

# *Heterogeneity of Individual Cognitive Types across Cultures*

Magoroh Maruyama

[Kuniko\\_maruyama@sbcglobal.net](mailto:Kuniko_maruyama@sbcglobal.net)

Interactive Heterogenistics

3833 Nobel Drive, Suite 3333, San Diego, CA 92122

(858) 452-3826

## **Abstract**

(1) In every cultural or social group, even if the group is “ethnically pure,” there is heterogeneity of individual cognitive/cogitative types; (2) Any individual cognitive/cogitative type that is found in a cultural or social group can be found in all other cultural and social groups, in other words, individual cognitive/cogitative types are not subcultural variations, but are transcultural occurrences; (3) Differences between cultural and social groups consist in the way one of the cognitive/cogitative types becomes, for historical or political reasons, powerful or “mainstream,” and in the way it utilizes, ignores or suppresses other types; (4) Most cultures have ways to utilize nonmainstream types; (5) If any type is suppressed, the individuals of the suppressed types resort to various strategies for social survival, ranging from niche formation to avoid the mainstream, to repression of one’s own type into the unconscious; (6) All these strategies entail psychological stress in the individuals, and waste of human resources in organizations; (7) Though there can be as many individual cognitive/cogitative types as there are individuals, the following four types and their mixtures account for approximately two-thirds of individuals in most cultures:

<u>H-type</u>	<u>I-type</u>	<u>S-type</u>	<u>G-type</u>
homogenist	heterogenist	heterogenist	heterogenist
hierarchical	independent	interactive	interactive
classificational	random	pattern-maintaining	pattern-generating
competitive	uniquing	cooperative	cogenerative
zero-sum	negative-sum	positive-sum	positive-sum
opposition	separation	absorption	outbreeding
one truth	subjective	poly-objective	poly-objective

## **To ignore, to suppress, or to welcome and facilitate**

Business management, which prefers standardization and simplification, tends to disregard or suppress the existence of heterogeneity of individual cognitive/cogitative types among employees. This happens both in firms which operate only inside one country, and in firms which operates between many countries. The result is waste of human resources in the

firms, and frustration, psychological stress, decreased motivation and low productivity in individuals.

But experienced managers know better. They develop their own methods to discover, utilize and foster heterogeneity of individual cognitive/cogitative types hidden beneath the surface of culturally ritualized, socially conditioned, standardized artificially stereotypical behavior (M. Maruyama and K. Maruyama, 2006. These innovative managers have “morphogenetic” (M. Maruyama, 1963, 1978, 1980, 2001, 2002) cognitive/cogitative types.

Since the 1950s, a small number of researchers knew that many individual cognitive/cogitative types existed in each cultural, social or gender group even when the group was “ethnically pure,” and the individual types were NOT subcultural, subsocial or subgender variations, but were transcultural, transsocial and pangenderic occurrences: each individual type that is found in a cultural, social or gender group is found also in all other cultural, social and gender groups (Maruyama, 1959, 1980, 2001).

This fact has begun to be verified in the 2000s in neuroscience (Fahle et al., 2003). Furthermore in the 1990s, animal psychologists identified several personality types that are common between many animal species including humans (Gosling, 2005; King 2007). This is called “transeidosity” of individual type, where “eidos” = species. Thus, heterogeneity of individual types must have had evolutionary advantages.

### **Basic cognitive/cogitative types**

There can be as many cognitive/cogitative types as there are individuals. Some types occur more frequently than others. The following four most frequently found types and their mixtures account for approximately two-thirds of the population in most countries.

H-type	I-type	S-type	G-type
homogenist	heterogenist	heterogenist	heterogenist
hierarchical	independent	interactive	interactive
classificational	random	pattern-maintaining	pattern-generating
competitive	uniquing	cooperative	cogenerative
zero-sum	negative-sum	positive-sum	positive-sum
opposition	separation	absorption	outbreeding
one truth	subjective	poly-objective	poly-objective

The remaining one-third are of the type other than these four and mixture of all types.

