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Excellence in Scientific Research and Writing

Kay Keiko Hisama

Two recent studies that systematically examined the number of published papers in English language journals by Japanese medical school researchers show a new wave of western influence of peer evaluation among Japanese reserchers. This article analyzed the characteristics of traditional Japanese culture and its relationship to the quality of scientific research and writing. It is suggested that the development of intellectual community is vital in achieving excellence in scientific research and writing among Japanese scholars.

Key Words
Peer evaluation,
Intellectual community,
Scientific research,
Scientific writing.

INTRODUCTION

Recently, Shigeru Yamazaki published two articles regarding the research productivity in life sciences (mainly medical school faculty) in Japan. The criterion variable for both studies was the number of scholarly articles published in English language journals. In his first study, Yamazaki used the 1989 issues of Excerpta Medica on CD-ROM (1). His second study used Medline on CD-ROM for the first half of 1993 (See Table 1. in Appendix) (2).

One might argue that the number does not ensure the quality of work and that the study did not examine articles written in Japanese. In defense of Yamazaki's study, a greater number of publications makes it more likely that the quality of any given articles would be better. Regarding the exclusion of Japanese articles from its consideration, it can be argued that in all science areas, Japanese scholars largely rely on the new scientific discoveries and progress made in the Western world. If there are any notable findings made by Japanese scholars, they would have been translated into English.

In this treatise I shall discuss the basic problems and challenges that Japanese researchers face in conducting research and writing English language articles. The discussion will start with cultural differences between the East and the West in their perception of science and of the scientific community.

SCIENCE AND SEIENTIFIC COMMUNITY IN JAPAN.

The word "Kagaku" (Japanese Kanji for natural science) was first used by Saishu in 1874 (Meiji 7). Saishu used the word meaning "hyakka no gaku" (studies of many disciplines). Serious inquiries of science were not

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made until 1893 (Meiji 26), when Rikigi Nakayama made a comparative analysis of science and philosophy (3).

Soseki Natsume, who was among the first to study in England during Meiji era (Meiji 32) under the auspices of the Meiji government, noted fundamental differences between the two cultures. According to Natsume, Western thinking privileges science, society, politics, and individual integrations, while Oriental thinking is based upon Zen buddhism, inquiry of mind, and quiet sitting by a Zen buddhist. In the Orient, one cannot change the outside world, so person has to change to conform to society. In contrast, in the western world, an individual dose not easily change but tries to change the outside world (4). In short, science and scientific thinking are foreign to the traditional Japanese culture.

Scientific research requires a nurturing community that is open for discussion of new ideas and creative thinking. Writing is the final step of all research activities and its purpose is to communicate to the members of a scientific community. In his recent book Hajime Tanaka discusses the nature of science and communication. Tanaka defines science as "a logical recognition of objective world" and the method of science is "accumulation of verified knowledge (5)."

Through research, each individual adds a piece of new information to the body of scientific knowledge. The body of knowledge is not one person's property but is the property of all who work for it. In other words, scientific progress depends on communication in an open society. They are important principles in developing a scientific community. The concept of scientific community is in direct conflict with Japanese feudalistic social systems where a powerful lord, with the help of his exclusive samurai, defends his territory.

Unlike the closed system of a feudal sciety, the concept of open communication is vital for scientific research. The most important principle of science is that there will never be an absolute truth in scientific discoveries. The truth is always relative: that is, scientific knowlege is true within certain limits. A good example given by Tanaka is the Newton's laws of motion. These laws have been verified by numerous researchers who observed natural phenomena such as eclipses of the moon and the sun (6).

However, Newtonian principles were unable to explain motion at the velocity of light or the mechanics of bodies of the size of the atom or the electron. Twentieth-century concepts of relativity and quantum theory have generally replaced Newtonian dynamics. Scientific research is a never-ending human endeavor; its validity will always be questioned by new generations of researchers.

