

Journal of Medical English Education

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Journal of Medical English Education

Vol. 6, No. 2, July 2007

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1. Article categories and *Journal* aims

Journal of Medical English Education, the official publication of the Japan Society for Medical English Education (JASMEE), is interested in articles on English education for medical purposes, including *clinical* medicine, *nursing*, *rehabilitation*, *dentistry*, *laboratory technician work*, research, and *international* medical activities such as reading and writing medical papers, making oral presentations, participating in forums, seminars, symposiums, workshops, international conferences, and continuing professional education. Categories are the *Special Article*, *Original Article*, *Short Communication*, and *Letter*. The Special Article is by invitation from the editor or is the address by a guest speaker or symposium participant at the annual JASMEE conference.

2. Preparing the manuscript

- 2.1. Articles may be submitted in English or Japanese.
- 2.2. The manuscript should be prepared on either Macintosh or Windows/DOS.
- 2.3. Use Page Layout *25-to-26 lines per A4 page, 12-point typeface* of a common font such as Times New Roman, Arial, Times, or Century. **Margins:**
Left 30 mm; **Right** 25 mm;
Top 30 mm; **Bottom** 25 mm.
Maximum length: about 20–24 pages, including the Title Page, text, figures, tables, and References.
- 2.4. *Number all pages consecutively*, beginning with the Title Page as p. 1 and including each page that has a Table or Figure.
- 2.5. Submit the manuscript in normal Page Layout *without the tracking protection tool*.
- 2.6. Do not use footnotes, op cit, or Ibid.

3. Title Page

Order of information on the Title Page:

- 3.1. A concise, informative title, centered near the top of the page. The 1st line of the title ought to be slightly longer than the 2nd line. Avoid abbreviations and formulae where possible. For example, *instead of SLA, write Second-language Acquisition*. A subtitle is seldom necessary, as the key information can usually be included in the base title.
- 3.2. Author names and affiliations. In the order agreed

upon by the authors, write the full names without academic degrees. Use asterisks to designate authors from more than one institution, as in 3.3 below; the asterisk goes AFTER the author's name and AFTER the comma. Example: Jun SUZUKI,* Arnold PALMER** and Helen KELLER*

- 3.3. Full names of the *institutions* and *departments* where the research was done, and City, and Prefecture (State and Nation if outside Japan). If authors are from different institutions, put one or more asterisks BEFORE the institution name. Example:
* ABC Medical University, English Department, Nanai, Hokkaido
** XYZ Medical University, School of Nursing, Gunma
- 3.4. *Keywords*. A maximum of six keywords or short phrases that would help in indexing the article.
- 3.5. *Corresponding author*. Name of the author (with job title, e.g., Professor, M.D.) who will handle correspondence throughout the editorial process; name the university and department affiliation, full address, telephone and fax numbers, and e-mail address.
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- 3.7. If part of the paper was presented orally or as a poster at a meeting, then at the bottom of the Title Page put *the title of the meeting, sponsoring organization, exact date(s), and the city where the meeting was held*.

4. Abstract

- 4.1. A maximum of 250 words (about one A4-size page). May be in 11-point typeface if necessary, to contain the Abstract on a single page.
- 4.2. State the **background** in one or two sentences (see 6.3 below), **objective** of the investigation in one sentence, then describe the **Methods** (study design, study population, protocol) in the past tense; **Results** (main finding or major contribution) in the past tense; and finally the **Conclusion** (or recommendations) in the present tense. Be concrete and avoid saying merely, "... was investigated" or "This paper describes"

5. Text

- 5.1. Use either American or British English, but do not mix the two in the same article.
- 5.2. *Indent* the first line of each new paragraph.
- 5.3. *Abbreviations* should be kept to a minimum and spelled out at first mention, giving the full term first, followed by the abbreviation in parentheses. Example: *English as a foreign language (EFL)*. In both humanities and natural science, *e.g. (for example)* and *i.e. (that is, namely)* are preceded and followed by a comma. Standard metric units (*mm, cm, μL, L, mg*) can be used without definition but must be accompanied by a numeral; symbols and metric units do NOT take a period. Common units such as *sec, min, h* (units of time do not use the plural form) are used only in combination with a numeral. Example: *The test was 80 min long. But NOT "The test took several min."* NOT *"For most students, an h was enough time."* Abbreviations requiring a period are those that could be confused with an existing word, such as **in.** for *inch*, were it not for the period.
- 5.4. **Reference citation.** Cite each reference as a superscript number matching the number in the References section of your paper. The superscript citations usually appear, without parentheses, at the **end** of the sentence, the **end** of the paragraph, or the **end** of a quotation. If more than one is used, the superscripts are separated by a comma but no space. The superscript goes **AFTER** the comma or period.
- 5.5. Author-and-date citation in parenthesis, i.e., the Harvard system, known also as the American Psychological Association (APA) system, is **NOT** used in this *Journal* now.

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- 6.1. Divide your article into clearly defined and/or numbered sections. Subsections may be numbered 1.1 (then 1.1.1, 1.1.2) etc.
- 6.2. Each subsection should be given a short heading. Subsections are helpful for cross-referencing within the paper. Instead of just saying, "... as mentioned above," we try to guide the reader by saying "... as shown in 1.1.3 above" or "as aforementioned (1.1.3)," or "as explained under *Evaluation* above."

- 6.3. **Introduction.** First, give the general topic, or territory, of the research in one or two sentences. Example: *How to help students hone their English listening skills is a standing concern of teachers, and especially for those teaching medical students.* After that, explain your rationale and lead up to the problem the paper is addressing, then state *the objective of your research or of your classroom approach.* References are necessary in the Introduction, but subheads are not (if you think subheads are needed, your Introduction is probably too long).
- 6.4. **Methods.** In the past tense, briefly describe your study design or classroom trial succinctly. Tell explicitly what was done, how many students were involved, what academic year they were in, what materials were used, how much time the study took (from when to when, if appropriate). Subheads are helpful in lengthy Methods.
- 6.5. **Results. (Results and Discussion** may be a single division of the paper, depending on author's preference.) Although each result is stated in the past tense, the discussion and generalization of the results are in the present or present progressive tense.
- 6.6. **Conclusion.** The Conclusion is usually the last subdivision or final paragraph of the **Discussion**, but a separate Conclusion is permissible. The conclusion is NOT a repetition of the Results but a (present-tense) generalization derived from the results.
- 6.7. **Acknowledgments.** If you express appreciation to someone for help with the data collection, analysis, manuscript, or for a grant, a brief Acknowledgments section is appropriate between the main text of the paper and the References.
- 6.8. *Figure legends, tables, figures*—in that order—may be collated at the end of the article, provided the text is marked to indicate the approximate location where each figure and table is intended. At the TOP of each **table**, number the tables consecutively according to their order of mention in the text and make a short title for each. Place table footnotes immediately below the table. Vertical lines are not necessary inside the table except in special cases. For figures embedded in the text, put the figure number and legend BENEATH each **figure**.

7. References

7.1. Switch off any automated Reference Manager, such as EndNote, ProCite, or other software you may have used, thus allowing editors to make stylistic conformation of the References if necessary.

7.2. a. **Preferred order:** *Citation order (the Vancouver method, modified slightly)*. List the references according to *the order cited in your text*, putting the **family name** of the authors first, followed simply by the initial or initials of the person's name without punctuation (Examples 7.9 below).

b. **Alternative order:** *Alphabet and number*. The references may be listed *alphabetically*, provided the entries are also numbered consecutively. Although the citation order is preferred, *Journal of Medical English Education* currently allows either style as a way to meet the needs of the unique JASMEE blend of social science and natural science scholars.

7.3. **Journal article** (Example 1 below). **Author(s)**. **Year**. **Article title**. *Journal Name* **Volume (Issue number, optional)** **page numbers**. The article title is written in *lowercase* except for the first word and proper nouns. In the *Journal Title*, the first letter of each word is in *uppercase*, and the *Journal Title* is italicized. The full *Journal Title* is preferred. The word "Vol." does not appear but the volume number is in **boldface**, followed by a non-bold colon, then the page numbers. Caution: 5(1): 64–65 but NOT 64–5. Note: p. or pp. is NOT used in *Journal* entries.

7.4. **Book** (Example 2). **The Book Author(s) or Editor(s)**. **Year**. **Book Title**. **City: Publisher Name**, **p. number** (optional if several scattered portions were used).

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followed by the numbers. Caution: pp. 128–136 but NOT pp. 128–36.

7.6. Journal *articles* or book *chapters* having 7 or more authors may list the first 4 authors followed by et al.

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7.8. Numbered references to personal communications, unpublished work, or manuscripts "in preparation" or "submitted" are unacceptable.

7.9. Examples:

1. Gledhill C. 2000. The discourse function of collocation in research article introductions. *English for Specific Purposes* 19: 115–136.
2. Sinclair JM. 1991. *Corpus, Concordance, Collocation*. Oxford: Oxford University Press. p. 78.
3. Nylenna M and Hagve TA. Small journals and non-English language journals. **In:** F. Godlee, T Jefferson (eds). 1999. *Peer Review in Health Sciences*. London: BMJ Books. pp. 112–121.
4. Sackett DL, Rosenberg WMC, Gray JAM, Haynes RB, and Richardson WS. 1999. Evidence-based medicine: What it is and what it isn't. <http://www.cebm.net/ebm_is_isnt.asp> (Accessed December, 2004).
5. Hishida H and Hirano M. 2003. Teaching material using Web site information on nursing. *Medical English* 4(2): 41–44. In Japanese.
6. 井上真紀, 佐藤利哉, 神田和幸. 2004. コミュニケーションから見た看護事情の改善の必要性. *Medical English* 5(1): 51–58.
7. SAS Use's Guide. 1989. 4th edn. Vol. 1, Version 6. Gary, NC: SAS Institute.

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8.1. A manuscript will be considered for publication with the understanding that it is being submitted solely to the *Journal of Medical English Education*

and that all pertinent sources of support and information have been acknowledged. Submission of an article implies that the work has not been published elsewhere (except perhaps as an Abstract in a conference Program or Proceedings) and that the work does, in fact, belong to the author(s) named on the Title Page.

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9. Japanese Articles

When writing an article in Japanese, follow the English Guidelines in addition to providing English in 4 places: (1) Just beneath the Japanese title of the article, provide an **English Title**, (2) put the **Author Name(s)** in Roman characters under the Japanese Name(s), (3) name the **Institution and Department** in Roman characters just below the same author affiliations in Japanese, (4) provide

the **Abstract** in English only.

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- 10.1. Articles prepared by students will be considered on a limited basis. All manuscripts are subject to the Guidelines for Authors, and the Title Page must include the name of a teacher, possibly a co-author, who will serve as the contact person throughout the editorial process. Provide e-mail addresses and telephone and fax numbers where the Editors might reach someone for consultation even after the student author has graduated.
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All manuscripts except Special Articles will be evaluated by 1 or 2 reviewers assigned by the Editors.

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Galley proofs of accepted manuscripts will be sent to the authors shortly before publication of the *Journal*. Typographical errors and errors in the data will be corrected upon return of the proofs, preferably by e-mail attachment or fax, to the JASMEE Office.

13. Reprints

Reprints are available free of charge for 20 copies or fewer when ordered with the returning of the proofs. The cost of copies exceeding the first 20 will be charged to the author(s).

* *Guidelines for Authors* in both English and Japanese can be downloaded from the following webpage (本ガイドラインならびに日本語投稿用のガイドラインは、下記のホームページでもご覧いただけます) :
<<http://www.medicalview.co.jp/jasmee/journal.shtml>>

Editor's Perspective

Reaching Out, Connecting the Dots

The authors are to be commended. As always, the authors are the ones who have made possible the continuation of the *Journal* and have kept the pathways open to the flow of new concepts and to the creation of expanding dimensions. For the first time in the life of the *Journal*, JASMEE writers submitted more papers this time than the *Journal* is able to accommodate in a single issue. Such a robust response to our call for papers is an encouraging sign not only of future growth and stability but also of present academic authority and credibility. This welcome increase in submissions adds a healthy competitive edge and invites debate.

At the same time, the increased number of papers raises important questions for all of JASMEE:

1. Has the time come when the *Journal* ought to be published three times a year instead of twice a year as the present schedule allows? If so, (a) would the members continue to submit enough papers for three issues and (b) would JASMEE be able to afford the cost?
2. What is the best way to increase the editorial staff, and how can interested candidates train for the meticulous work of editing?
3. Ought the annual Conference proceedings be published in a Special Conference Issue of the *Journal*, or as a Supplement to the *Journal*, instead of being delayed and split up until the next regular issue? Or should the Proceedings become a publication entirely independent of the *Journal*?
4. Ought the annual Conference proceedings have a separate editorial staff, who would use somewhat different expertise from that required for editing the formal papers?
5. What is the best way to obtain the files and printouts of the Conference lectures, symposiums, and presentations from the guest speakers and other participants, in order to help reduce the awesome amount of time and work involved in transcribing the materials from audiotape?
6. To make room for the formal papers being submitted, is it time to charge authors a fee for the number of pages that exceed a certain number of pages per article?

Through both the formal *Journal* paper written for readers and the informal oral presentation made for a listening audience, JASMEE researchers and thinkers are having an obvious impact on the study and teaching of English for international medical purposes. Half the *Journal* articles in the present issue deal, by coincidence, with the needs of nursing students and relate particularly to the field of materials development. Even without a consensus, these authors show that in their perceptions of the students' needs the similarities far outweigh the differences.

Throughout this issue, we also find a multidisciplinary endeavor on the part of the teachers. By combining English with other disciplines, the teachers are reaching out to the students to prepare the students, in turn, to reach out tomorrow to the people for whom they are training today. Whether the research article is about learning how to read and write medical papers in English as the lingua franca of science, or promoting academic integrity, or testing group work against individual work, or whatever each individual paper is about, together the papers speak with one accord as we watch them connecting the dots between English and anthropology, English and statistics, English and speech making, medical-oriented vocabulary and vocabulary for activities of daily living.

The *Journal* is receiving new submissions now.

Nell Kennedy, Editor-in-Chief

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Acknowledgments

To each Referee, thank you so much!

The Editors

Abbreviations and Acronyms Occurring in Studies on English Education

This list is a quick reference for readers whose academic field may not be the study of English education but whose work puts them in contact with such terms. Caution: The list is not a free license for authors to bypass the writer's etiquette and responsibility to spell out the full meaning when the term is first used in the main body of a paper.

Abbreviation	Full Expression
1. CALL	Computer-Assisted Language Learning
2. CARS	Create a Research Space
3. COBUILD	COLLINS Birmingham University International Language Database
4. DDL	Data-Driven Learning
5. EAP	English for Academic Purposes
6. EEP	English for Educational Purposes [now almost obsolete, replaced by EAP]
7. EFL	English as a Foreign Language
8. EGAP	English for General Academic Purposes [e.g. listening and note-taking, academic writing, reference skills, seminars, discussions]
9. EGP	English for General Purposes
10. ELP	English for Legal Purposes
11. ELT	English Language Teaching
12. EMP	English for Medical Purposes
13. EOP	English for Occupational Purposes [e.g. doctors, hotel staff, airline pilots]
14. EPP	English for Professional Purposes English for Pharmaceutical Purposes [of recent origin]
15. ESAP	English for Specific Academic Purposes [e.g. medicine, law, engineering, economics]
16. ESL	English as a Second Language
17. ESP	English for Specific Purposes
18. EST	English for Science and Technology
19. EVP	English for Vocational Purposes
20. IELTS	International English Language Testing System (UK)
21. ITA	International Teaching Assistant
22. L1	First language/mother tongue
23. L2	Second language/medium of communication
24. NS	Native Speaker (of English)
25. NSS	Non-native Speaker (of English)
26. PBL	Problem-Based Learning
27. PERC	Professional English Research Consortium [based in Japan]
28. RELC	Regional Language Centre (Singapore)
29. TEFL	Teaching English as a Foreign Language
30. TENOR	Teaching of English for No Obvious Reason [e.g. for children unaware of any particular need for English, sometimes equated with EGP]
31. TOEFL	Test of English as a Foreign Language
32. TOEIC	Test of International Communication
33. TSA	Target-Situation Analysis

Boldface indicates terms sometimes found in *Journal of Medical English Education*.

This list was compiled by the editors.

Logico-Linguistic Functions of the Modal Qualifiers and the Reason and Conclusion Indicators in Medical English: A Study of Medical English as the Language of Science*

Masanori Kameda

Division of Integrated Arts and Sciences, Fukushima Medical School

Studying medical English is indeed somewhat manageable with school grammar and by the skills acquired through painstaking practice. That is, however, not the best way to get into the very core of medical English as the language of science that is deeply established by the logic of scientific thinking. We need a much more theoretical and efficient way that is based on understanding the characteristics of medical English than the ways we have until now followed. Here, I would like to introduce a way, logico-linguistic analysis, focusing on the logico-linguistic function of *modal qualifiers*, *reason indicators* and *conclusion indicators*. First, giving an example of a medical statement that is grammatically correct but logico-linguistically imprecise, I show what and how modal qualifiers should be used in given medical context. Second, focusing on the logico-linguistic function of reason indicators and conclusion indicators that offer us practical guidance in how we should efficiently read and compose medical papers, I show why and how logico-linguistic analysis plays key-roles in scientific reasoning that is essential for medical articles.

J Med Eng Educ (2007) 6(2): 105–115

Key Words: medical English as the language of science, logico-linguistic analysis, modal qualifier, reason indicator, conclusion indicator, English logic in science

1. Introduction

Medical English is the language of science.¹ This means (a) that the logic of scientific discovery is linguistically structured in medical statements and (b) that what medical scientists state in medical statements such as *Taking arsenic causes death*² and *It is true that the cells in the brain don't divide very much after birth*³ is supposed to be inter-subjectively observable and confirmable. Medical English, in this sense, very much concerns seman-

tics rather than grammar.^{4–7}

All grammatical sentences composed by researchers can be called *observation sentences*; however, in this article, I seek a logico-linguistically possible condition or situation in which observation sentences can be semantically true. Therefore, I call such a semantically true observation sentence a *statement*.

The issue I especially focus on is how *modal qualifiers* (such as adverbs and adverbial phrases) and *reason* and *conclusion indicators* (such as connectives and half-connectives) function logico-linguistically in the reasoning that is essential to medical articles. By solving this issue, the study aims to bring to light the very characteristics of medical English as the language of science.

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*This paper was originally given at the 8th Annual Conference of the Japan Society for Medical English Education (Tokyo, August 10, 2005) under the title 'Logico-Linguistic Functions of *Modal Qualifiers*, *Reason* and *Conclusion Indicators* in Medical English.' I thank Fukushima Medical School for the 2005 Scientific Research Grant.

2. Modal Qualifiers

First of all, I enquire about how modal qualifiers function logico-linguistically in medical English.

What modal qualifiers are used in medicine?

Modal qualifiers depend totally on the degree of probability the scientific researchers intend. To provide the

reader with clues to the subtlety of meaning intended, then, researchers rely on a reservoir of modal qualifiers such as the following that are generally employed in scientific reasoning:

- *necessarily*
- *certainly*
- *apparently*
- *evidently*
- *probably*
- *in all probability*
- *for all that we can tell*
- *so far as evidence goes*
- *possibly*
- *very possibly*
- *may be*
- *plausibly*
- *presumably*
- *or so it seems*
- *very likely*
- *most likely*

How do modal qualifiers function?

Modal qualifiers, which are grammatically called adverbs and adverbial phrases, are commonly employed to mark the degree and kind of certainty that attaches to different claims, as pointed out by Toulmin et al.⁸ In actuality, modal qualifiers either enhance or diminish the semantic category of medical statements, as shown by the truth-value, or force, of the following medical statement, for example:

1.0 Passive smoking causes lung cancer⁹

The medical statement *Passive smoking causes lung cancer* is grammatically correct, as pointed out in my article *Logico-linguistic analysis of medical English*,⁵ but it is logico-linguistically (semantically) imprecise since the statement is true under some possible conditions and false under others. In other words, what 1.0 shows us is that it is true if, and only if, the medical statement *Passive smoking causes lung cancer* is true in EVERY situation. 1.0 is therefore a statement that reflects the very nature of scientific evidence that is based on the degrees of *probability / possibility and certainty*.⁸

Logico-linguistic analysis of 1.0

How about the logico-linguistic form of 1.0? Suppose *p* stands for *Passive smoking causes lung cancer*. Then, through the use of logical symbols such as \square (possibility operator), \equiv (equivalence), \neg (negation), and \square (necessity operator), the logico-linguistic form of 1.0 could be expressed as 1.1:

$$1.1 \quad p \quad \neg \quad \neg p$$

Translated into normal English, this reads: *It is true in some possible situations that passive smoking causes lung cancer* is equivalent to *It is not true in all possible situations that passive smoking causes lung cancer*.^{10,11}

Or, suppose *q* stands for 'passive smoking,' *r* for 'lung cancer' and *C* for the verb, 'cause.' In that case, then 1.1 can be fully rendered

$$1.1a \quad C(q, r) \quad \neg \quad C(q, r)$$

(*It is possible that passive smoking causes lung cancer* is equivalent to *It is not necessarily true that passive smoking causes lung cancer*.)

So it would be inappropriate to use the causative verb *cause* without restricting its semantic category. One of the ways we could make this statement more reasonable would be with the use of modal qualifiers (such as adverbs, adverbial phrases, prepositional phrases and modal auxiliaries). For example, using modal qualifiers such as those listed above, we can reformulate Statement 1.0 in such a way that it agrees with the logic of scientific discovery as follows:

- 1.2 Passive smoking *probably* causes lung cancer.
- 1.3 Passive smoking *presumably* causes lung cancer.
- 1.4 Passive smoking, *so far as evidence goes*, causes lung cancer.
- 1.5 Passive smoking *very likely* causes lung cancer.
- 1.6 Passive smoking *very possibly* causes lung cancer.

Thus, by using only modal qualifiers, we can more precisely show the semantically possible situations for a statement such as *Passive smoking causes lung cancer* (1.0).

3. Reason Indicators and Conclusion Indicators

Part 1: Formulating the basics of logico-linguistic analysis

The next issue I enquire about is how reason indicators and conclusion indicators function in medical English. The reason indicators are those that signal the presence of reasons given in scientific argument in general:¹²

- *because*
- *since*
- *follows from the fact that*
- *may be inferred from the fact that*
- *first, second*
- *third, fourth, etc.*
- *for*

Conclusion indicators, on the other hand, are those that signal the presence of conclusions that are supported or justified by reason indicators. Some conclusion indicators commonly used in medical situations appear below:¹²

- *which proves that*
- *justifies the belief that*
- *I conclude that*
- *demonstrates that*
- *which implies that*
- *establishes the fact that*
- *therefore*
- *so*
- *consequently*
- *hence*
- *thus*
- *it follows that*

However, in the following set of medical statements (2.0) we cannot find any reason indicators and conclusion indicators:

2.0 The Skin

The skin can be regarded as the largest organ in the body. It consists of two layers, the outer epidermis and the inner epidermis. Skin is elastic; it generates and functions in protection, thermoregulation and secretion. In its protective role, it prevents the body from dehydrating, resists the invasion of microorganisms and protects it from the harmful effects of ultraviolet light.¹³

As mentioned in the **Introduction** above, medical English very much concerns semantics rather than grammar, that is, all semantically true medical statements in which we cannot find any logical contradictions can be translated into a set of *declarative sentences* that are grammatical English.^{12,14,15} And such declarative sentences have a common linguistic formula: *it is true that*. For example, all medical statements that are composed from 2.0 can be translated as declarative sentences:

- 2.1 *It is true that* the skin can be regarded as the largest organ in the body.
- 2.2 *It is true that* the skin consists of two layers—the outer epidermis and the inner epidermis.
- 2.3 *It is true that* skin is elastic.
- 2.4 *It is true that* skin generates and functions in protection, thermoregulation and secretion.
- 2.5 *It is true that* skin has a protective role.
- 2.6 *It is true that* skin prevents the body from dehydrating, resists the invasion of microorganisms and protects it from the harmful effects of ultraviolet light.

In declarative sentences 2.1-to-2.6, then, facts scientifically observable and confirmable are stated in *that-clauses*. And, in the set of semantically true medical statements that can be translated into declarative sentences like 2.0, there is no good reason to treat one of the statements as a conclusion and the others as premises. This means that in a set of medical statements that simply describe facts that are inter-subjectively observable or

confirmable and that can be translated into declarative sentences, there is no need for scientific argument or reasoning to include a reason indicator or a conclusion indicator.

In the following case of clinical medicine (3.0), we can see how modal qualifiers, reason indicators and conclusion indicators function together:

3.0 A Clinical Case⁸

From a position at the bedside of a sick patient, the physician *may* pick up minute signs or pointers he or she can rely on as clues to what is troubling the patient. Yet the doctor *may not* be able to relate the meaning of those small signs to any general principles of a sort that might figure in a medical handbook or textbook. In such a situation, it will not be surprising to find the physician saying, "In my experience, that kind of pallor around the temples *can mean* some sort of viral infection, and in this particular kind of case, I am inclined to think that it does." Just exactly what "kind" of pallor and "kind" of case he is pointing to, the physician *may not* be able to explain any further; to that extent, *therefore*, the argument *may be incomplete*.⁸ (Italics are mine, indicating the modal qualifiers in this paragraph.)

Logico-linguistic analysis of 3.0

Toulmin et al. logico-linguistically analysed the clinical conditions described in 3.0 and concluded that there is a certain way of reasoning in the article. Suppose *G* stands for *ground*, *W* for *warrant*, and *C* for *claim*.

G: (It is true that) this patient displays pallor around the temples, together with lethargy and a low fever. Furthermore, the pallor in this case strikes me as the virus kind of pallor.

W: (It is true that) pallor, lethargy, and a low fever often mean viral or bacterial infection, or exhaustion from overwork or, in a few cases, neurotic stress.

C: This patient is *very possibly* suffering from a viral infection.⁸

3.1 The relationships among the ground, warrant and claim (*G*, *W*, *C*), that is, the reasoning carried out by the physician associated with 3.0, can be represented schematically as shown in Figure 1.

The logico-linguistic form of 3.1 can be finally reduced to: *G, therefore very possibly C*.⁸

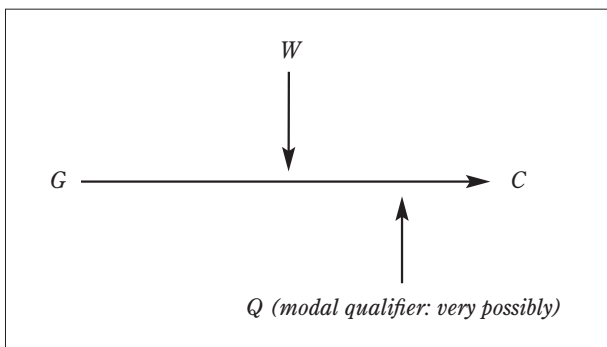


Figure 1. Logico-linguistic schema depicting the physician's reasoning in the clinical case presented in 3.0.

G: ground, W: warrant, C: claim, Q: modal qualifier.

The modal qualifier *very possibly* in claim statement *C* (*This patient is very possibly suffering from a viral infection*) shows us the degree of probability or degree of certainty of the conclusion the physician finally attained by observing the symptoms of his or her patient—in other words, the semantic category of claim *C*. That is, *C* neither states that it is true in all possible medical conditions nor that it is true in no possible medical conditions; but what *C* states is that it is true in some possible, or certain possible, medical conditions.

How will the modal qualifier *very possibly*, which is grammatically called a *sentence adverb* and which sets up the semantic category of *C*, be expressed in logico-linguistic form? Suppose *P* stands for *the patient*, *S* for *suffers from* and *V* for *a viral infection*. Then the logico-linguistic form that *C* takes would be that shown in 3.2:

3.2 $x (P(x) \quad y(V(y) \quad S(x, y)))$

(There is at least one patient who *very possibly* suffers from a viral infection.)

In this logico-linguistic formula,

- is an existential quantifier,
- indicates material implication,
- means conjunction, and
- is a possibility operator expressing the modal qualifier (*very possibly*).

Part 2: Applying logico-linguistic analysis function to medical articles

By applying logico-linguistic analysis such as that introduced in Section 3 Part 1, we will more clearly be able to see particularly how reason indicators and conclusion indicators function in medical English. A sample abstract is given below, to which I will apply logico-linguistic analysis of the medical statements to arrive at the structure of scientific reasoning involved in the article. This abstract is from the paper on 'Cementing techniques in hip resurfacing' in *Proceedings of the Institution*

of Mechanical Engineers (Feb. 2006).¹⁶

4.0 Cementing techniques in hip resurfacing (an abstract)¹⁶

The subject of the cementing technique in hip resurfacing has been poorly studied to date. The hip resurfacing prosthesis is unique in the family of cemented prostheses because the cement mantle is blind (hidden underneath the implant) and is radiographically obscured. This presents an immediate challenge to the surgeon at the time of surgery, but also has a long-term implication in terms of lack of post-operative clinical observation. This should be compared with total hip replacement or total knee replacement where the cement mantle can at least be partially observed both intra- and post-operatively. With this in mind, the objective of this review is, *firstly*, to understand the cement mantles typically achieved in current clinical practice and, *secondly*, to identify those factors affecting the cement mantle and to consolidate them into an improved and reproducible cementing technique. The outcome of this work shows that low-viscosity technique can commonly lead to excessive cement penetration in the proximal femoral head and an incompletely seated component, whereas a more consistent controlled cement mantle can be achieved with a high-viscosity cementing technique. *Consequently*, it is recommended that a high-viscosity technique should be used to minimize the build-up of excessive cement, to reduce the temperature created by the exothermic polymerization, and to help ensure correct seating of the prosthesis. A combination of these factors is potentially critical to the clinical success of some articular surface replacement (ASR) procedures. It is important to note that we specifically studied the DePuy ASR system; therefore only the general principles (and not the specifics) of the cementing technique may apply to other resurfacing prostheses, because of differences in internal geometry, clearance, and surgical technique.¹⁶ (Italics in the abstract are mine.)

In Abstract 4.0, it is obvious that *firstly* and *secondly* are not used as reason indicators: here they serve instead in *arranging copulative co-ordination* introducing a series of objectives of this review. *Because* and *because*

of are also not reason indicators that signal the existence of reasoning (scientific argument) but are conjunction and a two-word preposition that give us causal explanations;^{12,17} they in actuality do not give us reasons for believing that *the hip resurfacing prosthesis is unique in the family of cemented prostheses and that only the general principles (and not the specifics) of the cementing technique may apply to other resurfacing prostheses.*

Thus we can conclude that in this review there is no specifically noteworthy scientific reasoning that guides us to the conclusion that is signaled by the conclusion indicator *consequently*. (Though we can see *therefore* near the bottom of this abstract, it is not a linguistic clue that we have an argument there but a causal co-ordination that confines the conclusion the researchers attained.) Judging from the context, the passages led by *consequently* and *therefore* simply function as the claims (C) of this review.

However, in the following abstract (4.1), 'Seckel syndrome exhibits cellular features demonstrating defects in the TR-signaling pathway,' in *Human Molecular Genetics* (Dec. 15, 2004),¹⁸ we will be able to see more clearly how reason indicators and conclusion indicators function in medical reasoning.

4.1 Seckel syndrome exhibits cellular features demonstrating defects in the TR-signaling pathway (an abstract)¹⁸

To date, the only reported genetic defect identified in the developmental disorder, Seckel syndrome is a mutation in ataxia telangiectasia and Rad3-related (ATR) protein. Seckel syndrome is clinically and genetically heterogeneous and whether defects in ATR significantly contribute to Seckel syndrome is unclear. *Firstly*, we characterize ATR-Seckel cells for their response to DNA damage. ATR-Seckel cells display impaired phosphorylation of ATR-dependent substrates, impaired G2/M checkpoint arrest and elevated micronucleus (MN) formation following exposure to UV and agents that cause replication stalling. We describe a novel phenotype, designated nuclear fragmentation (NF), that occurs following replication arrest. *Finally*, we report that ATR-Seckel cells have an endogenously increased number of centrosomes in mitotic cells demonstrating a novel role for ATR in regulating centrosome stability. We exploit these phenotypes to examine cell lines derived from additional unre-

lated Seckel syndrome patients. We show that impaired phosphorylation of ATR-dependent substrates is a common but not invariant feature of Seckel syndrome cell lines. In contrast, all cell lines displayed defective G2/M arrest and increased levels of NF and MN formation following exposure to agents that cause replication stalling. All the Seckel syndrome cell lines examined showed increased endogenous centrosome numbers. Though ATR cDNA can complement the defects in ATR-Seckel cells, it failed to complement any of the additional cell lines. *We conclude that* Seckel syndrome represents a further damage response disorder that is uniquely associated with defects in the ATR-signaling pathway, resulting in failed checkpoint arrest following exposure to replication for stalling.¹⁸ (Italics are mine.)

In **Abstract 4.1**, the authors Alderton et al. used *we* in the sense described by Kuhn.^{18,19} In his classic book on the relationship between science and community structure, Kuhn noted that the personal pronoun *we* means that researchers belong to a scientific community.

Abstract 4.1 says that the researchers (*we*)¹⁹ intend to clarify whether defects in ATR significantly contribute to Seckel syndrome that is identified in the developmental state of the disorder. So this must be undoubtedly the ground (G) for their scientific research. And the two reason indicators *firstly* and *finally* signal the presence of warrants (W) that eventually lead us to the claim (C), which is signaled by the conclusion indicator *we conclude that*. We then may easily think that the way of reasoning in 4.1 is almost the same as that in 3.1; however, the matter we enquire about here is not so simple. Why? By using the scheme in 4.2 that depicts the way of reasoning employed in 4.1, I would like to show why it is not so simple as we might think.

Logico-linguistic analysis of 4.1

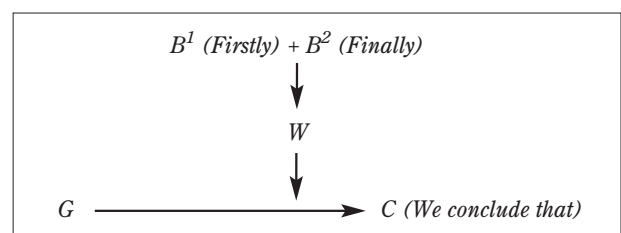


Figure 2. Logico-linguistic scheme depicting the physician's reasoning in the Seckel syndrome abstract in 4.1. B¹: backing (Firstly), B²: backing (Finally), G: ground, W: warrant, C: claim.

4.2 See Figure 2.

G: Seckel syndrome is a mutation in ataxia telangiectasia and Rad3-related (ATR) protein. However, whether defects in ATR significantly contribute to Seckel syndrome that is identified in the developmental disorder is unclear.

W: ATR-Seckel cells cause replication stalling of DNA.

*B*¹: (1) ATR-Seckel cells display impaired phosphorylation of ATR-dependent substrates.

(2) ATR-Seckel cells display impaired G2/M checkpoint arrest.

(3) ATR-Seckel cells display elevated micronucleus (MN) formation following exposure to UV and agents that cause replication stalling.

*B*²: (1) ATR-Seckel cells have an endogenously increased number of centrosomes in mitotic cells, demonstrating a novel role for ATR in regulating centrosome stability. (This means that whenever a centrosome loses its stability, ATR-Seckel cells cause replication stalling.)

(2) All cell lines derived from additional unrelated Seckel syndrome patients displayed defective G2/M, increasing levels of NF and MN formation following exposure to agents that cause replication stalling.

C: Seckel syndrome represents a further damage response disorder that is *uniquely associated with*⁵ defects in the ATR-signalling pathway resulting in failed checkpoint.

Then the reasoning carried out in 4.1 is consistent and can be formulated as (4.3) below:

4.3 *G*, *W* that is backed by *B*¹ and *B*² justifies *C*. Therefore, *C* is concluded. *C* confirms *G*.

Furthermore, 4.3 will be simply translated into the evidential connection (4.4):^{20,21}

4.4 $\neg W \quad \neg C$ (If *W* weren't true, *C* wouldn't hold.)²²

The form, or mood, of the verb in 4.4 is *subjunctive*, expressing a logical possibility and hypothesis under a certain possible condition; and, in this sense, 4.4 provides a rule for anticipation of inter-subjectively agreeable scientific confirmation or refutation.⁴ 4.4, therefore, shows us how deeply medical statements and reasoning employed in medical articles concern semantics rather than grammar. What the evidential connection 4.4 tells us, in logico-linguistic terms, is this:

(i) $\neg W \quad \neg C$ is true when the antecedent ($\neg W$) is

false and the conclusion ($\neg C$) is false;

(ii) $\neg W \quad \neg C$ is true when the antecedent ($\neg W$) is true and the conclusion ($\neg C$) true;

(iii) $\neg W \quad \neg C$ is true when the antecedent ($\neg W$) is false and the conclusion ($\neg C$) is true. In another case, that is,

(iv) $\neg W \quad \neg C$ is true when the antecedent ($\neg W$) is true and the conclusion ($\neg C$) is false, 4.4 is not true.

To illustrate such conditional relationships, it is quite useful to examine the following statement: *If a way were found to remove the hunger hormone grehlin from the body, people's appetites would be cured and they would be able to diet much more easily.* What this statement shows is that some evidential connection exists between the premise and the conclusion and that the subjunctive mood helps in expressing such a relationship.²²

This Seckel syndrome case (4.1) is, as it were, an ideal case to illustrate how modal qualifiers, reason indicators and conclusion indicators function logico-linguistically in medical articles. Medical papers we usually are concerned with, however, are generally written in a much more complicated manner than 4.1. The following article (5.0), which was written for those who are not scientifically trained, for example, requires us to do further logico-linguistic analysis to see how modal qualifiers, reason indicators and conclusion indicators function in the reasoning employed in medical articles.

5.0 Learning in your sleep²³

(a) Before a big exam, a sound night's sleep will do you more good than poring over your textbooks. That, at least, is the folk wisdom. And science, in the form of behavioural psychology, supports that wisdom. But such behavioural studies cannot distinguish between two competing theories of why sleep is good for the memory. One says that sleep is when permanent memories form. Another says that they are actually formed during the day, but then *edited* at night to flush away what is redundant.

(b) To tell the difference, it is necessary to peer into the brain of a sleeping person, and that is hard. But after a decade of painstaking work, a team led by Pierre Maquet of the Cyclotron Research Centre at Liège University in Belgium, has managed to do it. Dr. Maquet and his colleagues have persuaded enough people to fall asleep

inside a noisy, cramped brain-scanning machine to collect the evidence needed to show what is happening. Steven Laureys, one of Dr. Maquet's collaborators, revealed their results to a meeting of the Organisation for Human Brain Mapping in Sendai, Japan, earlier this month (June 2002).

- (c) The particular stage of sleep in which the Belgian group is interested is rapid eye movement (REM) sleep, when brain and body are active, heart rate and blood pressure increase, the eyes flick back and forth behind the eyelids as if watching a movie, and brainwave traces resemble those of wakefulness. It is during this period of sleep, usually lasting between 10 and 25 minutes, that people are most likely to relive events of the previous day in dreams — although somewhat mysteriously (if dreaming is involved in the laying down of memories), they rarely remember the dreams themselves.
- (d) Dr. Maquet used positron-emission tomography (PET) to study the brains of people as they practiced a task during the day and as they slept during the following night. The task required them to press a button as fast as possible, in response to a light coming on in one of six positions. As they learned how to do this, their response times got faster. What they did not know was that the appearance of the lights sometimes followed a pattern — what Dr. Laureys refers to as an *artificial grammar*. Yet the reductions in response time showed that they learnt faster when the pattern was present than when it was not. In other words, they were learning without being aware of it.
- (e) The PET scans revealed that the cuneus — a small structure at the back of the brain — was active during both the four-hour training period and the subsequent REM sleep, but not in any other stage of sleep. The scans, however, revealed significantly less activity in the cuneus during REM sleep in those who had seen randomly flashing lights than in those who had learnt the artificial grammar.
- (f) What is more, the grammar-learners, unlike those exposed to the random pattern, showed an increase in activation in brain areas distantly connected to the cuneus, such as the caudate nucleus, a structure already known to be involved in grammar and sequence learning.

Those with more to learn (i.e., the artificial grammar, as well as the mere mechanical task of pushing the button) have more active brains. The *editing* theory would not predict that, *since* the number of irrelevant stimuli would be the same in each case. And to quash any lingering doubts that the experimental subjects were learning as opposed to unlearning, their response times when they woke up were even quicker than when they went to sleep.

- (g) The team therefore concluded that the neural connections involved in memory are reinforced through reactivation during REM sleep, particularly if the brain detects an intrinsic structure in the material being learnt. So, now, on the eve of that crucial test, math students can sleep soundly in the knowledge that what they will remember the next day are the basic rules of algebra and not the incoherent babble from the radio next door.²³ (I have alphabetized the paragraphs for convenience.)

Logico-linguistic analysis of 5.0

In the article "Learning in your sleep" (5.0), the main thesis that is to be the ground (G) for being examined and justified through further scientific research is stated in paragraph (c):

- G: Something happens to our brains during the REM sleep, making it possible for learning and memories to be mutually interrelated during REM sleep.

The claim (C) to be asserted through the reasoning carried out in this article is broadly stated in paragraph (a):

- C: The folk wisdom says that before a big exam, a sound night's sleep will do you more good than poring over your textbooks. If a medical statement is presented as being true, it is said to be assertive.^{12,14} More precisely, therefore, in paragraph (a), there are three claims (C^1 , C^2 , C^3) that require us to assess their *assertibility*, and each claim takes the form of a grammatical question:
- C^1 : Is it true that sleep is when permanent memories form?
- C^2 : Is it true that memories are actually formed during the day?
- C^3 : Is it true that memories are edited at night to flush away what is redundant?¹⁴

Despite the absence of obvious reason indicators that

demonstrate *G* (the ground), except for the single intermediate reason indicator since in paragraph (f) in this article, we, judging from the context of this article, should construe the scientific evidence stated in paragraphs (d), (e) and (f) to give reasons to state (g), warrant (*W*). So (d), (e) and (f) should be backing (B^1, B^2, B^3) that supports *W* as being true.

