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# The accuracy of medical interpretations: A pilot study of errors in Japanese-English interpreters during a simulated medical scenario

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**Abstract:** The role of interpreters is significant, and the accuracy of interpretation is the most critical component of safe and effective communication between clinicians and patients in medical settings characterised by language and cultural barriers. Japan has an increasing number of foreign patients, and we report on the results of a pilot study of errors made by twenty Japanese–English interpreters during a simulated medical scenario. Communication was recorded and transcribed for error analysis. Interpretation errors were categorised using five error types: omission, false fluency, substitution, addition, and editorialisation, and three kinds of communication content were investigated. Participants with less interpreting experience tended to make more errors. Omission-type errors occurred most frequently. More errors tended to occur in the utterances related to socio-emotional contents. Utterances which express assurance or confirmation were especially likely to be characterized by omission-type errors. Participants' interpreting experience appeared to be a contributing factor on making errors. The result suggested implications for an integrated training programme to reduce interpretation errors and future research.

**Keywords:** medical interpreter; error analysis; Japanese-English interpreter; simulated scenario

## Introduction

### The significance of the interpreter's role in medical settings

In medical settings, satisfaction and trust in the patient–provider relationship and in clinical outcomes rely primarily on effective communication. Researchers have often stated that "the quality of communication between patients and clinicians can have a major impact on health outcomes" (Brach, Fraser, & Paez, 2005, p. 424). Additionally, according to Angelelli (2004), compromised development of a trusting relationship "increases the likelihood of physicians misunderstanding patients' descriptions of their symptoms, and decreases the probability that patients will adhere to physicians' recommendations" (p. 21). The elimination of language difficulties is a vital condition for success in medical consultations between healthcare providers and patients from different ethnic backgrounds that are characterised by a language barrier.

Cultural differences are recognised as a factor affecting provider–patient communication (Schiavo, 2007), and medical interpreters play a crucial role by mediating cross-cultural communication in medical settings. Language and culture are inseparable, and expressions for numerous

phenomena differ among cultures (Mizuno, 2008). For instance, *ashi* is a Japanese word for a lower extremity of the body that can mean "foot" or "leg", depending on the context; thus, interpreters need to know the cultural background of the Japanese language (Mizuno, 2008). Accurate translation of the superficial meaning of a word is insufficient in medical settings, and some cultural factors can hamper the conveyance of the true meaning of uttered words. For instance, concepts of illness can differ culturally (Kleinman, Eisenberg & Good, 1978; Schiavo, 2007; Dupre, 2009). Ideas and values related to paternalism, health information disclosure, attitudes or attire of healthcare professionals, and words and phrases for various emotional and somatic expressions are different in each culture (Kaufert and Putsch, 1997; Angelelli, 2004, Roter & Hall, 2007).

A previous study (Gumperz, 1982) presented a discourse analysis of a case in which a Filipino physician who spoke English, but whose native language was Tagalog, was charged with allegedly ignoring a child abuse case that he saw in an emergency room in the United States (US). The study findings revealed that the influence of the physician's native language on his spoken English could have caused misunderstanding between the physician and the native English speakers with whom he spoke. Ideas about child abuse in Filipino culture were also an influencing factor (Gumperz, 1982; Nadamitsu, 2009). This case demonstrates how cultural differences can significantly impact communication. Medical interpreters act as liaisons between different worlds (Vasquez & Javier, 1991). At the same time, healthcare providers also need to improve their cultural competence (Flores et al., 2000).

One of the important duties of medical interpreters is mediating communication related to the provision of informed consent (IC), a critical process in medical settings that enables patients to obtain medical information from physicians for use in decision making, and thus can significantly impact clinical outcomes (Betancourt & Jacobs, 2000; Lehna, 2005; Simon, Zyzanski, Durand, Jimenez & Kodish, 2006). A previous study conducted in the US found that the charts of patients with limited English proficiency were less likely to have documentation of IC for invasive medical procedures than were those of English-speaking patients (Schenker, Wang, Selig, Ng & Fernandez, 2007). This finding highlights the need for interpreters, and the importance of their role with respect to the clinical and legal aspects of medical practice.