CHALLENGE FOR JAPANESE RESEARCHERS

The examination of science, scientific community, and scientific principles indicates that they are essentially foreign to the traditional Japanese culture where authoritarianism dominates the society. Authoritarianism is still strong within Japanese society especially in the area of medicine. Even though, the Meiji government

decided to accept Western medicine and to discard traditional Chinese medicine, Japanese medicine has long been dependent on the system called Kaigyoisei.

Kaigyoisei is a closed system from the feudal era where a single physician or small number of his loyal associates controls all aspects of health care including the sales of drugs, hospital personnel, and management. Unlike many physicians who work under the Western medical system, most Japanese Kaigyoi (a physician in business) do business in their own home office without close connections to the medical sysyems outside.

Kosei Takahashi pointed out the serious problems common in pharmaceutical research in Japan, where opinions of a few authoritative figures prevail without scientific verification. Takahashi is a strong proponent of scientific medicine which has been overshadowed by traditional approach to clinical medicine. He compared contemporary drug research in Japan to ancient Chinese medicine where Shinno's opinion was accepted without question (7).

The other problem of Japanese biomedical research is a division between the academic medicine and the majority of practitioners called Kaigyoi who might not appreciate the importance of scientific medicine. A lack of a true sense of professionalism among Japanese kaigyoi surprises American Physicians. During the postwar period, for example, a team of American physicians who examined Japanese medical system were shocked to see that there were virtually no medical journals at the central office of the Japanese Medical Association (8).

Most Kaigyoi are deeply involved in the office management and related paper work. An average Japanese Kaigyoi spends 7 days a month writing nedical claim forms called "reseputo" leaving little time to read medical journals (9). This presents a serious problem in advancing biomedical research because support from the large number of practitioners can influence the direction and quality of medical research.

In the U.S.A., reading scientific articles in medicine, nursing, and health care begins at the undergraduate level for all health science students. For the physicians who must assume the highest level of knowledge and skills, keeping up with the latest medical information is a matter of "survival" in the very competitive medical practice. Reading is the first step towards writing the articles for the professional journals.

The ultimate purpose of scientific research is its application beyond the samples or situations investigated. However, all researchers must be aware of limited generalizability of scientific knowledge. This is especially important in medical research involving human subjects. Thus, a lack of interest in biomedical research among the Japanese practitioners presents serious problems in conducting research and utilazation.

WRITING FOR SCIENTIFIC JOURNALS

In writing scientific articles for English language journals, the authos must be aware of customs that reflect

cultural differences between the East and the West. The concepts of science and scientific community are closely related to conducting research and writing about it for biomedical journals. A prerequisite for writing a qoality article is that the researcher be thoroughly familiar with the content and the style of the journal articles for which he or she wishes to write. Journal articles have a range of preferred topics which are current within the particular research community. The style of writing also is expected to conform the common language and format specific to the journal.

The difference in the degree of selectivity is another matter. In general, compared to Japanese journals, any established English journals are highly selective in terms of the ideas and the style of the article. I have noticed significant differences between Japan and the U.S.A. in selecting papees for professional conferences. In Japan, many more papers are selected for very brief pesentations. At the major U.S.A. conferences, the papers presented have undergone a rigorous selection process and presenters are often given one hour.

The selection of articles for Japanese journals is probably based on the honor system as Ryunoske Actagawa once wrote (10). Akutagawa was amazed to find that because of his fame, even a short translation piece was published, while his best writings would have never been published when he an unknown author. In the U.S.A., the quality of paper is important and blind serection, where editors do not know the identity of the author, is common.

Much differences exist in how we train scholars to write journal articles. Compared to America researchers, most Japanese scholars are given little formal education in writing research articles. In the U.S.A. research writing starts at high school for many honors students, and in major universities, it is a required course among college freshmen. Peer evaluation is often used as a way of stimulating and improveing of writing.