B^1 : (d) The PET scan revealed that people learnt faster when they followed a pattern, that is, an *artificial grammar*.

B^2 : (e) The PET scan revealed that the cuneus was active during both the four-hour training period following an *artificial grammar* and the subsequent REM sleep. (It also revealed significantly less activity in the cuneus in individuals who did not follow the artificial grammar.)

B^3 : (f) The PET scan revealed that the *grammar learners* have more active brains than *non-grammar learners*.

W: The Researchers *therefore concluded that* the neural connections involved in memory are reinforced through reactivation during REM sleep, particularly if the brain detects an intrinsic structure in the material being learnt.

Three conclusion indicators (*therefore, concluded that, and so*) in paragraph (g), which are grammatically categorized as *causal connectives* and which mean *effects or results*, show us the locus of the very conclusion of reasoning we finally attain in this article and that is eventually to justify the claim (*C*). More precisely, C^1 and C^2 are justified by B^1, B^2 and B^3 but C^3 is not.

5.1 Then the way of reasoning carried out in “Learning in your sleep” (5.0) can be schematically described, as shown in Figure 3.

Although 5.0 does not tell us what modal qualifiers

should be used to express the degrees of scientific and logical probability of the experiment, on conjecture we are able to arrive at the form of reasoning, as described in 5.2:

5.2 It is said that *C* consists of C^1, C^2 and C^3 . There are B^1, B^2 and B^3 that give support to *W*. *W* justified C^1 and C^2 but didn’t justify C^3 . The researchers concluded that if B^1, B^2 and B^3 are given, then *in all probability/ so far as the evidence goes*, C^1 and C^2 are confirmed. Therefore, *C* is asserted in a broad sense.

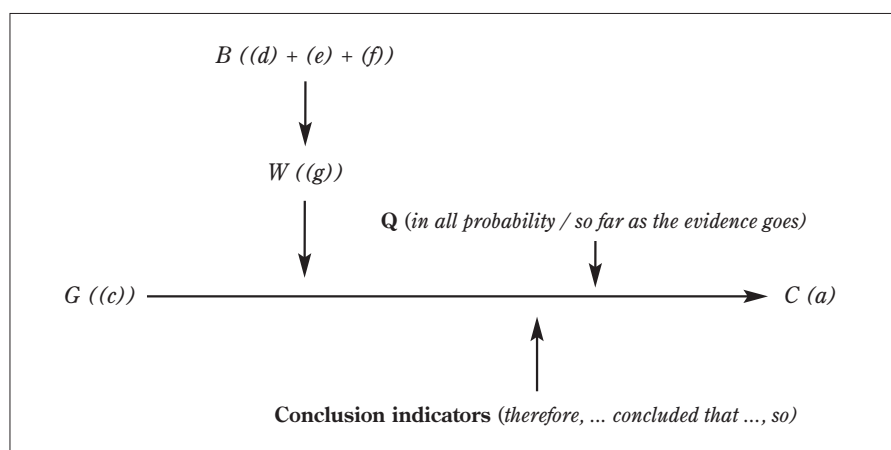
5.2 says that the article 5.0 (“Learning in your sleep”) has a logico-linguistically consistent structure, and medical statements that comprise the very core of 5.0 are translatable into a set of declarative sentences that are grammatical English sentences. This means that if a medical statement is translatable into a declarative sentence, the statement itself is a logico-linguistic reflection of consistent scientific thinking.

From the standpoint of medical articles, medical articles are all a consistent set of semantically true medical statements that are inter-subjectively confirmable or agreeable according to medical scientists. (So, if a medical article is not composed in a consistent or systematic manner, it will be deceptive or nonsensical.)¹² Such medical statements are semantically true and therefore can be intersubjectively observed or confirmed.

However, we here need some more logico-linguistic analysis of *what if the brain detects an intrinsic structure in the material being learnt*, as mentioned in paragraph (g), implies. Suppose *the material to be learnt* is a linguistics issue such as *phrase structure and its meaning* in the medical statement 5.3 below, derived from B^3 above that gives support to *W*.

5.3 The grammar learners have more active brains

Figure 3. Logico-linguistic scheme depicting the way of reasoning in the article “Learning in your sleep” in 5.0, written for readers not trained in science. B: backing, G: ground, W: warrant, C: claim; (a) (b) (c) (d) (e) (f) denote which paragraph in 5.0.



than non-grammar learners.

5.3 can first be analysed as: $x [x \text{ have more active brains than } \neg x]$. Suppose p stands for *grammar learners*, and A for *active brains*. Then the logico-linguistic form of (5.3) will be: $x (p(x) \rightarrow A(x, \neg p))$. This reads that for every x , it holds that if x is p then x has a more active brain than $\neg p$.

5.31 The phrase-marker in Figure 4 shows the constituents of 5.3 that form a grammatical medical statement.

Through 5.31, the deep grammar of 5.3 becomes clear, that is, that there are at least four ways of composing the medical statement 5.3 (*The grammar learners have more active brains than non-grammar learners.*):

5.32 S: NP + VP

5.33 S: NP [Det + NP] + VP [VP conj NP]

5.34 S: NP [Det + NP [N + N]] + VP [VP [VP] conj NP [N + N]]

5.35 S: NP [Det + NP [N + N]] + VP [VP [VP [AM + NP [Adj + N]]] conj NP [N + N]]

Through 5.31, we can see the *intrinsic structure* of 5.3, that is, *depth grammar* or *deep structure*^{24,25} of the medical statement of 5.3: how constituents of 5.3 correspond with/ to each other and how each of them forms

semantic connotations (5.32–5.35). Here, we can see that *the sequencing of words does not by itself produce a meaning; instead there is a hidden organization of words that gives them their meaning.*²⁶ So, if we randomly try to understand 5.3 without recognizing the intrinsic structure of it, that is, without following the logico-linguistic grammar of scientific language (it is medical English as the language of science), the neural connections involved in memory will not be reinforced through reactivation during REM sleep.

The researchers confirmed 5.3 presenting the report on brain activity and its relation to memory:

W: The Researchers *therefore concluded that* the neural connections involved in memory are reinforced through reactivation during REM sleep, particularly if the brain detects an intrinsic structure in the material being learnt.

Most readers of the article 5.0, however, may erroneously think that *W* has a form of *if-conditionals* and suppose that p stands for *The brain detects an intrinsic structure in the material being learnt* and q for *The neural connections involved in memory will be reinforced through reactivation during REM sleep* and then conclude that the logico-linguistic form of *W* will be: $p \rightarrow q$. However, we can see neither a temporal precedence that p precedes q nor a causal relationship that p causes q in *W* such as *Pneumonia is caused by a virus*. In addition to that, we

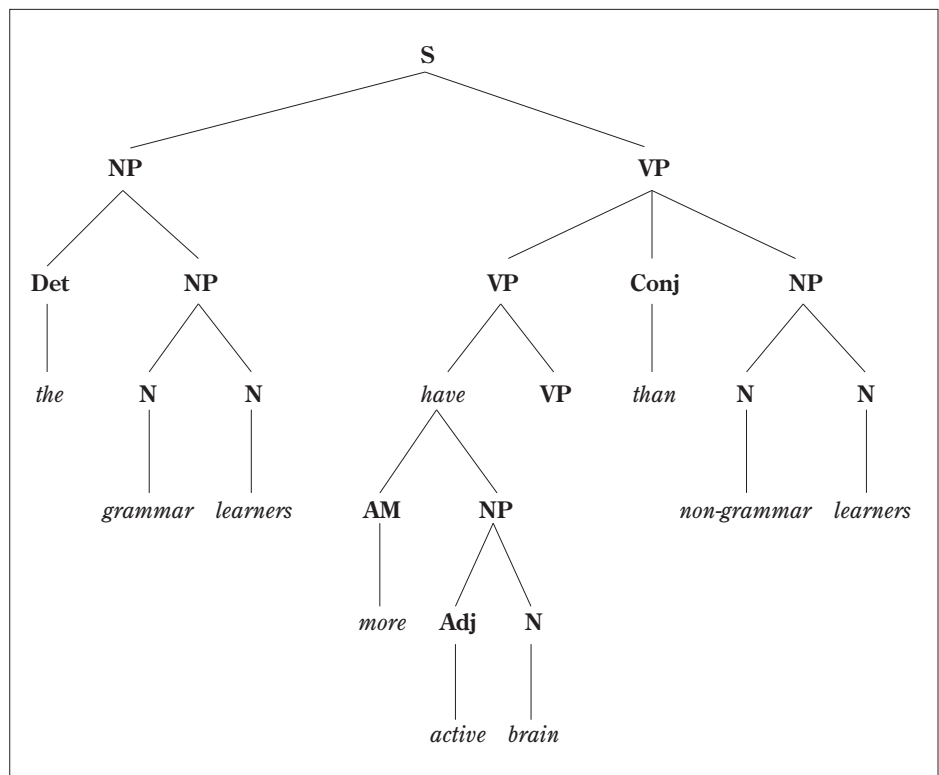


Figure 4. Phrase marker showing the constituents of the statement *The grammar learners have more active brains than non-grammar learners* (5.3).
S: sentence, NP: noun phrase, VP: verb phrase, Conj: conjunction, AM: adverbs of manner, N: noun, Adj: adjective.

cannot see any logical necessity in W such as: if p is true, and p implies q , then q must be true.² Taking the semantic approach to $p \rightarrow q$ also shows us that $p \rightarrow q$ does not agree with the logic of scientific discovery stated in W ; since $p \rightarrow q$ is true when p is true and when q is true, when p is false and when q is true and both p and q are false; but $p \rightarrow q$ is not true when p is true and q is false. This is not what W really states.

What W really states is a logical equivalence between p and q : q is a sufficient but not necessary requirement for *The neural connections involved in memory are reinforced through reactivation during REM sleep, particularly if the brain detects an intrinsic structure in the material being learnt*.^{10,14} So the logic of scientific discovery stated in W will be that in (5.4):

5.4 $p \leftrightarrow q$

The semantic approach to $p \leftrightarrow q$ shows us that it is true if, and only if, p and q are true or if both p and q are false. This is the logic of scientific discovery stated in W . Then, along the logico-linguistic form 5.4, W can be precisely restated as shown in 5.41 to 5.45:

5.41 *Just if* the brain detects an intrinsic structure in the material being learnt, the neural connections involved in memory are reinforced through reactivation during REM sleep.

5.42 *Precisely if* the brain detects an intrinsic structure in the material being learnt, the neural connections involved in memory are reinforced through reactivation during REM sleep.

5.43 *In the event that* the brain detects an intrinsic structure in the material being learnt, the neural connections involved in memory are reinforced through reactivation during REM sleep.^{10,14}

5.44 *If* the brain detects an intrinsic structure in the material being learnt, the neural connections involved in memory will be reinforced through reactivation during REM sleep.

5.45 *If and only if* the brain detects an intrinsic structure in the material being learnt, the neural connections involved in memory will be reinforced through reactivation during REM sleep.

In Article 5.0, what the warrant (W), which scientifically confirmed the folk wisdom referred to in the claim (C), brought us is that non-grammatical learners cannot efficiently learn anything. In other words, those who cannot follow the logico-linguistic grammar of the language of science cannot have an efficient way of studying med-

ical English and, in the end, cannot remember whatever they have studied correctly.

4. Conclusion: The prospect of logico-linguistic analysis in studying medical English

Studying logico-linguistic functions of *modal qualifiers*, *reason indicators* and *conclusion indicators* in medical English from the logico-linguistic point of view depicts not only the structure of reasoning employed in medical articles but also the very characteristics of medical English as the language of science that is deeply embedded in the logic of scientific thinking. Conversely, this logico-linguistic analysis plays key roles in reading medical journals efficiently and composing logically consistent medical articles.

Not far in the future, it may be possible that medical statements that comprise medical articles are *computed* from their truth-values because they very much concern semantics rather than grammar and that the logical relationships and the consistency of those medical statements are also *calculable*. In this sense, logico-linguistic analysis will become absolutely essential and will be greatly in demand for studying medical English as the language of science.

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Group Work versus Individual Work and the Effects on EFL Speech Performance of Nursing Students¹

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Language teachers often face the situation where some students in the class prefer group work, while others wish to work individually. Before deciding one way or the other, the teachers need to know the extent to which each method is effective for the particular subject area. In this study, a quantitative analysis was conducted in a nursing department of one university in Kanagawa in an attempt to investigate the effects of group work versus individual work on student performance in an English public speaking course. Ninety first-year students enrolled in a required course were given a choice of working individually or in groups. The student choice constituted the independent variable in the study. Approximately two-thirds of the students chose to work individually; the rest chose group work. All students received the same type and amount of instruction in demonstrative speech-making, and all completed the same written test on speech outlining, followed by two speaking assignments. The grade from each of these three assignments plus the final grade in the course made up the dependent variable of the study, i.e., student performance. Statistical analyses found no significant differences in student grades across the four assessment measures. This result seems to indicate that group work or individual work had no significant impact on student performance in the class. If so, students studying English speech-making in Japan can be allowed to choose the mode of learning that suits their preferences as well as maximizes their learning experiences, whether working individually or working in peer groups.

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Key Words: group work, collaborative learning, EFL, L2 speech education, nursing students

1. Introduction

In English classes for medical or nursing students, one of the dilemmas the English teachers face is whether to let the students work individually or to work in groups. The group work method has been used so extensively in

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current education of healthcare professionals that many students find not only their clinical practicum classes but also their lecture classes organized around some form of collaborative learning. When group work is employed in their English classes, however, the students seem divided in their reactions: many find group work a familiar and preferred mode of learning; others, in contrast, find it “too familiar.” Those who find group work “too familiar” often feel overwhelmed by the heavily collaborative exercises that characterize most of the classes in their major. This perceived overexposure to collaborative learning leads them to want their English classes to be non-collaborative, so that they can work on their own for a change.

How should teachers deal with these irreconcilable preferences of the students? One approach would be to assign “the more effective” method, be it individual work or group work, to the entire class. A drawback to this approach is that motivation to learn might be compromised for students who have reservations about the

method imposed. Another approach might be to let the students choose their own mode of learning, allowing some to work in small groups while others complete the same tasks independently. Before introducing this split instruction format, however, we need to ascertain whether the choices of group or individual work are equally effective. Only then, can the students who choose one method not be disadvantaged over those who choose the other.

As compared to the traditional whole-class instruction method, the group work method has two advantages. First, as noted by Davies et al., the processes that underlie cognition surface during the discourse of individuals engaged in collaborative problem-solving activities.¹ That is because when involved in group work, the students have to exchange their ideas by verbalizing their thought process, an important activity which does not occur when working on their own. Consequently, the students working in groups become more actively involved in the learning process as they hear themselves talk about the information newly acquired in class. Second, the “intellectual scaffolding” that occurs among peers working in small groups maximizes the learning effect, and the more knowledgeable and skillful students lead the others eventually to their potential levels of development.² This maximizing effect takes place partly because the students have an opportunity to gather ideas and exchange feedback on those ideas with group members.³

Not only is collaborative learning in itself an effective mode of learning, but it is particularly valuable in preparing students for a profession such as nursing, which requires a high degree of collaboration. The knowledge, methods, and skills needed for a person to work effectively in groups make up one of the key knowledge domains necessary for life-long learning of healthcare professionals. It is important for nurses to understand and value the perspectives and responsibilities of others and to exercise the capacity to foster the same in others, including an understanding of the implications of such work.⁴ For these reasons, the group work format is used extensively in the training of nursing professionals.^{5,6}

In addition, collaborative work creates a learning environment particularly conducive to learning how to construct and give a speech in public. The method is more effective in situations that require analytic, synthetic and evaluative levels of learning than in situations that engage in the acquisition of basic knowledge or simple

comprehension of the targeted material.⁷ Furthermore, collaborative learning has the social advantage of developing relationships among the students and between the students and teachers, which, in turn, leads to more effective and better learning. This could be even more pronounced in public speaking courses, where better class chemistry seems to lead to lower levels of communication apprehension. In fact, some public speaking courses for EFL students do use the collaborative learning methods to help facilitate class participation from the students who would otherwise not speak up in class.^{8,9}

Even so, the group work format, however effective it may have been reported to be, is not always preferred or welcomed by the students. A wide variety of factors affect

The group work format is used extensively in the training of nursing professionals.

student views on collaborative learning. For one thing, the student perception of the nature of the course content affects the student’s preference for the learning mode. In an L2

writing class, students who viewed writing as an individual, solitary activity were reported to show the strongest resistance to collaborative writing tasks in the class.³

Student reactions to collaborative learning are also influenced by the degree to which the work tasks are structured. Gillies reported that in junior high school, students assigned to structured group work, as compared to students in an unstructured group work situation, were more cooperative, provided more relevant verbal help, offered more assistance to each other, and were more likely to describe the learning session as enjoyable and report that the session provided them an opportunity to do quality work.¹⁰

Yet another factor that seems to influence student reactions toward group work is the level of self-confidence in the students’ own language skills.³ Overall, advanced learners rather than novices have a more positive attitude toward collaborative learning. In addition, instructors may not always be aware of the struggles experienced by non-native English speaking students in group projects that appear to be functioning well.¹¹ A study of Korean students in Canada revealed that “veterans” (students who had lived in Canada longer than a year) saw both social and instructional purposes in group work, whereas “new arrivals” (students who had lived in Canada for less than a year) saw only a socialization value in collaborative learning. The veterans were more comfortable with group work than were the new arrivals.¹² As for Japanese students studying English in the U.S., Storch reported that those who were reluctant

to work in pairs said they felt embarrassed by their perceived poor English skills.³ These findings indicate that the confidence level of the students, if not the actual aptitude level, influences their attitudes toward collaborative learning.

Furthermore, students' individual dispositions also affect their learning preferences. Generally, the group work method works better for extroverts than for introverts.¹³ A study of American nurse practitioners reported that student reactions to collaborative learning is influenced by the degree to which learners are willing to expose themselves to the judgment of others as well as to take responsibility for their own learning.¹⁴ Another study found that students, especially those from Asia, were concerned about criticizing others while engaged in collaborative learning. Those students indicated that they were worried about hurting the feelings of other members of the group, especially in peer review tasks.³

Similarly, the social and academic dynamics of a group could discourage some students in collaborative learning situations.¹¹ Platzer et al. found that barriers to learning in groups include the attitudes of other group members (such as their commitment or resistance to shared learning), the ways in which group members interact with each other, and styles of facilitating learning.¹⁴

In the light of these reports, an important question arises as to whether speeches prepared in group work are as good as those prepared individually. In preliminary efforts to answer this question, we have started investigating factors that influence, as well as factors that are influenced by, the student preferences for individual work and the preferences for group work in English classes.¹⁵ As the second part of our research project, the present study involved EFL speech education for first-year nursing students. The objective of the study was to clarify whether the quality of learning, i.e., the speech performance, differs between that of the students doing the work individually and that of the students doing the work in peer groups.

2. Methods

2.1 Study design

Permission to conduct the research was granted by the Research Ethics (Japan's equivalent of Institutional Research) Board of the Faculty of Nursing and Medical Care at Keio University. Participation in the study was

voluntary and the students were given a chance to switch (group vs. individual) learning styles at any time. All data were collected from regular class assignments during the fall semester in 2002–2003.

2.1.1 Independent variable

The student choice of group or individual work constituted the independent variable in this study. On the first day of instruction, students indicated their preference for group vs. individual in-class work after having a brief explanation on merits of both learning options. The size of a group ranged from two to four.

2.1.2 Dependent variables

Student performance in the speech course, i.e., the dependent variable in this study, was analyzed with the use of four different measures: two speaking assignments, a written test, and the final course grade.

Of utmost concern in this study was whether or not the learning style (i.e., individual vs. group) affects student learning. Thus, grades earned for speaking assignments in the course should be the most immediate measure of the learning outcome in the speech course. The students delivered the two speeches on the same topic, one before the "speech clinic" and one after the clinic, a one-on-one session where the students received feedback from, and discussed ways to improve their speech with, the course instructor. The first speech was graded on the scale of 0 to 15; the second speech, on the scale of 0 to 20.

A written test on speech outlining was included in order to assess student learning at the cognitive level. Japanese reportedly have a higher percentage of speakers with communication apprehension (i.e., stage fright) than comparable groups from other countries.¹⁶ If so, there is the real possibility that some students may have fully mastered course content at the cognitive level (e.g., students understood how a speech should be organized) but their actual performance may not accurately reflect the levels of their cognitive mastery. In that sense, speech grades themselves may not serve as the best indicator of student learning at the cognitive level. That is why the written test was employed as a dependent measure for student cognitive learning in this study. In this "topic-out-of-the-hat" exam, students were allowed to choose from several topics given, then required to construct detailed, full-sentence preparation speech outlines. These outlines were graded according to the criteria indi-

Asian students worried about hurting the feelings of other members of the group.

cated during the instruction and assigned points from 0 to 35.

Finally, the course grade was used as a measure to indicate each student's overall mastery of the course content. The final course grade adds up to 100 points: In addition to the speech assignments and written exam, two formal outlines for the speech assignments, self-critique on their first speech, and class participation contributed to the final grade.

2.1.3 Research Questions

In this study, we posed three research questions:

- RQ 1:** Is there a significant difference in speech outlining skills between the individual and the group learning conditions?
- RQ 2:** Is there a significant difference in actual speech performance between the individual and the group learning conditions?
- RQ 3:** Is there a significant difference in the final course grade between the individual and the group learning conditions?

2.2 Study population

Participants in this study consisted of 90 first-year students (81 female; 9 male) enrolled in four sections of the (English) public speaking course in the Faculty of Nursing and Medical Care at Keio University. Of those, 67 students (63 female; 4 male) chose to work in groups while 23 (18 female; 5 male) opted to work individually. One female student in the group work condition did not take the outlining exam, and two others (one each in the group and individual condition) declined to have their exam grades used for the purpose of the study. As a result, the sample size for the four measures differs: 90 for Speeches 1 and 2; 87 for the outlining exam; and 88 for the final course grade.

2.3 Statistical analysis

Preliminary analyses of data included tests of mean differences in students' performance on the outlining exam, the two speech assignments, and the final course grade. A *t*-test was used to investigate all three research questions. Alpha was set at .05 for significance tests.

3. Results

The effect of student preference for group vs. individual work on their speech performance was assessed. The first research question asked whether there was a signifi-

cant difference in speech outlining skills performed by "individuals" and "groups." The analysis showed no significant differences between the two learning-style groups ($n = 22$, Mean = 32.1 for "Individuals"; $n = 65$, Mean = 32.0 for "Groups"; $F [1, 86] = 0.513368658$).

- RQ 1:** There were no significant differences in student performance on the written examination on speech outlining between groups that chose individual work and that chose group work.

The second research question queried as to whether there is a significant difference between the preferred learning styles and grades earned on the two speech assignments. For Speech 1, the mean score of students who chose the individual work condition ($n = 23$, Mean = 9.52) did not significantly differ from that of students who opted to work in groups ($n = 67$, Mean = 9.86; $F [1, 89] = -0.12218089$). Likewise, no significant differences were found in the Speech 2 scores between the individual ($n = 23$, Mean = 14.6) and group ($n = 67$, Mean = 14.7) learning modes ($F [1, 89] = -0.19557491$).

- RQ 2:** There were no significant differences in student speech performance between groups that chose individual work and that chose group work.

The third research question addressed the relationship between student preference for the learning mode and the final grade in the course. Analysis of the mean scores of the two conditions indicated no significant differences between the two learning-style groups ($n = 22$; Mean = 81.0 for "individuals"; $n = 66$, Mean = 83.4 for "groups"; $F [1, 86] = -0.567901118$).

- RQ 3:** There were no significant differences in student final course grade between groups that chose individual work and that chose group work.

In short, no significant differences were found between the "individual" and "group" study conditions in any of the four dependent measures: grades for two speech assignments, outlining test score, and the course grade. In other words, as far as the sample of the present study is concerned, learning styles did not seem to have influenced students' learning outcome in the EFL public

speaking course.

4. Discussion

The results of this study indicate that the students' learning outcome in the EFL public speaking course was not influenced by whether they worked independently or in groups. The finding of no significant differences between student learning preference and their performance on written tests, speech performances, and the final grade may run counter to understandings in second language acquisition. Our present findings, however, seem to suggest that, as far as EFL public speaking classes are concerned, language teachers can safely let their students choose whether to work in groups or to work individually and can expect similar mastery levels of the course content.

Even though our study found the group work format as valid as the individual work format in its learning effectiveness, we would caution instructors to give due consideration to the use of individual versus group learning methods before actually implementing one or the other or both in each respective class.

In many instances, the decision on types of group work used is left to the preferences of the individual instructors: some of them give consideration to the relationship between social interaction and thinking; others give little pedagogical consideration to the learning purposes in work groups of different sizes.¹⁷ A British study surveyed within-class group work instructions in real classrooms and concluded that teachers may not think strategically about the size and composition of groupings in relation to the tasks assigned.¹⁸

Moreover, even after the decision is made to employ the collaborative learning format, language teachers may wish to proceed carefully unless they have time to provide training for the learners to develop group work skills or offer opportunity for those skills to be practiced before introduction of the new learning method.³ The collaborative activity in particular may need to be implemented with prior class preparation designed to promote collaboration and develop positive interpersonal relations in the classroom.³

The limitations of the present study are mainly methodological. The findings all depend on a total sample size of 90 students. Moreover, the period during which students choose their learning mode only lasted for the first four weeks of the semester. Given that all the graded assignments were prepared individually outside

of class, group work in the present study may weigh differently from that employed in other studies on collaborative learning.

A second limitation is that, because the students were not randomly assigned to the two learning conditions, the distribution of students was uneven in the two conditions. The individual work condition ended up having only one-third of the students in each class, which might have affected the statistical rigor in the study. Nevertheless, ethical considerations had led us to let the students choose their own preferred mode of learning, and this freedom of choice, we believe, contributed to the satisfactory outcomes of the speeches the students delivered in English.

Given the findings and limitations of the present study, several areas need to be explored further in search of pedagogical evidence on the effect the learning formats have on learning outcomes. One area for future research is to extend the period during which students choose their learning mode, particularly for graded assignments and possibly for speech preparations outside of class. Another possibility is to test the impact of collaborative and independent work in classes where groups are assigned, not voluntarily formed. By doing so, aptitude levels of members can be more balanced for each group. On the other hand, certain students may have less favorable reactions toward collaborative learning and, consequently, may become less motivated when they cannot choose group members on their own.

A third area for future research would be to interview the students after they complete the group or individual tasks. The present study simply compared the learning outcomes statistically between the two types of learning mode the students had chosen. The students' own accounts of their experiences in the individual or group learning method might shed valuable light on the research findings.

A difficult task facing language teachers, especially those in the education of healthcare professionals, is how to respond to students' preferences, such as the wish to work individually, but at the same time help them develop intellectual flexibility as well as social flexibility to work in groups so that they can grow to be successful team players in the future.³

In conclusion, the results of this study show that in EFL speech-making classes for nursing students in Japan, group work and independent work are equally conducive to quality learning and speech performance.

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Evaluation of English for Expressing Daily Living and Body Parts in First-Year Nursing Students in Japan and China¹

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BACKGROUND. Nursing students in Japan often lack the English skills for communicating routine activities of daily living (ADL) and the terms for body parts and symptoms. The objective of this study was to assess freshmen nursing students' communication of ADL, body parts and symptoms in English.

METHODS. A diagnostic test was created and administered to first-year nursing students in Japan and China (n = 180). In Japan the tests were given in May; in China, October. All tests were graded by the same two teachers, and answers were confirmed by an Australian teacher and an American teacher.

RESULTS. (1) Activities we expected to be easy turned out to be more difficult than we had expected: *lie down, brush your hair, put on your pants.* (2) *Button your jacket* and *tie your shoe* received the lowest scores. (3) Body parts that are often written in katakana received the highest scores, e.g., *face, mouth, neck, hip, shoulder, heart.* (4) Misunderstanding of the true meaning of loanwords abounded for *brush your teeth, chest,* and others. (5) If students did not know the target expression for the question, e.g., *appetite, my hand itches,* the Japanese students were unable to explain in other words and left the answers blank, whereas Chinese students tried to paraphrase the expressions.

CONCLUSION. Beginner nursing students in Japan are not proficient in English for ADL, body parts, and basic symptoms. Before starting nurse-to-patient dialogue exercises in university English classes, students need to be taught the essential expressions for ADL and body parts.

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Key Words: English for specific purposes (ESP), Activities of Daily Living (ADL), nursing students

1. Introduction

Medical assisting staff such as nurses must assist the patients with Activities of Daily Living (ADL) and evaluate each patient's ability to carry out the various ADL activities. So, by the time they enter university, the students in medical areas such as nursing are generally

expected to have acquired the practical English necessary for routine communication with the patients, as well as the names of the parts of the human body.

In university classes of English for nurse-care purposes, however, English teachers have found that their students lack the basic skills required for communicating routine ADL, terms of body parts, and expressions for common symptoms. The teachers lament that they find themselves repeatedly helping the students put together the words necessary to talk about routine activities a patient might experience on a daily basis, even though most of the vocabulary is presumably listed among the words studied in junior high school and in early high school English classes.

When nursing students from a university in Japan were taken to the United States for overseas study, their home-stay experiences put them in touch again with

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their lack of English skills for activities of daily living and for expressions of common symptoms, e.g., in short sentences such as these:

I'd like to take a bath.

Where can I wash my hair?

I don't feel like eating.

Where is the restroom?

I burned my finger.

During four years of university training the students gradually become adept at using medical English terminology, which they study for the first time in medical or medical-related universities. However, the fundamental question remains as to just how proficient they are at using practical English for ADL. The yawning gap observed between the expectations of the university English teachers and the apparent English deficiency of the nursing students has led us to two assumptions: (1) that from the beginning of their English-language studies in junior high school, the students may get nothing more than a superficial exposure to expressions related to the practical activities of daily living and (2) that as the students advance through high school they do not get much repetition and variation of whatever smattering of ADL-oriented English they may have had in the early years. We hypothesized that if first-year nursing students were tested on their practical English performance in their opening semester of university, the scores would reflect the extent to which they had been exposed to such practical terms during their formative years of English education.

The present study was made to evaluate the ability of first-year Japanese university students of nursing to use basic English for talking about ADL, common symptoms, and body parts, and to compare the results with those of first-year nursing students in China. Results of the study could serve as an indicator of the students' readiness for nurse-to-patient dialogue and other communicative training in university schools of nursing. In addition, the results would be potentially useful in pinpointing the English needs of the Japanese nursing students and in developing appropriate learning materials to help the students meet their specific needs.

2. Methods

We reviewed 7 textbooks of English authorized for junior high school students in Japan, then created a diagnostic test for first-semester university students of nursing.

We constructed the test, first, under the hypothetical criterion that it would be possible for the students to form answers within the range of vocabulary acquired when they had been in junior high school. Second, we picked up a few words we thought the students must have acquired in early high school English classes, thereby attempting to make an easy test at a fairly reachable level.

We administered the test in two 4-year universities in Japan (University-A, n = 54; University-B, n = 58; total n = 112) and in one 4-year university in China (n = 68). All the tests were graded and scored by the same two teachers (MH, HH) as a measure of assuring consistency. Correctness was based on understandability, not on grammar or spelling, and the answers were confirmed by an Australian teacher and an American teacher.

Finally, we checked the first 2,000 words on the *JACET List of 8000 Basic Words* (a compilation of the Japan Association of College English Teachers) to find out whether the list contained the vocabulary we had selected for use in our diagnostic test.¹

2.1. Test construction

The test had two parts: Part 1 (ADL and common symptoms) and Part 2 (body parts).

Part 1

PART 1 called for 10 expressions of Activities of Daily Living in English and 10 expressions of common symptoms in English. The ADL questions involved tasks we normally do on a routine basis.

ADL test questions

1. Can you take a bath?
2. Can you brush your hair?
3. Can you button up your jacket?
4. Can you lie down on the floor?
5. Can you put on your pants?
6. Can you wash your hair?
7. Can you stand up?
8. Can you brush your teeth?
9. Can you go to the toilet?
10. Can you tie your shoes?

Each question consisted of (1) an illustration of someone carrying out a daily task and (2) a short Japanese (or Chinese) sentence describing the activity shown in the accompanying illustration. The students were to express the activity in English by either translating the sentence from their native language or telling what was being

done in the illustration in their free style just using the mother-tongue sentence as a hint or guide.

In addition, 10 questions required the students to make short sentences about common symptoms. Like the ADL questions, these problems consisted of an illustration portraying the symptom and a short Japanese (or Chinese) sentence describing the symptom.

Symptoms targeted on the test

1. I have a headache.
2. I have a fever.
3. I have a stomachache.
4. I have diarrhea.
5. I have a toothache.
6. My hand is itchy.
7. I burned my finger.
8. My shoulders are stiff. (I have stiff shoulders.)
9. I have constipation.
10. I don't have any appetite.

Part 2

PART 2 required the students to name certain body parts in English: 14 questions required the labeling of external parts of the body, and 6 required the labeling of internal parts shown in two separate illustrations of the body.

External body parts on the test

- arm
- back
- chest
- chin
- elbow
- face
- foot
- hip
- leg
- mouth
- neck
- shoulder
- thigh
- stomach (abdomen)

Internal body parts on the test

- heart
- intestine
- liver
- lung
- muscle
- stomach (the organ)

Table 1. Activities of daily living as expressed in English.

	bath	brush hair	button	lie down	put on	wash hair	stand up	brush teeth	tie	toilet	AVERAGE
Japanese (N = 112)											
Correct Answers	65	28	0	4	8	80	94	41	10	86	
Percent correct	58.0%	25.0%	0.0%	3.6%	7.1%	71.4%	83.9%	36.6%	8.9%	76.8%	37.1%
Blank Answers	18	40	62	46	50	7	5	14	79	14	
Percent blank	16.1%	35.7%	55.4%	41.1%	44.6%	6.3%	4.5%	12.5%	70.5%	12.5%	29.9%
Chinese (N = 68)											
Correct Answers	55	8	0	24	25	63	68	17	15	51	
Percent correct	80.0%	11.8%	0.0%	35.3%	36.8%	92.6%	100.0%	25.0%	22.1%	75.0%	47.9%
Blank Answers	0	17	29	1	1	0	0	2	11	0	
Percent blank	0.0%	16.2%	42.6%	1.5%	1.5%	0.0%	0.0%	2.9%	16.2%	0.0%	8.1%

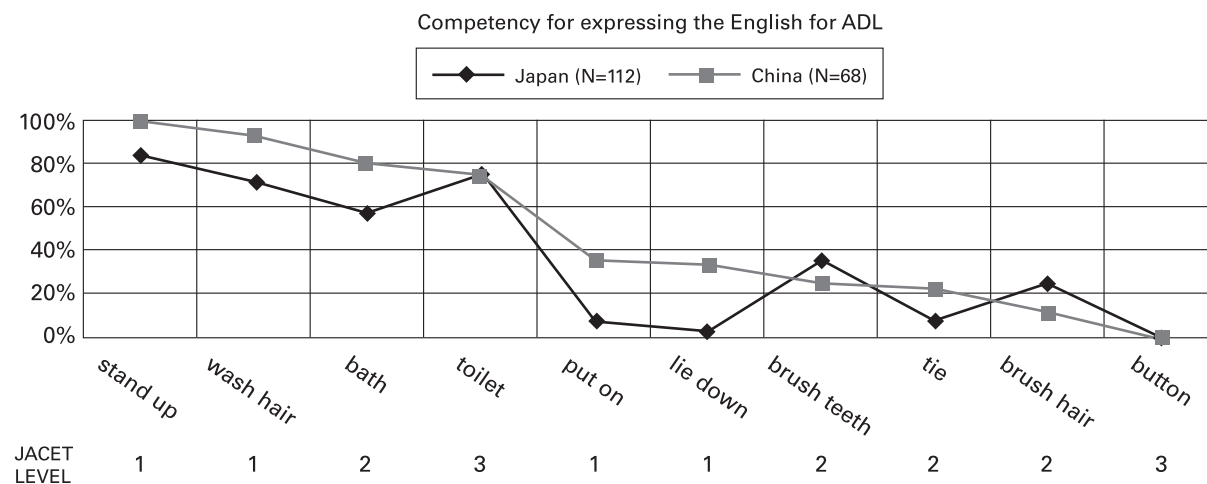


Figure 1. English for activities of daily living. Arranged from easy to difficult according to the scores in China.

3. Results

3.1. Part 1: Activities of daily living

In ADL, the average rate of correct answers was 37.1 percent for the Japanese nursing students and 47.9 percent for the Chinese nursing students. Only 4 items out of the 10 received an average score of 50 percent or higher: *take a bath*, *wash your hair*, *stand up*, and *go to the toilet* (Table 1).

The Japanese students were especially weak at using these 4 verbs or verb phrases: *put on*, *lie down*, *tie*, *button* (Table 1, Fig. 1). They did not seem to understand the difference between *put on* and *wear*. For *Can you lie down*, many students wrote *Can you lie / Can you lay / Can you lay down*. For grading, we accepted *Can you lay down*, because, in spite of being non-grammatical, the

expression is widely used by native speakers of English.

For *brush your teeth*, many students used the word *wash* instead of *brush* in both Japan and China. As for *tie your shoes*, or *tie your shoelaces*, few knew *shoelaces* (some called them *ropes*). More students knew the word *tie* in China than in Japan, though (Fig. 1).

3.2. Part 1: Symptoms

For symptoms, the rate of correct answers was 27.7 percent in Japan and 31.3 percent in China (Table 2). Japanese students appeared confident in expressing *headache* and *stomachache* (Table 2, Fig. 2). Chinese students got more correct answers in *appetite* and *burn*. Considerably more answers were left blank in Japan (51.5%) than in China (33.8%), as shown in Table 2.

Table 2. Expressing common symptoms in English.

	headache	fever	stomach-ache	diarrhea	tooth-ache	itchy	burn	stiff	constipation	appetite	AVERAGE
Japanese (N = 112)											
Correct Answers	80	52	59	14	38	5	20	7	3	32	
Percent correct	71.4%	46.4%	52.7%	12.5%	33.9%	4.5%	17.9%	6.3%	2.7%	28.6%	27.7%
Blank Answers	8	23	23	83	47	96	71	88	102	36	
Percent blank	7.1%	20.5%	20.5%	74.1%	42.0%	85.7%	63.4%	78.6%	91.1%	32.1%	51.5%
Chinese (N = 68)											
Correct Answers	37	29	9	15	34	3	32	1	0	53	
Percent correct	54.4%	42.6%	13.2%	22.1%	50.0%	4.4%	47.1%	1.5%	0.0%	77.9%	31.3%
Blank Answers	1	11	27	46	4	47	14	27	49	4	
Percent blank	1.5%	16.2%	39.7%	67.6%	5.9%	69.1%	20.6%	39.7%	72.1%	5.9%	33.8%

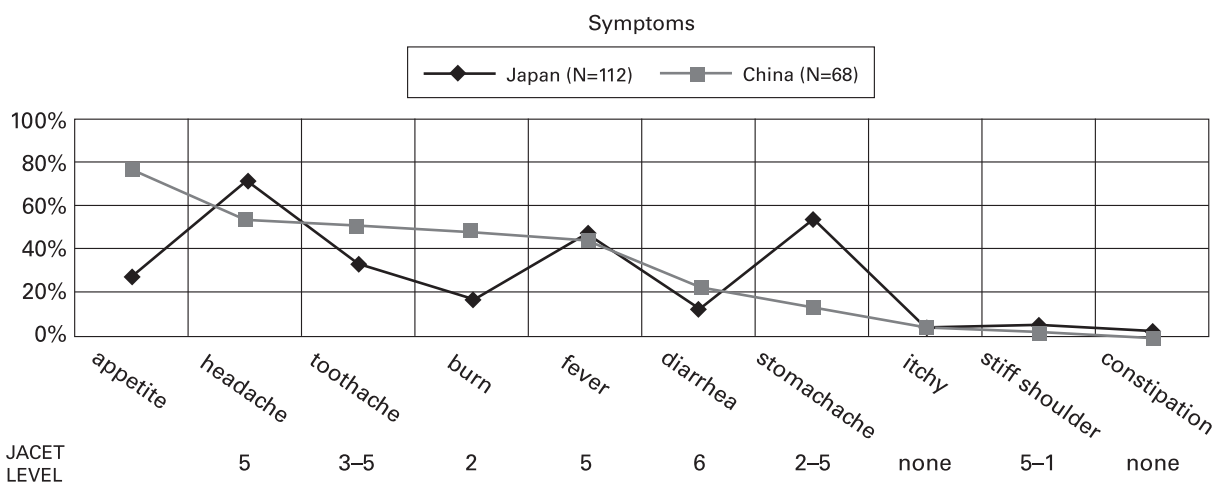


Figure 2. Common symptoms as expressed in English.

Arranged from easy to difficult according to the scores in China.

