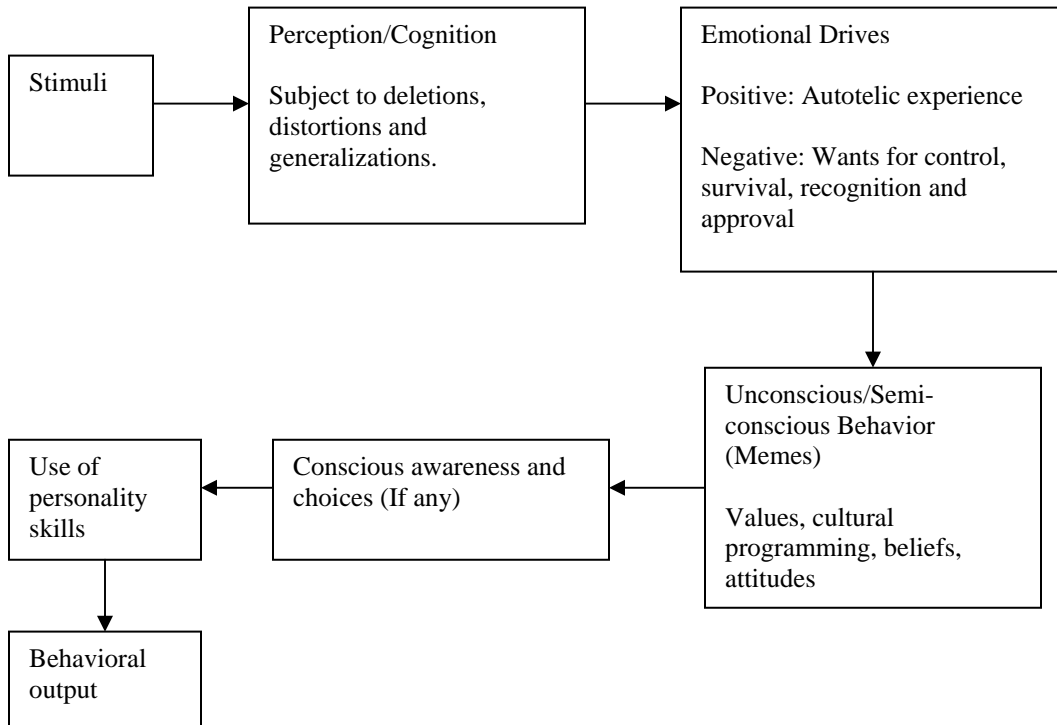
- Alea, N., M. Diehl, and S. Bluck. 2004. "Personality and Emotion in Late Life." *Encyclopedia of Applied Psychology*: 1-10. San Diego, CA: Elsevier.
- Baltes, P.B. 1987. "Theoretical Propositions of Life-Span Developmental Psychology: On the Dynamics between Growth and Decline." *Developmental Psychology* 23: 611-626.
- Barrick, M. R. and M. K. Mount. 1991. "The Big Five Personality Dimensions and Job Performance: A Meta-Analysis." *Personnel Psychology* 44 (1): 1-27.
- Becker, G. 1964. *Human Capital*. New York: Columbia University Press.
- Bjorklund, A., T. Eriksson, M. Jantti, O. Raaum, and E. Osterbacka. 1999. "Brother Correlations in Earnings in Denmark, Finland, Norway and Sweden Compared to the United States." Unpublished.
- Blackmore, S. 1996. "Memes, Minds, and Selves." *LSE, Thursday November 28th 1996 Seminar* in the series "About Biology."
- Blau, P. and O. Dudley Duncan. 1967. *The American Occupational Structure*. New York: Wiley.
- Bowles, S. and H. Gintis. 1990. "Contested Exchange: New Microfoundations for the Political Economy of Capitalism." *Politics and Society* 18 (2): 165-222.
- . 2000. "The Inheritance of Economic Status: Education, Class, and Genetics." *Santa Fe Working Paper*. Available at <http://ideas.repec.org/p/wop/safiwop/01-01-005.html>
- Bowles, S., H. Gintis, and M. Osborne. 2001a. "Incentive-Enhancing Preferences: Personality, Behavior, and Earnings." *American Economic Review, American Economic Association* 91 (2): 155-158.
- . 2001b. "The Determinants of Individual Earnings: Skills, Preferences, and Schooling." *Journal of Economic Literature* XXXIX (December): 1136-1176.
- Caspi, A. 1998. "Personality Development across the Life Course." In W. Damon (Ser. Ed.) and N. Eisenberg (vol. Ed.), *Handbook of Child Psychology, Vol 3: Social, Emotional, and Personality Development*. New York: John Wiley and Sons: 311-388.
- Caspi, A., and B.W. Roberts. 1999. "Personality, Continuity, and Change across the Life Course." *Handbook of Personality: Theory and Research*. New York: Guilford Press: 300-326.
- Coase, Ronald H. 1937. "The Nature of the Firm." *Economica* 4: 386-405.