G-type is the innovative type. It is also called the “morphogenetic” type because it generates new patterns by interaction among heterogeneous elements. H-type is most rigid: it assumes that there is only one truth, and it opposes those who disagree. It also classifies things into a hierarchy of categories, subcategories and supercategories. Even though G-type and H-type are two opposites, I-type and S-type are NOT between H-type and S-type. The four types are like the four apexes of a tetrahedron (a pyramid with a triangular base) (Maruyama, 1980). Negative-sum (I-type) cannot be between zero-sum (H-type) and positive-sum (S-type and G-type). Even though H-type persons find psychological security in rigidity, individuals of other types are frustrated, psychologically stressed, discouraged or alienated and become apathetic under H-type management.

Cultural differences between countries or between firms consist in the way a cognitive/cogitative type becomes, for historical or political reasons, powerful, official or “dominant,” and in the way it utilizes, ignores or suppresses other types. The individuals of suppressed types resort to various strategies for social survival: (a) to form niches to avoid the dominant “mainstream”; (b) to camouflage one’s own type; (c) to intentionally switch back and forth between feigning to be of the mainstream type and being one’s own type, depending on situations; (d) reversible repression of one’s own type into the unconscious, i.e. the repressed type can be reactivated under favorable conditions; (e) irreversible repression; (f) withdrawal or alienation; (g) rebellion; (h) to go to another firm.

All these strategies entail psychological stress in the individuals, and waste of human resources in organizations.

### **How to select G-type persons among applicants**

If a firm wants to be innovative, G-type individuals are needed. How do you select G-type individuals in job application interviews? There are three types of questions the interviewer can ask: (a) Has the applicant done something which no one else did? (b) Has the applicant swum against orthodoxy? (c) How does the applicant solve problems in unforeseen situations which the applicant never thought about?

In asking all these questions, the interviewer must pick up clues and dig into details without being satisfied with simple answers. In the problem-solving task, do not give cliché situations that are commonly talked about, such as environmental problems. The interviewer must keep inventing different situations in order to avoid ‘cheating’ among the applicants, i.e. informing one another about the problems given by the interviewer.

### **Examples of unforeseen situations**

Here are some examples. But if the applicant does not pause to reflect, it means that he/she has already thought about the situation. If so, give another situation.

Example 1: displacement of the world’s industrial centers: When petroleum becomes scarce or exhausted, arid lands become new centers of the world’s industry because of the availability of abundant solar energy (Maruyama, 1982). In order for the job interviewer to dig deeper to find the ability of the applicant to discuss details, let me give some technological details.

We have no technology to transport electricity cheaply over a long distance. High voltage transmission lines have a distance limit of several thousand kilometers (one mile = 1.609 kilometers). High voltage transmission cables waste energy because of: (a) conduction loss, i.e. energy loss as heat caused by electric current, similar to electric heaters; (b) radiation loss due to the electromagnetic effect of the current. The latter is especially serious if the electricity is transmitted as AC (alternating current) needed for voltage step-up and step-down in transformers. The relation between power, voltage and current is given in a simple equation  $E = V \times I$ , where E is energy, V is voltage and I is current. In order to minimize conduction loss by I, V is made higher (several thousand volts or more) by transformers. But for transformers to work, AC must be used. Electric current generates magnetic field. If the current is AC, the magnetic field expands, contracts and reserves in a sequence. The changing magnetic field induces AC in nearby electricity-conducting objects, especially metallic

objects such as metallic towers. Furthermore liquid in soil, plants and animals, which contains ions, conducts electricity, and thus absorbs AC from the power transmission cables.

Transportation of electric energy in batteries is impractical because: (a) batteries are heavy; (b) in batteries, both V and I are low, i.e. E is extremely low.

There were also proposals to transmit electric energy collected in outer space and beamed toward the Earth (Maruyama, 1982). But this method aggravates the already serious “green house” problem on the Earth. The beamed energy, once it reaches the Earth surface, will raise the temperature on the Earth surface, because the added exogenous energy will be converted to forms of energy that will be trapped on the Earth.