Table 3. Naming the external parts of the human body in English.

	face (1)	mouth (1)	foot (1)	leg (1)	back (1)	arm (1)	neck (2)	shoulder (1)	chin (3)	stomach (2)	chest (2)	hip (4)	elbow (4)	thigh (5)	Average
Japanese (N = 112)	104	99	61	57	46	48	80	79	11	45	20	80	28	0	
Percentage	92.9%	88.4%	54.5%	50.9%	41.1%	42.9%	71.4%	70.5%	9.8%	40.2%	17.9%	71.4%	25.0%	0.0%	48.3%
Chinese (N = 68)	68	64	63	53	40	35	26	25	19	12	8	0	0	0	
Percentage	100.0%	94.1%	92.6%	77.9%	58.8%	51.5%	38.2%	36.8%	27.9%	17.6%	11.8%	0.0%	0.0%	0.0%	43.4%

(): JACET Level

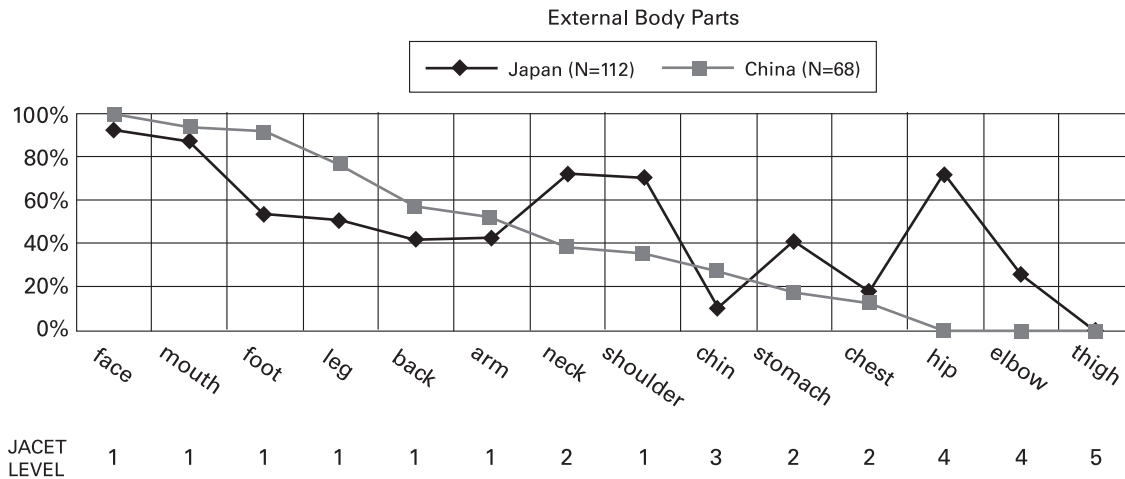


Figure 3. External parts of the human body in English.
Arranged from easy to difficult according to the scores in China.

Table 4. Naming the internal parts of the human body in English.

	heart (1)	stomach (2)	lung (3)	muscle (2)	liver (4)	intestine (0)	Average
Japanese (N = 112)	59	39	11	34	24	2	
Percentage	52.7%	34.8%	9.8%	30.4%	21.4%	1.8%	25.1%
Chinese (N = 68)	49	18	17	4	1	0	
Percentage	72.1%	26.5%	25.0%	5.9%	1.5%	0.0%	21.8%

(): JACET Level

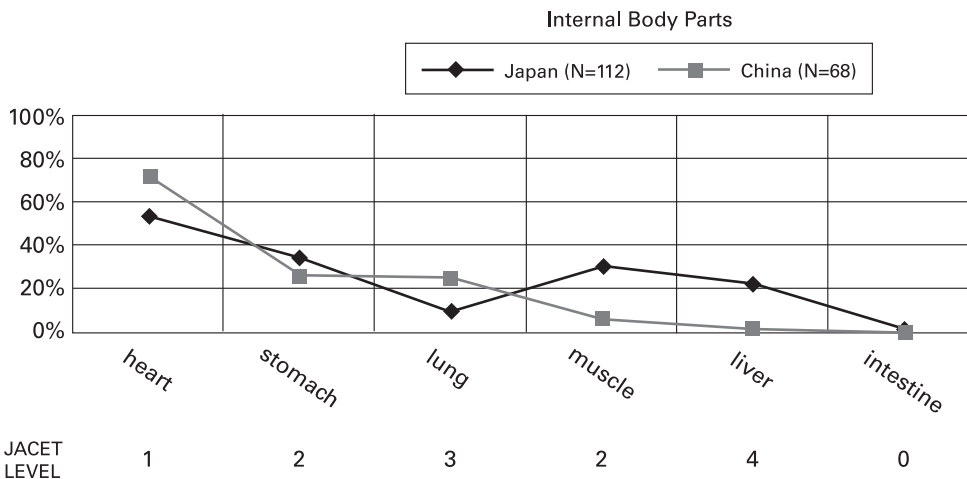


Figure 4. Internal parts of the human body in English.
Arranged from easy to difficult according to the scores in China.

3.3. Part 2: External body parts

On naming the external body parts in English, the average rate of correct answers was 48.3 percent in Japan and 43.4 percent in China (Table 3). *Neck*, *shoulder*, and *hip* got more than 30 points higher in Japanese students than in Chinese students (Fig. 3).

3.4. Part 2: Internal body parts

On the naming of the internal parts of the human body, curiously, in China no student got the word *intestine* and in Japan only two students got *intestine* right (Table 4, Fig. 4). But the Chinese students outperformed their Japanese counterparts on *heart* and *lung*. In stark contrast, however, only one Chinese student (1.5%) got *liver* right, whereas 24 (21.4%) of the Japanese students got *liver* right (Table 4, Fig. 4).

3.5. Junior high school textbooks

Table 5 shows the number of times the words for parts of the body were dealt with in context in *New Horizon 1, 2, and 3* (approved in 2001, Tokyo Shoseki, adopted by more than 40% percent of the schools) and the number of the textbooks (including *New Horizon*) that dealt with those words.

3.6. Our test words vs JACET

Table 6 lists the body parts and medical words found in Level 1 and Level 2 of the *JACET List of 8000 Basic Words*.¹ In Level 1 (the first 1,000 words in JACET) we found 18 body parts and 15 medically related words. In Level 2 (the second 1,000 words) we found 10 body parts and 29 medically related words.

4. Discussion

In this study, the nursing students had an unexpectedly low ability to use English for expressing activities of daily living, basic symptoms, and external and internal parts of the human body. As the test was given in the first semester of the freshman year, these results indicate that the students had not mastered those expressions at the time they entered university. This supports our hypothesis that the English performance of entering freshmen reflects their exposure to or

Table 5. Body parts named in authorized junior high school English textbooks (2001).

Target word	Number of times in <i>New Horizon</i>	Number of textbooks using the word*
mouth	one time	4 textbooks
face	none	3 textbooks
arm	2 times	2 textbooks
foot	one time	2 textbooks
leg	none	1 textbook
neck	none	1 textbook
back	none	1 textbook
shoulder	none	none
chest	none	none
chin	one	none
elbow	none	none
thigh	none	none
hip	none	none
muscle	none	none
heart [†]	none [†]	3 textbooks [†]
stomach	none	2 textbooks
lung	none	none
liver	none	none
intestine	none	none

* Including *New Horizon*. [†]*heart* is not used in the textbooks as an organ of the body but as one's innermost feelings or character.

Table 6. JACET Level 1 and Level 2 words for body parts and medical settings.

Level 1		Level 2		
Body Parts	Medically related words	Body Parts	Medically related words	
arm	accident	cheek	birth	injury
back	care	chest	blind	medical
blood	condition	ear	breath	medicine
body	damage	knee	breathe	mental
brain	dead	lip	burn	nurse
cell	death	stomach	cancer	female
eye	die	muscle	deaf	physical
face	disease	neck	diet	rescue
finger	doctor	throat	drug	sex
foot	health	tongue	fat	sick
hair	hospital		feed	temperature
hand	mind		female	victim
heart	pain		healthy	vision
head	patient		ill	wound
leg	sight		illness	
mouth				
shoulder				
skin				

lack of exposure to such terms during the early years of their English education, particularly that during junior high school.

A close look at seven approved textbooks may explain one cause of the students' deficiency.² Half of the names of the body parts we targeted do not appear in any of the seven authorized textbooks examined, i.e., *chest*, *chin*, *elbow*, *hip*, *intestine*, *liver*, *lung*, *muscle*, *shoulder* and *thigh*. Such a limited exposure to these expressions in the textbooks may be one reason the Japanese students did not do well on those questions. Matsuo argues that omission of words from junior high school textbooks is an obstacle to the students' learning of English later on.³ Our present results are in dramatic agreement with Matsuo's argument.

As for ADL words, examination of the junior high school textbooks for 2002 disclosed that even though we had chosen expressions which we took for granted to be in common use for expressing daily activities, the words we selected for the test rarely appeared in the textbooks, except for *stand* and *wash*. This vocabulary limitation suggests that when we teach university nursing students the daily communication skills, we first need to reinforce their basic vocabulary.

In spite of the absence of *shoulder* in the textbooks, however, the Japanese students were able to score well on that word. This may be explained by the use of loanwords, i.e., words written in the Japanese katakana syllabary. The students use a large number of loanwords in their daily living. Words that are commonly used in katakana, for example, *neck* for ネックレス (necklace), *hip* for ヒップアップ・パンツ (hip-up pants), and *shoulder* for ショルダーバッグ (shoulder bag), got the high points from Japanese students on the present test. This may also explain why the Chinese students did not score high on those words, because the Chinese language does not include such loanwords.

As far as the loanwords are concerned, another problem showed up on the test: the students made many spelling mistakes on these words. This is probably because those words had not been dealt with in English classes per se; loanwords are treated as a part of the Japanese language. Because the students rely so much on the katakana syllabary for loanwords, teachers of students in the early stage of English learning would do well to be aware of this learning pattern in the Japanese students and, therefore, to take as many opportunities as possible to correct the usage and spelling of loanwords. For example, Japanese 胸 (mune) can be translated three

ways in English: *chest*, *bust*, *breast*. Because the students usually use the katakana バスト for *breast*, some of the students who took the diagnostic test (20 out of 112) wrote *bust*, even though the test illustration was that of man's chest. We did not count *bust* correct.

Generally, the test scores demonstrated that the students' vocabulary is extremely limited. The gravity of their weakness raises the question of just how much vocabulary an English-as-a-foreign-language (EFL) learner needs to acquire. A general consensus has evolved that the most frequently used 2,000 English words may be enough for minimum reading and writing.¹ And the JACET committee reckons that the first two levels, Level 1 and Level 2, are enough to cover short and easy novels and 75 percent of the English newspapers.¹ But Hirsh and Nation, as well as Nation and Waring, maintain that the most frequent 2,000 words do not provide adequate coverage for pleasurable reading and that a vocabulary size of around 5,000 word families would be needed to do this.^{5,6} [For a discussion of word families, in this issue of the Journal see a related article by Fumie Takakubo, What English Vocabulary Should Be Taught to Nursing Students. —the editors]

Hasegawa and Chujo, comparing the vocabulary presented in three serial junior and senior high school English textbooks written in the 1980s, rewritten in the 1990s and again in the 2000s, reported that the repetition rate of the words used in the 2000s version of the series was the lowest of the three-textbook series.⁴ Reduced exposure to the vocabulary in the textbooks of the 2000s, we believe, played a strong role in the low achievement of the Japanese students in our present study. At the outset of this study, we highly suspected that from the beginning of the students' English-language studies the students were getting insufficient exposure to the vocabulary and expressions related to practical activities of daily living. Results of the present diagnostic test unequivocally bear out this suspicion.

The *JACET List of 8000 Basic Words*, familiarly known as *JACET 8000*, has provided a prestigious sampling of useful English vocabulary especially for college students. This list was derived from Corpus-Based Lexical Analysis, and the eight levels consist of 1000 words each.¹ Level 1 and Level 2 together comprise 2,000 words that are supposedly used for both junior high school students and high school beginners. Given that the *JACET 8000* is corpus based, any possible essential vocabulary and common expressions for ADL and body parts are scattered

among the eight levels. As for basic symptoms, the words *diarrhea*, *appetite*, *headache*, and *fever* are not listed until Level 5 or higher. *Itchy* and *constipation* are not in the list at all.

Now that the JACET committee has made a list of 'plus 250' and put the vocabulary such as numbers, days of the week, the months, countries, and cities into the list, we propose that, in the light of our present study, the *JACET 8000* should also provide a subcategory for body parts and simple medically related words just like 'plus 250.' In this way, the *JACET 8000* would be far more beneficial to its users in making students aware of the essential vocabulary and common expressions for ADL and body parts.

As suggested by the results of this study, university teachers of ESP may need to supplement corpus-based lists such as the *JACET 8000* Level 1 and Level 2 with basic expressions that more realistically derive from actual situations for specific purposes such as expressing ADL, basic symptoms, and the body parts. The Ministry of Education, Science and Technology as well as the authors and publishers of learning materials for junior high and high school might also need to reassess the suitability of target expressions for inclusion in textbooks for students in the formative years of English language education.

The last problem we found in the Japanese nursing students has to do with communication skills. On the present test, the Japanese students left a lot of answers blank. This suggests that if the students do not know the target expression for a certain question, e.g., *fever*, *burn*, or *stiff shoulder*, they are either unable or afraid to try to express the meaning in other words. They prefer to leave the answer blank. In contrast, the Chinese students did not leave many answers blank but, instead, tried to describe the symptoms by paraphrasing, even though they could not succeed so well. For *itchy*, the Chinese students gave paraphrases such as these:

don't feel well on my hand as if something were climbing (sic) on it
am feeling something is moving on my hands
scratches my hand
feel my hand not well and I want to ding it

The word *diarrhea* was problematic for the Japanese students. One Japanese attempt was not so bad: *no control my stomach*. For *diarrhea*, the Chinese students gave rather vivid paraphrases such as these:

go to the toilet many's time in a day
go to a toilet frequently
go to the toilet every few minutes
go to w.c. every 5 seconds

The Chinese students skillfully paraphrased the word *appetite* as *something like a desire for food*. A paraphrase is a statement or remark explained in other words or in another way, so as to simplify or clarify its meaning. In English, paraphrasing is possible only when the person has a clear understanding of the expressions or words themselves. To paraphrase, we need to (a) replace the original words with words that mean the same, (b) replace the original word with the definition, or (c) interpret the original meaning and identify the underlying meaning. These three techniques are vastly important in language learning. Many of the Chinese students tried to use these techniques, whereas the Japanese students seemed to aim toward word-for-word translation. This finding indicates that when we teach vocabulary, it is important for the teachers to express the meaning of a word in a variety of ways, rather than just giving the Japanese translation.

In 2003, the Ministry of Education, Science and Technology established an "Action Plan to Cultivate Japanese with English Abilities." According to that official Plan, the goal of junior high school English education is set up like this:

On graduation from a junior high school, students can conduct basic communication with regard to areas such as greetings, responses, or topics relating to daily life.

For college English education, the Plan states:

Each university should establish attainment targets from the viewpoint of fostering personnel who can use English in their work.

If the goals of these action Plans are to be achieved, some restructuring of the textbooks may be appropriate. In the *New Horizon* textbooks, the appendix of the first-year textbook gives a chart of expressions of daily activities from getting up to going to bed, the appendix of the second-year textbook gives a chart of leisure activities, and the appendix of the third-year textbook gives an illustration of the human body with external parts labeled. These important expressions, unfortunately, do not appear in the context of the learning units themselves. Therefore, instead of trying to highlight the expressions as something on which to take special notice, the authors and publisher appear to be relegating these expressions

to the back of the book, where perhaps few students and teachers would pay much attention or spare the time to notice. Results of the present study suggest the need to relocate such valuable practical material from the appendices to the main body of the textbooks, the learning units themselves.

Achievement of the goals of the action Plans described above would depend to a large extent on each student's mastery of practical English expressions related to everyday life and daily operations. Such English is indispensable to medical assisting professionals, including nurses, therapists, and other caregivers in their on-the-job routines. In university classes of English for nurse-care purposes, however, nurse-to-patient dialogue exercises may have to be delayed or modified until the teacher can help the students catch up on the basic vocabulary they have missed, especially words for expressing activities of daily living and for talking about the body parts and common symptoms. From that new starting point, the students would be more empowered to move forward and reach the goals of their chosen healthcare profession.

5. Conclusion

In conclusion, results of this study disclose that first-year university nursing students in Japan are not proficient in the essential vocabulary and practical English expressions related to everyday life and daily operations that are indispensable to medical assisting professionals in their on-the-job routines. One reason appears to be the skimpy and inadequate exposure to practical ADL terms provided by the textbooks authorized for teaching junior high school English. Consequently, before the students can adequately be taught English for specific purposes such as nursing, the university English teachers are compelled to lead the students through basic English vocabulary and expressions that were apparently missing during

the students' early English education. This study further suggests that the list of corpus-based *JACET 8000* is not adequate enough and needs to be revised with a greater number of basic expressions that derive from actual situations for specific purposes such as expressing activities of daily living and naming basic symptoms and the parts of the human body.

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Thinking Anthropology to Learn English in Health Care Situations for Nursing Students¹

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One central aspect of cultural anthropology is its attempt to engage imaginatively with the values and lives of Others. In many ways, anthropologists share this broad objective with medical caregivers, who must recognize the values and needs of their patients, which may be based on cultural, personal, and social facts and experiences very different from those of the caregivers themselves. This paper, based on ethnographic action research over a three-year period, describes a course in nursing English in which students think anthropology to learn English. Students start by considering specific care situations. Through a series of value-clarification exercises they come to know their own values regarding care, care-giving, medical treatment, and healing in the situation. They then share their understandings of their own values with other students. In the process they learn English and also come to know something of the diversity of responses and values possible in the situation. Each class ends by students engaging imaginatively with values through skits in which they bring the values and lives of imagined Others to life. After outlining the course, the paper focuses on one class, showing both the anthropological and English language foci, selected student productions in which the students engage with the material, and student responses to the process. The paper ends with a critique of the use and utility of anthropology in the language classroom.

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Key Words: anthropology, values, culture, nursing English, content-based language instruction

1. Issues

Anthropology

Anthropology is a discipline open to many interpretations. To some it is a body of knowledge of, for instance, kinship systems or botanical groupings or religious practices or political structures linked in cultural and social systems, linked system to system, and to the natural world.¹ To others it is the study of culture, of the learned and shared values of a group of people.² Other anthropologists find that the discipline centers on attempts to

enter empathically into the lives of others. And still other anthropologists think the discipline is broadly critical in the sense of studying the constraints and possibilities of other cultures and awakening to a sense of the constraints and possibilities of one's own.³ I start from the notion that cultural anthropology is inherently comparative and critical. Anthropologists look at particular cultures and at the diversity and the constants within and among cultures.

This comparative and critical approach to social reflection and research is not new. Montaigne, writing in 1590 in Renaissance France, practiced it in his essay "Of cannibals."⁴ The particular knowledge gained in the early voyages of European exploration, the knowledge of the exotic Other, allowed Montaigne to compare it with life in Europe at the time and to make critical sense of his own life and culture.

1.1. Anthropology and nursing English

Where do these notions place me in the nursing English classroom? To begin with, they place me firmly in

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the camp of content-based instruction, in that the language learning is organized around the specialized topics and information that future nurses and care-givers will need in their classes and professional lives.^{5,6} In this English class for first-year nursing students, we pay special attention to the importance of being able to talk about values in providing care. This issue has gained importance in recent years as patients have empowered themselves.⁷

In addition, the class draws on the cultural learning theory of writers such as Bourdieu and critical discourse theorists such as Fairclough and Lantolf.⁸⁻¹⁰ The focus is on the expressive functions of language and on the ways language leads us to express our values.

1.2. Methodology

The approaches I use in this project bring together qualitative methods common to anthropology and language research. Doing this requires methodological fluidity as I move back and forth between the anthropological perspective as a social researcher and the ESL/EFL literature as a practicing teacher. This, though typical, is not without problems, as Crotty notes.¹¹ Such research requires regular reflection on precisely where I am and what I am doing and the ways these matters impinge on both my research and my teaching. These methodological issues have bedeviled anthropologists since the very beginnings. (See Radcliffe-Brown's reflections on method, Malinowski's reflections on fieldwork, Crapanzano's discussion of the ways that fieldwork changes the fieldworker's own sense of self, and Lewin and Leap's edited collection of gay and lesbian anthropologists' fieldwork experiences for a sense of the range of discussions on the shifting practices and experiences of fieldwork.)¹²⁻¹⁵

Research methods shift as I move from section to section in this paper. In the first section I am a participant observer of my own class, teaching students while collecting data about them and their responses to the class. I also collect data from students on end-of-the-term questionnaires. Finally, when I examine my own teaching, I am engaging in a reflective practice that could be described as a personal narrative or autoethnography.¹⁶⁻¹⁸

2. Course description

A 90-minute content-based English course for first-year students in a department of nursing and medical

care, this is one of the students' four required English courses in the first year of the program. The focus is on oral communication skills. A class is typically composed of 25 students. The class uses a bound packet of materials I created.

In most classes, after a few minutes of teacher talk and class business, students do a knowledge activation exercise in which they note a few key words they associate with the topic under discussion. I circulate and, after a few minutes, summarize some of what the students wrote. Such exercises activate students' existing knowledge of the topic and are important in second language learning.^{19,20}

Students then do a value clarification exercise. This typically consists of a ranking exercise or a Ligert-scale exercise in which students respond to a series of related questions. A typical ranking question might be,

Below is a list of five things that can confuse or anger a patient from another culture. Rank them in order from 1 [the most important] to 5 [the least important].

A representative Ligert-scale statement might be,

Respond to the following statement. Use the scale 1 = strongly agree, 2 = agree, 3 = disagree, 4 = strongly disagree. Statement: A nurse should criticize a patient who smokes too much.

Students do the exercise as quickly as possible, if possible without using their dictionaries. I circulate and stress the communication point for the exercise—perhaps a communication strategy (such as asking for clarification or expressing agreement) or a meta-linguistic skill (such as eye contact, body language or intonation).

The exercise done, students turn to their neighbor(s) and discuss their responses. They do this in as low-key a way as possible. As I explain to them, keeping stress low can help them learn, an insight of Krashen and Terrell.²¹

Then students stand and find a "new face" to again discuss their responses. This goes on for a few minutes. When discussion flags, I have them stop, find a second "new face," and again go over the materials. Students know this exercise as a fluency practice. They repeatedly go over material that is meaningful to them, each time producing it more fluently.

After the new-face encounters, students return to their seats. They discuss with their neighbor(s) what they have learned from their own and other students' responses to the clarification exercise. This encourages them to consider the cultural and social variation within Japanese society (such as sex, the urban/rural distinction, and

social class). They finally engage imaginatively with the material when they respond to the matter as they think their parents or grandparents might. This gives them a chance to consider the roles that age and social historical factors and experiences play in shaping Japanese values.

With the anthropological issues explored, however briefly, students form small groups. They create short skits dramatizing the issues. They have 10 to 20 minutes to make and practice the skit. In the last 15 to 20 minutes of class, they perform their skits and bring the values and cultural issues to life.

3. A classroom observed

A close examination of one class will illustrate the way the course works. The class was held on Thursday, second period, running from 11:10 to 12:40. Of 25 students on the roll, 24 were present. Of those, 22 were women and 2 were men. The class size, sex ratio, and absenteeism rates were standard for this department.

3.1. Starting out

With the roll taken and work from the previous class returned, students turn to “Starting out.” (Materials used in the lesson are boxed below.)

1 • Starting out

Some people are very good at communicating. What do they do that is special?

As the students make notes, I circulate and note responses that seem to the point. I point out that there is no right or wrong response to this question. And I remind them that this exercise is just to start them thinking. After a couple of minutes, I note a few of the responses on the board in the form of a word-web.

3.2. I think

In the “I think” exercise students think more deeply about the qualities of communicating and the cultural factors shaping it. I introduce this section of the lesson with a little cultural background. I note that, in the United States, communication requires language skills such as those in “Starting out.” Communication also requires an awareness of one’s audience. In particular, communication in health care situations requires a frame of mind that is responsive to the patient’s needs.

We then start the “I think” task. I tell students, “First, remember, there is no right answer. It is about what you

think. There is no right order. Everyone will be different. Second, do not think about it too much. You can go back and change your answer later, if you want to. OK. Let’s start.”

2 • I think

Rank the following qualities of communication in importance from 1 (most important) to 6 (least important) when communicating with a patient. Write your answers in column A. Do not worry about column B. We will use it later.

- | | A | B |
|----|-----|----------------------|
| a. | ___ | Assertiveness (断定) |
| b. | ___ | Empathy (共感) |
| c. | ___ | Honesty |
| d. | ___ | Humor |
| e. | ___ | Patience |
| f. | ___ | Your own idea: _____ |

Once students have ranked the items, I briefly focus their attention on “Communication skill 6” and remind them of the importance of intonation.

3 • Communication skill 6

Intonation. Intonation tells your listener whether you are happy or sad, interested or bored. Intonation is an important tool for communicating in English. Practice it in your discussions today.

I use the example of the word “really” in English to show the different meanings intonation can give to a word: spoken with a rise at the end, “really” becomes a question; spoken with a rise in the middle it casts doubt; spoken with emphasis, it is an endorsement; and spoken flatly it signals acquiescence. I bring the matter home to the students by doing it again in Japanese, using “honto.”

3.3. Group discussion

With the targeted communication skill fresh in their minds, we start the discussion. For this portion of the lesson I remain out of the way, though I keep close at hand as a resource. I monitor English usage and encourage those who slip into Japanese to try to speak English.

They talk with the people sitting next to them—their partner(s). I again explain to students that this section of the lesson is low-key and that their affective filter is lowered.²⁰ They are talking with a friend. They are sitting down. No one is watching them. They have access to a dictionary if they need it. They can use the handout to

take notes. “Relax. Talk. Just try to get your thinking across.”

4 • Group discussion

- a. Compare your answers with your partner’s. Where do you think the same? Where do you think differently? Explain your thinking. Make notes about your thinking.
- b. What was your original suggestion (item f)? Explain why you added it. [Continued below.]

Most students try to speak in English. I remind the few that do not. If there is a second reminder, we joke about it. If they persist in speaking more than occasional Japanese, I stop their discussion and ask them to at least try. We shake hands as they promise to “Speak only English.” Students use their dictionaries to find or check out new words to help them better explain their thinking. When I see this, I encourage them to make notes about the word on their handout. “It’s a word that you need. Make a note. That way you can remember it more easily.” Many make notes on the handout about the experiences they are discussing. On the board, under “I think” I write “slow talk.”

3.4. New face

I stop “slow talk” after about seven minutes. Some are done. Others are still intent on the exercise. I compliment them on their work. “Next is the ‘new face’ exercise. Remember it? First you did ‘I think.’ Then you did ‘slow talk’ about it with your partner. [I point to ‘slow talk’ on the board.] Now find a new face and again talk about ‘I think.’ [I write ‘new face’ on the board under ‘slow talk.’] You know what you think. You know what you want to say. Try not to use a dictionary. Use your notes. Remember, the new face practice is one-to-one. Okay. Please stand up, get the blood and energy moving, and find a ‘new face.’”

They stand and, after a few seconds hesitation, scatter and go to students they know across the room. Two students stay seated a bit longer. By the time they are up, all the other students are paired off and speaking. They look at me. I look at them and shrug. Then I approach.

“Sensei. Everyone is busy.”

“I can see. You have to be faster.”

“Yes, sensei.”

“So then, who will be your new face?”

They look confused. I take a step to the right and get the attention of a pair of students already busy with their new

face exchange. “Excuse me. Can Yumi and Saiko talk with you?” The engaged pair then split and start over with Yumi and Saiko.

Students speak animatedly. I hear a few “reallys”; some students are trying it out as an intonation practice while others are imitating me. I catch the eye of one of these students, then smile and mouth, “Really!” and she giggles.

After about six minutes, I get the classes’ attention. “Good. Thank your partner. ‘Thank you for your time.’ ‘Thank you for talking to me.’” Then, waving my arms in the air like giant eggbeaters, I say, “Now find another new face. Talk about your answers in ‘I think.’ Remember to introduce yourself. Remember to get permission to speak, ‘May I speak with you?’ ‘May I ask you a few questions?’ Okay. Begin.”

As students again scatter to another new face and start talking, I turn to the whiteboard. Behind “New Face” I add a “1.” Under “New Face 1” I write “New Face 2.” I close the second new face exercise after four or five minutes. “This is a fluency practice.” I point at the steps written on the board. “The first step is ‘I think.’ No pressure. It’s your own thinking. Then you talk with your partner. Again, there’s no pressure. Sit. Relax. Help each other. Talk. Then comes ‘New Face 1.’ A little more pressure—you stand up. You talk faster. But you know what you want to say. Then ‘New Face 2.’ It’s the same topic, the same language, but faster.” I draw an arrow from “I think” at the top of the board all the way down to “New Face 2.” I turn to the class, “This is fluency practice. This helps you speak more quickly, more smoothly, and more fluently. Good. Any questions?”

There are none.

3.5. Group discussion

Students then start to discuss what they have learned from their own responses and those of other students. With a little prompting, they consider the range of answers they got. They think about the reasons different students gave for the different answers.

4 • Group discussion [continued]

- c. Compare your thinking with that of other classmates. Where do you think similarly? Where do you think differently? Explain your thinking.

Students also look for patterns in the responses and answers. They look for patterns in Japanese values and culture. As would any anthropologist, they look for the

ways the basics of society—age, sex, and social class, regional, and urban/rural experiences—shape a person’s values.

3.6. Imagine

To close the discussion, I ask students to work with their partners and imagine the responses of people they know. Here the latent anthropological content of the course becomes more explicit. Most students have given little thought to the lives of others. They are vaguely aware that their thinking differs from, for example, their parents’, but accept that as a given. This is a chance for students to consider differences and bring to the fore their knowledge of the ways experiences can shape values.

5 • Imagine

Imagine how you think your parents or grandparents would rank these qualities of communication. Put your thinking in column B. Discuss the matter with your partner(s). What are some reasons for the differences? Consider factors such as age, sex, region, historical experiences (such as World War II, Post-War Reconstruction, and the Bubble), and social class.

In this final section of the lesson, students start to imagine, if only in the most general way and in only the glancing manner, the anthropological Other. They begin to imaginatively enter into the lives of others. The interests of medical caregivers and anthropologists, for a moment, come together.

3.7. Expansion

In this class, the anthropological reflection section took ten minutes. With 30 minutes left, we start the expansion exercise. They form small groups from among the students sitting around them. In fifteen minutes, each group prepares and practices a short skit. They dramatize the role of communication qualities in care giving and bring to life the ideas in the lesson.

6 • Expansion

With your partner(s), prepare a skit about the following situation. Be prepared to perform your skit for the class.

You are talking to a patient who is recovering from an accident (for example: fell from a tree and broke an arm, scratched by a cat, broke a collarbone play-

ing soccer). As you talk to the patient and find out what happened, show that you can use some qualities of communication (I think: assertiveness, empathy, honesty, humor, patience) that make sense for the background of the person (including age, sex, region, culture, and experiences).

The dramas the students create vary. Some are humorous. Some are serious. Some actively engage the values considered in the class. Some limit themselves to the surface of the situation. As the students present their drama, I write notes on the performance. One focus of my notes is the students’ control of communication skills, particularly intonation studied in this lesson and other skills from earlier lessons. Another focus of my notes is the student’s imaginative engagement with ideas covered in the lesson: the qualities of communication and the social and cultural forces shaping those qualities.

In the last few minutes of class, I review the linguistic and anthropological matters covered. I then ask students to write short journal entries reflecting on the matters and consolidating their thinking about them. I ask them to write on what they have learned in the class about communicating in English (the warm-up exercise, the thinking exercise, the fluency exercises, the discussions, and the creation and performance of the skit). I also ask them to write on what they have learned in the class about themselves, about their feelings, about their values, and about the role that culture plays in these matters.

4. Student responses

The following student responses come from comments students made in class while doing the exercises in class and from end-of-term questionnaires, one administered by the university and one that I composed and administered. The names, where known, are changed.

Student comments fall into two broad categories: those dealing with language matters and those dealing with cultural matters. Where the comments were written in English, here I retain the language of the original, including mistakes. As the comments were made in good faith and in the dialect of the student, I refrain from commenting on errors with *sic*.

4.1. Language

Student responses regarding language fit generally within four broad categories: (1) communication skills,

(2) group work skills, (3) vocabulary and (4) fluency and English for special purposes.

(1) Many students emphasize the importance of the communication skills (such as eye contact and intonation) that they learned.

For example, Miki notes simply, *“I learned communication skills in English.”* Yuji is a bit more specific when he writes, *“In this class I learned that expression and nodding are very important in English. Expression and gesture help telling my feelings. Therefore good intonation is of course important but nonverbal languages such as expression, eye contact, gesture are more important in speaking English, I think.”* Hitomi notes the cultural structures shaping communication skills, *“I learned importance of gesture, intonation, and eye contact with Americans.”* Miyo adds the insight that communication is an active process within and between cultures, *“I learned many skills—making suggestions, ask more, summarize, and so on. Active is important to me with Americans.”*

(2) Other students focus on group work and language learning.

For instance, Saya notes that, *“I learned group work. This English course was useful for managing a work with some people.”* Nozomi goes further, specifying the importance of this for learning English, *“With Dorama I learned the importance of cooperation and the great of harmony. It was hard to make dorama from nothing by ourself, but we enjoyed it very much and had a feeling of happiness after Dorama went well. Dorama is very good to me to learn English more.”* Saori extends this, noting the importance of the group skills for her later professional life, *“I learned that group work is difficult but great. When I work in hospital, teamwork is the most important.”*

(3) For other students the development of nursing vocabulary is important.

Kumiko notes, *“I learned including vocabulary. Much increasing it.”* Ayane makes a similar observation, *“The good point of this English class was being able to learn the words we can use in the medical scene. In usual English class, we can’t learn them.”* Momoya notes that vocabulary growth requires the active use of the language, *“In other class I learn some medical English and in this class we use that English. Even if we think that we learned a word, we can’t use that many times (maybe).”*

(4) Finally, students find the greatest value of the

class in its focus on fluency.

Some, like Ayumi, find increased fluency, *“In April I can’t speak English fluently. But, now, I can speak English fluently, and I enjoy speaking English.”* A few students point out exercises that they find useful in developing communicative competency. Yuka recalls the value of both the “new face” fluency practices and the skits, *“I found that my fluency in English improved by new face practices and the skits. It is very fun. But at first shy.”* Some students compared this class with others in their experience. For example, Azusa notes, *“I had thought it is the most important to learn grammar for speaking English until I study in this course. But, I knew what I have to do in fact. It is important to have what I want to communicate, and to express my emotion.”* Ayana takes this insight and extends it to her future professional life, *“Difficult word is not always important. Making myself understood is more important. Because it is valuable that we show clear information to patients. If we make ourselves understood, there will be no turning back.”*

Students in general feel that in learning English in this way they have clear communication goals, they are empowered to reach them, and they are actively engaged in using English in the framework of their goals.

4.2. Culture

Though I do not explicitly teach anthropology, the underlying focus is on culture. Students pick up on this and some make reflective comments on these matters. I note five general issues students raise.

First, some students discover that they have values and that these values have roots in their culture. For example, Kumi notes, *“I learned we have different values of nursing. I have Japanese and values. This is so good for me.”* Similarly, Shunichi observes that he *“learned the way of nurse’s thinking has values and culture in it. All new for me.”*

Second, students discover that other people and other cultures have other values, based, like their own, on culture and experience. Yuri notes, *“Japanese medical treatment is not necessarily good for people from another country. I learned that I remember that each people have perspective culture and value.”* Ayana observes, *“There is no correct one value. There are ten human beings. Naturally, there are ten opinions values. Also ten stories. Nurse should recognize those ten opinions.”*

Third, some students realize that nursing and care are shaped by culture and values. Marina notes, *“When I made skits and dramas with friends, I learned the work of*

nursing connection to difference of culture and relationship between nurse thinking and difference of other thinking.” Ayane finds a connection between values and her future as a nurse: *“Before I join this class, I had never thought about ‘the relationship between nurse and values.’ I had thought about the relationship between nurse and patient, but thinking about values was new for me. My dream is working in developing country, so remembering what I learned in this class, I’ll work with people in all over the world.”*

Fourth, students learn to engage imaginatively with people from different cultures. Shirori notes the importance of skits in developing empathetic engagement, *“When we do skit, we play a lot of parts. Imagine a lot of parts. So we could experience and think a lot of part’s viewpoint. For example nurse, doctor, man, woman, other country. These viewpoints and feelings are very important and precious when I work as nurse.”* Chi develops the point, *“It was good for me to learn not only English but also values and nursing. I’m interested in working in other countries, so It was fun to know about nursing in foreign areas. In addition, it was a good opportunity to think about the relationships between nurses values and patients values and to make a skit according to what we learned in class. At first I didn’t like doing skits, but as I do it several times, I noticed this activity helps me imagine what nursing is like and helps me think about how nursing should be. An important thing.”*

Fifth, students come to want to learn more about their own and other cultures. Tomomi makes this point: *“I learned about many culture and difference. As nurses work in many places and many people, they have to get good communication skill about culture and thinking ways. To learn more is good for me.”* Hisae specifies the need to learn more about other cultures, *“I learned that activity in nursing is enjoying communication among different way of thinkings. That people are Japanese, American, German and so on, very various. So I will enjoy various communication about their thinking. I think that nursing is work that we can learn various cultures. So I need to learn more cultures.”*

These responses suggest students are thinking anthropology to learn English for nursing students. To this degree the class is a success.

5. Analysis

It is a long way from the critical and reflective musing of Montaigne to the responses of Japanese college students.⁴ But if we read the students’ responses sympathetically, we can see that the students’ thoughts share certain features with those of the French essayist. Both exercise the basic anthropological skill of comparative thinking. They take the particulars of one society and use them to develop a sense of social diversity and constants. Both the students and Montaigne exercise the anthropological skill of critical and empathetic thinking. They use what they learned about the exotic Other to reflect on their own culture and their places in it.

Still, I am less than wholly satisfied. As a teacher of English classes at a Japanese university, I am resigned to the structural limits on what I can do in a course and what I can fairly expect from students. Thirteen 90-minute class meetings spread out over four months, limited homework, and competing activities and classes sharply shape what I can expect students to do. Nevertheless, I want to find a way to start students thinking more concretely about the ways their values reflect the interests of the dominant Japanese culture. I want students to think more directly about the ways the values of this culture work to suppress the diversity that characterizes Japanese society. Such diversity includes ethnicity, as Lie notes, and social class, as Robertson delineates in her edited overview of Japanese society, and as Stevens makes clear in her intimate ethnography of an urban underclass.^{23–25}

I want to reshape the course to help students become more aware of less powerful groups, and how these groups’ values may develop in opposition to the values of dominant cultural groups. Doing this might require shifting the course to focus more on learning about these groups and less on reflecting on the students’ own values. It might require a course on power and health care. It might require a course on social theories of health care. It might require more than an English class for first-year nursing students can bear.

A second source of dissatisfaction with the course is harder to pin down. I believe students when they say they learned much about values. I would like students to take the next step and act on this. I realize this is a very American response: knowledge is for action. This response is based on my understanding of culture and conflict. My response is based on notions of individual autonomy and responsibility. I realize that these assump-

tions may play very differently in a society based on smoothly running functional relations and in-group cooperation.

As it stands, the class is a start in the basic anthropological skills of self-reflection and the practices of the ethnographic imagination. Combining content-based nursing English with an anthropological twist frees the students to think about their lives and respond to their own experiences and those of others in new ways. They create stories exploring values in health care situations, which bring to life the experiences and values of the characters. Thinking anthropology to learn English allows students to bring together personal responses with critical cognitive analytic and empathetic skills—skills the students can use in other classes and in their future professional lives.

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英語による統計学教育 福井大学医学部の事例から Teaching Statistics in English: A Classroom Trial at the University of Fukui

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Background. Although the field of statistics has become so important in medicine, at most medical schools in Japan the subject is taught only in the first year. By the time students begin to read professional articles including statistical analysis in the advanced years, they tend to have forgotten most of the statistical concepts they once learned. Moreover, as the majority of such articles are written in English, comprehension of statistical analysis becomes all the more difficult.

Objective. The present article proposes the idea of integrating statistics and English education in the advanced years of medical schools in Japan.

Methods. The Faculty of Medical Sciences at the University of Fukui introduced statistics into one of its advanced English courses. The students were instructed to solve statistical problems presented in English using Excel software and to write the results in English.

Results. The students gained proficiency in comprehending and performing statistical analysis in English. They also reported a high level of satisfaction with the course.

Conclusion. These results demonstrate the benefits of integrating statistics and English education. This finding has pedagogical bearing on curriculum planning, materials development, and course content.

