Editorial Comment

Some Incorrect Meta-Assumptions in Human Systems Management

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Meta-assumptions are epistemologically different assumptions. Epistemological structures may vary neurologically or culturally. Management which does not take the epistemological differences does injustice to individuals and fails to make maximum use of individual abilities. As concrete examples, dyslexia and nonverbal thinking are discussed, and concrete steps to remove the barriers caused by some incorrect assumptions are illustrated.

Keywords: Dyslexia, dysgraphia, dystopia, nonverbal, nonsymbolic

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1. Introduction

There are several assumptions in our educational and managerial systems which are taken for granted but are trapped in one epistemological structure, and are therefore incorrect from the point of view of the individuals whose epistemology differs due to neurological (innate) or cultural (learned) differences. Three of such assumptions are: (1) Slow reading is caused by low intelligence, emotional problems or bad habits; (2) All human thinking and reasoning can be translated into verbal statements or symbols; (3) verbal and symbolic thinking is superior to nonverbal and nonsymbolic thinking.

However, neurological studies [1] indicate that letter reversals and permutations in reading occur due to neurological reasons unrelated to intelligence, and are to a great extent hereditary. It was also shown [7] that about one-third of those in British samples were pictorial thinkers, another third non-pictorial, and the rest bimodal. More recently, computer graphics and accelerated video tape viewing are more efficient and can attain a higher level of abstraction and complexity [3,5] than spoken or written communication.

Consequently human management which relies on verbal communication tends to misuse and even abuse a considerable percentage of human talents. In this article, some concrete methods to remove the barriers created by the three incorrect assumptions and therefore to enable a fuller use of human talents are discussed.

2. Slow readers

A considerable portion of slow reading is caused by perceptual confusion of letters, especially: (1) horizontal mirror-imaging such as b-d, p-q, mob-dom, lib-dil, low-wol; (2) vertical reflection b-p, d-

q, M-W, box-pox, y-h, hob-yop; (3) 90° rotation Z-n; (4) 180° rotation mop-dow; (5) permutation bolt-blot.

These errors are usually included in a general term 'dyslexia'. However, 'Dystopia' would be more correct for mirror-imaging, vertical reflection and rotations. (In common language, 'dystopia' is used as opposite of 'eutopia').

Herman [1] found that these types of perceptual confusion are unrelated to intelligence, and sometimes occur together with mirror-imaging or reflection of music notes and other coding systems. He also found that the syndrome is to a great extent hereditary, and a 10% prevalence rate was recorded in the area of Schleswig-Holstein along the border between Denmark and Germany where the inhabitants were trapped during wars and had to practice much inbreeding.

Many educators believe that slow reading is caused by low intelligence, emotional problems or bad habits. However, a considerable percentage of slow reading has a perceptual and neurological cause unrelated to intelligence or emotion. The solution, therefore, is to make the alphabet system immune to reversals and rotations by removing reversable and rotatable pairs. The most common confusions occur around b-d-p-q. We can modify these four letters to make them less similar. For example, one of them can be square-headed instead of round-headed. Another can be triangular-headed. The fourth can have a dot or a bar in it. M and W can be made more distinguishable by giving one of them a bar. Similarly Z and N can be made more distinct. The same can be said about the numerals. 6 and 9 are rotatable. 2 and 5, especially in digital displays, are too similar. They can be made less similar. Examples are given in Fig. 1.

In languages which have no or few reversible or rotatable letters, the problem of dyslexia is less prevalent. For example in Chinese, there are almost no reversible or rotatable letters. Exceptions are given in Fig. 2.

Greek and Russian have less reversible or rotatable letters than English. It would be interesting to compare the prevalence of dyslexia in these languages.

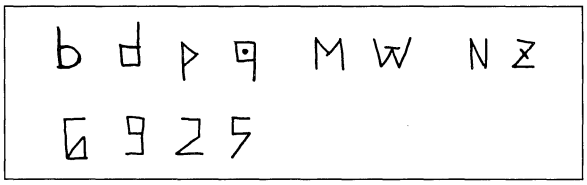


Fig. 1.

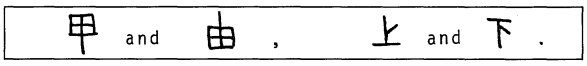


Fig. 2.