Even when the patient and physician share the same ethnic and cultural background, communication between them often could be difficult because of their different perspectives and expectations regarding the illness and its treatment. For patients with different cultural backgrounds, communication with the physician and the process of providing IC can be more difficult due to different cultural beliefs and customs regarding medical care and decision making (Kobayashi, 2007). In such situations, the removal of linguistic and cultural barriers between patient and physician by an interpreter with cultural competence is a prerequisite for effective communication during the IC process.

**Types of medical interpreters and quality problems**

Medical interpreters can be categorised into several types according to level of professionalism and availability as well as interpretation quality (Hsieh, 2006). Previous studies have commonly categorised interpreters as professional, *ad hoc*, trained, and untrained (Angelelli, 2004; Flores, 2005). Professional interpreters are paid and are often certified at the state or national level. *Ad hoc* interpreters include bilingual family members, friends,

or hospital staff who can provide linguistic help to patients. Trained/untrained interpreters are classified based on their formal training in interpretation.

*Ad-hoc* interpreters are untrained and their practice "often results in errors in interpreting" (Angelelli, 2004, p. 22). Bilingual physicians are often used but not all are sufficiently fluent in a foreign language, and "some physicians are not aware of the need for an interpreter believing that their own language skills are sufficient" (Brach, Fraser & Paez, 2005, p. 429). Although their medical knowledge may help to improve the accuracy of interpretation (Donelan, Hobrecker, Schapira, Mailhot, Goulart & Chabner, 2009), effective interpretation requires more than mere linguistic proficiency in the two languages. Previous studies have documented critical errors in the translation of medical terminology, misunderstandings that undermine patients' credibility, omissions of important information related to treatment plans, and informal mediation of information when untrained bilingual *ad hoc* interpreters, including bilingual medical staff, are used (Elderkin, Silver & Waitzkin, 2001; Flores, 2005; Moreno, Otero & Newman, 2007; Rosenberg, Leaza & Seller, 2007).

In contrast to the relative ease of securing a uniform level of interpretive competence in conference settings, it is difficult to maintain consistently high standards for interpreters in medical situations, as mentioned above. Nevertheless, medical situations such as those involving the provision of IC, in which patients need to receive information for decision-making purposes, as well as medical interviews, in which physicians need to understand patients' descriptions of complaints, require accurate interpretations rendered by highly skilled interpreters to enable all parties to achieve successful communication.

**The importance of accuracy in medical interpretations**

Accuracy is the most critical component of interpretation, especially in medical contexts (Mizuno, 2008). Accuracy is stipulated and defined in official documents and literature as a thorough and faithful rendering of the source language message (Washington State Department of Social and Health Services, 2012). Faithful rendering of a message in a source language is not the same as a simple word-for-word translation. According to Hale (2007), less experienced interpreters are more likely to produce literal renditions, leading to nonsensical translations, and "only the most competent interpreters will convert the message pragmatically, taking the top-down approach, understanding the text as discourse rather than as words or sentences strung together" ( p. 23). This is especially true when the pair of languages that are being translated differ substantially from each other in their structures. Additionally, interpretation in medical settings requires special precision because inaccurate interpretations of interventions "can have major ramifications on the outcome of a case or on the treatment of an illness" (Hale, 2007, p.33).

In order to implement accurate interpretation with precision, omissions, additions, or substitutions of information in the original message must be avoided while maintaining transparency based on an understanding of the client's cultural background (National Council on Interpreting in Health Care, 2005; Iryotsuyaku no kijun wo kentousuru kyougikai, 2010; Washington State Department of Social and Health Services, 2012). When a language barrier is present during medical consultation, successful communication between patients and healthcare professionals requires that interpreters accurately and faithfully translate all utterances that occur (Flores, 2005; Healthcare Interpretation Network, 2007).