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Key Words: statistics education, English for specific purposes

平成 13 年に発表された「医学教育における準備教育モデル・コア・カリキュラム」では、医学生が統計的推測(推定と検定)の原理と方法を理解することの重要性が謳われている。その背景として、多くの医学研究(特に誤差を含む複数の生体資料を用いるような研究)において統計的手法が不可欠であることが挙げられよう。これを踏まえ、現在全国の医学部において「情報の科学」等の名称の下で統計教育が行われているが、その効果に関しては疑問視する向きも少なくない。よく指摘される問題として、統計教育の対象がほとんどの場合 1 年次生であるため、学年が進行し、研究論文を資料として与えられるようになる頃には、統計的記述を理解するだけの知識がほとんど残っていないということ

がある。しかも医学の主要論文のほとんどが英語で書かれており、統計解析部分の読解はかなりの困難を伴うことになる。

このような問題に対処するため、福井大学医学部では、3 年次対象の必修英語科目(15 コマ)において統計学を英語で教育する試みを行っている。具体的には、15 コマのうち 7 コマ分を統計学に充て、全受講生 100 名中 50 名が前半の 7 コマに、残りの 50 名は後半の 7 コマにそれぞれ統計学を学習するという方式を取っている(なお、1 コマ目は 100 人全員を対象としたオリエンテーションとし、統計学を除いた残りの 7 コマ分においては別の教員がアカデミック・ライティングの指導を行っている)。本科目の統計学部分に対する学生の評価は非常に高く、英語で統計を理解することに対する医学生のニーズの高さが窺える。また、後にも触れることになるが、医学データを Excel で解析するという経験を通じて、医学研究を疑似体験できるということも本科目の魅力になっているようである。

本稿の目的は、福井大学医学部における事例を元に、英

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語による統計教育を推奨することにある。具体的には、2年次以降の英語科目に統計学を6～8コマ程度導入することを提案したい。この程度の教育内容の変更であれば、多くの大学で容易に実現が可能であろう。また、授業内容も、基本的には欧米の統計学の教科書にある練習問題をExcelで解析させ、結果をマニュアルに沿って英語で記述させるというもので十分な効果が得られると考える(統計学プロパーは既に履修済みであることが前提である)。実際の医学研究で統計解析を行う際、複雑な数式や独創的な英語表現はほとんど必要とされない。データはソフトウェアで解析し、結果はマニュアルに沿って淡々と記述するのみである。この現実を踏まえると、学生自身がさまざまな種類のデータを解析し、その結果を英語で記述する練習を繰り返すことが、統計手法および英語による統計記述に習熟する最善の道ではないかと思われる。つまり基本は学生による自学自習であり、教員は援助者としてExcel使用法の説明や標準的な書式の提示等を主に行うのである。研究や教育で統計解析を行った経験のある英語教員であれば、誰でも十分に対応が可能であると思われる。以下に、福井大学医学部における教育の詳細を紹介してみたい。

1. オリエンテーション(1コマ目)

英語の授業で統計を取り上げることに對して、多くの学生が戸惑いを覚えることも事実である。1年次の統計学で苦労した経験のある学生は、不安に満ちた表情を浮かべることになる。オリエンテーションの最大の目的は、英語で書かれた短い論文を教材として、英語と統計学が医学研究を理解する上で極めて重要であることを理解させることにある。全世界の医学論文の約9割が英文で書かれていることや、臨床医学のみならず疫学や薬学などの多くの研究分野で統計的手法が用いられていることなどを丁寧に説明することが大切である。また、医学研究者のほとんどが統計学の専門家ではないこと、データ処理はパソコンで行うため複雑な数式は必要でないこと、統計記述の英語には決まった書式があり、それを使いこなすことはそれほど難しいことなどを伝え、学生の不安感を和らげておくことも必要である。筆者がオリエンテーションで使用している論文は結腸内視鏡検査に関するものであるが、MethodsとResultsに標準的な統計記述があり、医学研究における統計利用のモデルとして重宝している。¹ 初見では暗号のように思われた記述も、授業終了時には容易に理解できるようになる旨を伝えれば、学生も前向きな姿勢を見せるようになる。

2. 対応のある t 検定(2コマ目)

2コマ目から6コマ目にかけては、各コマにつき1つずつの統計手法を取り上げている。授業の進め方としては、

まず最初の15分ほどを医学用語のテストに充て、その後米国統計学の教科書から採った例題とその解答例を提示することとしている。対応のある t 検定の例題および解答例は下記の通りである(*Statistics for the Behavioral Sciences*, by Jaccard and Becker, 2002)。²

Exercise 1

Attitudes toward socialized medicine as perceived before and after a lecture²
(A correlated groups t test)

Eight individuals indicated their attitudes toward socialized medicine before and after listening to a pro-socialized medicine lecture. Attitudes were assessed on a scale from 1 to 7, with higher scores indicating more positive attitudes. The attitudes before and after listening to the lecture were as indicated in the second and third columns of Table 1. Test for a relationship between the time of assessment and attitudes toward socialized medicine using a correlated groups t test.²

Table 1. Attitudes toward socialized medicine before and after listening to a pro-socialized medicine lecture.*

Individual	Before Speech	After Speech
A	3	6
B	4	6
C	3	3
D	5	7
E	2	4
F	5	6
G	3	7
H	4	6

*Data from Jaccard and Becker, 2002 (p. 306)²

Answer to Exercise 1

A correlated groups t test compared the mean attitude score toward socialized medicine before listening to a pro-socialized medicine lecture (mean = 3.63) with that after the lecture (mean = 5.63). The difference between the means was found to be statistically significant at an alpha level of .05, $t(7) = -4.73, p < .01$, suggesting that individuals have more positive attitudes toward socialized medicine after listening to a pro-socialized medicine lecture.

この授業では、統計の概念や数式ではなく、まず例題の解説から始める方法を採用している。例題において統計が使用された目的を学生が理解できれば、解説の目的はほぼ達成されたことになる。ただし、有意確率、自由度、片側・両側検定等の基礎的概念の確認は当然必要となつてこよう。例題の解説後、Excelによる解析をノートパソコンとプロジェクターを使用して実演し、解答例の解説を行う(Excelで

統計解析を行えるようにするには、[ツール]メニューの[アドイン]をクリックして、[分析ツール]を組み込む必要がある。なお、詳しい操作方法に関しては参考文献を参照のこと。³ 最後に例題と同じような練習問題 2 問を学生に配布し、各自に Excel によるデータ解析と解答欄の作成を行わせる。解答欄作成に当たっては、解答例の文型(ゴシック部分)をそのまま採用し、数字は該当箇所にそのまま代入するよう指導する。本授業で用いる有意水準(α level)は、0.05(5%)とした。なお、筆者の大学では、練習問題を行う際、学生をパソコンのある情報演習室へ移動させることにしている。演習中、教員は学生の質問に個別に応じるなどして、適宜指導を行う。

3. 対応のない *t* 検定(3 コマ目)

3 コマ目以降の授業では、15 分間の医学用語テストに続き、前回の練習問題の模範解答を学生に提示する。この際、前回の授業での Excel 操作や解答欄作成において学生が犯した典型的なミスについて、クラス全体の注意を喚起することが大切である。学生に同様なミスを繰り返させないようにすることは、教員の重要な務めである。

対応のない *t* 検定の例題と解答例は下記の通りである(*Introductory Biostatistics for the Health Sciences*, by Chernick and Friis, 2003)⁴。前述のように、解答例のゴシック部分は、学生が 2 問の練習問題の解答欄を作成する際、そのまま使用すべき箇所である。

Exercise 2

Clotting agent tested in pigs⁴

(An independent groups *t* test)

A company is interested in marketing a clotting agent that reduces blood loss when an accident causes an internal injury such as liver trauma. To obtain some indication of efficacy, the company conducts an experiment in which a controlled liver injury is induced in pigs and blood loss is measured. Pigs are randomized as to whether they receive the drug after the injury or do not receive drug therapy—the treatment and control groups, respectively. The data in Table 2 were taken from a study in which there were 10 pigs in the treatment group and 10 in the control group. The amount of blood loss was measured in milliliters. Test for a relationship between the drug and blood loss.⁴

Table 2. Blood loss in untreated and treated pigs.*

Blood loss shown in ml	
Control Group (n = 10)	Treatment Group (n = 10)
786	543
375	666
4446	455
2886	823
478	1716
587	797
434	2828
4764	1251
3281	702
3837	1078

*Data from Chernick and Friis (pp. 163–164)⁴

Answer to Exercise 2

An independent groups *t* test compared the mean blood loss for the control group (mean = 2187.40) with that for the treatment group (mean = 1085.90). The difference between the two groups was found to be statistically significant at an alpha level of .05, $t(18) = 1.78, p < .05$, indicating that the drug reduces blood loss from internal injury.

4. 1 要因の分散分析(4 コマ目)

15 分間の医学用語テスト、前回の練習問題の答え合わせに続き、1 要因の分散分析の例題と解答例を提示する。なお、Excel では分散分析後の多重比較を行うことができないため、手計算が可能な Tukey の honest and significant difference (HSD) テストを利用する必要が生じてくる(詳細は統計学の教科書を参照)²。Excel は手軽である反面、利用できない統計手法も多いので、この旨を学生に留意させておく必要がある。一方、HSD テストを手計算で行うことにより、多重比較の理解が深まるという点も同時に指摘しておきたい。

1 要因の分散分析の例題と解答例は下記の通りである(*Basic Statistical Concepts*, by Bartz, 1988)⁵。なお、多重比較の結果にはいくつかのパターンがあるので、それぞれの英文表記について学生にモデルを提示することが必要であろう。

Exercise 3

Evaluating the possible effect of aerobic exercise on mental dexterity in the elderly^{5,6}

Thirty elderly subjects (55–70 years of age) who had shown some evidence of memory loss and other mental impairments participated in an exercise program sponsored by the National Institutes of Health, the Veterans Administra-

tion, and the University of Utah. The subjects were assigned at random to one of three groups— aerobic exercise (fast walking), nonaerobic exercise (calisthenics), and a non-exercise control group. A test of mental dexterity was one of several psychological and physiological characteristics assessed before the exercise program began and again four months later. The scores of the subjects after four months are shown below. Was there a significant difference among the three groups? If so, which differences were significant?^{5,6}

Table 3. Mental dexterity scores of elderly subjects under three conditions of exercise.*

Mental dexterity score per person		
Aerobic Exercise n = 10	Nonaerobic Exercise n = 10	No Exercise n = 10
69	51	59
74	41	56
72	34	54
78	56	39
61	61	44
64	61	49
49	56	34
54	46	64
59	51	34
59	36	69

*Data simplified from Dustman et al. (*Neurobiology of Aging*, 1984) as cited in Bartz, 1988 (pp. 302-303)^{5,6}

Answer to Exercise 3

A one-way analysis of variance (ANOVA) compared the mean mental dexterity scores for the aerobic exercise, nonaerobic exercise, and no exercise conditions. The overall difference was found to be statistically significant at an alpha level of .05, $F(2, 27) = 6.05, p < .01$. A Tukey HSD test indicated that the mean for the aerobic exercise condition (mean = 63.90) was significantly greater than that for either the nonaerobic exercise condition (mean = 49.30) or the no exercise condition (mean = 50.20). The mean for the nonaerobic exercise condition did not differ significantly from that for the no exercise condition.

5. 相関分析(5 コマ目)

相関分析の例題と解答例を下記に示す。⁴ なお、Excelでは相関係数の有意確率を求めることができないので、有意水準.05および.01における相関係数の値を示す表を統計学書からコピーするなどして学生に提示する必要がある。

Exercise 4

Effect of stress on blood pressure in monkeys⁴
(Pearson's product-moment correlation coefficient (r) test)

An investigator studying the effects of stress on blood pressure subjected ten monkeys to increasing levels of electric shock as they attempted to obtain food from a feeder. At the end of a 2-minute stress period, blood pressure was measured. Use Pearson's r to see if there was a relationship between blood pressure and shock intensity.⁴

Table 4. Blood pressure and electric shock intensity.*

Monkey	Blood Pressure mm Hg	Shock Intensity Volts
A	126	30
B	129	30
C	127	40
D	140	40
E	130	50
F	141	50
G	160	60
H	144	60
I	167	70
J	159	70

*Fictitious data

Answer to Exercise 4

Pearson's correlation test addressed the possible relationship between blood pressure and shock intensity. The correlation was found to be statistically significant at an alpha level of .05, $r(18) = .89, p < .01$, indicating that the two variables are positively related. This shows that, in the monkeys tested, blood pressure had a proportional relationship with shock intensity.

6. カイ 2 乗 (²) 検定(6 コマ目)

² 検定の例題と解答例を下記に示す。⁴

Exercise 5

Breast cancer stage in relation to race⁴
(Chi-square test)

There may be delays in participating in breast cancer screening programs according to racial group membership. As a result, some racial groups may tend to present with more advanced forms of breast cancer. Data from a breast cancer staging study are shown in Table 5. Conduct a Chi-square test to see the association between race and cancer stage.⁴

Table 5. Race and breast cancer stage.*

	Stage 1 n	Stage 2 n	Stage 3 n
White	14	13	1
African American	4	12	8

* Fictitious data

Answer to Exercise 5

A Chi-square test was applied to the relationship between race and cancer stage. The association was found to be statistically significant at an alpha level of .05, $\chi^2(2, N = 52) = 10.62, p < .01$. This reflects the fact that African American women tend to present with more advanced forms of breast cancer than white American women.

7. まとめ(7 コマ目)

15 分間の医学用語テスト, 前回の練習問題の答え合わせに続き, 今までに学習した 5 つの統計手法に関する注意事項を確認する。最後に, オリエンテーション時に配布した論文の統計記述に関する解説を再び行う。初めは解説困難とも思われた統計記述が容易に理解できることを知り, 学生が達成感を感じる瞬間である。

8. 試験(8 コマ目)

5 つの統計手法について 1 問ずつ, 練習問題と同じ形式で出題した試験を 90 分間で行う。辞書, ノートおよび配布資料の参照を認める。統計解析を正確に行い, 結果を資料に沿った形で記述できれば試験は合格となる。なお, 解析結果が誤っている問題が 1 問でもあった場合, 当該学生には再試験を課している。データ処理には細心の注意を払うべきであることを理解させるためである。再試験の対象者は例年 100 名の受講者に対し 20 名ほどである。

9. 結論

今回紹介した授業に対する本年度の学生評価(5 点満点)は, 講義内容に関しては平均 4.4 点(全 112 講義中 28 位), 教材に関しては平均 4.5 点(同 14 位)であった。英語による統計の練習問題を繰り返すことにより, 学生は, 教員の手をさほど煩わせることなく統計手法および英語による統計記述に習熟することができる。また, 将来要求される医学論文の読解や作成に関して, ある程度の自信を得ることも期待できる。本稿では 8 コマ分の授業を紹介したが, 比較的難解な分散分析やまとめを省略することなどでコマ数を減らすことも可能である。全国の医学部において, 英語 1 科目は最低でも 15 コマに設定されているが, そのうちの 6 ~ 8 コマ程度に統計学を導入することは, 十分検討に値すると考えている。

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Promoting Academic Integrity: A Discussion of Attitudes and Methods

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Aim. The aim of this paper is to examine some of the available data on cheating at college or university level, and to assess some possible implications of what is known and of what is unknown, primarily with a view to implications for teachers at medical schools in Japan.

Methods. We discussed cheating incidents among ourselves and with other university teachers (mostly at medical schools in Japan), made a partial search of the very large amount of available literature on the Internet, and read Gregory Cizek's book on cheating.

Results and Discussion. Most of the published data come from studies within the USA. The data indicate that cheating is extremely common among students and staff at all levels and in all sorts of courses, though over 99 percent of cheating goes undetected, and it is vastly underestimated by many or most staff. While it is known that most people cheat, little is known about how often. There is a reported correlation between dishonesty in medical students and dishonesty in relation to patients later. We have no reason to think that the situation is any better in Japan than in America, and there are apparently reasons for grave concern. Institutional policies about cheating vary widely, and there is remarkably little unanimity on countermeasures.

Conclusion. Far more data are needed, especially from outside the USA, on how often cheating occurs. Teaching staff everywhere should be seriously concerned about cheating, but lack of awareness and lack of detailed information are major obstacles; further, staff need to decide in a concerted and structured way what to do about cheating.

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Key Words: academic integrity, cheating, college, dishonesty, university

1. Introduction

The promotion of academic integrity can involve everyone who has a role in education, and much of academic life might be the better for this special sort of integrity. Unfortunately, cheating is more or less an expected part of academic routine; most teachers expect a few students to try to cheat occasionally (hence, for

example, alert proctoring by some staff during tests) and many teachers expect to detect most attempts at cheating. We regard cheating as the academic version of fraud, that is, dishonestly affecting someone's academic credit. The most popular form, naturally, is upward adjustment for selfish purposes, by students or staff, i.e., seeking academic credit which was not earned, the classic methods being to carry a "crib" into a test and to copy another person's answers. Other varieties also occur, notably staff raising students' scores or ignoring the problems. Although a number of published sources are cited in the present paper, information gained from personal communications or from personal experience is intentionally not identified by source, for reasons of confidentiality.

Recently we were surprised to learn of two obvious cheating cases representing radically different responses by the two medical schools concerned, and we were fur-

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ther surprised to learn that those cases were not as unrepresentative as we had assumed. One student was caught cheating on an end-of-year examination, despite knowing the set penalty; he tried various tactics, including apologies, but was made to repeat the year. The student at the other university adamantly denied cheating despite absolute and incontrovertible proof of guilt; he was given a further chance and cheated again and lied blatantly, but by order of senior university staff he was let off and given a passing grade anyway. Personal communications with staff at a number of other universities, both state and private within Japan, indicate that neither approach is unique. Also, on a number of occasions teachers have found discarded “crib” papers scattered in classrooms after examinations, raising the possibility that far more students had been cheating than were ever caught in the act.

A literature search indicated, first, that most of the data which we could find came from surveys in the USA—so much so that all numerical data given here are from surveys in the USA unless otherwise indicated. Second, there may be vastly more cheating than is detected. Third, there is apparently a shortage of published information about how much cheating really occurs. Further, there is a correlation between dishonesty in medical students and dishonesty among those same people when they become doctors; this is at least potentially relevant to everyone, since every one of us is likely to be a patient in the future.^{1,2} There seem to be a number of strong contrasts among the data on cheating, such as the discrepancy between actual cheating rates and staff perceptions thereof.

The aims of this paper are to review some of the available data on cheating at college or university level and to assess some implications of what is known and of what is unknown, primarily with a view to implications for teachers at medical schools in Japan.

Terminology. For simplicity, this article uses some related terms: *Staff* implies administrators, invigilators, proctors, teachers, and generally anyone in charge; in some circumstances, the term *teacher* is more specifically relevant. *Student* generally implies anyone taking a test. *Test* implies any test or examination, and the principles that apply to tests may include written homework.

2. Methods

Among ourselves and with other university teachers, mostly at medical schools in Japan, we discussed cheating incidents and made a search of some of the large amount of available literature in print and on the Internet.³

3. Results and Discussion

3.1. Appearance and reality

Most students condemn cheating, and most do it. The vast majority of students—never below 90 percent of students, according to Davis et al.—condemn cheating as inappropriate; at the same time, the vast majority (reportedly over 80 percent in some contexts) are likely to do it at least occasionally.⁴ The majority of staff, though notably not all, likewise express disapproval, but have themselves been known to cheat in various ways.

3.1.1. The reality of cheating

Reports on rates of cheating among students include the following statements:

a. Cheating happens everywhere

- Cheating is happening in all types of classrooms from high school to medical school.⁵
- Academic dishonesty, or cheating, is a ubiquitous phenomenon in higher education.⁶
- Research findings suggest that cheating on tests is universal and that it occurs as frequently in other countries. However, cheating is considerably more acceptable in other countries than it is in the United States.⁷
- Most people cheat. Over the past 50 years, numerous studies have reported that cheating, academic dishonesty, and other forms of academic misconduct among college students appear to be the rule rather than the exception, and the “deviant” student has been described as one who has not engaged in academic misconduct at any time.⁸

b. Anyone might cheat

- Teachers would still have to realize that every student is a potential cheater.⁵
- Who cheats? Well, just about anyone, if the stakes are right.⁹
- In sum, no relationship between individual traits of personality type, self-esteem, or locus of control has been found.¹⁰

c. Cheating may be on the increase

- Cases of malpractice detected by exam boards in England rose by more than a quarter last summer [2005].¹¹
- Cheating is becoming a larger problem in high school and college classrooms in every part of the world. In 1941, Drake reported that the rate of students who cheated was 23%, whereas Stern and Havlicek reported the rate of students who cheated was 82% in 1982.^{5,12}
- One decade of research on cheating in academic institutions ... demonstrates that cheating is prevalent and that some forms of cheating have increased dramatically in the last 30 years.¹³
- The frequency of cheating is reportedly on the rise ... cheating is on the rise on both college and high school campuses.¹⁴

d. Or, it may not be increasing. During the past 30 years numerous researchers have replicated and expanded upon Bowers' findings.^{4,15} For example, McCabe and Bowers, as well as Spiller and Crown reported that contemporary rates of cheating are equivalent to rates reported 30 years earlier.^{16,17}

e. High proportions of students who admitted having cheated:

Premedical Students	Medical Students	Medical Graduates
87.6% ¹	58.2% ¹	30-40% ²⁴
82% ¹²		
80% ¹⁸		
76% ¹⁹		
75% ^{20,6}		
74% ²¹		
70% ²²		
67% ²³		
60% ⁴		

f. Little has been published about how often people cheat. The figures above indicate students who admit to cheating at least once, but little is known about the frequency distribution of cheating, i.e., how often people cheat, or in other words how many students are likely to cheat in any given event. Erickson and Smith found that 43% of 118 college students took the opportunity, and Sherrill et al. found that 32% of 91 cheating students cheated at every opportunity.^{25,26}

3.1.2. Attitudes expressed

Most people condemn cheating in others and excuse it

in themselves. Although the vast majority of people (students, staff, and others) condemn cheating as inappropriate in others, many apparently find special circumstances which may lead them to cheat.

3.1.3. Teachers' misperception

Teachers may think cheating rare, whereas students think it ubiquitous. Unfair behavior in academic contexts is reportedly common, and may be far more common than many teachers know or admit. Some reports indicate cheating rates over 80 percent by students in certain American colleges, but staff have been quoted as imagining it to be extremely rare and almost always caught when it does occur.

- MIT Faculty Member: "I think you should bear in mind that many students—I hope and believe most—could never dream of cheating no matter what the pressures, opportunities or incentives."²⁷
- MIT Graduate Teaching Assistant: "Copying is so common at MIT. I think students even forget that it is cheating."²⁷
- ... faculty tended to underestimate the prevalence of academic dishonesty²⁸

Students' perception of cheating frequency is important, not least because a perception of frequent cheating promotes further cheating.¹³ Teacher misperceptions are important because unless one knows how much cheating is really happening, one cannot know how much of it one is not catching. Regrettably, most available data are, in a sense, one-dimensional, describing the percentage of students who confess to having cheated at least once in a given period (typically in the last year, or in their whole college career), but there seems to be little information published about how many people are cheating in any one event, or in the total number of actual cheating events, versus the number of cheating events detected.

3.2. Detection rates

3.2.1. Comparing numbers

As for the total number of actual cheating events, in a study of students at Rutgers University, Fishbein found that 45% of 232 students admitted cheating at least once in university, and 33% of the 232 were "hardcore" cheaters who admitted to cheating on at least 8 courses.²⁹ Cizek estimated the rate of cheating detection:

With more than 33,000 students on the Rutgers campus, even if only the hardcore cheaters were caught, and even if each of the hardcore cheaters were caught

in only one of the courses they cheated in, the number of cheating cases at Rutgers would be approximately 11,000 annually. However, according to Fishbein, fewer than 80 cases of cheating are typically reported in a given year.³

This is a highly conservative set of assumptions, and not necessarily realistic; a less optimistic estimate might be as follows:

If each hardcore cheater cheats once per course (this being merely an example, as we have no reason to assume such restraint) on only 8 courses during 4 years, and a further 45% of students cheat only once each (an optimistic interpretation of Fishbein's "at least once") in 4 years, the total number of cheating events per year would be: $[(45\% \times 33000) + (33\% \times 33000 \times 8)]/4 = 24,492$ cheating events per year, for an overall detection rate of only 0.3%, i.e., catching one in over 300 cases.

Even that estimate may be unrealistically conservative. Hetherington and Feldman found that only 10% of those who cheated even once limited their cheating to one time, and Sherrill et al. found that 32% of cheating students cheated at every opportunity.^{26,30} On that basis, if one assumes that each "occasional" cheater offends once a year, and each "hardcore" cheater does so 4 times a year, the total number of cheating events would be about 47,000 a year, indicating a detection rate of 1 in 590 cases, or 0.17%; and this is by no means an upper limit on possible cheating rates.

3.2.2. Reasons for concern in Japan

The majority of available data on cheating seems to be American, showing cheating rates high enough to justify calls for greater efforts by teachers. It would be entirely understandable for teachers anywhere to turn a blind eye to such figures or to imagine that the situation in their own region or institution is, for whatever reason, very different. One might, for example, suppose that data are scarce because there is no significant problem requiring detailed research. Absence of proof, however, does not constitute proof of absence of cheating, and there is no obvious evidence to support any such assumption.

Conversely, there are relevant similarities between Japan and the USA. For example, (a) Some social institutions are comparable: some studies show more cheating by members of fraternities in America,³ and anecdotal evidence indicates considerable passing of test-informa-

tion from *Sempai* (senior) to *Kohai* (junior) in Japanese clubs and "circles." (b) Financial pressures may drive repayments. American medical students may be driven more by fear of their medical school loan burden; Japanese students may be lured by the vast sums available to some successful doctors.

Nevertheless, it might be interesting to imagine a scenario justifying relative complacency among teachers in Japan, as follows: Start with the Rutgers-related figures (section 3.2.1 above), and assume (though with no known factual basis) both that Japanese students are about as sophisticated in their cheating methods as are American students and that detection rates depend mainly on the perspicacity of teachers. Then for Japanese staff to detect just half of all cheating cases, they would have to be some 200 times more perspicacious than their American counterparts. So far, we are inclined to doubt that this would be credible; therefore, complacency cannot be justified.

Absence of proof, however, does not constitute proof of absence of cheating.

3.3. Attitudes and examples

3.3.1. Student attitudes

Studies report student unwillingness to report specific cheating, but students sometimes complain about staff failures to stop cheating. In a recent case, a group of students at one medical school in Japan complained to staff that the considerable number of students who had cheated on a recent exam had all passed, whereas most of those who did not cheat had failed despite proper effort. The unwillingness of students to take clear action against cheating is notably paralleled by inaction on the part of many staff members on witnessing cheating.

3.3.2. Morality teaching

Cheating sounds like something that might be promoted by lack of moral values, but some studies seem to show just the opposite correlation. The available evidence does not support faith in moral teaching; various studies show more cheating by people who have more formal religious education and by those who say they attend church more often.³ We wonder whether one should distinguish between theoretical moral/ethical instructions of that sort and practical examples. Some sources indicate that honor codes may reduce cheating, especially where such codes are long established in an institution.¹³

3.3.3. Senior examples

Important, powerful, and senior people and institutions set both good and bad examples for students and doctors. We tend to think of cheating as being done by students, but their seniors do it too. Students may cheat to help themselves, and staff may cheat either to help students or their institutions, or to harm students. A common reason, rationalization, or excuse for cheating is that “everybody” does it, and this may be a compelling argument. Even when nobody knows the real rate of cheating, the image is all too available.

Periodic scandals repeatedly reveal successful, senior figures cheating; famous examples include individuals such as American AIDS researcher Robert Gallo and the Korean biotechnology researcher Hwang Woo-Suk who, even when exposed, have enjoyed powerful support. Almost every day, newspapers report high-profile cases of embezzlement, fraud, and other sorts of cheating too numerous to list; mere routine academic cheating seems trivial in contrast.

3.3.4. Ill effects

Institutional-level cheating may create special risks. Apart from moral or immediate ethical considerations, practical disadvantages may arise.

- a. Medical graduates are hired on the basis of the conventional understanding that graduation guarantees that each practitioner has a good basic medical education; the immediate risk is of misdiagnosis and mistreatment of patients.
- b. The long-term risk is that employers and others will gradually notice that graduates from certain medical schools have too often proved substandard. This seems increasingly likely with the current rise in pressure on medical and other institutions to disclose performance details.
- c. Another and previously unsuspected possibility arose in the case of the medical student caught cheating on a test, as described in the Introduction, above. The student’s parents’ threat to sue the university if their son was punished was backed by some research on their part. The mother stated that other students at that university had cheated successfully in the past, and she argued that to punish her son would constitute unfair discrimination. Her case was rejected by the university and was dropped. However, it would have been an entirely different story had this hap-

Even teachers who hate cheating may be partly responsible for promoting cheating.

pened at one of the universities which had already established precedents of rewarding cheating students with a passing grade. If such a university tries to fight such a case in court, it can expect bad publicity; and if the university yields without fighting the case, it will only have established a stronger precedent for all future objections to discipline, making punishment of any future misdeeds highly questionable. In other words, taking the easiest course, in the short-term, risks ruinous consequences later.

3.3.5. Cheating in later life

We all, presumably, want doctors to be honest, but graduation does not necessarily make them so. We may hope that doctors are honest, at least in their work with patients, but there are indications that medical student dishonesty continues into professional life, as Sierles et al. and as Thorpe et al. pointed out:^{1,2}

- The most disturbing finding was the positive correlation between cheating in school and cheating in patient care. There was a continuum from cheating in college to cheating in medical school didactic areas, to cheating in clerkships in patient care.¹
- Students with a history of cheating are likely to continue to cheat.²

3.3.6. What should teachers do?

Even teachers who hate cheating may be partly responsible for promoting cheating. Factors seen as promoting cheating include time pressure for assignments and tests, and seemingly inadequate teaching. To reduce these risks, teachers need regular and timely surveys on course and curriculum progress; university-wide surveys taken once a year may not be sufficient for this purpose.

Teachers are expected, by written or unwritten rules, personally to prevent cheating, but may be discouraged from doing so by a number of factors including practical disincentives and pressures from staff and parents.

- a. It is practically impossible to stop all unfair practice, even in controlled test conditions; indeed, the estimates in section 3.2.1 above indicate that one would be hard put to stop more than a small fraction. From this point of view, it would be frustrating even to try, and ignorance (albeit deliberate) really may be bliss compared to the uncertainty and frustration resulting from knowing that students are cheating successfully. It seems unclear at what level of cheating-detect-

tion educational institutions may be entitled (whether on moral, ethical, or pragmatic grounds) to “rest on their laurels” and to take the view that their measures against cheating are sufficient and defensible. Given those figures for America (section 3.2.1 above), we suspect that boosting detection rates to any level remotely acceptable to the public will be a daunting challenge. This may be a major reason for the scarcity of data for other countries. One possible reason for this may be that if a problem is not officially known to exist, it is easier to ignore it, and the easier it would be to accuse anyone who raises the topic of making trouble unnecessarily.

- b. Staff may have moral incentives to try to stop cheating, but economic and social incentives not to catch it. A teacher who reports cheats is disconcertingly likely to become involved in a time-consuming and increasingly complex web of official procedures, one of the effects of which is likely to be the requirement that the teacher create a further test and mark it, and possibly be present for a second test occasion; there may be meetings and perhaps formal hearings at which the teacher will have to be present. McCabe et al. shed light on such events.¹³ All this can become a powerful disincentive, considering, for example, a teacher who has arranged and paid for a journey abroad in July or August to visit relatives or to give a paper at a conference (potentially with career implications), who is then required to miss the conference or delay the trip and perhaps face higher fares, one may imagine some reluctance to take action.
- c. The difficulty of proving cheating, beyond not merely a reasonable doubt but beyond obfuscation and denial, rests on the available evidence; at the easy extreme is the student caught holding a “crib” during a test; many alternatives are almost or entirely impossible to prove conclusively.
- d. Reports by a number of university teachers in Japan indicate that even when a cheat is caught, doing anything about it may be uphill work, against resistance from the cheater, his or her classmates or peers, sports-club associates, parents, and others, with increasing likelihood of personal intimidation and/or

Staff may have moral incentives to try to stop cheating, but economic and social incentives not to catch it.

A consensus may exist that cheating should be punished, without clear agreement on how to punish it.

threatened legal action against the teacher or institution to prevent punishment. One medical student reportedly sent all the (male) members of his sports club (in a group) to intimidate the (female) teacher concerned. The risks to the teacher are likely to be

severely exacerbated if the university does not have a consistent and defensible record of high academic probity. If anyone, particularly the accused student, knows that cheating—especially a high rate of cheating—has continued unchecked, or has even been condoned, that knowledge

becomes a professional embarrassment, perhaps even putting job security at risk. Teachers are likely to ask themselves whether it is worth running risks such as losing a full-time teaching job just to catch some people cheating; there is, after all, no pragmatic incentive to catch anyone—just the opposite. Unless a teacher expects full support from the administration in taking action against cheating, it may not seem worthwhile even starting to act against it.

A consensus may exist that cheating should be punished, without clear agreement on how to punish it. For maximum efficiency, incentives should be systematic and consistent; this should involve increased awareness among teachers and greater consistency between institutions. Between institutions there is great variation; for example, some punishments for students caught cheating include these:

- a. British universities are sometimes said to expel cheats.
- b. Some Japanese universities make cheats repeat the academic year.
- c. Some Japanese universities make cheats repeat the semester’s examinations.

4. Conclusion

In conclusion, much has been written on cheating, from many points of view, but not enough is known even now. Cheating is becoming easier and more sophisticated with the help of modern technology. Teachers are generally far behind, partly because they may not appreciate (nor perhaps want to know) the scale of cheating, partly because they may not wish to seem harsh, malevo-

lent, or strange in supervision, and partly because checking is sometimes difficult or impossible. Far more data are needed, especially on events in countries outside the USA, and on how often cheating occurs. We believe that teachers and their institutions need to be much better informed about what actually happens and that they need to decide in a concerted and structured way what to do about cheating.

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A Study of the Language of Medically Oriented Papers

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Background. Journals provide detailed guidelines for authors but do not specify the kind of English they expect. It is likely, however, that the editors will dismiss papers that will follow all the guidelines but will not be in the type of English that the editorial board prefers. It is necessary to know what kind of language is accepted by journals when teaching the students to read and write papers.

Methods. Journals and health related books were studied to see what kind of language is commonly used. Papers by one particular author were studied over time and this was augmented by material from other sources.

Results. The study revealed that many specialist publications accept and publish papers that are written in a fairly easy to understand way. It also showed that failure to understand plain English can lead to mis-comprehensions and mistakes.

Conclusion. A proper English programme at a medical institution will need to provide the students with some basic knowledge of English before going on to the specialist language of medicine.

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1. Introduction

Is there a case for teaching non-English speaking medical students everyday English, or do they need only medical vocabulary? To look at the problem, papers on medically related subjects were analysed for their language. Two questions were posed: (1) Do the papers display a fair amount of everyday English? (2) Do the papers that are mainly in medical jargon still require an understanding of some of the innate meanings in the language?

2. Methods

Journals were studied for their language and compared with scientific literature and with works about medical and health sciences that were not intended for the specialist such as Sherwin Nuland and Desmond Morris. The study was narrowed to the works of one scientist who, having received the Nobel prize is fairly

known. His papers were studied and compared to see whether it was his own style or the style demanded by the journal that decided how he was writing.

3. Results

Andrew Fire is a Stanford University geneticist who, together with Craig Mello won the 2006 Nobel prize for medicine. True to form, Dr. Fire has published numerous papers, most on RNAi, the work that won him the prize. Some of Dr. Fire's papers since his ideas were first published in 1998 are studied here, not for their genetics but for their English. The original paper was published as a letter in *Nature*.¹ The paper explains the purpose of the work:

Excerpt 1. Here we investigate the requirements for structure and delivery of the interfering RNA. To our surprise, we found that double-stranded RNA was substantially more effective at producing interference than was either strand individually.¹ (p. 806)

Excerpt 1 is in ordinary English, with the obvious addition of the professional terms interfering RNA, double-stranded RNA. Note the effective use of the word either, instead of *each* that could also have been used; the latter

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would not have emphasized the fact that it did not matter which of the two strands was applied. The paper, albeit in the letters section, is written entirely in this style. It may be possible that parts of the Discussion are complicated and that the uninitiated reader would find it a struggle to decipher them. On the other hand, how would a specialist without any knowledge of common, everyday English manage? Is it necessary to understand everyday English to follow a complicated argument?

Excerpt 2. There are several possible mechanisms for RNA interference in *C. elegans*. A simple antisense model is not likely: annealing between a few injected RNA molecules and excess endogenous transcripts would not be expected to yield observable prototypes.¹ (p. 810)

Excerpt 2 shows a mix of the two types of language (everyday English and specialist language), and we must take into consideration that the Discussion in its entirety is much longer than the sample quoted here. Expressions such as *not likely*, *not expected to yield*, may throw the specialist off, making it difficult to understand what the authors are trying to imply.

In 1999, Dr. Fire published a paper in *Trends in Genetics* on RNA-triggered gene silencing.² This paper states:

Excerpt 3. As gene transfer technologies have become commonplace, an increasing number of organisms have been shown to exhibit potent and unexpected responses to foreign nucleic acids.² (p. 359)

Excerpt 3, except for the term *foreign*, is mostly in plain, everyday English. In another section the paper states:

Excerpt 4. One intriguing aspect of PTGS has been the ability of transgenes that are designed to produce only sense or only antisense RNA to act as triggers.² (p. 360)

Again, Excerpt 4 contains some specialist words: *PTGS*, *transgenes*, *antisense RNA*. This is not surprising since only specialists are likely to pick up a journal called *Trends in Genetics*; but exactly for that same reason it is surprising how simple and easy to follow is the English of this paper. A study of the language of this paper does reveal certain nuances that may be lost on the reading-by-translation addict. An *intriguing aspect* indicates a question mark and some uncertainty that is implied and will not be in the dictionary, the *spurious transcription*

(not shown) is an interesting way of expressing the idea that although the information is false, it still has a role to play in the production of low levels of dsRNA. Many writers on medical subjects like to employ the crutch of *may*. This, of course, can also mean *may not*. In this paper the idea is expressed through *it now seems possible*, which is preferable since it clearly points the reader to future developments. This is particularly so since the sentence begins with the words *as an alternative*. The combination clearly carries the message: *we have gone so far and are looking forward in that direction*.

A year later, in 2000, Dr. Fire and J. Hsieh published a paper in *Annual Review of Genetics*, Recognition and silencing of repeated DNA.³ In that paper we find the following passage:

Excerpt 5. ... like *Neurospora* and *Ascobolus*, plants appear to have a mechanism that senses the copy number of specific sequences and uses this information to modulate levels of gene activity. Assaad et al. (1) created an allelic series of Arabidopsis strains containing different copy numbers of a drug-resistance gene, all integrated at a single locus. Although single-copy inserts displayed normal expression of the drug-resistance gene, transgenic lines with multiple copies of the inserted DNA were subjected to silencing in subsequent generations. Silencing of the drug-resistance gene correlated with increased DNA methylation and decreased mRNA product for the silenced region. A subsequent study demonstrated that there was reduced accessibility of DnaseI and micrococcal nuclease to the region containing the multicopy drug resistance gene of Arabidopsis (76). This indicated an altered chromatin structure in the region of repeated sequence.³

Excerpt 5 is more common, everyday English. It should not be difficult for an educated individual to follow this explanation but it may be more difficult for the dictionary-dependent specialist to discern the meaning. Compare this with the following by Belvindrah et. al. in *Molecular and Cellular Neuroscience*.⁴

Excerpt 6. Previous studies have shown that an intact meningeal basement membrane is essential to regulate GCP proliferation (Pehlmann et. al., 1985; Blaess et. al., 2004). To evaluate proliferative defects in *Ilk-CNSko* mice, we first determined cerebellar size. The overall size of the cerebellum in the mutants was reduced by ~25% (Fig.

5C, D, supplementary Fig. 2).⁴ (p. 116)

Although jargon-encrusted papers need rather short sentences, everyday English prose tends to have much longer ones. Yet an ongoing problem with many scientific papers is, indeed that their sentences are too long. Add to this the fact that certain terms tend to be repeated, and you get a paper that is hardly comprehensible. It is, of course, a point of good and interesting writing to vary the length of your sentences, while it is common sense to use short sentences when trying to impart a large amount of raw information or difficult, complicated arguments. Sentences such as *plants appear to have a mechanism that senses the copy number of specific sequences and uses this information to modulate levels of gene activity* (Excerpt 5 above) contain little specialist vocabulary and the explanation is crystal clear.

On the other hand, the following from *Diabetes*, is long, totally in jargon and exceedingly difficult to follow:

Excerpt 7. Time since diagnosis of type 2 diabetes ranged from 2 to 11 years. All of the patients were treated with diet recommendations, and in addition some patients were treated with tolbutamide 1,000 mg/day (n = 2), glibenclamide 7 mg/day (n = 1), metformin 1,700 mg/day (n = 1), amlodipin 5 mg/day (n = 1), and cerivastatin 200 µg/day (n = 1). On the experimental day, no medication was taken. None of the control subjects took any medication.⁵ (p. 296)

The non-English speaker specialist, unlike the English speaker, may have more trouble with *correlate*, and almost certainly will have to go back and figure out what *the silenced region* is (in Excerpt 5 above).

The writing of scientific papers depends on the journal more than on the subject matter. Papers that are written in plain, everyday English are accepted by one journal and rejected by another. Audience profile seems to matter little in these instances since the journals quoted above are meant for the dedicated professional and it is accepted that writing in concise, un-English like scientific jargon saves space. It is possible to cram into a few pages something that will need double the amount when written out in full. There is, however, a price to pay. It is far more difficult to express nuances and to insinuate when writing a short, scientific language piece; and when insinuations are included they may be lost on those readers who are not fluent in English. Some journals use both styles, depending on the subject matter. The *Lancet*, for

example has got the following in a recent issue:⁶

Excerpt 8. Tophus formation in untreated chronic gout can cause lesions that mimic malignant disease, abscess, neurological compression syndromes, heart-valve defects, and cutaneous calcinosis. Definitive diagnosis can be achieved by use of polarised microscopy of tissue and fluids. Our case report documents urate-induced intestinal perforation in conjunction with impaired wound healing. In our patient, side-effect-driven discontinuation of common gout drugs and high inflammatory activity led us to use a recombinant urate oxidase, which greatly improved his clinical condition and inflammatory markers. Continuous administration of rasburicase might have consolidated the initial effect.⁶

However, because high therapeutic costs are a consideration with this drug[1], pegylated urate oxidase formulations[2] or febuxostat, a novel selective on-purine xanthine oxidase inhibitor[3], might be possible therapeutic options for continuous treatment of severe cases of tophaceous gout in the future.⁶ (p. 2032)

And also, in the same volume:

Excerpt 9. That psychedelic drugs, such as LSD and MDMA (ecstasy), can be effective treatments for various psychiatric illnesses is an old idea. Once considered wonder drugs for their effects on anxiety, depression, alcoholism, and other mental illnesses, they have been effectively banished from medical practice after legal rulings banned their sale and use. Although such bans were largely put in place to quash concerns about rampant *recreational drug use* fuelling the *counter cultures* of the 1960s and 1980s (LSD and MDMA, respectively), criminalisation of these agents has also led to an excessively cautious approach to further research into their therapeutic benefits.⁷ (p. 1214)

Both are in the same journal, yet the first piece (Excerpt 8) is in jargon and intended solely for the specialist, whereas the second piece (Excerpt 9) poses no difficulty to any reader, although some of the younger ones may have difficulties with *counter cultures*, while being thoroughly familiar with *recreational drugs*. So what are the common denominators that should guide any writer of scientific papers?