But utilization of solar energy in arid lands does not increase the green house effect because it uses solar energy which reaches Earth regardless of whether arid lands become industrial centers. If anything, it reduces the pollution of the present industrial countries which burn petroleum.

Until now, the greatest obstacle to human habitation in arid lands has been the impossibility of agriculture. However, in an enclosed agriculture system in which the evaporation is recycled, agriculture becomes possible. In Japan, where in the 1980s the price of agricultural products was extremely high due to political reasons (Maruyama, 1987), indoor agriculture systems were invented and became commercially competitive with outdoor agriculture (Maruyama, 2004a). This technology can be used in arid lands as well as in outer space communities: the evaporation is recycled; no soil is used but the roots of vegetables hanging from racks are sprayed with fertilizer; artificial sunlight makes vegetables grow 24 hours a day; there are no insects or weeds and therefore no pesticides or herbicides are used.

The technology is useful in such places as Norway where the short summer limits agriculture, and agricultural products are imported with very heavy import taxes. Fortunately Norway has very cheap hydroelectricity thanks to the heavy snowfall in high mountains. Norway exports electricity to Sweden, which is a highly industrialized country: steel, cars, chemical products, electronics, robots, machines, paper products such as tetrapak containers.

Example 2: Displacement of human populations to large-scale outer space orbiting communities: The life in large-scale orbiting communities will be more comfortable than the life on the Earth (Maruyama, 1976, 1984). The temperature, humidity, circadian cycle, and seasonal cycle can be set as you choose. Artificial gravity is created by centrifugal force of the rotation of the entire community, and can be set lower than, the same as, or higher than the Earth surface gravity. For example one rotation per minute at a radius of half-a-mile results in the same centrifugal force as the gravitational force on the surface of the Earth.

In the past, human cultures on the Earth surface developed under climatic and geographic constraints. But in orbiting communities, we can invent new cultures and choose physical parameters for the new cultures.

In the course of biological evolution, land animals descended from fish, even though some land animals evolved back to aquatic life. Once on land, animals proliferated into many species and prospered. Was the transition from ocean to land “necessary”? This question is useless and irrelevant now. Suppose fish had discussions as to whether they should move onto land: some were for, and some were against. No matter how they agreed or disagreed, it does not matter now. Similarly, humans and earth animals will evolve and proliferate in outer space.

The construction of orbiting communities is expensive. But two calculations (O’Neill, 1977; Dyson, 1979) show that the investment in the initial communities will be recovered in

30 years, and thereafter the profit from products such as crystals and chemical compounds manufactured in low or high gravity environments will exceed expenses, and the magnitude of the initial investment is comparable to May Flower immigration from England to North America, or Mormons' westward move from the East Coast to Utah, computed at the money value of the historic time.

### **How to nurture creativity once the applicants enter the firm**

Now you have selected G-type applicants, and they are in your firm. How can you nurture their creativity further? There are several considerations:

1. Employees' self-designed experimentation without punishment for failure.
2. Letting "the nail which sticks out" grow instead of hammering it down.
3. To consider crazy ideas seriously.
4. Agility and high-speed circulation of ideas.
5. Spontaneous and change-generating interactions among heterogeneous employees.
6. Cultivation of craftsmen's pride instead of filling the requirements like robots.
7. Barrier-free outbreeding to and from outside.
8. Elimination of proceduralism, inbreeding, and spoon-feeding of predigested ideas.

The first two are easier said than done. Innovators encounter obstinate and pernicious resistance from others. This is not because of so-called "vested interests," but because of the differences in cognitive/cogitative types. In most of the North-American organizations, H-type tends to prevail in the administration. These managers are unable to understand the G-type individuals. This inability cannot be overcome by increased explanations. It is as impossible to explain colors to congenitally blind persons or to explain music to congenitally deaf persons (Maruyama, 1961, 1962, 1979, 2004b).