- Conner, Kathleen R. and C. K. Pralahad. 1996. "A Resource-Based Theory of the Firm: Knowledge versus Opportunism." *Organisation Science* 7: 447-501.
- Czikszentmihalyi, M. 1990. *Flow: The Psychology of Optimal Experience*. Harper and Row, Publishers, Inc.
- Dawkins, R. 1976. *The Selfish Gene*. Oxford, OUP (new edition with additional material 1989).
- Dwoskin, H. 2003. *The Sedona Method*. Sedona Press.
- Galbraith, J. K. and W. Darity. 1993. *Macroeconomics*. Houghton Mifflin.
- Grant, Robert M. 1996. "Toward a Knowledge-Based Theory of the Firm." *Strategic Management Journal* 17: 109-122.
- Hamer, D. 2004. *The God Gene*. Random House Inc.: Doubleday.
- Helson, R., V.S.Y. Kwan, O. P. John, and C. Jones. 2002. "The Growing Evidence of Personality Change in Adulthood: Findings from Research with Personality Inventories." *Journal of Research in Personality* 36: 287-306.
- Jencks, C. 1979. *Who Gets Ahead?* New York: Basic Books.
- Johnson, W., M. McGue, and R. F. Krueger. 2005. "Personality Stability in Late Adulthood: A Behavioral Genetic Analysis." *Journal of Personality* 73:2. Blackwell Publishing.
- Katz, L. and L. Summers. 1989. "Industry Rents: Evidence and Implications." *Brookings Papers on Economic Activity (Microeconomics)*: 209-290.
- Keynes, J. M. 1936. *The General Theory of Employment, Interest, and Money*. Macmillan, Cambridge University Press.
- Kierstead, J. 1998. "Personality and Job Performance: A Research Overview." Available at http://www.hrma-agrh.gc.ca/research/personnel/personality_e.pdf
- Kogut, B. and U. Zander. 1992. "Knowledge of the Firm, Combinative Capabilities, and the Replication of Technology." *Organisation Science* 3: 383-397.
- Krueger, A. and L. Summers. 1987. "Reflections on the Inter-Industry Wage Structure." In Lang, K. and J. Leonard (eds.) op. cit. 17 47.
- . 1988. "Efficiency Wages and the Inter-Industry Wage Structure." *Econometrica* 56 (2) (March): 259-93.
- Langlois, R. N. 1988. "Rule-Following, Expertise, and Rationality: A New Behavioral Economics?" In Kenneth Dennis (ed.), *Rationality in Economics: Alternative Perspectives*. Dordrecht: Kluwer Academic Publishers: 57-80, reprinted in Massimo Egidi and Salvatore Rizzello (eds.), *Cognitive Economics*. Cheltenham: Edward Elgar,