It is assumed that writers who submit a paper to a journal have read the same journal. This means that they know roughly what kind of writing is expected. In addition, writers also need to consider the guidelines of each journal. Most large journals conform to the IMRAD format outlined in the *Uniform Requirements for Manuscripts Submitted to Biomedical Journals: Writing and Editing for Biomedical Publication*.⁸

Excerpt 10. The text of observational and experimental articles is usually (but not necessarily) divided into sections with the headings Introduction, Methods, Results, and Discussion. This so-called “IMRAD” structure is not simply an arbitrary publication format but rather a direct reflection of the process of scientific discovery. Long articles may need subheadings within some sections (especially the Results and Discussion sections) to clarify their content. Other types of articles, such as case reports, reviews, and editorials, are likely to need other formats.⁷

This paragraph—the whole thing is rather long—stresses the need for order within the paper but does not specify the language that is to be employed. Note, however, the brackets that set off the information about IMRAD, it is not always the case! Editors do, therefore, wield discretionary powers over the kind of text they will allow and, judging from the examples above, exercise it regularly. Guidebooks rarely tell you what kind of English to use, excepting of course that it be correct. Instead, they tend to concentrate on how to organise the paper. Huth says, “*Whether a scientific paper gets published or not depends far more on what it says—the content and its sequence—than on the prose in which it is said. If the editor sees the paper as important to the journal’s audience, minor defects in style are not likely to block its getting into print.*”⁹ Note Huth’s expression *minor defects in style*,⁹ which may not necessarily reflect the literary style of some authors.

4. Discussion

Writing for scientific journals, and medical ones in particular is usually believed to be in concise jargon. As a result, only medics can decipher most medical papers and in many instances only the specialist in the particular field of study can manage. Journals that appeal to a wider audience and, in particular books meant to elucidate the secrets of the human body such as Sherwin Nuland or, at

a more basic level Desmond Morris, will naturally be written in a common and jargon-free English. The dilemma of the non-English speaker is, therefore, whether to learn the language itself or to memorise the necessary jargon and use reading-translation to cope with the material. Disregarding the fact that reading-translation is far more time consuming than understanding the material in English, it is also true that the reader will have access to non-specialized material as well. The few quotes in this paper show that even specialized journals may at times publish in common, everyday English and that some nuances may be lost in reading-by-translation.

Manuals written for the specialist author do not really dwell very much on the question of language. It is one aspect of the very broad term ‘style.’ Perhaps the best discussion of the width and breadth of this term can be found in The British Medical Journal’s book *How to Write a Paper*.¹⁰ In it Norma Pearce says that style “*refers to a manner and expression of language but also to the customs followed in the manner of spelling, capitalisation, punctuation, and printing arrangements and display—the house style.*” There follows a paragraph about the JAMA stylebook, which she quotes: “*A scientific journal should have a consistency of style and an accuracy of reporting.*” And she informs the reader that in the JAMA stylebook “*there follow approximately 160 printed pages of simple, inviolable rules (pp. 116–117).*”¹⁰ Well, they certainly have covered everything. It does not, however, talk very much about the type of English one needs to adopt.

Pearce differentiates between *style* and *house style*, the latter being what the editors of a particular journal would require.¹⁰ Yet quite a few journals admit papers written in plain English as well as in jargon. This makes it more complicated for the non-English speakers who believe that mastering the jargon will allow them to sail through the rough seas of professional publications.

As a result of all this, the English teacher at a medical school faces a number of problems when approaching the teaching dilemma. Students normally do most of their English during the first two years, but their knowledge of medicine at that time is nonexistent. Teachers who attempt to work with medically related language find that they are teaching medicine, for which they are not really qualified. At the same time, the students find it difficult to understand the language and are not yet familiar with the subject matter. Teaching paper-writing and related subjects is an even more problematic issue with students who are not capable of understanding the medicine. In many places clinicians hold the power and push

from above, demanding that the English programme be totally geared toward paper reading and writing. This may prove to be the ultimate Gordian knot, as the journal articles analysed here suggest that there is a need for common, everyday English introduced as a first step leading to the more specialized language of medical English.

In books intended for the general reader, information that is not substantially different from that of the specialist journal will be expressed in common English. Richard Dawkins, for example in *The Selfish Gene*:¹¹

Excerpt 11. Individuals are not stable things, they are fleeting. Chromosomes too are shuffled to oblivion, like hands of cards soon after they are dealt. But the cards themselves survive the shuffling. The cards are the genes. The genes are not destroyed by crossing-over, they merely change partners and march on. Of course they march on. That is their business. They are the replicators and we are their survival machines. When we have served our purpose we are cast aside. But genes are denizens of geological time: genes are forever.¹¹ (p. 320)

Note the analogy he makes to the shuffling of cards, chromosomes are shuffled to oblivion, like hands of cards after they are dealt. Although whether hands are indeed doomed to oblivion once they have shuffled the cards is debatable.

5. Conclusion

Whereas people who have not mastered the English language may feel that as specialists all they need is to approach professional literature with the dictionary, the results of their efforts may yield only partial, incomplete information and at times lead to erroneous conclusions. Inability to understand everyday English will also mean that anything written in plain words will prove even more time consuming and difficult to follow. It will be of benefit, therefore, to introduce medical English programmes that begin with the rudiments of the spoken and written language and then lead into the more hallowed grounds of medical jargon.

There are authors who manage to cling to their own style and get published. Huth's statement that the style may be defective is rather one sided. Obviously few scientific authors will reach literary heights and few editors are capable of judging outstanding style. However, as seen in Dr. Fire's papers, he has managed to cling to his style with slight alterations that catered to the idiosyncrasies special to the particular journal in which he was published.

Students would do well to master the rudiments of English regardless of what they believe they may need. The ability to manage the language as well as their specialist field may improve their comprehension, speed up their reading and enable them to write better papers.

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What English Vocabulary Should Be Taught to Nursing Students?

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One of the important roles of teachers of English for specific purposes (ESP) is to develop learners' vocabulary, but lexical items taught in classes are still controversial. This review mainly concerns vocabulary teaching to nursing students and is aimed toward answering the questions of (1) how important technical terms would be in vocabulary teaching in ESP courses, and (2) which high frequency words and general academic words should be taught in such classes. A journal search was performed to answer these questions. I conclude that technical terms would account for a significant amount of words in nursing English and that an appropriate way of teaching non-technical vocabulary in ESP courses for nursing students at present might be to introduce the first 1,000 word families of West's General Word List plus word families on Coxhead's Academic Word List as a goal or a reference in vocabulary teaching. When teachers use these wordlists, I suggest they be careful with the word families which have different meanings for the same word form, since some of them are found to be exclusively used for their medical meanings in the wordlists of Japanese English textbooks for nursing students.

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1. Introduction

Vocabulary teaching is obviously an essential part of English education, but deciding what lexical items to teach is one of the hardest parts for teachers. In the wide realm of English for Specific Purposes (ESP), no set rules are available on how many words should be taught or what vocabulary to teach. As a result, in Japan many teachers choose their teaching materials according to their own preferences and judgment, and the materials are thus subject to trial and error for the classes.

One possible way for teachers to decide the lexical items for ESP courses could be to ask the learners to choose the words themselves, expecting that student motivation and autonomy toward vocabulary study would increase if the students were actively involved in the vocabulary selection. In a study by Guest, in which Japanese medical students were given an opportunity to choose the lexical items for vocabulary study, the teach-

ers' choice and the medical students' choice differed considerably.¹ The teachers selected more general words and general phrases than the students did, mainly because they considered the general items to be more useful in the students' future, whereas most of the students chose terms they considered to have utility within the medical field itself.¹ These different viewpoints between teachers and students lead teachers to realize once again that although the teacher, not the student, needs to choose the words to teach, the choice ought to be based on some sort of standard. Teachers need practical information on source materials from which they might select appropriate words for targeting ESP vocabulary in their classes.

An approach that might be effective could be to use a designated wordlist as a goal or reference for developing the teaching materials. Several wordlists have been developed from corpus-based studies and are available for examination. I hypothesized that if the various corpus-based wordlists were evaluated for their strengths and weaknesses, then one of these existing wordlists might be useful as a standardized list from which teachers of English for nursing students in Japan could select

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the words most suitable to the needs of their students. As a teacher of ESP for nursing students in this country, I searched the journals for word lists and narrowed the results to three lists that might be useful:

General Service List of English Words (GSL), compiled by Michael West²

University Word List (UWL)³

Academic Word List (AWL)⁴

The primary objective of the present paper is to review these three wordlists for their utility in helping teachers decide their target vocabulary to teach in ESP classes for nursing students in Japan. Because the wordlists are large, this review draws upon original works that have evaluated the wordlists against multiple fields of corpora that take in general, academic, and technical English; and also draws from works that have rated the coverage of the wordlists in the light of specialized texts. As these three wordlists are made up mostly of general English words, the questions arise as to what proportion of the target vocabulary should incorporate technical vocabulary and what technical words should be included. The review addresses this issue in the beginning, then assesses the three wordlists and, finally, explores the pedagogical applications of the wordlists in English reading courses.

2. Definitions

Within this review, certain terminology may closely resemble the name of one of the wordlists or other terminology, depending on the way the authors of the original sources used the terms. To help prevent confusion, from the outset of the review, the meanings and subtle differences are explained here.

- *word type*: A *word type* is a single word form and simply refers to a different word.⁵
- *word family*: “The number of word families” ought not be confused with “the number of words” or “the number of word types.” A *word family* includes a collection of formally related and semantically related word types and therefore it refers to the word in its various parts of speech. For example, “excel, excellence, excellent” comprise ONE word FAMILY.⁵
- *academic corpus*: The “academic corpus” is not the same as the “Academic Word List (AWL).” The academic corpora refer to the larger bank of words from which the Academic Word List and other lists were derived and/or compared. In this review, we meet two

types of academic corpus. One is the General Academic Corpus created by Sutarsyah et al. (1994), and the other is the Academic Corpus developed by Coxhead (1998).^{6,7}

- *high-frequency words*: As used in this review, particularly the most frequently used 2,000 word families listed on the General Service List (GSL).²
- *academic vocabulary*: Words sometimes called sub- or semi-technical vocabulary and refer to the words which are used frequently in the academic field but not included in most frequently used 2,000 word families provided on the General Service List (GSL).² They are used in designating word families on the University Word List (UWL)^{3,6} or on the Academic Word List (AWL).^{4,5}
- *technical vocabulary*: Words frequently used only in specialized fields.
- *low-frequency words*: The words other than those of high-frequency, academic vocabulary, and technical vocabulary.

3. How important is technical vocabulary?

Questions regarding the importance of teaching technical vocabulary are often raised when teachers have to select teaching materials for courses in English for academic purposes (EAP) classes, especially if the class is made up of learners from multiple academic fields. In such cases, the teacher often selects the materials that cover several disciplines, and the learners would either accept such materials or choose lexical items themselves from the materials according to their own specific purposes and disregard the items they consider irrelevant to their particular needs. It has been quite a long time since I studied so-called “scientific English for postgraduate students” at a language school in the UK, but I remember studying a wide variety of technical terms with several engineers from Egypt and Costa Rica, an architect from Mongolia, gardeners from Turkey, a nurse from Thailand, a medical doctor from Italy, and others. I had a great time there but I have to admit I felt it was somewhat a waste of my time spent abroad learning English technical vocabulary that I was not very keen on studying. It would have been more appropriate if the teacher had used a discipline-specific text depending on each student’s interest in learning technical terms, but I assume administrative restrictions did not allow it to happen.

Some teachers hold the view that general words are well worth teaching.¹ Takakubo’s analysis of the vocabu-

lary in the wordlists of 20 textbooks for Japanese nursing students has demonstrated that 60 percent of the frequently observed word types in the examined wordlists appeared in the top 3,400 words in the *Collins COBUILD English Dictionary*.^{8,9} This suggests that the textbook writers think general vocabulary is useful in the teaching of nursing English and, therefore, that the general words need to be taken up in classes for the nursing students in Japan.

To build up the students' vocabulary in medical and nursing English classes, teachers focus on both the technical vocabulary and the general vocabulary used frequently in the medical and nursing fields. Medical and nursing students study English not only to read and write academic papers, instructions, manuals etc. but also to communicate with non-Japanese-speaking patients and to study or train abroad. Therefore, teaching only technical terms in ESP courses would not sufficiently meet the students' English needs.

If general academic vocabulary could meet the learners' needs beyond their individual specialties and if the teachers knew just what general vocabulary ought to be introduced to these learners, then it would seem that teachers ought to focus more intensively on general academic English vocabulary in such mixed classes.

3.1. The General Academic Corpus versus an economics text

In a corpus-based study, Sutarsyah et al. tackled the matter of technical versus non-technical vocabulary by analyzing the proportion of technical vocabulary in a discipline-specific text, in this case a single university economics text of approximately 300,000 running words.⁶ First, the researchers created a general academic corpus of approximately 310,000 running words from the texts in a variety of disciplines (the General Academic Corpus), then they compared the word families of the economics text with those of the General Academic Corpus. One of the reasons I chose their study for inclusion in the present review was that their academic corpus included texts from the fields of natural science and medicine, which I expected to be useful in the teaching of vocabulary to nursing students. The other academic fields incorporated in this general academic corpus are mathematics, social science, political science, law, education, humanities, and technology and engineering.⁶

Results of the study by Sutarsyah et al. showed two important points. First, the size of the vocabulary in the general academic corpus was strikingly greater (as great

as 2.3-times larger in number of word families than that of the economics text). The authors attributed this difference mainly to the fact that substantially more low-frequency word families existed in the general academic corpus than in the economics text. In fact, they claimed that approximately 40 percent of the word families in the economics text were not found in the general academic corpus.⁶

Second, regarding word choice, the high-ranked words for the frequency (the first to the seventeenth) of the economics text and those of the General Academic Corpus were almost the same (such as *the*, *of*, and *be*), which accounted for more than 35 percent of the running words in either the economics text or the General Academic Corpus. This would not be very surprising because the words we are looking at here are mostly the general words with high frequency and, therefore, those words would be expected to appear frequently in both the academic corpus and the economics text.

Differences were found in the content words related to economics (nouns, verbs, adjectives or adverbs, such as *price*, *cost*, *demand* and *curve*), that is, their occurrence was about seven times higher in the economics text than in the General Academic Corpus.

3.2. The General Service List compared to the University Word List

Sutarsyah et al. then compared word families identified in the economics text with those on two of the wordlists,⁶ i.e., West's General Service List (GSL)² and the University Word List (UWL).³ Briefly, the GSL contains 2,000 word families with a wide range of occurrence in general English, and the UWL lists approximately 800 word families that frequently occur over a range of academic texts and not included in the GSL. The Academic Word List (AWL) had not been created at the time of the study by Sutarsyah et al.⁶

Around 78 percent of the word families in the economics text were found to be in the first 1,000 word families of the GSL, and about 9 percent in the UWL. This means that the first 1,000 word families in the GSL plus the 800 word families of the UWL cover most of the word families in the economics text, and that technical terms account for an indistinct part of the economics text.⁶ The authors noted that the content words found more frequently in the economics text than in the General Academic Corpus were, nevertheless, included on both the GSL and the UWL.⁶

If the importance of technical terms in vocabulary

study is estimated only from these data, technical terms would not seem to have priority over the words included on the GSL and the UWL, and non-technical vocabulary in the GSL and the UWL would be crucial vocabulary for learners aiming at academic study. The data also suggest that if teachers use the general academic corpus as a goal in vocabulary study, a much larger vocabulary load would be unnecessarily imposed on the learners.

There may be two problems to be dealt with here. One would concern how reliable the UWL could be for assessing the proportion of technical terms. The list contains only about 800 word families, and the inconsistency of the word sources and the word selection for the UWL have been known to be problematic.⁴ The second problem would derive from the fact that the authors did not separate the technical terms of the examined text from the non-technical words for their analysis. On this point, I think the study of Chung and Nation⁵ was designed more carefully than that of Sutarsyah et al.⁶ and I will describe details on this under section 3.3.

After taking all the above considerations into account, I believe Sutarsyah et al.⁶ still showed two important points. First, the size of the vocabulary in the General Academic Corpus was strikingly greater than that in the economics text, and the authors attributed this difference mainly to the fact that substantially more low-frequency word families existed in the general academic corpus than in the economics text. Second, the authors noted that differences were found in the content words related to economics, and these content words were, nevertheless, included on both the GSL and the UWL.

3.3. An anatomy text compared to an economics text

Chung and Nation, after checking the inter-rater reliability, classified the words in the discipline-specific texts—an anatomy text and an applied linguistics text—into four groups, which they call *high frequency word*, *academic vocabulary*, *technical vocabulary* and *low frequency word* (see the Definitions, section 2, in the present review).⁵ The authors showed that about 30 percent of the running words in the anatomy text were technical words and that the word types of the technical terms accounted for about 40 percent of all the word types observed in the anatomy text. Thus, the proportion of the technical words would be greater in their study than in the study of Sutarsyah et al.⁵ By clearly distinguishing the technical terms from the non-technical terms, and by using the GSL and the AWL, not the UWL (see sections 3.4 and 4),

Chung and Nation, I believe, characterized the technical terms as accurately as possible.

3.4. An anatomy text compared to an applied linguistics text

In the study of the economics text, by Sutarsyah et al., the high-frequency word families (the 2,000 GSL word families) and the academic words (the UWL word families in their study) were found to cover most of the word families in the text, and the rest of the word families, including technical words, accounted for less than 9 percent in the text.⁶ In Chung and Nation's study of the applied linguistics text, the high-frequency word families (the 2,000 GSL word families) plus academic words (the AWL word families in their study) accounted for about 75 percent of the total running words, and technical word families accounted for about 20 percent.⁵ The anatomy text seems to contain more technical word families (30%) than either the economics text or the applied linguistics text.⁵

Here again, the authors investigated the vocabulary in only one textbook each from the fields of economics, applied linguistics, and anatomy. Obviously the papers were not intended to offer a basis on which one can conclude that university nursing or medical texts would include more technical vocabulary than university texts in other academic fields. Yet, the results suggest that the size of the technical vocabulary in the specific specialty texts would vary depending on the discipline. Teachers of English for nurses need to be aware of the possibility that texts in the nursing and medical fields would consist of a large amount of technical words.

It would be necessary that vocabulary in university nursing or medical texts in each subject be investigated first, to evaluate the validity of the general academic corpora, the GSL, the UWL, and the AWL as resource lists for teaching nursing English, and then be compared with words on these lists. When teachers decide which wordlists or corpora to be used in teaching, it is important that they take into consideration the learners' specific vocabulary needs.

4. What general vocabulary should be taught in classes of English for nurses?

The studies introduced above suggest that texts in the nursing field might contain technical terms at a higher rate than economics or applied linguistics texts. The findings also suggest, however, that the proportion of gener-

al vocabulary is greater than the technical vocabulary even in the anatomy text.⁵ In addition, the technical terms to be taught would obviously vary depending on the specialty of the learners. Therefore, I focus on general vocabulary for the rest of this review and ask the question, what general vocabulary should be taught in ESP classes for nursing students. The wordlists derived from corpus studies would be expected to shed light on what general vocabulary would be appropriate for nursing students to learn.

Regarding the high-frequency words, the studies indicate that the GSL would be the most useful wordlist in teaching vocabulary to ESP learners at present.^{5,6}

As for lists of academic words, the Academic Word List (AWL) was created in the year 1998 to overcome one well-known problem of the University Word List, namely its inconsistency in word selection principles.^{4,7} The UWL is a combination of four word lists, whereas the words on the AWL were selected from the Academic Corpus, which was created by Coxhead and which contains approximately 70,000 word types of four subcorpora and each subcorpus consists of seven subject areas.⁴

Coxhead reported that around 16 percent of the UWL word families were not contained in his Academic Corpus.⁴ All word families in the AWL occurred in the Academic Corpus and, therefore, the AWL could be used to complement the GSL and the UWL. In addition, the author showed that the coverage of the first 1,000 GSL word families plus the AWL for the Academic Corpus was about 5 percent higher than that of the 2,000 GSL word families, with the learners' vocabulary load being reduced by about 20 percent. These data suggest that when the AWL is used with the first 1,000 word families of the GSL, the AWL would be more appropriate than either the UWL or the second 2,000 GSL word families in vocabulary teaching.

4.1. General Service List as compared to academic subcorpora

Occurrences of word families in each subcorpus of the Academic Corpus, i.e., arts, commerce, law, and science, in the Academic Word List and in the most frequently used 2,000 words on the GSL were also examined, and differences in word frequency between these wordlists were reported.⁴ Approximately 9 percent of the science subcorpus was covered in the AWL. This was much higher than that covered by the second 1,000 words on the GSL (5%).⁴ This would be useful information for teachers of English for science or nursing, because science pro-

vides the groundwork for some basic subjects in the nursing field.

My major concern with Coxhead's AWL study regards the procedures the author used in selecting words for the list. The author obviously gathered enough words to meet the requirement, but he employed only range and frequency as the criteria.¹⁰ Checking only range and frequency might risk leaving some important words out of the list, and other criteria such as pronunciation ease or difficulty, word length, and coverage of useful concepts need to be taken into consideration.

Another possible problem of the AWL taken up by Ming-Tzu and Nation is that the selection of the words was performed by use of computer program.¹¹ As a result, the meanings of word forms were not taken into account for the word selection. Such a limitation of this computer-based approach might misrepresent the composition of the AWL and increase the learning burden of AWL-word learners unnecessarily.

4.2. Homographs in the Academic Word List

Ming-Tzu and Nation scrutinized the Academic Word List for homographs, that is, words having different meanings for the same word form, to determine (1) whether the computer program employed had inappropriately included some homographs in the same word family and (2) whether such homographs were so great in number as to merit re-evaluation as candidates for word entry in the AWL.¹¹

First, these authors checked the meanings of each individual word member of the various word families in the AWL by using the prestigious dictionary the *New Oxford Dictionary of English*.¹² Then they developed a semantic relatedness scale to analyze the dictionary definitions and performed an inter-rater reliability test to check whether use of the scale provided reliability in categorizing the word families into homographs. Finally, they examined the occurrence of the homographs in the AWL and in the Academic Corpus.¹¹

Their results showed that approximately 10 percent of the AWL word families contain homographs that should not be categorized into the same family. By frequency of these word families in the Academic Corpus, the authors estimated that only 35 percent of the AWL word families with homographs were worth examining. Consequently, only one percent of the AWL word families would have to be newly included in the AWL, and 0.5 percent would need to be removed from the AWL because none of their homographs satisfied the inclusion criteria.¹¹

The number of homographs in the Academic Word List turned out not to be large enough to create a critical drawback in using the list in teaching. Nevertheless, for teachers, it would be useful to know that one member of the word family is often used predominantly over the other members of the word family, even when the word family contains homographs.

The problem with this study lies in the semantic relatedness scale developed and used by the authors of the study. By performing an inter-rater reliability test, the authors tried to show that their classifications could be determined similarly by different individuals. In this test, they had an original rater, and one other rater who checked only the inter-rater reliability. Therefore, a total of two raters were involved in this reliability test and the test was carried out by using only 20 word families. As a result, the authors obtained an accuracy score of 75 percent, which they claimed was satisfactory. However, the number of raters employed, the number of words examined, and the accuracy score obtained might not be large enough to substantiate reliability.¹¹

By using *A University Word List*¹³ and *Headwords of the Academic Word List*,¹⁴ I examined the coverage of the UWL and the AWL for the word types on a composite word list of 2,650 word types, a list made from word lists of 20 textbooks for Japanese nursing students,⁸ and found that the AWL covered 94 word types and the UWL covered 100 word types on the composite list. The UWL covered slightly more; however, the AWL would be more appropriate as a vocabulary study goal and a source for materials development when learners' vocabulary load is considered, because the AWL consists of 570 word families and the UWL contains 807 word families.^{13,14} When teachers use the AWL, care should be taken with homography, as I found some words on the composite wordlist (for example *episode*, *port*, and *sole*) used for different meanings in the nursing field from the main meanings of the same words in the more authentic lists described above.

5. Pedagogical implication of word lists

To clarify what kind of planning would be needed to ensure that the necessary University Word List vocabulary was covered in an English-for-Academic-Purposes reading course, Worthington and Nation carried out a study four years before the Academic Word List had been created, in which the UWL was set as the goal of vocabulary study in an ESP reading course.¹⁵ They

selected four disciplines—political science, social science, technology and engineering, and natural science—and prepared three sets of 12 texts 2,000 words long in each discipline. Only one set of the 12 texts, however, was provided for natural science. The combined text included 95 percent of the UWL word families. By checking the first occurrence of the UWL words in each text, they analyzed (1) how many texts the learners should read to meet all the words on the UWL at least once and (2) of the UWL words the learners first met in the texts, at what rate would the words recur as the student continued reading.

A large standard deviation was obtained for the number of previously unmet words, and the authors commented that the reason for this would be that the number of the UWL families in each text varied widely among individual texts. Yet, the authors showed by presenting the average that over 20 percent of the UWL word families were met in the first three texts, around 34 percent of the word families were covered by the first six texts, and nearly 50 percent of the UWL word families were met in the 12th text. As expected, the number of previously unmet UWL words decreased markedly at first then gradually tapered off. For academic vocabulary teaching in reading courses, the authors proposed a step-wise method: starting with high-frequency word families, then studying the UWL word families, and finally, doing extensive reading to meet the lower-frequency word families.

The study of Worthington and Nation provides useful information to ESP teachers on how many texts learners must read when the UWL is used as a goal in vocabulary study, and it could help teachers in making a syllabus for EAP reading courses.¹⁵ My major concern is that this research might be built up on the authors' several assumptions. First, there are several difficulties involved in checking the natural occurrence of words in texts. The authors assumed that the first occurrence of a word in the texts was the learners' initial opportunity to meet the word, but there is a possibility that learners had already encountered the word before, especially regarding a high-frequency word. Provided that the authors examined the learners' initial opportunity, only one sporadic meeting of a word might not be effective enough for most vocabulary learners to remember it. The quantity and sequencing of vocabulary and how many times learners need to meet words to fully comprehend and memorize them can be different among learners, depending on the individual's ability and English level, which would be

an important factor to be considered when a teacher designs his or her course.

Second, 2,000-word texts were used for the analysis but a 2,000-word text would be too long as a target reading material for Japanese EFL and ESL learners for even an intensive reading course. Therefore, their suggestions may not be very practical to EFL and ESL learners. If such texts were employed in my ESP classes for Japanese nursing students, the students would take the whole semester to read just one of them. The authors proposed a plan for academic vocabulary teaching in reading courses assuming that 12 weeks was the modest length of an EAP course, but most ESP teachers in Japan would not be able to spend the whole semester to teach only vocabulary or concentrate on reading especially to nursing students, because of their tight curriculums at school.

6. Conclusion

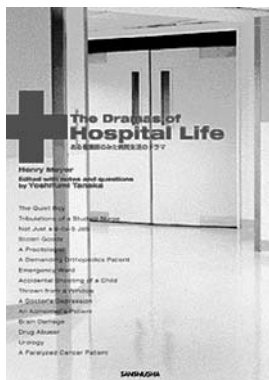
At present, not many studies targeting English lexical items for Japanese nursing students have been reported and, as a result, ESP teachers of nursing students in Japan still have to rely on studies in EAP and other ESP for sources of information. The findings of this review, obtained by analyzing an economics textbook, an applied linguistics textbook and an anatomy textbook, cannot be applied to textbooks in every discipline. Nor can the findings be generalized as being representative of textbooks for other subjects such as nursing. The review strongly suggests, however, the necessity of corpus studies as a rationale for selecting the English vocabulary to teach Japanese nursing students. The study also shows the importance of examining the validity of existing corpora or wordlists as vocabulary study goals or as learning materials for nursing students.

Acknowledgments

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ある看護師のみた病院生活のドラマ The Dramas of Hospital Life

田中芳文 編著)

B5判, 80頁, 定価 1,785 円(5%税込), 2007年3月刊行, 三修社

大病院に32年間勤務した看護師が、病院生活でのさまざまな経験を記録した、Henry J. Meyer 著“ The Dramas of Hospital Life ”を題材とした英語教材。原書の中から興味深い15話を選び、英語学習用に編集した。主に看護学生など医療系分野の学生を対象とするが、その他の分野の学生にも十分に使用可能。練習問題は、内容理解と基礎力の養成に配慮した。全15章構成。

CD(別売), 教授用資料(試訳付)あり。



誰でも書ける! 英語医学論文プロのコツ

Jeremy Williams(著), ウィリアムス美由紀(訳)

四六判, 160頁, 定価 2,730 円(5%税込), 2007年4月刊行, メジカルビュー社

先生と生徒の会話形式で解説が進んでいく“英語論文教室の実況中継”。日本で長年にわたって論文校閲の経験がある著者が、論文初心者だけでなく、中・上級者にとっても有効なポイントを詳解。さらに、重要なポイントはイラストやマンガを使って極力わかりやすく、覚えやすくしている。読みものとして楽しみながら英語論文についても学べる1冊。



これだけは知っておきたい看護英語の基本用語と表現

園城寺康子, 川越栄子(編著), Caroline White(英文校閲)

B6変型判, 240頁, 定価 1,890 円(5%税込), 2007年3月刊行, メジカルビュー社

様々なシチュエーションで患者と接する看護師にとって、英語でのコミュニケーション能力は大きな武器となる。看護師の日常業務において必要な“語彙”と、現場で有効な“会話表現”を集めた実践的な1冊である。巻末には「カルテ用語集」も収載。『これだけは知っておきたい医学英語の基本用語と表現』(藤枝宏壽, 玉巻欣子, Randolph Mann 編著)の姉妹編。

コーパスの医学英語教育への貢献： PERC Corpus プロジェクトを中心に How Corpus Linguistics Helps EMP Education, with Particular Reference to the PERC Project

演者

投野由起夫

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それでは最初に、コーパス言語学の基礎的な概念をお話しします。ここでお話しするのは、まずコーパスの定義 (definition) です。それから、コーパスにはいろいろな情報を言語的に入れ込むということを行います。1つは mark-up、もう1つは annotation といいますが、そこにはどのような情報が入るのかということをご紹介します。それから、英語のさまざまなコーパスがすでにかなりできあがっているのですけれども、どんなものがあるかをザッと紹介します。最後に、ESPとか、私はここで初めて知ったのですが、EMP というような言い方をするそうですね、その EMP Corpora はどうかというようなことを見たいと思います。

コーパスの定義と言語情報

まず definition ということですが、コーパスというのはいろいろ条件があるのです。1つ目は *New Oxford Dictionary of English* (NODE) で、いまは2版が出ていますが、その98年の definition です。“a collection of written or spoken material in machine-readable form, assembled for the purpose of studying English structures, frequencies, etc.” というので、collection であると。それから、書き言葉でもあるし、話し言葉でもあるよということです。また machine readable form ということ、コンピュータが読め

るようになってきているということです。そして「特定の目的のために集められている」ということです。

もう1つ、別の definition がありまして、これは私がランカスターの同じ仲間たちと一緒に書いた text なのですが、これにもいくつか似たようなことが繰り返されています。“Corpus is a collection of machine-readable authentic texts, which is a sample to be representative of a particular language or languages variety” ということです。ここでもいくつかポイントになるような要素が挙げられています。

コーパスというのは単純な寄せ集めではないのです。例えば、Google か何かで検索したような結果とは違います。コーパスの場合は、中身が何かわかっているということです。そして、収集には目的があるということです。特定の言語の編集なりバラエティ、あるいは医学英語なら医学英語というような、特定の目的をまず頭に入れて集められているということです。

続いて、コーパスにはいろいろな特徴があります。まず、言語的な特徴、corpus mark-up というものを見てみましょう。コーパスにはさまざまな text 的な情報を入力するのですけれども、普通はコーパスはただの plain text なのです。そこにさまざまな情報を入れる入れ方があります。大きく分けると、mark-up と annotation とに分かれています。“mark-up” というのは、text に関する情報を入れるのです。

演者紹介：投野由起夫氏 (とうの・ゆきお)

東京学芸大学卒業。同大学大学院英語科教育専攻(英語教育学)、英国ランカスター大学大学院言語学科博士課程修了、Ph.D.(コーパス言語学)。東京都立航空工業高等専門学校英語科専任講師、東京学芸大学教育学部英語科教育講座専任講師等を経て、2001年より現職。

大量の言語データをコンピュータで分析して言語研究を行うコーパス言語学を専門とし、コーパス言語学に基づく第2言語習得(特に語彙習得)を応用したNHK教育テレビ「100語でスタート! 英会話」の講師としても活躍。



Features: corpus mark-up

- Mark-up: a system of standard codes inserted into a document stored in electronic form to provide information about the text itself.

```
<header>
<textnum>0057</textnum>
<filedesc>
  <title>my family</title>
  <name>Hanako Yamada</name>
  <grade>10</grade>
  <date>1999-07-10</date>
</filedesc>
<textdesc>
  <medium>essay</medium>
  <domain>informative</imaginative>
  <genre>student writing</genre>
  <region>Japanese EFL</region>
</textdesc>
```

スライド 1

これはだいたいヘッダセクションに入れるのですけれども、例えばその text がだれによって書かれたかとか、何年に出版されたかとか、どこのウェブから取ってきたかとか、そのような text に関する情報です。information about text ということです。

もう1つは、text の structure があります。例えば、ここからここまでが paragraph なのだとか、ここまでが section だとか、ここが Abstract だとか、論文だったらここが Conclusion だとか、そのような paragraph、あるいは論文なり text の構造がありますが、そういうものを記号で入れるというようなことをします。

もう1つは“corpus annotation”です。annotation という用語は、言語的な情報を入れるときに使います。text の言語的特徴という、例えば品詞のタグです。これは動詞だとか、名詞だとか、そのような情報です。

2つ目はラマタイゼーション(lemmatization)といいまして、これは見出し語です。例えばbring, brought, bringingとか、そのように活用するときに、全部これはbringなのだとか、そのような見出し語情報を入れたいります。

“semantic tagging”というのは、意味領域を入れたいります。それから“parsing”、これは構文解析データです。

例えば、スライド 1 は corpus mark-up の例です。これは私がつくっている learner corpus の例ですけれども、text 自体は出ていないけれども、text の description とか file description の部分をヘッダに格納しているという、このようなフォーマットです。ここを検索して、コンピュータが、例えば皆さんが目的とするような text をコンピュータが探すときの手がかりなわけです。例えば、医学英語でこういう領域の text だけ取ってこいとか指示できるようになっているわけです。

同じように、その論文の構造みたいなことに関する情報を mark-up しておけば、abstract だけ取って来るとか、あるいは review のところの表現だけ取って来るとか、そんなこともできるかもしれません。

Corpus annotation: POS tagging

- POS information (British National Corpus)

```
<s n="26">
<w PNP>It <w VBZ>is <w AV0>now <w DT0>more <w CJS>than
<w AV0>ever <w VVB>clear <w CJT>that <w AT0>every <w NN1>section
<w PRF>of <w NN1>society <w VVZ>needs <w TO0>to <w VBI>be
<w AJ0>involved <w PRP>in <w VVG>responding <w PRP>to <w NN1>AIDS
<c PUN>, <w PRP>including <w AT0>the <w NN2>churches<c PUN>.
<s n="27">
<w NP0>ACET <w VBZ>is <w AT0>a <w AJ0>Christian <w NN1>initiative
<w VVN>supported <w PRP>by <w DT0>all <w NN2>denominations<c PUN>.
<s n="28">
<w PNP>It <w VBZ>is <w AT0>the <w NN2>churches <w CJT>that
<w VVB>provide <w DPS>our <w NN2>volunteers<c PUN>;
<w PRP>without <w DPS>their <w NN1>support <w PNP>we <w VM0>would
<w XX0>not <w VBI>be <w AJ0>able <w TO0>to <w VVI>provide <w AT0>a
<w NN1>service <w AV0>at all<c PUN>.
```

スライド 2

Corpus annotation: lemmatization

- POS information (CLAWS vertical format)

0000001	002	----	----	PUNC
0000002	001	NULL	<text>	PUNC
0000003	001	NULL	<s>	PUNC
0000003	010	PPY	You	you
0000003	020	VM	must	must
0000003	030	VVI	leave	leave
0000003	040	RT	now	now
0000003	041	/	/	PUNC
0000003	050	RR	otherwise	otherwise
0000003	051	/	/	PUNC
0000003	060	PPY	you	you
0000003	070	VM	will	will
0000003	080	VBI	be	be
0000003	090	JJ	late	late
0000003	100	IF	for	for
0000003	110	APPGE	your	your
0000003	120	JJ	social	social
0000003	130	NN2	studies	study
0000003	140	NN1	class	class
0000003	141	.	.	PUNC

スライド 3

今度は言語的な annotation というのはどんなものがあるかということ、品詞の tagging というのがあります。品詞タグ付与ですね。これは、いま、世界で最も大きいバランスのとれた、「均衡 corpus」といいますけれども、その1億語の corpus がイギリス英語であるのですが、その British National Corpus (BNC) というものの内容です。

スライド 2 を見ていただくと、1個1個の単語の前の部分に angle blanket といいますが、<w PNP> とか書いてありますね。こういうものがタグなわけです。この品詞のタグを手がかりに、一括で、例えば動詞の形を全部取って来るとか、その連鎖を取って来たりということもできるのです。

続けて、同じようなことに lemma の情報をつけることができます。例えば、スライド 3 では1行に1単語ベースのフォーマットになっています。You/must/leave/now/otherwise/you/will/be/late/for/your/social/studies/class. とか。そうすると、1単語ごとに品詞がついて、これが lemma になっているわけです。studies というところが study になったりしています。そうすると、見出し語検索をすれば、複数形でも単数形でも一括で取って来たり、そのようなことが全部できるわけです。

Corpus annotation: semantic tagging

■ Semantic tags (SEMTAG vertical format)

```

0000009 082 -----
0000009 090 PPIS1 I Z8mf
0000009 091 VBM 'm Z5 A3+
0000009 100 VVGK going T1.1.3[i4.2.1
0000009 110 TO to T1.1.3[i4.2.2 Z5
0000009 120 VVI tell Q2.1 Q2.2 X3 A10+
0000009 130 PPY you Z8mf
0000009 140 II about Z5
0000009 150 APPGE my Z8
0000010 010 NN1 host S2mf B1@ Y2@ S9%
0000010 020 NN1 family S4c A4.1c
0000010 021 /
0000010 030 AT the Z5
0000010 040 NN2 Saitos Z99
0000010 041 .
    
```

スライド 4

Features of corpus-based approaches

- Various language statistics (frequencies and distributions)
- Machine-readable text ⇒ Quick search for words/phrases
- Genre balance ⇒ Genre analysis
- Computer analysis ⇒ Find typical patterns not idiosyncrasies
- Huge amount of data ⇒ Finding patterns Statistical analysis
- POS/Syntactic info ⇒ more possibilities for noiseless data
- Cluster information ⇒ collocation pos n-grams, etc.