As for the third, history of science and technology is full of examples of ideas, which were once considered incorrect but later turned out to be correct. An example is the theory of continental drift. The idea that Europe and Africa were once joined with North and South Americas looked childish, because children who play jigsaw puzzles would come up with such an idea. But later, the discovery of plate tectonics made this idea correct.

Agility and high-speed circulation of ideas seldom appear in the list of high priorities. In economics, there is a concept called "velocity" of money. One dollar inside your locked safe has velocity zero. One dollar which goes through many transactions quickly has high velocity. A dollar which moves twice as fast doubles the money supply value. Similarly we can talk about the velocity of ideas. If a new idea moves twice as fast, it doubles its creativity value. Engineers and scientists are mostly pictorial thinkers. They communicate most efficiently with graphs, drawings and hand movements. If the organization depends on written reports, the velocity of ideas among engineers and scientists goes down to almost zero. The management must design ways to increase face-to-face interaction between specialists in different departments, for example constructing a cafeteria or coffee shop easily accessible from many departments. A novel method for exchange of ideas is to convert corridors between departments to art exhibition halls, where employees can display new ideas and hunches. Amateurish informal unfinished exhibits are better than polished formal exhibits. In order to encourage shy people, you might format the exhibition as consisting of projects by groups, and in each group, all members must participate, but instead of requiring

each group to self-homogenize, each group is required to show the heterogeneity of individuals in it. This is individual cooperation disguised as competition between groups.

### **Cultivation of craftsmen's pride**

Violin makers are craftsmen. Each violin maker's name is known among connoisseurs. Famous violin makers' products are as treasured as masterpieces of famous painters. Old time sword smiths of Japan were craftsmen. They put their soul and spirit into their product.

Even semi-massproduced products such as grand pianos, for example by Steinway, may have individualities, and among the connoisseurs, each unit is known for its unique quality.

Some handicraft teachers in schools teach children to be craftsmen. I knew a teacher who told children to be "kind" to their products, as if their products were human beings.

I knew a car repairman in France, who repaired cars not as a mechanic, but as a craftsman. He had to satisfy himself with his work. For his extra work, he did not charge extra fees. Philippe d'Iribarne (1989) called this state of mind "la logique de l'honneur."

Writers and scholars may crystallize their craftsmen's pride in their work by developing very person-specific styles, and may feel insulted if their styles were tampered with or changed by an editor or a publisher.

Authors who write with utmost care in their own styles can notice any change made by editors. Even a third person who does not know the authors but is an expert on individual writing styles can detect any slight change made by editors or anyone else. Ibsen and Karg (1928) were such experts. They developed a method of analysis called "Schallanalyse." Like immunological rejection of grafted organs, Schallanalyse can identify inauthentic alterations.

To give a concrete example of insult of craftsmen's pride, let us look at the following incident. I was a mathematician and trained myself to write concisely but precisely. In fact, mathematicians can put complex ideas in very short and exact statements. A friend of mine from my student time, Hans Wilhelmsson who studied under Niels Bohr in Denmark and became a plasma physicist at Chalmers Tekniska Högskola (Chalmer Institute of Technology) in Göteborg in Sweden, told me that he had seen a doctoral dissertation in mathematics consisting of only three pages.

Later I moved onto social sciences, but my writing principles have always been concision and precision. Concise and precise writing does not have to be dry. It can be humorous, funny, or even sarcastic. My literary models were *Les Lettres de mon Moulin* by Alfonse Daudet (1868) and *Tsurezuregusa* (Yoshida, written around 1320-1350 in Japanese) and fairy tales by H. C. Andersen (1837). Daudet and Yoshida were humorous, while Andersen was a sharp social critic disguised as a fairy tale writer. Actually, his stories are filled with sadness, sympathy, resentment and anger. You have to read Andersen in Danish to fully appreciate him.