The consequences of this different training can be observed in the review of literature and in citing other researchers' works from the primary sources whenever possible. Citing all major references is part of the western tradition; it indicates respect for and acknowledgement of prior contributions made by other scientists. Articles written by Japanese scientists cite very few references or none at all. Poor library facilities in most Japanese cities and towns and a lack of the concept of an intellectual community might account for this difference.

A corollary to this tradition is seen in translating literature from one language to another. In Japan, translators receive much credit for doing so. In the U.S.A., translating other's works receives little credit as a scholar. Reading translated literature may be convenient, but reading the original work is ecouraged. This is an important principle of examining a primary source in writing.

Native English speakers who have edited English articles written by the Japanese have pointed out two primary levels of problems. One of these is a lack of clarity and organization of

content (11). In terms of English mechanics the most serious problem lies in word choice and phrasing. The Japanese writers often "make up" English words and phrases by looking up Japanese-English dictionaries. In additon to English expression, the oter major problem is the actual content. The method of evaluating quality of an scientific article is now being investigated.

TOWARD EXCELLENCE IN SCIENTIFIC RESEARCH

Although Yamazaki's study did not address the quality of medical research, it is a form of peer evaluation. Western culture is driven by individualism and excellence in one's work. For example, excellence versus mediocrity was a central theme of the well known movie "Amadeus." Amadeus was Mozart's middle name which literally means "God's love." Salieli was a court composer who strived for excellence. However, he realized that his work is nothing but mediocre when he met Mozart and heard his music.

A genius of Mozart's stature would appear only once in several hundred years. In science, geniuses who at Mozart's level includes Issac Newton and Albert Einstein. However, all of them needed to live in an intellectual community where their work could thrive. I believe that the concept of an intellectual community is of paramount importance to ensure excellence in scientific research.

SUMMARY AND CONCLUSIONS

In the current climate of global society, Japanese researchers no longer be able to ignore the concept of intellectual or scientific community and now becoming its productive members. Recent studies showed a new wave of Western influence of peer evvaluation. Peer evaluation among professionals is vital for the advancement of all disciplines including medicine amd biomedical research. Such study can be seen as a catalyst for developing the intellectual community among Japanese medical scholars and practitioners not only to catch up with standards of current medical practice in the U.S.A. but also to become a leader in the new millennium.

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Appendix

Table 1. Ranking of Universities

Medical schools Rank	Number of papers		Output of faculty		Output of faculty, res. assist, grad. stud.	
	Name	Paper	Name	Per head (annual)	Name	Per head (annual)
1	*Osaka	244	*Kyushu	2.42	*Kyushu	0.94
2	*Kyoto	233	*Osaka	1.95	Shimane	0.75
3	*Kyushu	226	*Kyoto	1.89	*Tohoku	0.66
4	*Tokyo	218	*Nagoya	1.67	*Osaka	0.55
5	*Tohoku	172	*Tohoku	1.54	Gifu	0.55
6	*Nagoya	138	Kumamoto	1.36	Gunma	0.53
7	†Keio	130	Kobe	1.34	Shinshu	0.50
8	Tokyo Med. & Dent.	102	Shimane	1.33	*Kyoto	0.50
9	Kumamoto	96	†Keio	1.31	*Nagoya	0.47
10	Kanazawa	91	Gifu	1.19	Kyoto Prefectural	0.47
11	†Kansai Med.	89	Shinshu	1.17	Niigata	0.46
12	Kyoto Prefectural	84	Osaka City	1.16	†Keio	0.46
13	*Hokkaido	83	*Tokyo	1.14	Kumamoto	0.45
14	Kobe	78	Kanazawa	1.06	*Tokyo	0.41
15	Niigata	77	Kyoto Prefectural	1.04	Tokyo Med. & Dent.	0.40

* Former imperial university,
† Private university
Adopted from Yamazaki, S. Ranking Japan's life science research. Nature, 372, 10. p. 126 with permission.