スライド 6

Corpus annotation: Parsing

■ Suzanne Corpus (POS, lemma, parsing)

```

A01:0250j - PPH1 It it [S[Ni:s.Ni:s]
A01:0250k - VVDt urged urge [Vd.Vd]
A01:0250m - CST that that [Fn%:o.
A01:0250n - AT the the [Ns:s.
A01:0250p - NNL1c city city .Ns:s]
A01:0250q - YIL <ldquo> -
A01:0250r - VV0v +take take [V.V]
A01:0260a - NNL2 steps step [Np:o.Np:o]
A01:0260b - TO to to [Ti:c[Vi.
A01:0260c - VV0t remedy remedy .Vi]
A01:0260d - YIR +<rdquo> -
A01:0260e - DD1i this this [Ns:o.
A01:0260f - NN1c problemproblem .Ns:o]Ti:c]Fn%:o]S]
A01:0260g - YF +. - .O]
    
```

スライド 5

もう少し進んだ研究をしている人たちもいます。彼らは semantic field というタグをつけているのです(スライド 4)。例えば、ランカスターには USAS (UCREL Semantic Analysis System) というタグセットがあって、これは Longman の Lexicon という thesaurus の dictionary があるのですが、その類義語辞書のような意味領域を単語に振っているのです。このようなことをすることによって、例えば、一般の人が読んでいる health と、専門領域の health ということを仕分けるようなことが技術的にできるようになる可能性があります。

また、context word のタグの意味領域を見ることで、専門的なことを言っているのか、一般的なことを言っているのかを text で分別するような技術が、ここから出てくる可能性があります。

スライド 5 は parsing のデータです。“It” 以下がずっと元の文なのですが、これが lemma です。その隣の “it” 以下が品詞です。ここは全部構文解析した頭語情報が入っているのです。これは Suzanne Corpus というコーパスの一部分なのですが、このようにセンテンスの NODE から、NP、VP のかたまりなどということが入って来たりす

ると、構造的な情報を検索したりすることもできます。

このような情報が入ってくると、いろいろなことの検索が可能になってくるわけです。皆さんはもうわかると思いますが、こういうデータを入れたものから、コーパス言語学というのはさまざまな頻度、そして分布の情報を取ってきます(スライド 6)。

まず、コンピュータに入っていますから、非常に高速に単語やフレーズのサーチができます。それだけではなくて、ジャンルのバランスなどをとってあれば、こういう領域ではこんな使い方、みたいなこともできます。

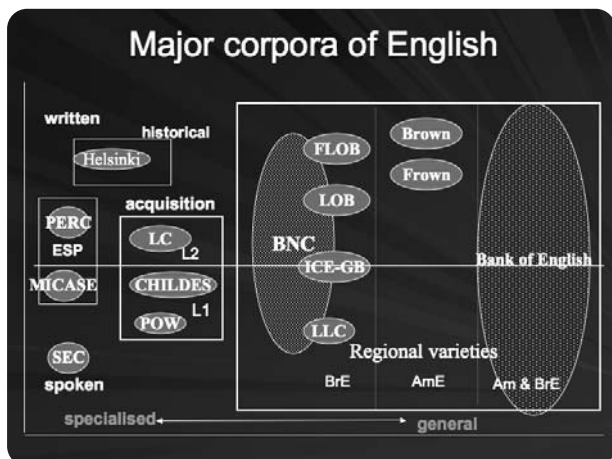
次に、コンピュータ処理しますから、人間が気づかないようなパターンを取って来たりすることができます。

それから、ものすごく量が多くなってくると、いろいろな統計処理などをして、さまざまなデータの summary の仕方ができます。

それから、単純に単語レベルで検索していたり、あるいは文字列処理しているだけだと正確に取ってこれないのですが、それに品詞や構造、構文解析のデータがついていれば、もっとノイズの少ない、正確なサーチができるようになります。

また、1単語だけではなくて、クラスタの情報も取ってこられます。ですから、どういう単語とどういう単語が連結しているのかとか、どういう品詞とどういう品詞がよくくっついてくるのかとか、品詞と単語の連鎖なども取ってこることができます。

以上がコーパスのおおよその特徴なのですが、英語のコーパスというのは世界中にどのくらいあるかということ、いまはものすごくたくさんあるのです。前は自分でリストをつくっていたのですが、いまはあまりにもたくさんいろいろなコーパスがあるので、自分でリストをつくっているのが面倒くさくなってしまったくらい、たくさんあります。



スライド7

Text Selection

- **Journal Citation Reports (JCR)**
<http://www.isinet.com/isi/products/citation/jcr>
 - It presents quantifiable statistical data that provides a systematic, objective way to determine the relative importance of journals within their subject categories.
 - 5,700 journals in the Science Edition
 - **Impact factor:** provides a way to evaluate or compare a journal's relative importance to others in the same field
- Selection was made by choosing the top 20% of the journals with the highest impact factor in each field
- JCR classification of subject fields is used

スライド8

コーパス の分類

大きく分けると、書き言葉のコーパス(written corpus), それから spoken corpus とに分かれます(スライド7)。それから、どちらかという general な汎用のコーパスと, specialised corpus といいますが、特殊領域のコーパスに分かれるのです。汎用のほうは、大規模なものが多いです。BNCは1億語、Bank of Englishがいまは4億数千万語とされていますが、つい最近、OxfordがOxford English Corpusというのをつくってしまっていて、来年ぐらいに完成する予定なのです。そのコーパスのサイズは10億語です。ものすごい規模のコーパスの構築がいま盛んになってきています。

特殊コーパスのほうは、集めにくかったり、技術的に spoken だと書き起こしに手間がかかったり、小さいものが多いです。ESP関係は、このあたりの領域に位置づけられるわけです。EAPなども含めれば、いくつか公開されているものがありますけれども。

医学英語というのは、実は私は門外漢で、今回も発表の中にたくさん難しい単語が出てきて、私の知らない単語がたくさんあったので、先生方に「これは何という意味?」と聞かれると恥ずかしいな、と思ったりしたのですが、Medical English Corporaというのは、私の知るかぎりではあまりたくさん公開はされていないのです。

1つは、歴史的な研究をしている人たちが公開しているものがあります。The Corpus of Early English Medical Writing というものがあります。これはCD-ROMでJohn Benjaminから出ているのですが、ご存じの方もいるかもしれませんが、昔どのように英語を使っていたかという、歴史的なものです。

あとは、コーパス言語学の学会に行っても、ESP関係で Medical English という発表は多いですが、ほとんどが自分でインターネット等で取ってきているものばかりです。ですから、コピーライトをクリアしているような試みはあまりないのです。私的なinstituteの中でキープしていたりして、だれも使えないというデータがたくさんあります。

PERC と CPE

そこで、われわれはそのような壁を1つ打破しようということで、いま、大きなプロジェクトを立ち上げています。それがPERCという団体と、CPEというプロジェクトなのです。これをザッとご紹介したいと思います。

PERC(Professional English Research Consortium)は2002年に、割と広く Professional English というものに関するさまざまな研究をするような association として発足しました。コーパスだけではなくて、例えば教材作成やテスト作成、広く Professional English の研究というものをやる団体です。
<http://www.perc21.org>

一応、日本でできたのですけれども、いまは会津大学のThomas Orr先生がヘッドになっています。世界的には、例えばミシガンのJohn Swalesとか、Ulla Connorとか、そのようなESP関係の大御所もPERCのメンバーとして活動してくださる予定です。

いま、PERCの活動の中心になっているのが、このCPE(Corpus of Professional English)ということで、科学技術系の英語に関してコーパスづくりをしようということになって、私がコーパス言語学のほうで、Professional Englishの専門家ではないのですけれども、コーパスづくりという意味で参画しています。

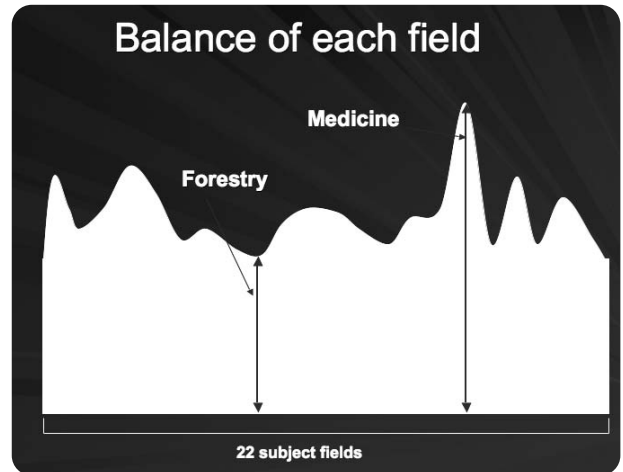
そして、さまざまな形のリサーチを、このデータを使ってやっていこうではないかということで始まっているのです。ただ、なかなか時間がかかって大変な作業なので、まだ完成には程遠いのですが、第1段階はほぼ終わってきたのでご紹介しています。CPEは、もともとはさまざまなコーパスのtextのタイプをバランスよく集めようということを考えています。例えば、医学なら医学なのだけれども、journalだけではなくて、この分野のさまざまなことをサンプルとして1つのコーパス・データとして持っているようなことをイメージしています。ただ、最初はacademic journalsを中心に収集しています(スライド8)。

textセレクションは、Journal Citation Reportsというもの

JCR Fields

■ Medicine	■ Electrical & Electronic Engineering
■ Biology	■ Computer Science
■ Food Science	■ Telecommunications
■ Environmental Sciences	■ Nuclear Science
■ Mathematics	■ Material Science
■ Physics	■ Metallurgical Engineering
■ Chemistry	■ Construction & Building Technology
■ Engineering	■ Civil Engineering
■ Earth Science	■ Fisheries
■ Agriculture	■ General Sciences
■ Oceanography	
■ Forestry	

スライド 9



スライド 10

を元にして、ここのインパクトファクターが非常に高い journal を選定して、サイエンスのエディションだと5,700 誌ぐらいがこのレポートに載っているのですが、そのうち上位20%の journal を選んでいます。そしてその出版元に Consortiumとして手紙を書いて、年から年までの全部の article(あるいは論文)を研究用に提供してほしい、というようなことをしています。

JCRの fields は、大体 22 fields(スライド 9)になります。medicine は、そのうちの1つなのです。科学技術関係の割と総合的なコーパスというようなデザインになっています。

バランスに関しては、実は 22 fields をやってみると、JCR でも随分違うのです。例えば、medicine は非常に JCR に出てくる率が高いとか、あるいは forestry は低いとか、そのようなことがあります(スライド 10)。

そこで、コーパスのデザイン的には、まず academic journal text を、例えば 30 万語ぐらい必ずどの領域にも集めておく。そのあと、70 万語ぐらいは他の text type を集めて、少なくとも 100 万語規模のものを 22 fields 集めると。そうすると、2,200 万語になりますから。このようなもので、100 万語単位の比較が科学技術分野に関してできるようなものを、まずベースに持っています。そして、それに集められるだけ上乗せしておいて、使える方は全部 medicine を使いたいとか、そのようなことがあってもよいだろうというようなデザインになっています。

さまざまな出版社にコンタクトをとって、そして非常に大きな反響がありました。例えば、いま大御所だったら Elsevier とか、IEEE とか、そのようなところからもコピーライトの許諾を得ています。ただ、彼らはテキストファイルで提供してはくれないのです。勝手にウェブページにアクセスして、取っていいよということはいわゆる誰でも。

われわれがずっとこの 2 年ぐらいやっているのは、PDF ファイルを e-journal のサイトから取って、そしてそれを全部テキスト処理でダウンロードしたものをコンバートして、

CPE-Medicine

■ ALLERGY	■ MEDICINE, OPHTHALMOLOGY
■ MEDICINE, DENTISTRY, ORAL SURGERY & MEDICINE	■ MEDICINE, OTORHINOLARYNGOLOGY
■ MEDICINE, EMERGENCY MEDICINE	■ MEDICINE, PARASITOLOGY
■ MEDICINE, ENDOCRINOLOGY & METABOLISM	■ MEDICINE, PERIPHERAL VASCULAR DISEASE
■ MEDICINE, GASTROENTEROLOGY & HEPATOLOGY	■ MEDICINE, PSYCHIATRY
■ MEDICINE, GENERAL & INTERNAL MEDICINE	■ MEDICINE, RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING
■ MEDICINE, GERIATRICS & GERONTOLOGY	■ MEDICINE RESEARCH & EXPERIMENTAL
■ MEDICINE, HEALTH CARE SCIENCES & SERVICES	■ MEDICINE, SUBSTANCE ABUSE
■ MEDICINE, IMMUNOLOGY	■ MEDICINE, TOXICOLOGY
■ MEDICINE, MEDICAL INFORMATICS	■ MEDICINE, VETERINARY SCIENCES
■ MEDICINE, NEUROSCIENCES	■ NEUROSCIENCES
■ MEDICINE, OBSTETRICS & GYNECOLOGY	■ OTORHINOLARYNGOLOGY
■ MEDICINE, ONCOLOGY	■ PHARMACOLOGY & PHARMACY
	■ VETERINARY SCIENCES

Tokens (running words) in text 3,155,412

スライド 11

そしてクリーニングするという作業をしています。この部分の作業がものすごく大変で、これで何本も論文を書いているぐらいのものなのですが、PDF からテキストへの自動変換というのは非常に難しいのです。簡単だ、ソフトもあるよ、と言う人がよくいるのですが、そんな生易しいものではなくて、さまざまなゴミが出るのです。そのようなものをクリーニングしながら、皆さんが程度使えるようなフォーマットにまでするのが一苦労という作業を、ずっとしてきました。

今回、CPE の first release というのがそろそろ出せるような状態になってきました。これは academic journal だけです。ですから、先ほどのバランスはとれていません。ただ、すばらしいことに、すべてコピーライトは許諾を得ています。そして、さまざまな出版社から、いまのところ 3,700 編の学術論文を取れています。いまの規模ですと、1,700 万語ぐらい、これは科学技術英語全体ですけれども、それが 22 fields に分かれています(スライド 11)。

medicine はどんな内容になっているかという、GSER のブレイクダウンなのですが、スライド 9 のような分野のものが取れていて、journal はまたこの下に何種類か

Word	Freq	%F	RC	Freq	RC	%F	Keywords
PATIENTS	8,710	0.29	2,076	0.02	20,000.30	0.0000000000	
CELLS	8,971	0.28	12,752	0.08	7,939.30	0.0000000000	
DRUG	2,589	0.08	695		6,363.49	0.0000000000	
DISEASE	2,787	0.09	1,277		6,623.63	0.0000000000	
CLINICAL	2,203	0.07	763		4,929.33	0.0000000000	
TREATMENT	4,211	0.13	5,391	0.03	4,195.11	0.0000000000	
CELL	5,944	0.19	10,247	0.06	4,100.00	0.0000000000	
INFECTION	1,791	0.06	711		3,839.97	0.0000000000	
NICE	2,211	0.07	1,396		3,794.46	0.0000000000	
WOMEN	1,379	0.04	247		3,766.48	0.0000000000	
DRUGS	1,397	0.04	355		3,457.16	0.0000000000	
DOSE	1,936	0.06	1,141		3,450.71	0.0000000000	
BLOOD	2,144	0.07	1,570		3,362.07	0.0000000000	
TUMOR	1,299	0.04	253		3,363.60	0.0000000000	
RISK	2,082	0.07	1,612		3,282.20	0.0000000000	
CANCER	1,267	0.04	297		3,204.74	0.0000000000	
COCAINE	991	0.03	79		3,104.26	0.0000000000	
PATIENT	1,638	0.05	920		2,981.56	0.0000000000	
VACCINE	673	0.03	29		2,960.73	0.0000000000	
WERE	20,829	0.66	70,758	0.43	2,883.44	0.0000000000	
THERAPY	1,083	0.03	268		2,726.66	0.0000000000	
ORAL	1,108	0.04	315		2,676.30	0.0000000000	
ANTIGEN	1,157	0.04	359		2,617.33	0.0000000000	
HUMAN	2,340	0.07	2,608	0.02	2,574.55	0.0000000000	
IMMUNE	1,230	0.04	547		2,514.46	0.0000000000	
RECEPTOR	1,972	0.06	1,943	0.01	2,492.00	0.0000000000	
INFECTED	1,213	0.04	635		2,488.65	0.0000000000	
IL	1,522	0.05	1,086		2,426.15	0.0000000000	
LDL	969	0.03	259		2,384.42	0.0000000000	
WHO	1,867	0.06	1,000	0.01	2,330.03	0.0000000000	
VIRUS	1,072	0.03	429		2,290.81	0.0000000000	
ASTHMA	640	0.02	8		1,287.65	0.0000000000	

スライド 12

入っているのだと思います。

現在、われわれがつくっている全体のコーパスの中で、medicineのセクションは300万語ぐらいです。ですから、それを大きいと思うか、小さいと思うかは皆さん次第だと思えますけれども、少なくともこのぐらいの規模のものがいま集まっています。

CPEのavailabilityということですが、このfirst releaseというのは、まず最初はPERC researchersという人たちが使って初期の研究をします。public releaseというのは、web-basedなインターフェースで、将来、来年の初めぐらいにオープンにしたいと思って、いま作業中です。小学館コーパスネットワーク <http://www.corpora.jp> という、小学館が企業としてこの科学技術関係の部分のサポートしてくれているので、そのようなサイトをオープンする予定です。

もう皆さんも知っているかもしれませんが、BNCとか、COBUILDのデータとか、大きなコーパス・データが、この小学館のサイトではweb-basedで利用できるようになっています。ですから、web-basedな、コーパスのポータルみたいな感じに使っていくということです。

コーパス と EMP

では、残りの20分ぐらい、コーパスとEMPという話をしたいと思えます。先ほどのようなデータができてきて、われわれがそれにアクセスできるようになると、どのような分析が可能で、そしてそれを元にすると、例えばどんな可能性があるのだろうかというようなことを、ちょっと考えてみたいと思えます。

実は私の分野というのは、コーパス言語学といってもバリバリにコーパス処理の言語学的な部分ではないのです。私はどちらかというと、言語教育とのリンクを考えるようなことが専門なので、医学英語教育という意味では、私のやっているようなことを医学英語に適用するようなことを

blood: grammatical relations

■ Triplets:

- <subject, flow, blood>:
 - "blood" is the subject of "flow"
- <object, suck, blood>:
 - "blood" is the object of "suck"
- <modifies, transfusion, blood>:
 - "blood" modifies "transfusion"
- <a_modifier, blood, cold>:
 - "cold" is an adjective modifier of "blood"

スライド 13

やっでごらんになったらよいか、と思うことがいくつかあります。そういう研究分野では、実はコーパスというのは、皆さんもおわかりだと思いますが、直接的に利用する場合と、間接的に利用する場合があるのです。そういうことについて、ちょっとお話ししたいと思います。

それから後半のほうでは、available corporaということ、すでにつくられているコーパスを使うというようなことと、あとはDIY (do it yourself) corporaですね、自分でコーパスをつくるような技術が、最近発達してきているのです。これはたぶん、インターネット等に興味のある方ならば、必ず役に立つ技術だと思いますから、ぜひメモでもしてってください。

まず、間接的にはどんなことが可能かということの例をいくつかお見せします。まずはEMPのmaterials developmentということで、たぶん語彙リストみたいなものをつくっている方がいますね。コーパスをうまく使えば、非常に有効に語彙リストが作れます。それから、そこから発展してlexicon database、単なるword listではなくてlexiconとしてそういうもののデータをつくっていくというようなことも可能になります。それから、reference toolsだったら辞書や文法書、それから教科書、テキストですね、それから言語テスト。先ほど、言語テストの話をされていたと思いますが、

一般の英語教育のほうでされているようなことをちょっと見て、それを元に、医学英語だったらどうかというようなことを考えてみたいと思えます。

コーパスを使った語彙リストにはいろいろな技術があるので、いまでは非常に目的特化したtextを集めます。そして、そのtextでどんな単語が使われているかを自動抽出するような技術があります。それはreference corpusといって、大量の一般的な英語の文章と比較することによって、その専門分野で特によく使われている特徴語を抽出するような、そういう手法があるのです。それぞれのコーパスから語彙リストをつくって、医学英語のコーパスから

Behavior of “blood” (1)

		BNC	CPE-Med
blood + V	run	91	0
	flow	68	0
	come	51	0
	take	38	taken (1)
	pour	34	0

• In PERC-Med Corpus, the word “blood” is seldom followed directly by a verb.

スライド 14

頻度表をつくる。そして、そのreferenceになる大型コーパスから、無色の、割とニュートラルなリストと比べてみるわけです。そういうことによって、medical Englishに特徴的な語彙を取り出すということです。このようなことを、いまはコーパスではソフトウェアで簡単に行うことが、技術的には可能になっているのです。

これには、いろいろな統計の手法を使って抽出する、例えば代表的なものはlog likelihoodとか、そういう相対頻度のずれの度合いの大きいものを抽出するものを使います。

そうしますと、例えば先ほどのmedicineのセクションをCPE(科学技術英語)全体と比べてみたりすると、medicineの300万語のセクションのキーワードは、スライド12のような感じで出てくるのです。medicineのtext properに出てくる特徴語が、特に特徴の強いものから順番に並んだりします。なかには専門用語、専門用語との中間、機能語的なものももう少し下へ行くと出てきますけれども、医学英語の特徴をこういう形で機械的に抽出してみて、そしてわれわれが気がつかなかったようなポイントをコンピュータ的に取り出すようなことが可能になります。

これだけでと、単にword listを分野ごとに細かくつくる、というような発想になりますね。それだと単語単体のことになってしまうので、どのようにほかの単語と一緒に使うかというようなことがわかりません。

そこで、もう少し細かく文法的な関係、これをgrammatical relationsというのですけれども、そのようなものをしっかり見たり、それからcollocation分析みたいなことをすると、もっと単語の使い方が詳しくわかるようになります。

例えば、“blood”という単語を例にとると、一般の英英辞典であるMacmillanの辞書では、こんなことが書いてありました。1つめは普通の「血液」です。2つめは「血統」とか、町、地域、グループとしての、仲間意識としての「血」みたいなことでしょうか。そして3つめがviolenceやdeathを意味するという一般の英語で使われる“blood”の定義がありません。

Behavior of “blood” (2)

■ *blood* + noun: most common usage

- blood flow
- blood pressure
- blood samples
- blood vessels
- blood cells
- blood donation
- blood glucose
- blood transfusion
- blood aqueous
- blood gas
- blood ocular
- blood retinal
- blood loss
- blood levels

スライド 15

そして、一般英語のコーパスを見てみますと、“blood”というのは割と“blood”単体で出てきて、そして動詞と結合するようなものがたくさん類文で出てきます。ですから、一般の英語で“blood”と使う使い方というのは、動詞とのcollocationなどがとても多いのです。

ところが、これをもっと詳細に分析してみるわけです。例えば“blood”というのがどのような関係をしているかというのを、tripletという形で取り出すわけです(スライド13)。「bloodはflowのsubject(主語)になる位置関係にある」というのを<subject / flow / blood>というtripletとして取り出します。このようなことを、機械的にやるわけです。そうすると、“blood”という単語の使われる場面や状況を、grammatical relationsの束で表そうとするわけです。こういうことをたくさんやると、“blood”という単語がどのように使われるかということをもっとtextを分析した結果としてデータベース的に取り出すことができるのです。こういうものを取り出すと、かなりメリハリがわかってきます。動詞との連結の例を見るだけでもかなり違うのです。

BNCではこういう動詞との結合がたくさん出てくるのですけれども、おもしろいことに、medicineのコーパスではこういう例はほとんど出てこないのです(スライド14)。つまり、“blood”単体で結びつく動詞との連鎖は、medicalなtextではほとんど出てこないのです。逆にどういうものが出てくるかということ、“blood”というのはほとんどがcompoundで出てくるのです。

スライド15は名詞との連鎖で、大量に先ほどのmedicineのテキストから抽出したもののなのですけれども、この“blood flow”のflowは動詞ではなく、名詞のflowなのです。このようなmedicalなテキストでは、“blood + noun”という形での結合が圧倒的に多いのです。単純に動詞とbloodが結びついている例というのは、ほとんどありませんでした。

これを見ると、われわれが知っている“blood”などという単語でも、医学では全く違う使い方をすることがわかります。こういう部分というのは、案外われわれにとっ

Sketch Engine

- Adam Kilgarriff (Univ. of Brighton, Lexicom)
- His Sketch Engine makes it possible to integrate grammatical information extracted from corpora into a web-based lexicon database.
- Easy to use, very fast
- <http://sketchengine.co.uk>

スライド 16

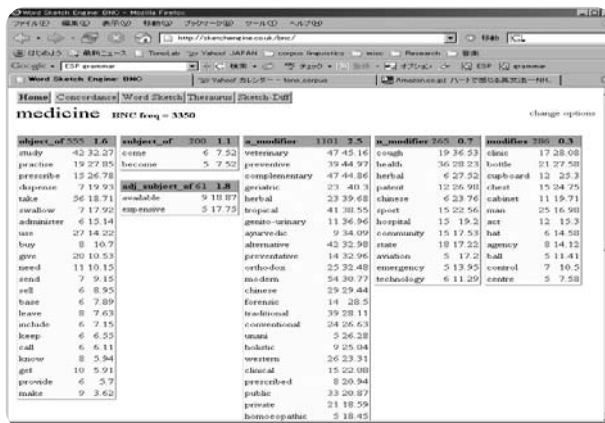
て、というか普通の英語を勉強してきた者にとっては難しい点というか、あまり気がつかない点ではないかと思えます。

実は、これを大量にデータベースとして皆が使えるような研究をしている人がいるのです。Brighton大学のAdam Kilgarriffという人ですけれども、この人はLongmanの辞書、Macmillanの辞書、そしていまはOxfordなどを手伝っている自然言語処理(natural language processing)の研究者で、lexical databaseなどに非常に詳しい人です。この人はSketch Engine(<http://sketchengine.co.uk>)という先ほどのgrammatical relationsみたいなものをウェブ上で検索できるようなシステムをつくっているのです(スライド 16)。

これは非常にパワフルなもので、例えば“medicine”という単語を検索すると、これはBNCなので、ESPのテキストではないのですが、それでも、例えば“medicine”というものは、“object of”ですから、こういう動詞の目的語になって現れる。“study medicine”, “practice medicine”, “prescribe medicine”とか、そのような目的語の関係。こちらはこういう形容詞がくつつくか。それから、どんなcompoundをつくるかなどということが、データベースの形でガーッと出るので。

そうすると、この“medicine”という単語の使われ方がチャートになっていて、そしてこういうところのstudyの42番というところをクリックすると、具体的に例文に飛ぶわけです(スライド 17)。そうすると、どのような使われ方をするかが一度にわかるわけです。これをESPのコーパスでやったら、とてもおもしろいのではないのでしょうか。そうすれば、一般のgeneral Englishではなくて、ESPのtext、EMPのtextだったらどうなるかというようなことがわかれば、その差がかなりあると思うのです。そういう差を研究するようなことも、必要だと思えます。

いま、コーパスを使った辞書というのは国内外でたくさん出ているのです。ですから、たぶん先生方も先ほどのようなことを元にして研究すれば、もっと使いやすいEMP用の辞書というのをつくれるはずなのです。いまのEMP用の



スライド 17

辞書は、私はよくわからないですけれども、専門用語の辞書は単にterminologyの辞書ですよね。そういうものが圧倒的に多いと思うのです。ですから、本当の使い方がよくわからないものが多いと思うのです。

例えば“infection”という単語は、一般の英英辞典ではan ear infectionという用例が1つ、それからあとはmild/slight/severeなどの程度を表す形容詞と一緒に使われているとか、この程度の情報量です。これを医学生が聞いても、とてもではないけれども、彼らは“infection”の医学における全体像はわからないでしょう。

ところが、先ほどのようなデータベースを駆使して研究した結果、何かしらそういうものを元にしたテキストをつくれば、例えばですけれども、“infection”の2つの意味で、特にこちらのほうの意味では、どのような名詞とcompoundをつくるかとか、adjectiveだったらどんな種類のものとか結びつくかなどということを整理したりできるかもしれません(スライド 18)。これは、ちょっと不正確なものもあるかもしれませんが。ですから、これは1つの例だと思って見てください。こちらでは、動詞との結びつきです。そういうものも、“infection”にくつつく動詞などがあって、これがもしも訳語と簡単な例文つきなどで出てくれば、相当活用できるresourceになるのではないのでしょうか。

コーパスを用いた辞書だけではなくて、いまは文法書もどんどん出始めてきているのです。先生方はどうお考えになるかわかりませんが、医学英語には医学英語なりの文法があるのでしょうか。そういうことは、ESPなどでもいろいろ議論があると思います。もしも一般の文法とは少し違う文法の特徴があるとすれば、そのようなものをコーパスで調べて、コーパスに基づくような医学英語の文法書があってもよいかもしれません。maybe ENP grammarということですね。

私は、コーパスを使ったテキストをたくさん出しています。NHK関係もそうですし、ほかにもいろいろなところから出ています。こういうものは、先ほどのiPodとか、iTunesとか、ああいうところにも私の教材が載っているの

EMP dictionary entries

in·fec·tion [n.]

1 [countable] a disease that affects a particular part of your body and is caused by bacteria or a virus:

[noun + infection] *HIV; pylorus; HIV-1; virus; tract; chest; throat; ear*
 [adj. + infection] (1) *viral; bacterial; urinary; respiratory; fungal; candidal; trichomonal; chronic; genital*
 (2) *secondary; heavy; opportunistic; acute; recurrent*

2 [uncountable] when someone is infected by a disease:

[verb + infection] *prevent; acquire; diagnose; eradicate; transmit; cause; treat; combat; associate; develop; catch; eliminate; spread; suffer; avoid*

スライド 18

ですけれども、そういうコーパスに基づくテキストという発想があれば、ひょっとしたらコーパスに基づくEMPのテキストもあってよいかもしれません。私のような中高生モード、一般モードでなくても、もっと医学生向きの何かができるかもしれません。

そして、Language Test Developmentということですが、実はいまは世界的な規模でいくと、CambridgeのUCLES、USAではETS、この辺が大量にコーパス・データを集めています(スライド 19)。5年ぐらい前には、そういうことはしていませんでしたが、最近は彼らは非常にそういうことについての重要性を感じ始めていて、テストを受けた人たちの exam responses とかエッセーなどを大量にアーカイブしているのです。そして、それを元に、いろいろな形のことをしています。例えば、自分たちのつくったテストの開発、そして validation のためにそのようなものを参考にしたり、それからエッセーを自動gradingするということですね。これはETSなどがいま盛んにレポートを発表していますけれども、こんなこともやっています。

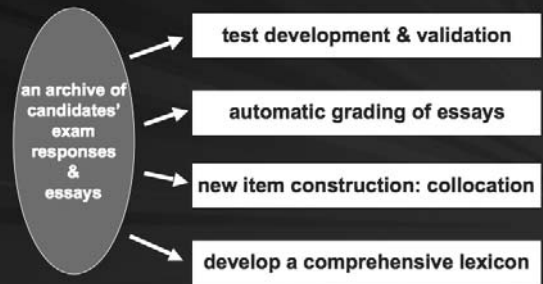
それから、新しい item construction というのを collocation でやるようなことを、UCLES でやっています。つまり、collocation の知識で測ったほうが、単語単体の知識よりも弁別性があるというようなことを、彼らはレポートで言っているのです。

それから、comprehensive lexicon ということで、このようなものを元にして、どのような単語の知識のデータベースができれば、それを元にテストが開発できるか、そのようなものを総合的につくろうというような発想も、テスト分野の人たちの間には出てきています。

いまの繰り返しになってしまいますが、general English と medical 関係の English との間の違いも、当然あるでしょうね。そして、それを習っている医学生が、あるいはお医者さんになる人たちが習っている過程で、どんなつまずきや間違いをするか。きょうも学習者コーパス(learner corpus)の発表がいくつかありましたけれども、そのような発想で、こういう3つのデータを組み合わせて研究するよう

Language test development

■ UCLES (Cambridge) & ETS (USA)



スライド 19

な可能性が出てきます。つまり、目標となるESPのターゲットの様子をしっかりと研究するだけではなくて、そこまでするまでどのようなプロセスを経ていて、どこがつまずいているかというようなことを、learner corpus で調べるわけです。これは、spoken だったり、written だったりしますけれども。こんなことを組み合わせていくと、EMPのさまざまな materials development に非常にプラスになるような素材をたくさん集めることができます。

Web as Corpus

すでにあるコーパスを使うというのは、先ほどのPERCのコーパスなどを使えばよいのですが、そうではなくて、自分でつくりたいという方がいると思うのです。実は、こういう技術が最近ものすごく発達してきているので、ちょっとそのことをご紹介します。

実は、web as corpora,あるいはweb as corpus というような動きが、コーパス言語学者の中にあるのです。2006年度のAdam Kilgarriffによれば、Googleでインデックスされている duplicate-free データベースの形になっていない、つまり static な形でインターネットに載っているような text は、英語の場合は 10 thousand billion words です。どのぐらいか、日本語だと何兆と言ってよいのかわからなくなってしまいうぐらい多い量ですけれども、このぐらいが estimate であるので、本当はどうかわからないぐらいたくさんの量があります。

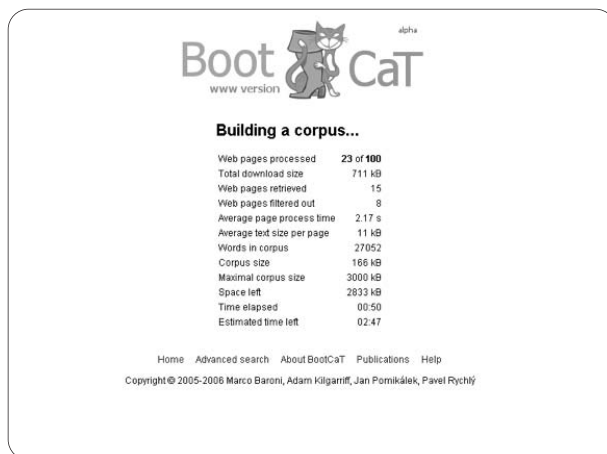
これを何とかして利用しなければ、というようなムーブメントがだんだん強くなってきて、実はGoogleに勤めている Franz Ochさんという人が、250 billion word のトレーニング・コーパスというのをつくったと発表しました。すごい量ですね。ですので、こういうことが実際に研究としては可能になってきています。

そこで、いくつか既存の技術で皆さんが検索できるような corpus の使い方があるかというようなことを、ちょっと説明します。

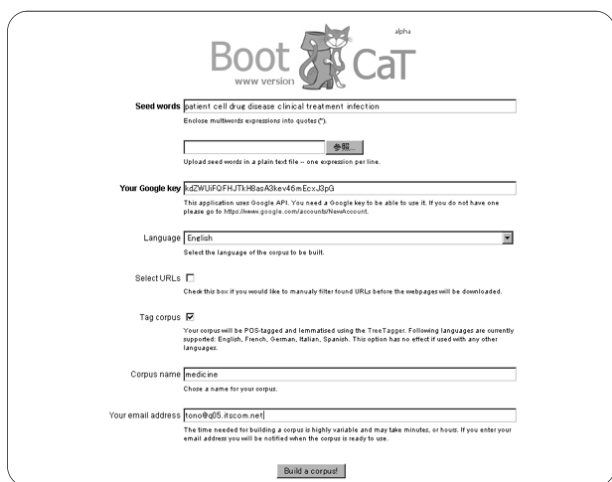
1つはWebCorp(<http://webcorp.org.uk>)という、これは



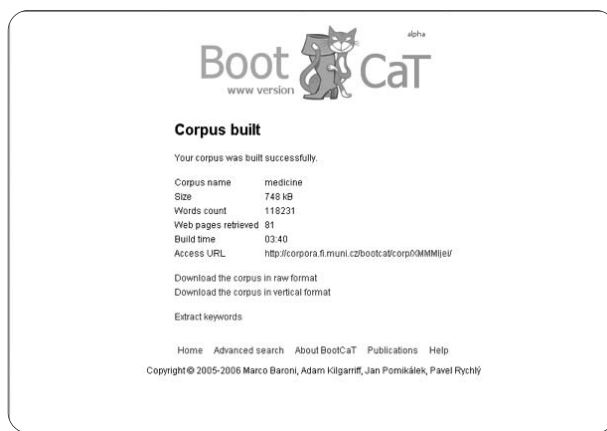
スライド 20



スライド 22



スライド 21



スライド 23

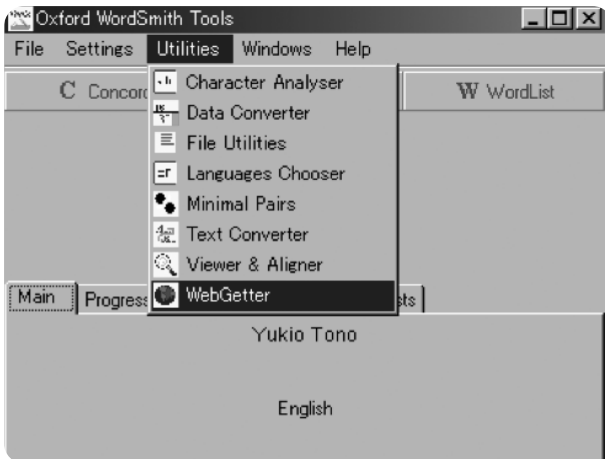
Antoinette Renoufという人が中心でやっています(スライド 20)。Liverpool大学から最近 Central England 大学へ移りましたが、これはウェブ上の Google などの resource を元にキーワードを検索して、それを表示するようなサービスです。それも、ウェブページをコーパス的に使おうというような発想のインターフェースなのです。

WebCorp を立ち上げて search term というところにご自分でキーワードを入れるわけです。これを組み合わせたりすることもできますし、自分なりにパターンを書いたりすれば、かなり医学的な text だけを絞って取ってくるようなことができます。サーチエンジンを選んだり、いろいろなことをやって、submit を押すのです。ただ、ウェブをクロールして集めてくるので、ちょっと時間がかかります。ですから、WebCorp の 1 つの問題は、遅いということなのです。ただし、チョンとやっておいて、少しどこかへ行ってから戻ってきたりすると、このようになっているわけです。中には「何だこりゃ」と思うようなものも出てくるかもしれませんが。そういう場合には、もともとの URL へ行って、そこが信頼できるかどうかということをチェックしてくればよいわけです。しかし、少なくともこういう形でたくさんフレーズを一度に集めたりするようなことは、イ

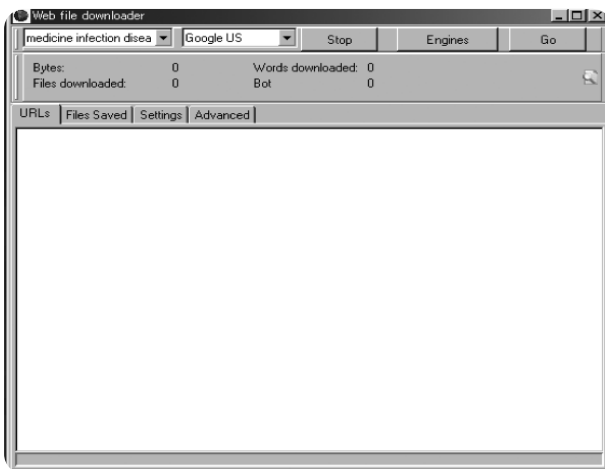
ンターネット上でもできます。こういうインターフェイスのほうが、Google よりもごみがなくて、比較的好いかもしれません。

次に、まだ開発中なのですが、すごいものが出てきました。BootCaT というシステムです(スライド 21)。これは Bootstrapping Corpora and Terms というのですけれども、これは先ほどのような分野ごとの特徴語みたいなもの、「このキーワードを 10 個ぐらい入れれば、絶対に関連する text がばっちり取れる」と思うようなキーワードのリストをつくりますね。そういうものを seedwords といいます。その seedwords を元に、tuples という、いくつかペアをつくるのです。例えば、3 つずつぐらいのペアを、10 個のうち最初の 3 つ、1, 2, 3。次には 2, 3, 4。次には 3, 4, 5 というように、組み合わせた単語のリストをどんどん Google にほうり込みます。そうすると、その組み合わせで Google が取ってきたものの中の集合体みたいなものができるね。それをコーパスとして考えようという発想なのです。そして、Google のヒットを、これは API でヒットしたヒット結果を元に、自動でダウンロードするようなことをするわけです。

この BootCaT は現在開発途中なのですが、彼らは何とすべてをウェブインターフェースでやろうと考えています。



スライド 24



スライド 25

ですから、われわれ利用したい人がその seedword を入れれば、クローリングしてきて、コンピュータでサイトから集めてきたウェブページを保存して、クリーニングして、そしてすべてコーパスとしてそれをフォーマットして見せてあげるといところまで、全部やるのです。すごい技術でしょう。このようなことを、いま WACCX (web as corpus cool initiative) という団体が中心でやっているのです。

どのようになっているのか、お見せしますと、私が medicine のセクションから取ってきた “patient” “cell” “drug” “disease” “clinical” “treatment” “infection” などというキーワードトップの単語を入れたとします。これには Google の API を使う、Google に登録したキーが必要ですが、英語のデータを取ってきてくれ、それを “medicine” という名前にするよ、私のメールアドレスはこれですと書いて、submit するわけです。

そうすると、コーパスをつくっていますということで、ウェブページをプロセスしたのがこれだけで、というようなページが出て、自動的にこの数字がどんどんふえていくわけです (スライド 22)。そして、corpus built (コーパスができました) というメッセージが表示されれば完了です (スライド 23)。実は先ほどありましたけれども、いまのバ

Conclusions

- Corpora will save the world of EMP!
- Collaborate with corpus linguists!
- Join the international community!

スライド 26

ージョンはテスト版で出ているので3メガバイトまでしかつくるパワーがないのです。だけれども、この範囲でこの URL にアクセスすると、何と、単に text をダウンロードできるだけではなくて、すぐに検索できるインターフェースに飛んでいけるのです。つくってくれたものを、すぐにコーパスの検索ソフトとして使用できます。そうすれば、“infection” というようなものの動き方などが、全部コーパス上でさまざまに分析することができます。

それだけではなくて、collocation の処理等もできます。例えば「動詞 + cancer という形を取ってこい」というと、動詞のところが高ライトされて、cancer とどんな動詞がくつつくかとか、そのようなこともわかっていきます。

このようなインターフェースは、実は Sketch Engine とも連動しています。将来的には、何と、先ほど私が紹介した grammatical relations みたいなものも瞬間的につくって、そしてデータベースとして同時に使えるような技術をいま開発中なのです。大量のデータにこういうことができるようになるには、まだちょっと時間がかかるとは思いますが、少なくとも先生方が教室内で非常に特定の文脈の医学トピックのようなものを seedword にして、この text を世界中から取ってきて、ミニ・コーパスを使って授業をしたりということは、すでに可能な時代になってきているということです。

似たようなことは、実はいちばん新しい WordSmith のバージョン 4 という、Windows のソフトでもできるのです。WebGetter という機能を使うのですが、WebGetter というのを選びます (スライド 24)、こんな画面になって (スライド 25)、そこに先ほどの “medicine” とか “infection” というキーワードを入れるわけです。そして「Google で取ってきて」というようにやると、どんどん世界中のこういうページがあるところをクローリングしていきます。そうすると、先ほどの WordSmith ですぐに検索できます。ただしこれは、先ほどのように文法のタグ等はつきません。先ほどの Boot-Cat のほうは、文法のタグまでつけるので、それがすごい

ですけれども。こんな感じで手軽に、この WordSmith などは1万数千円のソフトですけれども、こういうものを使うだけでも、すぐにかかりのことはできます。

こういうことを元にすれば、直接医学生がソフトを使って、そしてコーパスにアクセスして、そのコーパスでいろいろ調べるようなことが現実味を帯びてきます。インターネットさえあれば、自分でキーワードを入れて、瞬時にコーパスをつくったりすることもできるかもしれません。また、そういうものを元にしてエッセーを書いたり、いろいろなことをする指導をうまく組み合わせることもできます。こういうものを data-driven learning というのですけれども、そのようなことを実際にやっている人たちもふえてきています。

ということで、皆さんはコーパスをどう思われたでしょうか。EMP に非常に役に立つ部分があると思うのです。ま

だあまりたくさん行われてはいないかもしれませんが。手間暇をどのくらいかけるかということでは、ある程度テクニックさえ習えば、1人でもできます。それほど大変なことではないです。大変だと思ったら、われわれのようなコーパス言語学者と組んでやればよいわけですから。そして、international committee、先ほどの BootCat みたいなものは、世界中の人たちが「おれもやりたい」といって参加して、オープンソースでやっているのです。あの辺の技術は、全部無料です。ですから、そのようなことを皆さんと一緒にやれば、resource を共有したりできますね。Medical English というのは、たぶん世界中共通なところが何かあるのでしようから、そのようなことをやってみるのもよいのではないのでしょうか。どうもありがとうございました。

(2006年7月16日、ウェルシティ金沢にて収録)

医学英語学習能力の開発

座長

吉岡俊正

東京女子医科大学医学部

1 . ESP for Effective EMP: Basic Concepts, Tools, and Applications

Judy Noguchi (武庫川女子大学薬学部)

2 . 国際化時代の看護専門職に求められる英語力：その教育のあり方

飯田恭子 (首都大学東京 健康福祉学部 / 日本医療科学大学)

3 . Effective Teaching of Medical English with a Problem-based Learning Technique in a Large Class

植村研一 (横浜市立脳血管医療センター)

4 . アイ・アム・ユア・ドクター プロジェクト

吉岡俊正 (東京女子医科大学医学部)

1 . ESP* for Effective EMP** : Basic Concepts, Tools, and Applications

Judy Noguchi (Mukogawa Women's University, School of Pharmaceutical Sciences)

*ESP: English for Specific Purposes, **EMP: English for Medical Purposes (See p. 104)

First of all, I would like to start with what ESP is and is not. People have misunderstood ESP. It is not simply about technical terms, it is not only about the grammar, it is not only about reading, and it is not only about writing a research paper. ESP encompasses a lot more. ESP is actually about all of these and much more, so I would like to explain some of the possibilities of ESP today.