My craftsmanship was horridly violated in a shocking incident in the early 1990s. An anthropologist friend of mine asked me to write a chapter in a book on North American culture seen from outside. The chapters would be written mostly by foreigners, but he also wanted to include me as a person who had lived in many countries. When I sent my manuscript to him, he responded that my manuscript was fine and required very little editing and therefore he would first tackle the manuscripts by non-English speakers, and come back to mine after finishing theirs. He basically re-wrote theirs in his style. He got carried away

and re-wrote mine instead of editing. When I received his “edited” version of my manuscript, I got shocked. I did not recognize it as my own writing. The precision and concision which I had carefully built into my manuscript were gone. Instead, I saw sloppy prosaic imprecise narratives which kept dragging on. I wrote back to him that I could not accept his version, and advised him to go back to my original and start from scratch. He answered that it was too late because all manuscripts were to go to press immediately. I had to withdraw my manuscript. If he had simply “edited” my manuscript before he re-wrote the others’, there would have been enough time to make corrections. He, as an anthropologist, should have known how tribal artists put their craftsmen’s pride in their work. If he tried to “improve” their art work, his ignorance and arrogance would have shocked the tribe. Many anthropologists have a patronizing “do-gooder” attitude which is resented by the members of the community. Similarly, many anthropologists pretentiously delude themselves to be spokesmen for the tribe without allowing the tribesmen to speak for themselves, or rather assume that the tribesmen are inferior to anthropologists. This is an imperialism. I can give many examples. But instead of speaking “for” tribesmen, I preferred to give my first-hand bitter experience.

### **Barrier-free outbreeding to and from outside**

Interactions can be encouraged between the inside and the outside of an organization. Insiders can be given “sabbatical leaves” to work in outside organizations. It is better to call such extramural activities “sabbatical leaves” than “assignments” in order to emphasize freedom and flexibility. One can move around anywhere in the world. In fact, it is better to move around in many parts of the world to counteract regionalism.

Care must be taken to avoid pseudo-sabbaticals which are a euphemism for paid vacations. Many Korean business firms, and some Japanese business firms, give paid vacations to their employees under the guise of “study abroad,” and there are universities which have programs for these phony “students”: the universities collect “tuition,” and “students” get paid vacations.

Another variation is to send away unwanted or useless employees to foreign countries. Instead of “kicking someone upstairs,” this can be called “kicking someone outside the tent,” or “kicking someone outside the mosquito net.” This method is used also by some dictatorial countries to expel political opponents. An architect friend of mine in a Middle-East country was given a “scholarship” to do research in Boston because his political view disagreed with the Dictator’s.

### **Elimination of procedurism, inbreeding and spoon-feeding of predigested ideas**

Nowadays editors of journals and books, and organizers of conferences rely on the system of reviewers and referees. This procedurism results in two anti-creative tendencies: (1) inbreeding; (2) spoon-feeding.

The system of reviewers and referees has become a mechanism to reject those who do not please inbreeders. Criticisms on the inbreeding system were voiced from time to time. *Science* (November 5<sup>th</sup> issue, 1999, pp. 1074-1075) quoted the following complaints: “Under the present focus on fault finding and amplification of minor errors and discouraging innovative research, nearly all NIH fundings have gone into confirming, reconfirming what is

already known. The reviewers often do not understand the underlying principles or broad objectives of a proposal and resort to nit-picking. Basically all new ideas are rejected.”

There are many similarities between communist managers and North American grantsmen (Maruyama, 1998). A good manager in a communist system is the one skilled at obtaining allocations, not the one who maximizes profit. Allocations do not have to produce profit. They do not have to be repaid. If you ran out of allocations, you request more allocations. Similarly research grants in North America do not have to produce profit. They do not have to be repaid. If you ran out of grants, you apply for more grants. Even now, many of the Russian enterprises regard foreign joint-venture partners as grant-giving foundations. They do not produce profit. They do not repay. They keep requesting more investments. Communist managers have to show allegiance to a political ideology. North American grantsmen have to show allegiance to the dominant theory or methodology.