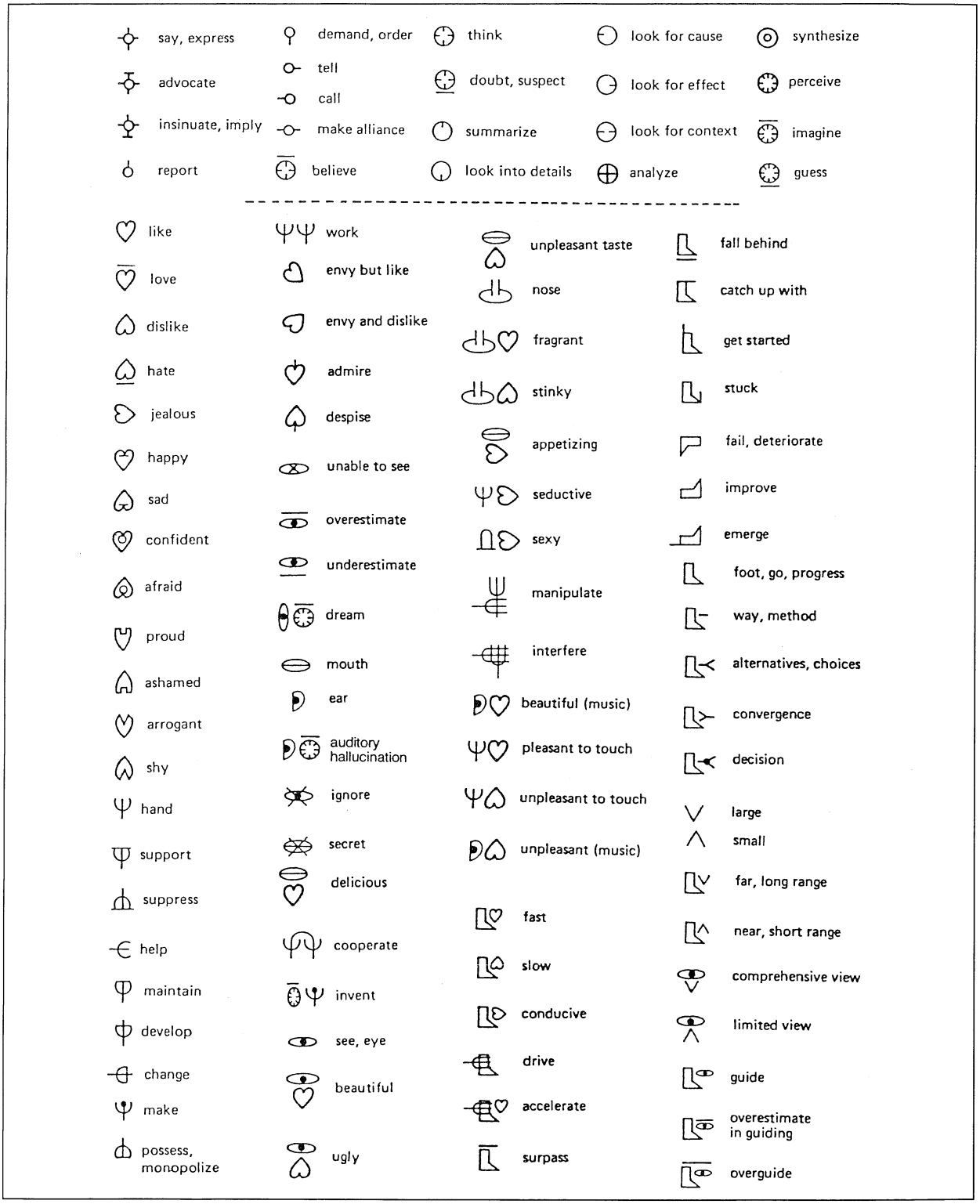
3. Nonverbal Thinkers

Walter [7] monitored the alpha-rhythm of subjects during mental tasks requiring geometric thinking. For example: 'Suppose you have a wooden cube painted red. You cut it vertically in half, then cut the halves horizontally in half. How many painted sides do you have now?' The results showed that about one-third of the subjects used visual images in their mind, another third without images, and the rest were bimodal. This shows that among 'normal' subjects, there are differences in the way the mind processes reasoning.