Three views of ESP

I think ESP has been misunderstood because it basically has three viewpoints, and it also has had a rather meandering history. The three viewpoints, Thomas Orr has nicely summed up in his book on English for special purposes case studies in the TESOL practice series. He says there are three referents when you talk about ESP in the world of English language education:

1. *It could be a specific subset of the English language.* If you are a researcher, this is probably what you are most interested in.
2. *Or it could be a branch of language education.* If you are interested in teaching, then this is what you want

to consider.

3. But it also has been *a movement that has popularized the profession and the work with ESP discourse.* You have people who translate, who copy-edit, who help people to rewrite. There are many, many different fields related to ESP and so you have a lot of people involved in this.

Some ESP history

Now the **history of ESP** has also been rather meandering. There are many key texts on English language teaching and applied linguistics. In the sixties and seventies, when ESP was really getting started, there was no word for ESP. It was known under many names, like EST (English for Science and Technology). Right now “English for Specific Purposes” is most often used, but some people still refer to it as English for specialized or special purposes. Why is it that ESP didn't have a nice little name that people could all remember it by? Well, I think the researchers themselves didn't really know what was happening. They were trying to find out more about this

very interesting sort of language.

In the 1960s, it started off with *register analysis*. People were saying, “Hey, you know, these scientific texts are doing something interesting. Look at the grammar! Look at the lexical features.” They didn’t have corpus linguistics in those days, so a lot of these things evolved slowly. By the 1970s, people were looking at larger portions of text, saying, “Ah, OK, if you look at it from the rhetorical aspect, from a discourse aspect, then we can say these things”

And finally in the 1980s and 90s, you got something called *genre analysis*. The term genre analysis is also a bit confusing. John Swales wrote about this from around 1990, but there are different schools of *genre analysis*, and that’s what makes it a bit complicated. Basically, there are three big schools in practice today, around the world. The North American school, which is looking at the interrelations between text and context, considers genre to be dynamic and unstable, and so it’s something difficult to capture.

The Australian school is very much informed by systemic functional linguistics, which has a strong sociolinguistic basis. But they do look at the textural characteristics: they are moving from the textual to a little bit more of the social aspects, but they consider genre integrity to be attainable and stable. In Australia, they’re actually using this genre analysis approach to teach the native English language even to children in elementary schools. This approach makes a lot of sense in the Australian school system.

What is of interest to people in ESP and EMP in this case is the Swalesian school, after John Swales; it tries to bridge the gap between the North American and the Australian schools. It considers genre integrity to be static but developing; so John Swales’ 2005 book on research genres has a section on “the research article revisited.” When he first came out with his genre analysis book, he focused on the research article and he now comes back to it again and says there are other related genres that also need to be considered. So it’s a developing phenomenon. So what is genre according to Swales? He has defined it in many ways, in different publications, but it’s very nicely put in Bhatia’s book on analyzing genres.

Defining genre

Somebody asked me, what is genre? And it’s not a text; it’s a communicative event, and I think this word “communicative event” nicely summarizes what a genre

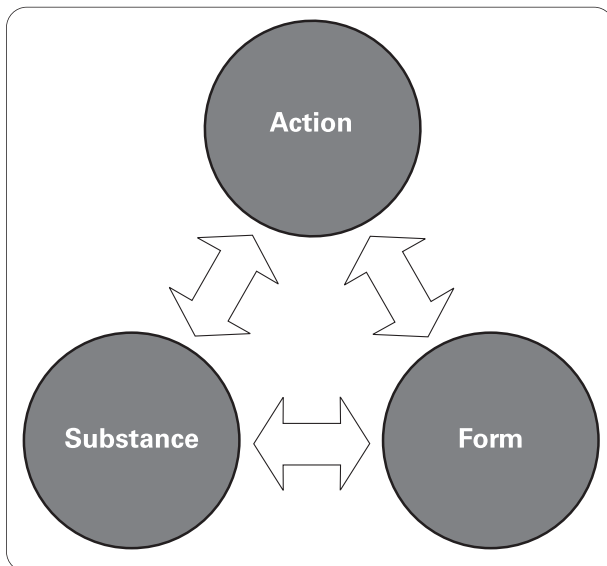
is and can be. It’s characterized by communicative practices, which are understood by the people within the same community. The community of people who use a genre know what it is. They give it a name. So if I told Professor Tono, “I just dashed off a conference abstract because I want to present at the conference next year in Spain,” he would say “Oh yeah, OK. So she has probably written a 200 to 250-word abstract describing the study she’s doing with the aim, the materials and methods that she’s used, the kinds of results she’s gotten, and what she intends to say about it.” So this word “conference abstract” has a specific meaning to people in the field. This is genre—200 to 250 words, it’s very highly structured, it’s conventionalized, it has constraints, it tells me what I can do with it. I have to package the information in a certain way so that I can get this information to the intended audience as smoothly as possible. So this packaging constrains me but it also frees me in a way, saying that if I do it this way, the message will get across. And these constraints are used—they’re exploited—this word *exploit* usually comes out with a negative meaning, but here it’s used in a positive sense. People who are expert members of the community exploit these constraints so that they can tell the world what they’re thinking, and what they want to do. Within the framework of socially recognized purposes, it becomes nicely acceptable.

So you can summarize it like this, I think: language is composed of patterns: the sounds form patterns to make words, the word patterns form phrases and clauses, these phrase and clause patterns form sentences, and sentence patterns form texts. Many people who teach language usually stop here. They teach the students the vocabulary, they teach them grammar, they teach them how to write a sentence, and there’s a lot about paragraph and essay writing. But many people don’t go this one step further, which is, I think, the realm of what ESP is about. *It is these text patterns that form genres*. And it’s these genres that we need to be aware of if we want our students to be successful in the community that they join in the future. It’s these genres that we need to look at.

Action, substance and form of genre

Genre has these three components: an action component, a substance component, and a form component (slide 1.1). If you don’t have a good balance of these three, you will not have a good genre text.

If you have something wrong with the **form**, let’s say that I wrote a paper for a scientific journal and I send it



Slide 1.1. Three components of genre.

A genre text has three components.

off and I get—I think many of you have seen this Dear Dr. Yamamoto letter from the editor—“Your manuscript referenced above has been reviewed and I invite you to revise it and resubmit the manuscript along the lines suggested for further consideration in the *Journal of Surgical Research*” and whatnot.

Reviewer 1: “The concept of this study is interesting, but the data are difficult to interpret. The conclusion may not be valid. First, the conclusion in the abstract should be restated.”

Another comment: “But in the current form, the message is quite mixed and not readily interpretable.” More problems with the **form**.

Reviewer 2: “Although the writing is generally good, there are numerous instances of awkward wording.” So here, there’s something wrong with the form. You’ve got to do something with it so that your message becomes clear.

Sometimes there is a problem with the substance. The **substance** is the content of the thing itself. This came out in the July 6th *Nature Podcast*. *Nature* featured an article “Sociologist Fools Physics Judges.” Harry Collins is a social scientist, but he has been studying physicists and how they work. So he decided to try and pull a ruse. He decided to try and fool physicists into believing that he was a physicist. What did he do? He made up a set of seven questions about gravity wave physics and gave a reply that he thought of, which was not really based on physics principles. He also had a response from a real physicist. It was interesting: real

physicists couldn’t quite distinguish between the two. Seven were unsure and two actually chose Collins’s answer as the correct one. To check this, *Nature* sent the questions and answers to another gravitational wave physicist at the University of Glasgow and she also was unable to spot the impostor. So this is an instance, I think, where you have the correct **form**, but the **substance** is not really quite what you’re looking for.

There was another very famous affair, the Sokal affair, which was a hoax posed by physicist Alan Sokal. He actually wrote a paper, a pseudoscientific paper, for publication in a postmodern cultural studies journal. And on the day that it was published, he revealed that it was a hoax in the *Lingua Franca*. So there are ways of fooling people: your form looks good, but your substance is lacking. That’s why you have peer review.

OK, what about this **action** component? Is it possible to have something that looks good, has good content, and yet doesn’t do anything? Well, Carolyn Miller, who has been doing a lot of genre studies, says yes, this is possible. In 1984, when she was thinking about this, she said, rhetorically, a sound definition of genre must be centered not on the substance or the form of discourse, but **on the action it is aiming to accomplish**. The discourse community, the people that you are trying to move, to shake up, the society you’re trying to work with, have to be moved to do something with whatever it is that you are publishing. Miller rejected a group of environmental impact statements (this was in the United States); these documents were very good substance-wise. The form was also good and they looked like genre articles, genre documents. However, she said these documents had no coherent pragmatic force. Nobody read them and did anything with them. Therefore, she said that without any meaningful action, you cannot consider these as genre texts; they’re not working in the community. So when you’re thinking about a genre text, you have to think about what it is going to do. How is it going to move the community? How is it going to make a difference?

So a genre text has to have a good balance of these three components: action, substance, and form.

Focusing on genre form

In the realm of teaching, from an ESP practitioner viewpoint, what I am most interested in is the **form** component. This is what I’m trying to teach my students. For the action and the substance components, I would need

to collaborate with people in my field, people in medicine, in pharmacy, in nursing, to get what it is that this text is trying to do in their field. As professionals, what do they intend to do with this text? What is the substance they will accept? This is where the peer review stuff comes in. And then I, as a language expert, will look at the form and say, “OK. In order to effectively teach this, why don’t you do this?”

Why do we have so much focus on form? Well, researchers in second-language acquisition—Doughty, Williams, Long, and Ellis—have said that classroom-oriented research reveals that some linguistic features do not ultimately develop to target-like levels. On the first day of this JASMEE conference somebody mentioned the fact that “my students don’t understand general English, so how in heck are we going to have them function at a professional level?” Well, these people, when they graduate, when they start working in their fields, all of a sudden they go from beginner, or intermediate, to professional. They have to perform at this very high level. And it’s not something that you can gradually build up over the years; you just don’t have time for that. So what do you do?

Ellis says you can focus on form in different ways. You can focus on *forms*—notice the *s* at the end!—meaning that you can look at all these grammatical structures, you could look at these lexical items and focus on that. But in doing so, you’ll only be focusing on form. You’re only going to be teaching the lexis. You’re only going to be teaching the grammar. You’re not going to be teaching the genre, so we have to be careful about this.

The last one at the bottom, “incidental focus-on-form” (slide 1.2), is the path that many native speakers take. You get tons of material, you are exposed to this all your life, you get a feeling for the language. Because of this extensive exposure, you understand the meaning and you start saying, “Oh, this looks like what I should do if I’m writing a conference abstract.”

In a seminar I was presenting together with some-

body who had just finished a physics degree at Cambridge, after I talked about using this genre approach to writing the abstract, he came up and said “Yeah, come to think of it, that’s what I’m doing. I just didn’t know I was doing it.”

What we take in ESP is this middle path, *planned focus on form* (slide 1.2). The main emphasis is on meaning, in other words action and substance are important, but we also specifically focus on the forms when necessary. How do we do this? Well, I use the “OCHA” approach.

Using the OCHA approach

Most of my students are in science and technology, so the observe-classify-hypothesize-and-apply approach makes sense to them. This is what they’re doing in their field anyway. And so I say, “Would you please use this approach to looking at language? Don’t just say, ‘Oh, this is an English text; where is my dictionary?’ Don’t start translating from word one. Step back. Look at this text. Who was it written for? Why was it written? What is the purpose of this text? Who is the audience that it was written for? What kind of information do you think it contains based on what you looked at in the beginning?” And therefore if you have to translate this text, or if you have to understand this text, what kind of language features does it have? This is where we started looking and, “Oh, the passive voice is used a lot. There are a lot of modal auxiliaries.” I just finished a lesson on instructions for dealing with hypoglycemia. You have a lot of *ifs, when, may, might*—modal auxiliaries—in there: *In case of this, do this.*

Look at the language features themselves. If you’re looking at the rhetorical, the general structure of this text, the first section is on background, and then you run into the instructions section, and then you see a little follow-up. What kind of structure does this text have? And, of course, the grammar. I just said we look at the modal auxiliaries; we look at the verbs. Do you use present tense verbs? Do you use past tense verbs? Are they passive? And then, the lexis. Professor Tono was talking about the fact that *blood* often appears in a compound noun. Yes, that’s true in medical language, and we need to know this. Also looking at how these words are structured, from Latin and Greek affixes is also useful.

	Types of Form-focused Instruction	
	Primary focus	Distribution
Focus-on-forms	Form	Intensive
Planned focus-on-form	Meaning	Intensive
Incidental focus-on-form	Meaning	Extensive

Slide 1.2. Genre forms.

Ellis: Form-focused Instruction and Second Language Learning (2001).

Nature Podcasts as teaching materials

Then there are the technical and phonological elements. I would like to introduce a lesson that I gave with my students. These students are not in medicine, but this can be used with people in medicine. *Nature* has these podcasts which come with transcripts. This is the beauty of it: They give you both the MP3 file and the transcript, which means that if students have a problem with just listening and understanding, they can read the portion of the text that they're interested in. So this is the *Nature Podcast*.

What you get here (slide showing webpage) is the interviewer talking with the scientist who actually published something in *Nature*. I put the script taken from the Web into Excel and rearranged it. And then looked at what the speakers were doing. This question-and-answer thing was very useful. I teach students who are preparing a conference abstract for conferences and have been doing research on this. We are finding that there are certain set patterns for this question-and-answer period. I've also done research with poster sessions. The same kind of question-answer sequence comes up. So what I did was look through that, analyzed that with the students, and then had them plan their own little podcast so that they could apply what they had learned.

So when you're thinking about educational materials, I think we should make the students aware that they have certain features that they should observe, classify, hypothesize, and apply. They should use them in practicing and learning about the language that they need to learn.

Yoshioka (Moderator): Thank you very much. So, may I ask you a question? You've shown some videos actually using ESP in your class; how often do you do this type of lecture in order for students to be familiarized with those forms?

Noguchi: At the beginning, I tell them, OK, I'd like you to (a) listen to the *Nature Podcast*. I have them

choose the section that they're interested in and have them (b) summarize it. The next time, I ask them to (c) look at the questions that Chris Smith asks (Chris Smith is the narrator). The next time, I ask them to (d) focus on how the answers are given. And the beauty about the *Nature Podcast* is that it's aimed at a general audience, which means that the student has to be able to explain his or her research in understandable terms, and this seems to be extremely difficult. It's the difficult portion in the question and answer period in a conference. And it's also very difficult in a poster session presentation. So this gives them practice in restating vocabulary.

And also, if you look at the transcripts, these transcripts are not the script; they're transcripts from the audio. Which means they also include restatements, they include mistakes—things like that. So the students realize "Oh, even native speakers do things like this." And not all of the speakers are native speakers. The researchers that are interviewed are from all over the world. So you get different types of language, you get all kinds of fields related to this one, everything from geochemistry to, of course, a lot of medicine.

Yoshioka : Do you need, as a teacher, some ability to do some reflection, or feedback?

Noguchi: Yes, there are always a lot of questions about what does this mean, and so looking at phrases and also not understanding what was being said. But the thing about the html transcript is that you can click on one of the markers and it'll take you to the *Nature* original paper, or even, if you have web access to the Japanese version, the Japanese version of whatever is being explained. So it's very useful.

Yoshioka: No other questions, anyone? No? It was a very interesting presentation. Thank you very much, Professor Noguchi.

(Transcription by Christopher Holmes)

2. 国際化時代の看護専門職に求められる英語力：その教育のあり方

Specialized English Education for Health/Medical Professionals

Yasuko Iida (Tokyo Metropolitan University, Nihon University of Medical Science)

看護英語を取り巻く状況

私の大学では、看護職、作業療法、理学療法、放射線、臨床放射線技師など、いわゆるコメディカルの方々、特に看護職、リハビリ職などの学生さんたちの教育が主ですので、そういう領域の方々に特化した、特に看護職における専門英語教育を具体的に展開しています。

この領域の専門英語教育のニーズは、ご存知の通り大変高まっています。高学歴化は全般的に日本全国そうなのですが特に看護系では急速に大学や大学院の数が増えてきて、この10年くらいで7~8倍になっていると思います。大学院も70を超えています。大学も150以上あります。

とにかく生き残りをかけて、全部の大学が高学歴になっていますので、自動的に英語の文献も読めなければいけないとか、そういうニーズが高まっています。

看護職で非常に難しいのは、より高度な看護職を目指すのであればいけないということです。大卒者の場合、専門学校卒の人は1年早く臨床に出ていますから、臨床に入ったときには1年先輩になるわけですね。そうしますと、大学卒の新たなアイデンティティが欲しいという気持ちが大変強くありまして、その一つに「自分たちは現場で英語ができる」という自信を持ちたいという気持ちがあるようです。

ただ、看護の専門職化が非常に高度になってきていますので、それ以外にCNS(clinical nurse specialist)とか、専門看護師のcertificateなどが欲しいということもありますので、英語でアイデンティティが欲しいというのは、そのごく一部です。

もう一つ、専門学校卒の方々がそのまま大学院に入学できるようになりまして、即大学院を受験したいというニーズも非常にあります。

それから全般的には、小学校から英語教育が始まるみたいですが、国際共通語としての英語はmother tongueとしてしゃべる国の人たちから、official languageの人たち、second languageとしてまで、十数億人はいるだろうということですから、どうしても語学のニーズというのはどの領域でも高まっているわけです。

ただ、英語教育実施上で私が大変感じることは、看護領域の学生さんとか専門職の場合に、概して英語力レベルが大変低いということです。ですから、看護学生に対しては、医学生対象の英語教育のようにはいかないという現実があると思います。

それから、このコメディカル領域、特に看護領域は女子学生が非常に多い。それもあせいか、学習目的とか、その内容、考え方が非常に現実的であり、実際的な自分の二

ーズに合うようなものでないと、なかなか乗ってこないということがあります。

また、専門職意識が大変強いです。“I am a nurse.”という、数十年前にナースの免許を取ったような人が、大して看護職をしていなくても「自分は看護職である」というような意識が大変強いです。

ですからいろいろな面で、看護の視点というものをとても大事にします。看護学は非常に学問体系化が進んでいて、理論も非常によくシステム化されています。そうしますと、それぞれの学問というのは、もちろん—logyがlogicでlogosであるように、一つひとつの言葉というものが非常に大切になります。

特に看護学では、特有の言葉というものがあまして、近年は看護職で非常に語学のできる人たちが増えてきていますので、一般英語の通訳とか翻訳者たちの誤訳を指摘することが大変に多くなってきました。それは、やはりその領域の学問を学習していないと、どうしても起こることなのです。やはり看護の言葉ですから、看護職自身が自ら語学レベルの水準を上げていくと。

看護領域、リハビリ領域はたいがい欧米で学問体系化されていますので、もちろんそれは当然、言葉のほとんどがいまは英語です。それをそのまま理解していかないと、非常に厳しいところがあります。ですから、非常にできる人たちがどんどん増えてきていて、とてもよいことだと思っています。

看護学生の要望

今回の話は具体的なものにしたいと思ひまして、たくさん看護職の方々から伺ったことを私なりの言葉に書き換えてみました。

Bilingual professionalになりたいとか、contributorでなければいけない。特に看護の場合は、いままでは欧米で研究されていたようなアプローチを、人間へのケアですから、文化的、宗教的な、また生活レベルでの考え方が反映されなければいけないのですが、日本では合いにくい理論が非常にたくさんあります。それを今度は、日本は日本の看護であるということを発信していきたいという、発信型ということを大変強調されています。それで、contributorになりたいという人が非常に多いのです。

それから、ethicsの問題とか、collaborator, team workもすごく強調されてきています。特にteam workに関しては、非常にニーズを感じられていて、日本の医学界も変わってきました。

ただ、「team work」というのは、全員がおれの考えに従う

1. Growing needs for specialized English education

* Intensive Scholastic Development of health/medical professionals

Universal Higher Education in Japan: A rapid increase in the number of 4-year colleges/universities, master and doctoral programs in nursing and allied health areas

The 4-year college/universities graduates, seeking for a different identity, feel that English proficiency could be their possible distinguished quality.

* Opportunities opened for graduates of professional training colleges to apply for master's programs without completing 4-year colleges

2. Growing needs for medical English instructors.

An increasing number of nursing training colleges, junior colleges, and 4-year colleges are replacing the requirements for general English with medical/nursing English.

Slide 2.1. Specialized English Education for Health/Medical Professionals.

- English is currently the most widely-spoken language of communication to be able to reach out to the international English-speaking mind, interact with foreign patients, and seek job opportunities worldwide. A working knowledge and good communication skill are indispensable.
- By employing English we can all be instantly connected with the most advanced medicine and technology, in touch with the up-to-the-minute information in making the most accurate diagnosis and treatment.
- Major medical research and publications require English availability for contribution to or subscription for journals worldwide, for keeping abreast of the cutting-edge of knowledge, philosophy and technology.
- Increased dynamic participation in international activities among health professionals.

Slide 2.2. Increasingly Rapid Globalization: Globalization is a reality for all of us.

ことだ」などと言った人がいましたが、そのような発想でとらえられることが、まだまだ医学界では多いようです。

Collaboration というキーワードでの論文というものは、医師が書かれたものはほとんどなくて、やはりコメディカル、特にナースとか、作業療法などの視点から書かれたものが非常に多いようです。

それから ethics の問題とか、そういう領域も非常に関心が高まってきています。リスクマネージャーでありたいということがありますので、そういった領域の彼らのニーズに応えなければいけないということがあります。

- Being a bilingual professional. (Being able to freely express either orally or in written language and participate in discussions in the specialty area.)
- Being a contributor to the international society. (Being able to develop unique conceptions or messages and dispatch them to the outside world with confidence.)
- Being an internationally accepted specialist. (Being able to constantly improve knowledge and skill of the specialty area based on the internationally common concepts and theory and make decisions from a broad perspective.)
- Being a collaborator in a multidisciplinary or multicultural group. (Being able to cooperate or collaborate with specialists of different cultures and disciplines.)
- Being a good risk manager. (Being able to self-manage, self-control with proper risk management strategy in an international society.)

Slide 2.3. Requirements of Internationally-active Health/ medical Professionals.

Prepare students:

- To be bilingual clinicians in hospitals in Japan.
- To be able to access the recent medical, nursing issues.
- To be able to participate in the international nursing world.
- To be researchers in specialized areas.
- To work and study abroad.
- For foreign government license examinations.
- To be health/medical English teachers.

Slide 2.4. Specific Educational Goals.**看護の視点**

具体的な教育内容とか目標は、やはり学生さんや看護職を見てみると、臨床現場の bilingual になりたいというのが一つです。それは一つの大きなグループです。

それから、もう少し学術的な領域を目指したいというグループがあります。研究、留学、論文を読む、海外のライセンスを取る、大学院に進学したいとか、そういう2つの目標に分かれていると思います。

臨床の bilingual になりたいというのは、やはり臨床現場のいろいろなことを学習したいと。ですから、私はこの2つの目標にそれぞれどういう教育が必要か、非常に具体的にリストアップしています。

きょうはコーパスのお話を大変興味深く聞きましたが、そのようなことを私ももっと primitive なレベルで、たくさん読んだ文献中から frequency で、どういう言葉にどういう言葉がついているかというような発想で、いろいろ調べてきました。

例えば臨床現場ですと、現場で飛び交っている foreign-loan words といっていますが、カタカナ語みたいなものが

Foreign-loan words in clinical situations.
Foreign-loan concepts in nursing science.
Terminology: prefixes, suffixes, roots.
Communication skills based on case studies.
Assessment, Patient teaching, Providing explanations.
Expressing compassion, encouragement, etc.
Postural and ADL-related expressions.
Therapeutic positions, motions.
Usage of frequently used verbs in nursing literature.

Slide 2.5. Educational Emphasis.

大変多いです。

それを私は何度も繰り返し調査しまして、ほとんど臨床経験が2年以上ある看護職とか、実習先にいったときにどれだけそういうものを聞かかということ調べて、まず知っておくべき語のベスト100を選びました。それは、もちろん英語に全部転換させまして、かつ、英語でどのように使えばよいのかということをやっています。だいたい350ぐらい覚えていればよいだろうと思っています。

それ以外にも、もちろん terminology, これは医学部と共通ですが、接頭辞、接尾辞、必須の言葉がありますから、それを覚えるように学習させなければいけないだろうと思います。

それから先ほども言いましたように、割と英語力そのものの水準が低い場合が非常に多いのです。かといって、中学・高校で6年間も英語教育をしているわけですから、おとなに一からピアノを教えるわけにはいかないと同様に

おとなの人にピアノを教えるときには、好きな曲からやらせていくみたいなのところがありまして 語学的に厳密性を追求していくとなかなかついて来られないところがありますので、その辺の考慮も必要ではないかと思っています。

そこで、basic wordsを選んでいきます。それはすでに高校くらいで当然知っている言葉を、医療系でどう使いこなすかということです。

それから、やはり medical English corpusの説明でありましたが、結局看護系のテキストとか、向こうのいろいろな州が出している看護職のライセンスの試験問題の本をたくさん調べました。そして、どのような動詞の頻度が高いかも調査しました。

また、看護系は特有の使い方をしていきますから、医師の場合はこういう言葉を使うのに、看護職ではこういう動詞を使うということがありますので、それは看護というものとのとらえ方、やはりそれが看護の視点なのだろうと理解しています。そして、教えるときには必ず evidenceを示していかなければいけません。

先ほども言いましたように、主に学生さんたちは、実際的、具体的、現実的なものを望みますので、いちいち「これはこういう理由で、看護系では大変よく使う言葉である」と、

Materials taken from license examinations in U.S.
Translated materials from the Japanese national examination.
Prepared materials from all areas of nursing science with questions to check comprehension.
Reading abstracts of scientific papers.
Reading tables and figures with statistical analyses.

Slide 2.6. Rapid Reading and Comprehension Practice.

理由を提示することと、実際にこのような頻度に使われているということを明示して「だから、この30の動詞を覚えなさい」という必要があります。それから、看護職の場合は言葉のニュアンスの違い、それが非常に大事だと思います。文法的なこともさることながら、その言葉の持つニュアンスというものを native 感覚でとらえられるような指導の仕方を、私はできるかぎりしています。

例えば、先ほどのコーパスのことですが、ある言葉にどのような形容詞がついているか。といいますのは、看護というのはすべての用語が概念ですから、概念にすべて definitionがついています。それで、看護ではこの概念というのがたくさんありますが、それに「こういう definitionである」ということで使っています。

その definitionの説明をするときに、先ほどのコーパス的な発想で、その言葉にどのような形容詞がついているかということ、あるいはその言葉にどのような動詞が使われているか。例えば、stressとpainとで、どのような動詞が使われていて、どのような動詞がどちらかに使われていないか。例えば stressとは何かということ具体的に defineできるぐらい、どのような用語がついているかということが一つのおもしろい研究になるぐらいで、私は今日のコーパスの発表も興味深く聞きました。

それから、先ほどの bloodにどのような複合語があるかと。そういう複合語というのものも、特にケアとか看護の重要な概念です。そのときに、どのような複合語がついていて、それはなぜかみたいな発想から入っていくと、自分たちの専門の内容であるだけに、非常についてくるように私は感じました。

Educational emphasis(スライド2.5)と書きましたが、現場でのカナ語とか、臨床現場の言葉とか、概念とか、terminologyです。それから communication skillとしては、それなりにアセスメントの言葉とか、patient teaching, 看護職は指示しなければいけませんし、アセスメントをしなければいけない。さらにいろいろなこと説明しなければいけないし、compassionを示さなければいけないし、励まさなければいけないというような、たくさんの communication skillがありますから、看護職に特化したものを、その状況に応じてケーススタディ方式で指導していくことをしています。

- Names of disease, device, equipment
- Nursing and medical techniques, procedures
- Concepts of foreign origin
- Advanced medical technology
- English words commonly used in Katakana, yet with different nuances
- English expressions preferred for their scientific or sophisticated atmosphere
- Already recognized Japanese words
- High-level English preferred by doctors
- Previously non-existent roles
- Specific nursing interventions
- Euphemistic expressions
- English used for convenience
- Words only understood among those of the same profession
- English words coined in Japan

Slide 2.7. Foreign-loan Words in Clinical Setting Categorization.

こういったいろいろなことを通じて、特に看護職の人たちというのは英語のプロになるわけではなくて、看護職のプロになりたいと思っているわけですから、その人たちを支援するという視点がないと、なかなか受け容れてもらえないと思います。

それから、看護職が看護英語教育を担っていききたいという希望も随分出てきていますので、そういった意味での看護のプロフェッショナルというか、看護の teacher というか、看護英語のインストラクターみたいなことを希望する人もいます。

また、いろいろなところから rapid reading のために材料を取ってきています(スライド2.6)。例えば、米国の国家試験問題をリライトして、日本の国試問題を英語に翻訳したものとか、看護のテキストとか、いろいろなところからです。それから、私は論文を指導するときには、まず抄録を読んで、最初に図表を全部見させてしまいます。そこで結果を見ると、何となく概要がわかるのです。図表というのは英語の数が少なく非常に見やすいですから、図表を見せながら、その読み取り訓練ということで、たくさん関連問題をつくりまして、それでトレーニングしていくというように、何を勉強したいか、何のためかというのが具体的に見えるような指導をします。国試に通りたいという気持ちがあるので、国試問題を英訳したような問題は随分乗ってきます。そういったニーズに合わせてやっています(スライド2.7)。

それから、現場の言葉というものは、カタカナとかをレポートでも減茶苦茶に使っていますので、十数種類にカテゴライズして、それを全部英語と結びつけて指導するようにしています。

雑駁な報告で申しわけありませんが、以上です。

【吉岡俊正(座長)】どうもありがとうございました。看護学部の中で、医学英語をどういう概念でとらえていて、どういう方略、方法を使って教えていらっしゃるかということ伺ったと思います。何かご質問、ご討議、ありますでしょうか。

【渡邊容子(群馬県立県民健康科学大学)】先生のお話の中で、いま国試の英訳とか、要するに看護師の国家試験ですよ。例えば、先生もコーパスの話と絡めてお話しなさっていたのですが、アメリカの国試問題集等がありますよね。そういうもので、特に先生がこういったものを学生に使うようにして、英語の勉強につなげるというような、先生ご自身の参考になさっていらっしゃるような practical なものがあれば、お伺いしたいと思ったのですが。

【飯田】どれを参考にと言われてもちょっと困ってしまうのですが、実は専門英語というのは、私どもの大学では、2年生と同時に、原著購読という形で4年生にやっているのです。そうすると、4年生にやるときには、国試が目の前に迫っていますので、普通にやってもだれも聞かないわけ。乗ってこない。それで、国試問題を使います。私は看護専門ではありませんが、都合のよいことに、国試問題というのは解答に解説がありますので、問題と解説を両方読みまして、仮に問題の答えがわからなくても、英語が読み取れば答えられるように問題を工夫しています。

それから、海外のものもそうです。海外のものはものすごく都合がよいことに、同じように問題が全領域であります。たくさん集めて読んでいます。そうすると、ちょうど対で解説があるのです。もちろん multiple choice なのですが「3の答えは違う、なぜならばこうだから」と、ダーッと書いてあるわけです。ですから、問題がつくりやすいというか、答えがわからなくてもちゃんとくれるのです。

それをやりますと、非常に乗ってくるのです。すぐ目の前の国試の準備になるということで。ですから、すべて私はただただ学生さんのご要望に応えるように、何とか乗っていただくように、すべて教育システムをアレンジしているわけです。私が「このほうがいいじゃないか」というようにやっても乗ってこないものですから、全く向こうのニーズに合わせて、どうにかアレンジしているところです。

【渡辺】向こうの看護協会があって、そこでデジタルのCD-ROM みたいになっていて、問題集が全部入っているものとか。

【飯田】それはちょっと難しいのです、まだ看護の学生には。

【渡辺】もう1つは、向こうの看護師の国家試験の中で、problem solving などがたくさん出てきて、レベル分けて

学生が受けるときに、コンピュータでレベル1の人は次の問題とか、作り方が非常に sophisticated になっているものがあると聞いたので、もしもそういうもので学生に使えるものがあれば。

【飯田】そうですね、実は、やはり最初に言いましたように、なかなか語学レベルが低いものですから、私は全部リライトしています。作りかえています。非常に terminology も多いです、そのままだとやはりちょっと。

Terminology というのは領域別ですから、どれが最も頻度がよい、などというわけにはいかないのです。その

ベースはもちろん教えます、ルートとして。非常に頻度の高いものというものを私が100選んで、それは絶対教えますけれども、やはり個別ですから、それをするわけにはいかないところもあります。

それから、向こうの英文にもずいぶん間違っているものがあつたりしますので、けっこうリライトしています。きょうはサンプル等お見せしようかと思ったのですが、時間もないと思って、ちょっとさぼってつくらなかったのです、すみません。

【吉岡】飯田先生、どうもありがとうございました。

3 . Effective Teaching of Medical English with a Problem-based Learning Technique in a Large Class

Kenichi Uemura (President, Yokohama Stroke and Brain Center)

Introduction

Despite hard learning of English for eight years in Japan, few college graduates can communicate fluently in English. The reason for such failure is here analyzed according to the cerebral mechanism for learning a foreign language. I also propose a new and effective teaching strategy based on 40 years of experience of medical English teaching at several medical, nursing, and pharmaceutical schools.

Failure of English education in Japan

English is taught in Japan for eight years, including three years in junior high school, three in senior high school and two in college. The third year medical students usually learn medical English. Except for those students who have returned from English speaking countries, however, no medical students can communicate fluently in English, none can understand even the main points of radio news in English and none can read an editorial in English newspapers without a dictionary, even though these medical students have passed the severe English entrance examination. This clearly indicates that the eight-year English teaching in Japan has completely failed.

More than 20 years ago, when I visited the United States, an American student at Harvard University spoke to me in Japanese not only quite fluently but also with perfect pronunciation and intonation, and further he read an editorial in the Japanese *Asahi Newspaper* even without the dictionary. He had never visited Japan but he had studied Japanese for only two years, not for eight

years as in Japan.

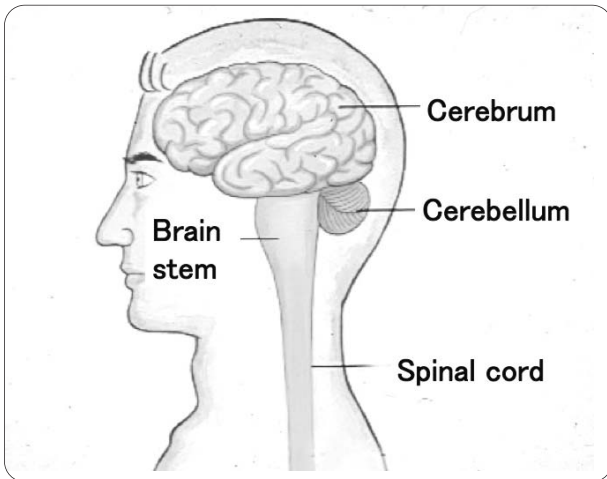
About 20 years ago, a Japanese friend of mine was transferred to (West) Germany for work. Since she had never studied German and could not communicate at all, she was taken to a refugee camp in West Germany for language training. German was taught there for three months by native German teachers using only German. After three months she wrote me a letter in perfect German, stating she had no difficulty communicating in daily work.

English teaching in Japan has failed, because English has been taught through reading English by grammatical literal translation into Japanese, has usually been taught by teachers unable to speak English fluently, and listening ability and conversation have not been taught nor examined for college entrance.

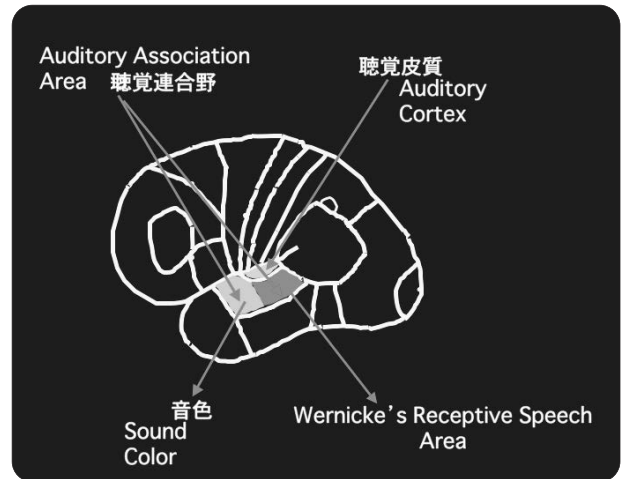
Cerebral mechanism for language learning

A baby learns a language first by listening and then by speaking, and not by reading nor by grammar. The human brain is organized to learn a language by listening and speaking.

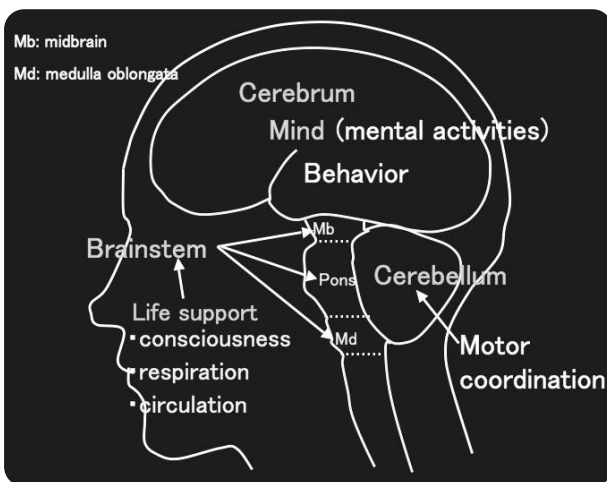
As shown in Slide 3.1, the brain consists of the cerebrum (大脳), the cerebellum (小脳) and the brainstem (脳幹). The cerebrum is the site for our mind (mental activities) and behavior, the cerebellum coordinates our voluntary movements, and the brainstem consisting of the midbrain (中脳), the pons (橋) and the medulla oblongata (延髄), maintains our consciousness, respiration and circulation and is thus indispensable for life support (slide 3.2).



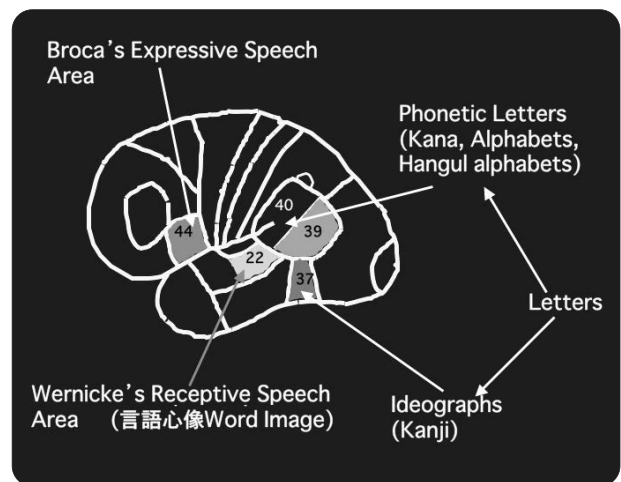
Slide 3.1.



Slide 3.3.



Slide 3.2.



Slide 3.4.

The cerebrum has two hemispheres: the right hemisphere controlling the motor and sensory functions on the left side of the body, and the left controlling those on the right side. In almost all the right-handers and most of the left-handers, the language is the function of the left hemisphere, thus the left hemisphere is called the dominant hemisphere (優位半球) and the right is called the nondominant hemisphere (劣位半球).

Various mental and intellectual activities are localized to respective specific cortical areas. Here only those cortical areas associated with language function are briefly reviewed.

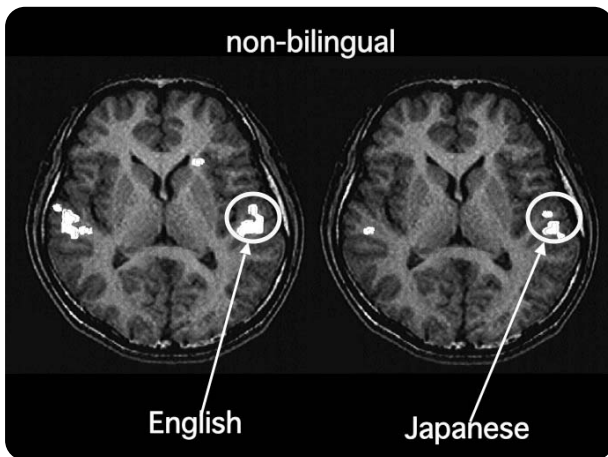
The nerve impulses in response to the sounds heard by both ears are transmitted bilaterally (60% contralaterally and 40% ipsilaterally) to the auditory cortex 聴覚皮質 of the temporal lobe, where the pitch of sounds is perceived (slide 3.3). The information is then transmitted to the adjacent auditory association area 聴覚連合野 for further analysis and interpretation. Language information is interpreted in the dominant hemisphere, whereas musi-

cal information is interpreted in the nondominant hemisphere.

In the dominant hemisphere, the sound color is recognized in the anterior portion of the auditory association area, whereas the meaning of the speech sounds is interpreted in the posterior portion called Wernicke's receptive speech area (ウェルニッケ感覚性言語野). When we have a telephone call from an intimate person, we can immediately identify who is calling, thanks to that anterior auditory association area; and can understand what he or she is talking about, thanks to this posterior area.

Slide 3.4 shows that our speaking is the function of Broca's expressive speech area (ブローカ運動言語野). Among letters, phonetic letters like alphabets, kana and Hangul alphabets, are recognized at Brodmann's area 39, whereas ideographs like kanji are recognized at Brodmann's area 37. Thus a patient with an infarct at area 39 cannot read kana but can still read kanji.