- 2004.
- . 1990 “Bounded Rationality and Behavioralism: A Clarification and a Critique.” *Journal of Institutional and Theoretical Economics* 146 (4): 691-5.
- . 1990. “Rationality in Economics.” *International Encyclopedia of Business and Management, 2nd edition*. London: Thompson International Publishers.
- Lerner, A. 1972. “The Economics and Politics of Consumer Sovereignty.” *American Economic Review* 62: 259.
- Loasby, B. J. 1967. “Management Economics and the Theory of the Firm.” *The Journal of Industrial Economics* 15 (3) (July): 165-167.
- McCrae, R. R. and P. T. Costa. 2003. *Personality in Adulthood: A Five-Factor Theory Perspective* 2nd ed. New York: Guilford.
- Morizot, J. 2003. “Personality and Aging: Stability or Maturity?” Available at <http://www.geronto.org/Vitalaging/February2003/personality.htm>
- Nooteboom, B. 1997. “Towards A Cognitive Theory of the Firm.” Paper; *Research School of Systems, Organizations and Management (SOM)*
- Roberts, B. W. and W. F DelVecchio. 2000. “The Rank-Order Consistency of Personality from Childhood to Old Age: A Quantitative Review of Longitudinal Studies.” *Psychological Bulletin* 126: 3-25.
- Saraph, A. 1994. *Toolbox for Tomorrow: Exploring and Designing Sustainable Systems*. Ph.D. Thesis Rijksuniversiteit Groningen, Simlab, Pune, India.
- Simon, Herbert A. 1955. “A Behavioral Model of Rational Choice.” *Quarterly Journal of Economics* 69: 99-118.
- Simon, Herbert A. 1959. “Theories of Decision-Making in Economics and Behavioral Science.” *American Economic Review* 49: 253-83.
- Tett, R. P., D. N. Jackson and M. Rothstein. 1991. “Personality Measures as Predictors of Job Performance: A Meta-Analytic Review.” *Personnel Psychology* 44 (4): 703-742.
- Weeks, J. and C. Galunic. (forthcoming in *Organisation Studies*). Available at <http://faculty.insead.edu/weeks/documents/Weeks-and-Galunic-Memes.pdf>

Appendix 1: A Workable Conception of Personality for Explaining Behavior

Given the components of personality developed above, a stylized model of behavior may be developed as follows:



This model outlines, in flow-chart form, a theoretical process which describes how perception/cognition, emotional drives, memes, conscious awareness, and personality skills affect each other in producing a given behavioral output.

Personality skills. An individual's persona, and thus the resulting behavior, can well be the result of the way he processes things mentally. For example, within a Myers-Briggs Type Indicator model of personality, one would find that an introvert could do conceptual work better than an extrovert in the same way that the extrovert would outdo the introvert on management and sales.

While "introvert" and "extrovert" are convenient characteristic/trait labels, they stump the economist attempting to link them in an intelligible way to earnings. One method of doing this might be to invoke the memetic explanation of earnings, and thus say that a characteristic is rewarded by the degree of "fit" it has within the organization. However, for the moment,

another route that might be open to the hopeful economist is in redefining personality in terms of skills.

Emotional drives. The intensity to which a person performs a chore may well be affected by the emotional drives within him. Work by Hale Dwoskin (2003) has identified four emotional wanting drives which may explain how people may behave: the want for approval, the want for survival, the want for recognition, and the want for control. These wants are often unconscious drives, and manifest in unexpected ways during the work process. According to Dwoskin, they can cause mental suffering.

On the other side of the equation, I propose that there is also a positive emotional drive. This is the work by psychologist Mihaly Csikszentmihalyi (1990) on the theory of flow. According to him, optimal performance occurs simultaneously with optimal emotional experience. This flow (or autotelic) state is achieved accidentally by practically everyone at some point, where the act of doing something is its own reward. He claims that there is an autotelic personality, i.e. a personality in which the occurrence of an autotelic experience is more likely. This would provide a positive emotional incentive for optimal work performance.

Perception and cognition. Perception and cognition affect the way in which people react to events. Thus, two people having exactly the same personality wiring may react in completely different ways to the same stimuli, simply because of the way in which they interpret it. To account for this, I am borrowing from the neuro-linguistic programming (NLP) literature, pioneered by Richard Bandler and John Grinder, by saying that everything an individual perceives is subject to distortions, deletions, and generalizations. It is expected that this will become an important part of the personality model.