Another problem is that the vista of the reviewers and referees is too specialized and too narrow. If your proposal cuts across boundaries between disciplines, the reviewers and referees keep passing the buck: This manuscript is not psychology but sociology; this is not sociology but history; this is not history but philosophy; this is not philosophy but psychology; and so they make you go in circles.

Spoon-feeding of baby food is another problem. Most of the 18<sup>th</sup> and 19<sup>th</sup> centuries classics such as Kant’s *Kritik der Reinen Vernunft* would never have been published if these masterpieces had to go through today’s review system. Nowadays publishers want to spoon-feed predigested baby food to readers. Kant’s *Kritik der Reinen Vernunft* is raw meat. Scholars of past several centuries cherished and savored the challenge of raw meat. The more difficult the book, the more satisfaction they felt when they began to get new insights. They chose difficult books, like mountain climbers who chose difficult peaks. There was a superb reward. It was like groping through dense fogs until you glimpsed a ray of new revelation.

## Conclusion

This paper presented several new concepts in human resources management: (1) heterogeneity of individual cognitive/cogitative types; (2) how to identify and select individuals of morphogenetic cognitive/cogitative types among the applicants; (3) how to nurture creativity once the applicants entered the firm; (4) cultivation of craftsmen’s pride; (5) obstacles inherent in the present systems.

## Reference

- Andersen, H. C. 1937. *Eventyr*. This classic was reprinted by many publishers.
- Daudet, A. 1869. *les Lettres de mon Moulin*. Paris: Hetzel.
- D’Iribarne, P. 1989. *La logique de L’Honneur*. Paris: Seuil.
- Dyson, F. 1979. *Disturbing the Universe*. New York: Harper and Row.
- Fahle, M. et al. 2003. Heterogeneity of brain responses to identical stimuli. *Internatinoal Review of Sociology* 13: 507-532.
- Gosling, S. 2005. As summarized in *Science* 307: 1405, 4 March 2005.
- Ibsen, G. and Karg, K. 1928. *Schallenanalytische Versuche*. Heidelberg: Proben.

- King, J. E. 2007. Dimensions of the ape mind: adding personality to behavior and cognition. in *Emergents and Rational Behaviorism* ed. by D. A. Washburn, Washington DC: American Psychological Association Press.
- Maruyama, M. 1959. Critique de quelques idées très répandues au sujet des rapports entre la culture et la santé mentale. *Revue de Psychologie des Peuples* 15: 273-276.
- Maruyama, M. 1963. The second cybernetics: deviation-amplifying mutual causal processes. *American Scientist* 51: 164-179; 250-256.
- Maruyama, M. 1978. Heterogenistics and Morphogenetics: toward a new concept of the scientific. *Theory and Society* 5: 75-96.
- Maruyama, M. 1980. Mindscapes and science theories. *Current Anthropology* 21: 589-599.
- Maruyama, M. 1982. Future advantages of tropical, polar, circumpolar, arid, and high altitude regions. *Futurics* 6: 1-14.
- Maruyama, M. 1987. Japan's agricultural policy failure. *Food Policy* May 1987, pp. 123-126.
- Maruyama, M. 1989. Academic concept inbreeding, failure of interbreeding, and its remedy by outbreeding. *Human Systems Management* 17: 89-91.
- Maruyama, M. 2001. Individual types: subcultural or transcultural? *General Psychologist* 36: 64-67.
- Maruyama, M. 2002. Individual heterogeneity, human resources and management policy. *Metamorphosis* 1: 155-183.
- Maruyama, M. 2004a. Futurogenic management. *Metamorphosis* 3: 61-73.
- Maruyama, M. 2004b. Polyocular vision or subunderstanding? *Organization Studies* 25: 467-480.
- Maruyama, M. and Maruyama, K. 2006. Management dynamics for de-stereotyping the corporate culture. *Management Dynamics* 6: 5-31.
- O'Neill, G. K. 1977. *The High Frontier*. New York: Morrow.
- Science 1999. November 5 issue, pp. 1074-1075.
- Yoshida, K. (written around 1320-1350) *Tsurezuregusa*. Many later editions.