In the past we thought that the entire area of Wernicke's receptive speech area was associated with under-



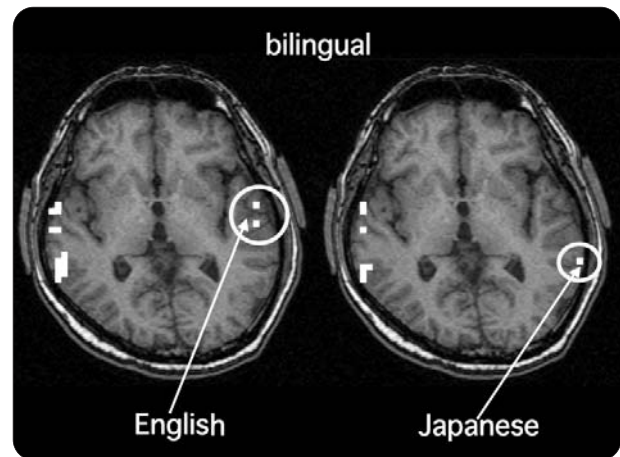
Slide 3.5.

standing the heard language. Recently, however, Dr. George Ojamann, Professor of Neurosurgery at the University of Washington, clearly demonstrated that all the bilinguals tested during surgery had very small areas separated by at least 2 centimeters for the respective languages.

Slides 3.5 and 3.6 show the results of our study at Hamamatsu University School of Medicine, using functional magnetic resonance imaging. A nonbilingual physician, who read and wrote many medical articles in English but was unable to speak English fluently, showed focal activation in his receptive speech area (slide 3.5, right) when he listened to Japanese NHK news, and the same area (slide 3.5, left) was also activated when he listened to English CNN news, which he did not understand at all. On the other hand, a bilingual author who had conducted simultaneous translation between English and Japanese for more than 30 years, demonstrated two separate areas for English (slide 3.6, left) and Japanese (slide 3.6, right). Slide 3.7 shows the lateral aspect of my dominant hemisphere, showing two separate areas for English and Japanese.

The nonbilingual physician learned English at school through grammatical literal translation and had not been to English speaking countries. He had no opportunity to establish an independent area specific for English. But I had played with an American boy for three years in kindergarten, and learned English after World War II through daily conversation with American soldiers in addition to having usual English lessons at high school and college.

So multilinguals have separate and independent areas for respective languages. Such an independent area will develop only after listening to the language, but will never develop even after years of grammatical reading



Slide 3.6.

and translation.

Personal experience of learning multiple languages

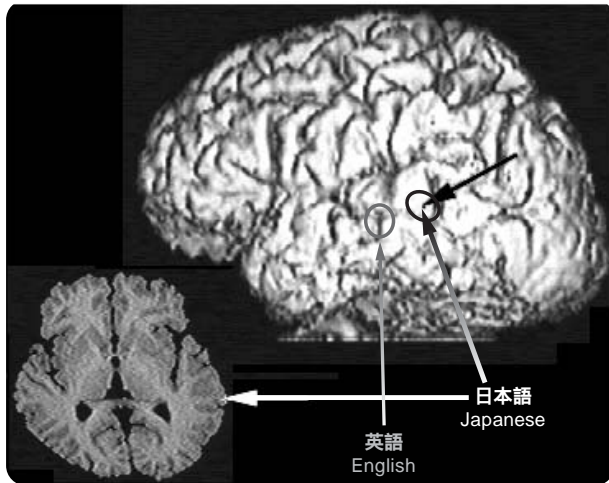
In addition to English, I learned German at college, and in medical school I was able to read a textbook of anatomy in German without difficulty and was able to take notes in German on the lecture given in Japanese. But with lack of listening practice, I could not understand at all when I was suddenly spoken to by a German physician. I learned French by myself through reading and translation, but I could not communicate at all when I visited France.

After I retired from Hamamatsu University at age 65, I relearned German and French and, in addition, learned by myself Chinese, Korean, Dutch, Italian, Spanish, Portuguese, Russian, Polish, Finnish, Hungarian, and Greek. I delivered a 30-minute lecture in Russian at St. Petersburg, and a 90-minute lecture in Polish at Warsaw, after only 4 months of self-learning of the respective languages.

In order to establish respectively specific areas for these languages, I employed five strategies:

- (1) to concentrate my learning onto only one foreign language at least for four months,
- (2) to listen to the audiotope without reading the text at least for one hour every day (in fact, I listened to the tape while driving), using the "Express Series,"
- (3) to shadow while listening,
- (4) to repeat each phrase or short sentence immediately following listening, and
- (5) to read the text and grammatical explanation between, and not during, the listening practice.

At the beginning, I could not catch any phoneme at all because of liaisons with the natural speed of the lan-



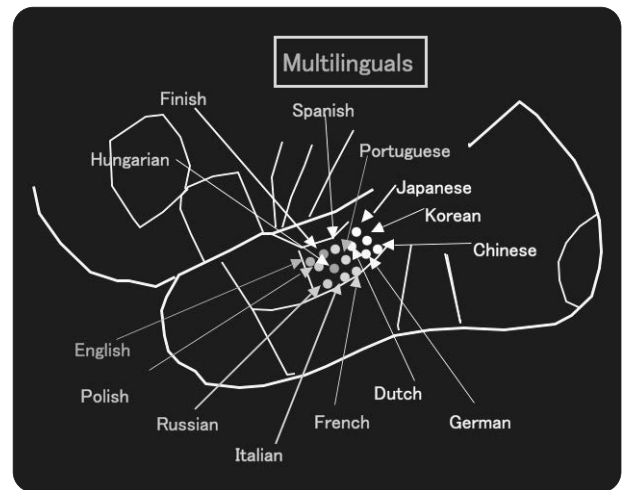
Slide 3.7.

guage, but in any language after three months of hard listening practice, I suddenly became able to catch all phonemes. This indicates that an independent area was established for that language in my Wernicke's receptive speech area. During the fourth month, I wrote a paper to be presented first in English, and then translated it into that language to be used. When I did not have a plan to lecture in a certain country, I either wrote a letter to a professor of neurosurgery in that country, first in English and then in that language, or I simply practiced daily conversation so that I could manage during my stay in that country.

Listening practice by repetition

To understand a spoken language, you must be able to memorize and repeat at least one phrase. All kinds of sensory information (such as auditory, tactile, visual) are perceived at respective sensory association areas and retained there for up to only 7 seconds. Beyond this immediate memory span of maximum 7 seconds, all the information will be lost (forgotten) unless it is transferred to the hippocampus, where it will be retained for up to 2 years (intermediate memory). The information that is returned from the hippocampus to the respective association area will be retained for a long period of time (long-term memory). Most of what we learned in high school has been forgotten because it remained in the hippocampus, but some information such as the name of the high school we went to and the multiplication tables still clearly remain in our memory since it is stored in the long-term memory.

To test an immediate memory span for a student is very simple. I usually have students listen to an audio-tape that contains the following recorded paragraph:



Slide 3.8.

“This morning, ladies and gentlemen, we are concerned with a complicated case of colitis. Dr. Smith will present the case for us and then Professor Jarvis will lead the discussion. Dr. Smith, will you please present your case?”

No one, including native English speakers, can repeat the entire paragraph without any mistake after listening to this tape only once, because the narration of this entire paragraph lasts for 14 seconds, and this is well beyond the immediate memory span of 7 seconds (abbreviated as 7"). Then the first sentence is reproduced alone:

“This morning, ladies and gentlemen, we are concerned with a complicated colitis.”

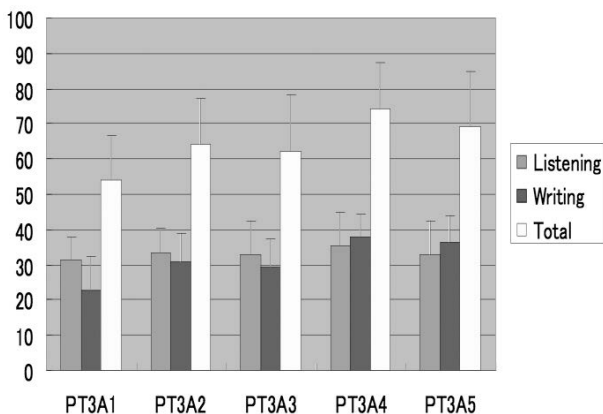
All native speakers and able students can now repeat it perfectly since this lasts only 4.86 seconds, which is much shorter than the immediate memory span of 7 seconds. For slower students each phrase is presented separately:

“This morning” (0"63), “ladies and gentlemen” (1"30), “we are concerned” (1"37), “with a complicated case” (2"42), “of colitis.”(0"79).

Most students can now repeat most of these phrases, but a very slow student failed to repeat any and his immediate memory span was found to be only 0.6 seconds, which is too short for any English phrase. The immediate memory span for English must be expanded for at least 5 seconds and the way to do this is by listening practice.

Medical English education

The time allocated for medical English education is usually very short, from 5 to 15 hours, in different medical schools. The time should not be wasted on whatever the students will usually learn later by themselves. The



Slide 3.9.

time is too short for any teaching, and the most effective strategy is to motivate the students to spend extra hours outside the class for hard self-learning.

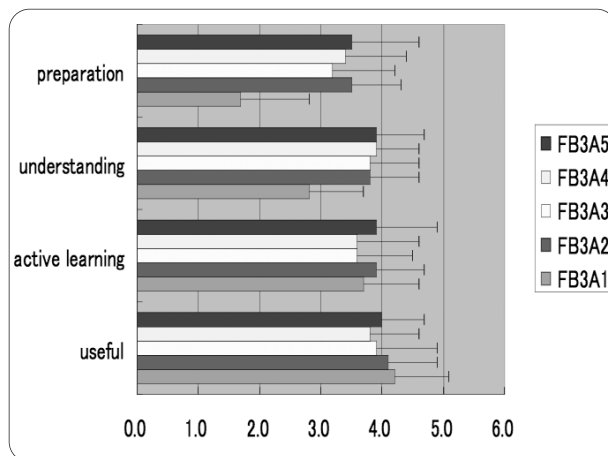
In most medical schools, medical terms and reading medical articles in English are probably taught, but medical graduates are usually forced to read many articles in English, learning medical terms quickly and obtaining reading ability without any difficulty. Speaking and conversation are best taught in small groups by native English speakers.

What bilingual physicians can and must teach are (1) to establish an independent English area in the receptive speech area of each student through the student's hard listening practice at home and (2) to make sure each student learns how to use "comfortable," not simply grammatically correct, English.

Effective strategies for problem-based self-learning

Here I will explain the strategy I used most recently in two medical schools. First, I tell the students in advance to prepare my class with the textbook and its audiotape of *English for Medical Students* by Kamiyama et al., knowing that they will come to the first class without any preparation.

My first class starts with a pretest to examine their ability to listen and write. The students first listen to five short sentences recorded by native speakers, each repeated three times, and write down whatever they hear. They will then interpret five given Japanese short sentences into comfortable English, not simply grammatically correct English. These Japanese sentences are taken from the textbook, through interpretation into comfortable Japanese and not simply grammatical and



Slide 3.10.

literal translation. Two examples are shown here:

J: 脳には2つの半球があり、お互いに鏡像になっている。

E: The cerebrum has two hemispheres, which are mirror images of each other.

J: 血清は、血漿からフィブリンを引いたものにすぎない。

E: Serum is just plasma minus fibrin.

Except those very few students who returned from English speaking countries, most students are shocked to recognize their lack of listening and writing ability of English after the 8-year learning. When they read the textbook later at home, they also recognize that the English sentences they translated literally from the comfortable Japanese are quite different from those in the text. In the next class session, then, I lecture on the cerebral mechanisms for learning a foreign language, insisting that hard listening practice at home is the only way to establish an independent English area in their brain. I conclude the classes by obtaining feedback from students.

Even with this instruction and recommendation, most students of my first class did not prepare at all, simply hoping to cram just before the term examination. So I told the students that the term examination would be exempted for those whose average pretest scores were above 60, and that those who fail to do so must take the term examination, which would include even the second textbook not used in the class.

The average for the initial pretest was just above 50, but it increased subsequently (slide 3.9). Only a few out of 100 students had to take the term examination. In one university the preparation grade increased from 1.7 to 3.5 (slide 3.10).

The objective of Medical English Education is not to teach medical English, but (1) to motivate students to

establish an English area in their receptive speech area by listening practice and (2) to cultivate a basic skill to write comfortable English.

【吉岡俊正（座長）】ただいまのご発表に対して、なにかご質問はございますでしょうか。

【Bukasa Kalubi（徳島大学）】I think your technique for teaching English is very good. That's the way I was taught English myself in junior high school—not by a native speaker, but somebody trained to teach English. So we had a test every first 5 minutes of the class, every day, so this had us speaking English two years later. So that's why.

And then you have, in Africa you have people speaking many, many languages. So this is the environment, you know: every day you listen to this language or that language and that's why we result having learned that before we speak So listening to the language every day is very important. And that's a comment on your talk.

【植村】ほとんどの学生はテキストを読んで聴きますが、「聴き流し」ではダメです。本を見ながら聴くということは、逆に「視覚が入らないと聴けない」という耳をつくってしまいます。聴くときは聴かなくちゃいけない、本を見てはいけません。私は14カ国語を勉強しましたが、いつも車を運転しながらやります。運転中はテキストを見られませんか、聴くしかない。わからなくて頭に來ますよ。家に帰ってテキストを見て「なぜこれがわからないのか」、その悔しさ... そうすると次からわかってくるんです。

それからリエゾンがほどけるのに100時間かかります。“Wo / wohnen / Sie?”なんて訊いてくるドイツ人はいませんから、リエゾンがナチュラル・スピードでわからないとダメなんです。そのためにはリスニングとシャドーイングで学ぶ、真似るしかありません。そうすることで耳が発達し、不思議なことにこれが100時間経つと一気にわかってきます。Wernickeに中枢が独立したということなんです。これは自宅学習ですしかありませんが、学生に伝えてほしいのは、絶対にテキストを読んで

はいけない、ひたすら聴け、そして真似しろということです。

【大井静雄（東京慈恵会医科大学）】現在、医学英語の教育システムがいろいろ考えられていますし、文部科学省では小学生から英語教育を行う方向に変わってきていますが、日本人の中でも英語を最も得意とする植村先生が育てられた環境についてお伺いしたいのですが... どのように英語に接しここまで上達されたのか教えていただけますでしょうか。

【植村】短く言いますと、私は3歳のとき広島におりまして、父が私をアメリカ人が経営する幼稚園に入れました。その頃に私の耳におそらく英語の発音が入っていたのだと思います。その後戦争になりまして、その間は英語はまったく使えなかったのですが、終戦直後から私はアメリカ人と付き合い小学6年から会話を始めました。ですから最初に教わったのは学校の英語じゃなくて兵隊さんが教えてくれたナマの英語ですね。それで学校の授業が始まったら、先生の英語がダメで「これは英語じゃない」なんていって先生とケンカしたともありましたが... それから英語弁論大会にも毎年出ていました。最高は全国で2位まで行ったこともありました。

私はモノマネが得意でしたから、イントネーションを真似するのも趣味だったんです。最初に発音から入ったのが良かったのかなと思います。英語をいちばん「勉強」したのは大学に入ってから、アメリカ英語とイギリス英語の違いや音声学をたき込まれました。

私の研究だと、6歳を過ぎると母音を聞き分ける能力が低下し、10歳になるとゼロです。私は文科省に何度も通って政務次官クラスに力説しましたが、それで私のいう幼稚園と今の中学校の間をとって小学校からということに変わったんです。皆さんもお子さんを育てるときは、幼稚園をどこにするか、どういう教育をするか(小学校はどこでもいいんです)、それでその人の一生は大きく変わります。そして小学校に入ったら10歳までが限界です。中学校では手遅れだということを考えていただきたいと思います。

【吉岡】植村先生、どうもありがとうございました。

4. アイ・アム・ユア・ドクター プロジェクト

Educational program for medical English communication: I am your doctor project

Toshimasa Yoshioka (Tokyo Women's Medical University, School of Medicine)

背景

東京女子医科大学医学部の医学英語の取り組みを紹介させていただきます。今回報告するのは、文部科学省の教育支援事業の一つである現代的教育ニーズ取組支援プログラム(現代

GP)に採択された教育プログラムです。個々の教育方法ではなく何を目標に、どう理論を構築し、どのような医学英語カリキュラムを計画したかを話します。

初めに背景を話します。スライド4.1に示すように「医学英語の必要性は高い」といえます。例えば基礎医学の分野で

の研究成果の公表や臨床医学の大規模臨床試験などは英語で行われます。臨床医学における Evidence-based medicine (EBM) のエビデンスは英語で提示されます。また、われわれの大学病院では、毎日数人は外国人の患者さんが来院します。

しかし残念ながら、学生の学習動機を高める環境が乏しいともいえます。国家試験は日本語で出題されます。教材は日本語で豊富にあります。実際に学生が英語を使う医療現場も少ないです。

このような実情で従来の私どもの医学教育カリキュラムでは英語教育の時間は限られていました。我々の大学のカリキュラムは1年生から4年生が臨床前教育、5・6年生が臨床教育となっています。その中で英語は昨年度までは1年生に週2コマと、4年生に5コマでした。これが全学生の学習機会、あとは選択英語、5年生終わりの交換留学、6年生の熱帯医学臨床実習(クラークシップ)で途上国でのフィールドワークという一部の学生を対象としたカリキュラムのみでした。

私どもの大学では臨床前教育のカリキュラムの約1/3に problem-based learning (PBL) テュートリアルを充てています。その分講義時間が限られていて英語教育のための時間を大幅に増やすことは出来ない状況でした。しかし、教育ニーズもありますので、限られた時間で大学の教育理念に沿った医学英語教育を考え、一つのプランとしたのが「アイ・アム・ユア・ドクター プロジェクト」です。

アイ・アム・ユア・ドクター プロジェクトの概要

スライド4.2はアイ・アム・ユア・ドクタープロジェクトのめざすものを示します。限られた時間では多くを教えることは出来ませんので目標を絞りました。植村先生のお話と一致するものがありますが、臨床で英語を使ってコミュニケーションできる力を目標を置きました。ただし単に医療面接を行うのではなく、大学の教育理念に沿って人間関係を確立し医師としての態度・マナーと心遣い、すなわち文化の異なる患者とところを通わせる医療コミュニケーションをめざしています。

このような医学英語カリキュラムを現状の制約の中で達成することを考えました。そのために学生の学ぶ動機を高めることが必要です。少ない授業時間で全てを教えられないので自己学習を組み込みました。ただし自己学習は動機が無ければ期待できないので、ここでも動機を高める工夫が必要と考えました。

スライド4.3に、従来と計画中の英語カリキュラムの構築を示します。計画は4つの区分に分かれますがそれぞれが関連しています。1つ目は基本から臨床医学英語への累進性のある講義です。2つ目は実践的な学習機会を通じた臨床会話能力を開発です。3つ目は学習動機を高め、目標を設定す

るための「振り返り」の場としてのフィードバックです。4つ目は自己学習の機会とその達成度の確認です。

スライド4.3左に示す従来のカリキュラムに、今述べた4つの要素を加えて右に示すカリキュラムが構築されました。授業として加わったのは2,3年生に数コマです。さらに後で述べる幾つかの学習機会が提供されます。フィードバックシステムを入れて学生に目標をもたせ、学生のレベルに合わせた自己学習プログラムを利用し、学習を進められる構築となっています。この教育カリキュラムではいかに学生の「やる気」を引き出すかが重要です。

動機(やる気)を引き出す教育モデル

能動学習、自己学習を促進する教育理論は沢山あります。今回活用したのは Miller が提唱した ARCS (アークス) モデルでスライド4.4に示します。^{1,2} Aは attention で「おもしろそうだ」、Rは relevance で「役に立ちそうだ」、Cは confidence で「やればできる」、そして Sは satisfaction で「やってよかった」、を表します。ARCSに沿って教育デザインを構築することにより学習者が興味を持って教育プログラムを受けるとされています。³ 私どもの医学教育で用いている PBLも学習者の学習動機に基づく自己主導型学習による教育法ですので、⁴⁻⁶ PBLを実践している学生にあわせてアイ・アム・ユア・ドクター プロジェクトが作られています。

植村先生は「英語には講義はだめだ」と言われました。カリキュラム上の制約もあり講義の時間は最小限になっています(スライド4.5)。学生は講義で学ぶというより、どのように学ぶかインストラクションを受けます。これが relevance としての必要性の認識となります。

講義よりも実践で学ぶ、あるいは自己学習のきっかけを作るようにプログラムが考えられています。英語による模擬診療での医療面接を1年生から実施します。

1年生は医師と同じように面接はできませんが、患者への心遣い、話の間の置き方などを体験することができ、適切なフィードバックを受けることにより技術を伸ばせます。もちろん、学年があがるに従って実践に近いコミュニケーションを行うようになります。

現在、外国人の英語教員を模擬患者とすることを計画中です。模擬患者は患者を演じる訓練を積んだ健常者です。例えば偏頭痛の患者の特徴、病歴などを外国人の教員に演じられるようになってもらい学生が医療面接を行います。スライド4.6に示すようにシミュレーションラボで実際の外来と同じ環境で、学生が白衣を着て行きますと臨場感ができます。学生も興味(attention)をもって実習を行います。

ここで外国人模擬患者にお願いするのは、国によって違う習慣、患者心理、社会的背景などまで考えて患者を演じてもらいたいと思っています。適切なシナリオ開発を本年度から行います。

学習したことが実際に使われることで、confidence(やっ

医学教育における英語教育の現状

- ◆ 医学英語の必要性の認識は高い
 - 医学研究分野
 - 基礎医学研究
 - 大規模臨床試験
 - 臨床医学実践
 - 「根拠に基づく医療」
 - 外国人患者対応
- ◆ 学習動機を高める環境が乏しい
 - 医師国家試験は日本語により実施
 - 教材は日本語で豊富に提供される
 - 学生が実際に英語を用いる医療現場が少ない

スライド 4.1 . 医学教育における英語教育の現状 .

効果的な教育プログラム

- ◆ ARCSモデル
 - A** Attention:面白そうだ
 - R** Relevance:役に立ちそうだ
 - C** Confidence:やれば出来るんだ
 - S** Satisfaction: やってよかった
- ◆ 動機付けに基づく能動学習(自学自習)
 - PBLチュートリアル
 - アイ・アム・ユア・ドクター プロジェクト

スライド 4.4 . ARCS モデル .

「アイ・アム・ユア・ドクター プロジェクト」の概要

- ◆ 臨床で英語を使ってコミュニケーションできる。
 - 英語で医療面接を行なう。
 - 外国人との人間関係確立を通じて、医療実践における態度・マナー・心遣いを修得する。
- ◆ カリキュラム上の制約の中で目的を達成する。
 - 英語を学習する動機を高める。
 - 少ない授業時間で達成できないことを、自己学習で達成できるようにプログラムを組む。

スライド 4.2 . アイ・アム・ユア・ドクター プロジェクトの概要 .

話すための基本的英語能力開発

- ◆ 必修英語
 - 1年生 週2コマ
 - 能力別クラス(8名から12名)
- ◆ 臨床医学英語 I・II・III
 - 2年生 2コマ 医学英語の基礎(語形成と発音)
 - 3年生 3コマ 医学分野の英語文・会話の理解
 - 4年生 5コマ 診療で使われる英語表現、ケースサマリー講読、ケースレポートの書き方

R: 医学英語の必要性の認識

スライド 4.5 . 話すための基本的英語能力開発 .

プロジェクト導入による英語教育の改良

- ◆ 基本から臨床的英語への累進性のある授業
- ◆ 実践的学習機会による臨床での会話能力開発
- ◆ フィードバックによる英語学習動機の強化
- ◆ 自己学習と達成度の確認

学習レベルに応じて、常に自己学習できる環境の整備

現在	取り組み
1 基本的英語会話力	基本的英語会話力
2	サービスマーケティング
3	英語模擬診療
4 臨床医学英語	臨床医学英語
5 交換留学による臨床実習	交換留学による臨床実習
6 選択臨床実習における国際医療協力	選択臨床実習における国際医療協力

スライド 4.3 . プロジェクト導入による改良 .

臨床での会話力開発 実践的学習機会-1

- ◆ 英語模擬診療
 - 臨床技能研修センターでの英語による医療面接実習
 - 外国人英語教員が模擬患者(患者を演じることの出来る訓練を積んだ健常者)となって実習を行う。
 - 外国人教員の教育能力開発
 - 国によって異なる人間・患者の心理・社会背景などに配慮した医療面接の学習
 - 適切なシナリオの開発

A: 臨場感があって面白い

スライド 4.6 . シミュレーションラボ .

て良かった)が生じます。サービスマーケティングは、学んだことが実際の社会サービスとして活用される教育法です。具体的なプランは決まっていますが、例えば英語による医学情報サービスのボランティアが考えられます。東京女子医科大学病院には「からだ情報館」という患者用図書館があります。医師からの説明などがわからないとき、自分で図書あるいはインターネットで調べる場所です。ここに英語

のreferenceを備えれば、外国人も利用出来るようになり、司書のもとでボランティアとして学生が情報提供の支援を行えば、実際に自分がやったサービスが医療に貢献することでconfidenceと学習意欲が高まると考えています。

このような学習機会を通じて得たものが、国外での医療体験で実際に使えることがsatisfaction(やって良かった)となります。本学では交換留学制度として欧米の大学病院で

自己学習の支援

- ◆ 基本的英語力の自己学習ツール
 - 平成17年度より開始(既存ソフトを利用)
- ◆ 医学英語ボキャブラリー自己開発ツール
 - 英語eラーニング企業と共同開発
 - 基本1,400語を平成18年度から使用
 - 臨床医が使う基礎医学と臨床医学語彙
 - 語彙を用例の中で学習し、自己評価を行うシステム
 - 語彙・用例を医師が患者に説明する設定で作成
- ◆ 臨床現場を題材とした臨床会話学習ツール
 - 計画中
 - 聞く、話すおよび人間関係・文化・社会

A: 面白い
R: 本当っぽい
C: 実習で使えた
S: やったら出来た

スライド 4.7 . 自己学習の支援 .

研修, クラークシップとして熱帯医学のフィールドワークなどの海外実習機会があります。学生の希望者が多く, 派遣者は選抜となるのでプログラムが提供されることが英語学習の動機ともなります。

自己学習のためにe-learningを提供します(スライド4.7)。e-learningは学習者に任せきりでは効果が無いと思います。講義, 模擬診療, サービ斯拉ーニング, 国外研修などと関連させたARCSのなかで自己学習を促進します。

現在用意されているプログラムは1年生用の基本的英語力学習の市販のシステムです。これが終了すると医学英語ボキャブラリーのe-learningに進みます。このシステムは現在開発中です。システムの特徴は, 臨床医が使う言彙と医学の基本的語彙に絞り, 語彙を用例の中で学ぶことです。用例は臨床で医師が患者に説明する設定で作っています。今後の計画として, 語彙学習を終了した学生に提供する, 臨床現場を題材とした学習会話学習システムを作りたいと思っています。

学生に医学英語語彙の評価を行ったところ興味深い結果を得ました(スライド4.8)。学生はmyocardial infarctionとか, cerebral palsyなどの専門的病名は語彙として持っている割合が高く, 一方で患者も使用する基本的な語彙, 例えばlaxativeは誰も知らないという結果を得ました。評価対象は交換留学志望者でしたので英語に比較的馴染んだ学生の結果です。学習システムを作る際は学生の医学英語語彙は英語一般の語彙の難易度とは異なることに留意しなくてはなりません。

最近の医学教育カリキュラムの考え方にoutcome-based medical educationがありますが,⁷ 実際に学生さんがどういうoutcomeを持っているかを評価してカリキュラムを作らないと, 理想論だけでは現実的となりません。

Attentionとsatisfaction(AとS)を提供するのがフィードバックです。全学年, 全学生に通年的に英語教員(専任教員および非常勤外国人教員)がアドバイスを行いたいと思っています。学生に達成度の振り返りを行わせ, 次の目標と, 目標達成の方法を支援的にアドバイスすることにより自己

意外な語彙の不足

- ◆ 交換留学志望者の語彙試験結果

正答率 30~50%	正答率 <10%
index finger	hemorrhoid
neutrophil	laxative
CPR	contagious
migraine	bruise

スライド 4.8 . 交換留学志望者の語彙試験結果 .

学習を促進できます。達成度のreflection(省察)を繰り返すことが自分でできるという自信(自己効力感, self-efficacy)につながります。これはPBLを行っている学生の観察でも, PBLで目標とする能動学習・問題発見解決に学生が自己効力感を高めることが認められます。^{9,10} 医学英語コミュニケーションでも, 「ここまで自信がある」という気持ちを持たせることが大事であると思います。

まとめ

東京女子医科大学医学部の医学英語教育カリキュラム「アイ・アム・ユア・ドクター プロジェクト」は, “I am your doctor, how can I help you?” と躊躇なく言えるための英語コミュニケーション能力教育プログラムです。卒前医学教育の制約の中で英語を用いた会話, コミュニケーションができることを目標にしています。医師としてのコミュニケーションを学ぶ過程で他の英語力も, 必要性に気付く自ら学習する習慣をつけてもらいたいと望んでいます。

医師としてのコミュニケーション能力とは単に英語で話すのではなく, 文化・社会的背景の異なる患者とのコミュニケーションでも医療者としての人間性を示すことです。これが建学の精神である「至誠と愛」を, 英語を用いた診療の中で実践することであると考えています。

質問等をお受けしたいと思います。

【平野美津子(聖隷クリストファー大学)】大変興味深いプロジェクトをありがとうございました。1点お聞きしたいのは, 模擬患者を外国人の方がやるときに, 何か訓練みたいなものをやるのでしょうか。

【吉岡】模擬患者の研修は必要で, どのように行うか検討中です。本年度は国外で医学教育に携わっている医師が来日した際に, 模擬患者さんへのトレーニングコースを行ってもらい, 英語教員からは好評でした。今後, われわれでシナリオを作るなど, 外国人模擬患者のfaculty developmentを構築します。

【Bukasa Kalubi(徳島大学医学部)】このプロジェクトは, 1

年生から臨床の面接が始まりますね。だからすごくよいプロジェクトと思います。

私は徳島大学に行っているのですが、1年生から医学英語を始めようと思ったら、やはり1年生のプログラムは文科省で全部決まっているから、チェンジできないという話を聞きました。

私が思っているのは、6年間、中学、高校で覚えなかったことを、1年で週1回か2回では覚えられないわけです。だから、無駄な時間だと思っている。1年生から、どんな形でそのところからスタートしましょうというプレッシャーを、皆さん、かけましょう。その仕事の一つです。

【吉岡】非常に重要なことだと思います。大学によっては、教養課程と専門課程が分かれていて、医学英語を含む専門的教育的障害となっていることがあります。私どもの大学は教養と専門の区別のない一貫教育なのでこのようなプロジェクトが可能となります。

日本の医科大学は臨床実習を5・6年年生で行う場合が多いですが、イギリスなどでは高校を卒業したばかりの医学部1年生にすぐに病院実習が始まります。カオスに放り込まれてそこで自分は何を学ぶのかの目的と、現場を見ての動機づけがされます。early clinical exposureと言われますが、日本での機会は少ないです。しかし各大学で取り入れるようになってきました。

医学英語でearly clinical exposureを入れるのは難しいですが、模擬患者を使ったりすれば1年生でも臨床的意義を感じてくれると考えています。

【A(発言者不明)】先生のところはoral communicationを重視していらっしゃるプログラムですから、ちょっと質問の内容がずれるかもしれないのですが、実は、身近なことで非常に困っていることがあります。私どもの病院は病院評価を受ける準備をしていますが、その中で、診療録を一般の方に開示するために、英語を使うのは非常に具合が悪くなっています。文科省では、仕事で英語を使える日本人プロジェクトがあるのに、厚労省は英語を使ってはいけないと言っていることとなります。いま非常に悩んでいることの一つなのです。

先生のところの場合はoral communicationを重視しているのですが、それはwritten languageのほうは学生のモチベーションを下げるような方向にはいかないだろうという、そういう予想はありますか。文字の英語を使ってはいけないという。

【吉岡】医療におけるコミュニケーション能力を高める中で、writingあるいはreadingの力も合わせて向上して欲しいと思っています。今回のプロジェクトはコミュニケーションを主体とした教育ですが、臨床でコミュニケーショ

ンするためには例えば、書いて説明する、メモをとる、あるいは説明するためにエビデンスとなる英文を読む必要が生じます。これらがニーズとモチベーションとなって話す以外のことの自己学習を促進してもらえたらと思います。時間があれば全てを教えるプログラムを組めませんが限られた時間なので、実際上優先度を決めなくてはならなかった部分もあります。

診療録は日本語で書くことがいま前提になっていますので、日本での診療では、英語を使うことが出来ないのはおっしゃる通りです。

【A】そうすると若い時期に、非常に学習に対して大きなモチベーションをつけて、学生の中で確固たるモチベーションになっていけば、多少厚労省が意地悪をしても、それは妨害されないだろうと考えてもよいかもしいと。

【吉岡】植村先生をモデルにさせていただきたいと思います。(笑)

【A】ありがとうございます。

【吉岡】ほかにいかがでしょうか。では、時間になりましたので、熱心なご討議をありがとうございました。これでこのシンポジウムを終わらせていただきます。

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(2006年7月16日, ウェルシティ金沢にて収録)

Continuing Professional Education

Where should we put these types of information in the IMRD paper? Assemble the Information in a Clinical Research Paper*

Into which IMRD section does each of these types of information belong?

Put for Yes, put for *Optional*, and for *No, not usually*

(No. 1 is done as an example) 注意: One item on this list does not belong in any paper

Type of Information	I Introduction	M Methods	R Results	D Discussion
1 The age of the patients in my study	—		—	—
2 A gap, or unknown, about my topic before we started this study				
3 A weakness of my study				
4 My hypothesis (仮説)				
5 The kind of study (cohort, case-control, crossover)				
6 A table (表) (if we used a table)				
7 A figure (図) (if we used a figure)				
8 My rationale (論理の根拠) for doing this study				
9 The broad, general topic of this study				
10 The institutional review board approved the study				
11 How my results apply to clinical understanding or What general truth they show				
12 Name of the statistical software we used				
13 If I experimented on animals, say that the animals were housed well and given water ad libitum				
14 Compare my results with results from other studies				
15 Why some result in my study differed from what we expected (if so)				
16 The data Mean and range that we found, if any				
17 The sex of the patients in my study				
18 The number of men and women in my study				
19 Written informed consent was received from all the patients in this study				
20 Results of this study support our hypothesis that...				
21 The finding by Smith agrees with our finding				
22 This finding agrees with that reported by Smith				

*This Continuing Professional Education corner was prepared by the Editor-in-Chief of the Journal.

Answers may be seen on page 201.

会告 Announcements

第 10 回 日本医学英語教育学会 総会

会 期：2007 年 7 月 14・15 日(土・日)
会 場：メトロポリタンプラザ・オフィスタワー(12F
会議室)(東京都豊島区西池袋 1-11-1, TEL 03-5954-
1111(代), URL: <http://metopoli.com/>)
会 長：大石 実(日本大学医学部)

問合せ先：日本医学英語教育学会事務局

〒162-0845 東京都新宿区市谷本村町 2-30
メジカルビュー社内
TEL 03-5228-2057(ダイヤルイン)
FAX 03-5228-2062
E-MAIL jasmee@medicalview.co.jp

Announcement of the tenth annual JASMEE conference

Date: July 14 & 15, 2007 (Saturday & Sunday)
Place: Metropolitan Plaza Office Tower 12F Conference
Room
Address: 1-11-1 Nishi-Ikebukuro, Toshima-ku, Tokyo
Phone: 03-5954-1111 (key number)
URL: <http://metopoli.com/>
Chair: Minoru Oishi, M.D. (School of Medicine, Nihon University)

Contact Address:

Secretariat, JASMEE
c/o Medical View Co., Ltd. 2-30 Ichigaya-hommuracho,
Shinjuku-ku, Tokyo 162-0845, Japan
Phone: +81-3-5228-2057
Fax: +81-3-5228-2062
E-mail: jasmee@medicalview.co.jp

開催案内 Notices

医学英語キャンプ in ニセコ

日程：2007 年 8 月 1 日(水)~ 5 日(日)
会場：The Niseko Company (北海道虻田郡ニセコ町)
<http://www.thenisekocompany.com/jp/properties.html>
講師：R. ブルーヘルマンズ(東京医科大学国際医学情報センター
准教授 & 日本英語医療通訳協会名誉会員)
押味貴之(日本英語医療通訳協会理事 & 米国 Cross Cultural
Health Care Program 公認医療通訳トレーナー)
E. J. ジェーゴ(日本英語医療通訳協会理事 & 旭川医科大学非
常勤講師)
主催：日本英語医療通訳協会(J.E.) <http://www.medical-english.net/>
MLS Japan <http://www.mlsjapan.com/>

「海外で医学英語を学びたいけれど、留学する時間とお金がない」
そのような方は医学英語の国内留学のチャンスをお届けします。
今年の夏、日本英語医療通訳協会(J.E.)とMLS Japan(Medical
Language Service Japan)は、北海道のニセコにて「医学英語キャン
プ」を開催致します。

このキャンプでは「医学英語」に関する様々なスキルを5日間か
けてしっかりと学びます。特に日本人が苦手とするリスニングと
スピーキングにおけるスキル向上に重点を置いています。医師
や看護師といった現役の医療従事者はもちろん、医学部生や看護
学生の方々、また医療通訳者や医療翻訳者、そして今後そのよ
うな職業を目指そうとしている方々にはぴったりの講習会です。

ニセコは現在、多くのオーストラリア人が定住している「日本
の中のオーストラリア」です。この「医学英語キャンプ」では、講
師も施設スタッフも全て「英語のみを話す」という恵まれた環境
の中で、短期海外留学以上の学習効果を目的としています。会場は
カナダ人が経営する北海道ニセコのペンション「The Niseko Com
pany」で、施設スタッフは全て英語のネイティブスピーカーです。
また医学英語学習の他にも、ラフティングなどのアクティビティ
も用意してあります。その際のインストラクターも全て英語ネイ
ティブスピーカーです。今年の夏はニセコの大自然の中、一緒に
医学英語を学びませんか？

プログラム:

- Day 0(7/31)「ようこそニセコへ！」(午後3時に新千歳空港から札幌
駅を経由する無料送迎バスが出発。夜には会場となるペンシ
ョンにて Welcome Party を行います。)
- Day 1(8/1) 1. 「医療用語の基礎と応用」
2. 「国際学会でのプレゼンテーション：基礎編」
- Day 2(8/2) 1. 「患者さんとの医療英会話」
2. 「リスニングトレーニング1」
- Day 3(8/3) 1. 「カルテの英語」
2. 「リスニングトレーニング2」
3. 「アクティビティ」(ネイティブスピーカーのリバ
ーガイドと一緒に、ニセコの大自然の中で「ラフティ
ング」を楽しんで頂きます。)
- Day 4(8/4) 1. 「学術論文の基礎」
2. 「医療翻訳」
- Day 5(8/5) 1. 「国際学会でのプレゼンテーション：応用編」

参加対象：「英検準1級」「TOEIC 700 点以上」程度の英語力を
前提としています。またキャンプ中は「日本語禁止」
ですので、「英語で基本的なコミュニケーションがと
れる」ことが必要になります。

参加費用：89,000 円(税込)(宿泊費[5泊分]、滞在中の食費、新千歳空
港及び札幌駅からコテージまでの送迎、ラフティング費用込。ベ
ッドルームは2名1室[個室希望の場合は114,000円])

定員：20名

申込〆切：7月20日(定員となり次第、締め切らせて頂きます。)

申込方法：下記内容をご記入の上、メールにてお申込み下さい。

申込内容：氏名(ふりがな)、メールアドレス、住所、電話番号、
職業、医学英語に関する背景・経験など、英語の資
格、無料送迎バス：希望する(新千歳空港 or JR 札幌
駅)/希望しない。

申込先：日本英語医療通訳協会(J.E.):
je_medical_english@yahoo.co.jp

Continuing Professional Education

Where should we put these types of information in the IMRD paper?

Answer Sheet

Assemble the Information in a Clinical Research Paper

Yes, Optional, — No, not usually

Type of Information	I Introduction	M Methods	R Results	D Discussion
1 The age of the patients in my study	—		—	—
2 A gap, or unknown, about my topic before we started this study		—	—	—
3 A weakness of my study	—	—	—	
4 My hypothesis (仮説)		—	—	
5 The kind of study (cohort, case-control, crossover)			—	
6 A table (表) (if we used a table)	—			—
7 A figure (図) (if we used a figure)	—			—
8 My rationale (論理の根拠) for doing this study		—	—	—
9 The broad, general topic of this study		—	—	—
10 The institutional review board approved the study	—		—	—
11 How my results apply to clinical understanding or What general truth they show	—	—	—	
12 Name of the statistical software we used	—		—	—
13 If I experimented on animals, say that the animals were housed well and given water ad libitum	—		—	—
14 Compare my results with results from other studies	—	—	—	
15 Why some result in my study differed from what we expected (if so)	—	—	—	
16 The data Mean and range that we found, if any	—	—		—
17 The sex of the patients in my study			—	
18 The number of men and women in my study	—		—	—
19 Written informed consent was received from all the patients in this study	—		—	—
20 Results of this study support our hypothesis that...	—	—	—	
21 The finding by Smith agrees with our finding	—	—	—	—
22 This finding agrees with that reported by Smith	—	—	—	

Caution: No. 21 does not belong in any paper.

日本医学英語教育学会
理事・評議員
(任期 2004 年 8 月 ~ 2007 年 7 月)

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投稿申請書

Submission Consent Form

受付番号 _____

(コピー可)

下記の論文を日本医学英語教育学会会誌 *Journal of Medical English Education* に投稿します。なお、他誌への類似論文の投稿はいたしません。また、採用された場合、本論文の著作権が日本医学英語教育学会に帰属することに同意いたします。

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