Verbal thinkers assume that all persons are verbal thinkers. They reduce everything into verbal statements, and then argue that all thinking is verbal. This dimensions reduction [2,4] produces a tautology which is incorrect. The richness, the complexity and the high level of nonverbal thinking cannot be understood by verbal thinkers. It is impossible to explain colors to color-blind people. Likewise, it is futile to try to make verbal thinkers understand nonverbal thinking.

There are several types of nonverbal thinkers: (a) symbolic thinkers; (b) pictorial thinkers; (c) nonsymbolic, nonpictorial, relational thinkers.

Symbols may be a precise coding (for example, stop sign) or notations (music notes, mathematical equations). For musicians, music notes are means of communication, not music itself. It is possible to have musicians who do not or cannot read music notes. Similarly, mathematical notations are not mathematics. Among mathematicians, there are notational thinkers and non-notational thinkers, just as the case of verbal and nonverbal thinkers. There are also pictorial as well as non-pictorial thinkers among mathematicians.


say, express
advocate
insinuate, imply
report
demand, order
tell
call
make alliance
believe
think
doubt, suspect
summarize
look into details
look for cause
look for effect
look for context
analyze
synthesize
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love
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maintain
develop
change
make
possess, monopolize
work
envy but like
envy and dislike
admire
despise
unable to see
overestimate
underestimate
dream
mouth
ear
auditory hallucination
ignore
secret
delicious
cooperate
invent
see, eye
beautiful
ugly
unpleasant taste
nose
fragrant
stinky
appetizing
seductive
sexy
manipulate
interfere
beautiful (music)
pleasant to touch
unpleasant to touch
unpleasant (music)
fast
slow
conducive
drive
accelerate
surpass
fall behind
catch up with
get started
stuck
fail, deteriorate
improve
emerge
foot, go, progress
way, method
alternatives, choices
convergence
decision
large
small
far, long range
near, short range
comprehensive view
limited view
guide
overestimate in guiding
overguide

Fig. 3.

And there are nonverbal, nonsymbolic, nonpictorial but relational thinkers. I happen to be one of them. Even though I speak six languages, for me the thinking goes without any language, symbol or picture.

As I discussed elsewhere [6], excessive dependence on written reports and spoken explanations retard the process of inventions. I have also pointed out specific methods of remedies [6].

4. Pictorial thinking is superior to verbal thinking

Recent advances in computer graphics and graphic communication has made pictorial communication and thinking not only faster and more efficient than verbal thinking, but also higher in the level of abstraction and complexity as well.

From the point of view of the mathematical information theory, pictorial communication and thinking have several advantages: (1) The amount of information which one page of picture can contain is much higher than that of one page of written text; (2) Pictorial input to the brain is simultaneous, but verbal input is sequential. Therefore time economy is much higher; (3) If relations shown in a picture has to be translated into verbal statements, complex relations must first be broken down into segments and coded into statements. The recipient must reconstruct the relations from statements. The coding and decoding are between two different types and complexities of information, and much distortions occur in both. Suppose you have to explain someone's face over the telephone, and the other party has to reconstruct the face from your statements: The reconstruction will be very inaccurate.

Japanese children [3] go to video centers, which charge $1.20 per 30 minutes for the use of a VTR player but provide unlimited number of tapes free. Many viewers accelerate the playback speed in order to save money, and they can view in 30 minutes several tapes, each of which takes 60 to 90 minutes at the normal speed. Moreover, they can remember all the details of the stories. An important aspect of this viewing is that the children interact with the machine, accelerating and slowing it down, depending on what is happening in the story. This active interaction distinguishes the video viewing from the passive television watching.

It was often argued that words can have a higher level of abstraction than pictures. This is no longer true [5]. *Combination* of pictures can express highly abstract ideas. Examples are given in Fig. 3.

Even in English, abstract words consist of parts which are less abstract, for example abstract = ab + tract. Pictorial combinations give much richer abstract ideas.

With further advances in computer graphic and combinatorial input keying instead of sequential keying, use of picturial thinking will progress much beyond verbal thinking.

5. Conclusion

This article has given some examples of incorrect meta-assumptions and their remedy in human systems management. We must look for other incorrect meta-assumptions in order to avoid misusing or abusing human talents and to allow their fulfilment.

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