As noted in the previous section, the quality of an interpretation may affect clinical outcomes and patient safety. If interpreters fail to interpret expressions of pain or explanations of medication regimens accurately, the consequences can be life threatening. Flores, Laws, Mayo, Zuckerman, Abreu, Medina and Hardt (2003) measured the accuracy of medical interpreters using error analysis and reported that omission-type errors, which can potentially influence patients' health outcomes, occurred most frequently. Their study identified several errors with potential clinical consequences: omissions of key information about allergies from medical histories, omissions of information about chief complaints, and insertions of personal opinions about sexually transmitted diseases, presumably to spare the patient from having to answer such questions (Flores et al., 2003). Inaccurate interpretations are dangerous because accurate information is crucial for accurate medical diagnoses and effective treatment recommendations. Previous research has also found that utterances by physicians containing medical jargon were less likely to be interpreted accurately (Simon et al., 2006). This finding suggests that medical interpreters need to have adequate knowledge of medical terminology in addition to basic linguistic proficiency and interpretation skills.

As interpretation is a complex process, it is difficult to define accuracy only as the aspect of linguistic faithfulness. Reciprocal understanding cannot be accomplished by mere verbatim translation (Hassen & Aplers, 2010), and assessing interpreters' performances may require a "more comprehensive approach" (Jacobson, 2009, p. 49). As stated above, culture is never separable from language, and accurate interpretation requires not merely lexical translating, but also the conveyance of the meaning of uttered words with an understanding of the cultural contexts in both source and target languages (Kaufert & Koolage, 1984; Haffner, 1992). Non-verbal aspects of communication should also be considered if accuracy in the performance of interpreters' duties is to be achieved.

To perform accurate medical interpretations, in addition to linguistic and cultural competencies, interpreters may also need to know about the health communication perspective in which patients are regarded as holistic beings and healthcare providers are expected not only to pay attention to diseases, but also to try to establish relationships with patients and their families (Sawamura & Nakajima, 2005). This perspective argues that in conversations exchanged during medical consultation, casual and small talk and non-verbal messages are also important for confidence building (Mukohara, 2006). Since interpreters need to interpret faithfully, they should be fully aware of the importance of the accurately translated messages for trust development in physician–patient relationships.

**The necessity of medical interpretation in Japan**

Japan has come to contain an increasing number of foreign residents, a large number of whom are originally from China, Brazil, the Philippines, the Koreas, and Peru. As of 2010, the number of foreign residents exceeded 2 million, accounting for more than 1.6% of Japan's total population (Japanese Ministry of Justice, 2010). Although this proportion is far smaller than that found in more diverse countries such as US, the increased number of foreign residents in Japan is becoming an issue that has potential implications for various aspects of society, including healthcare.

Currently, the safeguards that would allow foreigners with language difficulties to access clinics or hospitals without undue concerns, are lacking in Japan. Although the necessity and importance of accommodating foreign patients has been gradually understood by healthcare providers, situations

involving various linguistic and cultural needs remain difficult to handle (Mizuno, 2008; Centre for Multicultural Society Kyoto, 2011). In recognition of potential problems such as miscommunication and the costs associated with linguistic or cultural barriers, some municipalities and hospitals have made efforts to utilise interpreters to resolve and prevent problems. In Japan, many volunteer interpreters who wish to assist foreigners in the community, register as medical interpreters. Each municipality or non-profit organisation (NPO) organising a medical interpretation programme conducts informal language assessments. When these organisations receive a request from a hospital or clinic for a medical interpreter, they assign a registered volunteer interpreter, at his/her convenience, to the task (Mizuno, 2008; Centre for Multicultural Society Kyoto, 2011; Multi-language Information Centre Kanagawa, 2011). Few hospitals have professional medical interpreters on staff, and no formal training system or certification process for professional medical interpreters exists in Japan. In fact, in the absence of any formal assessment of skills related to medical interpretation, some hospitals unofficially rely on their bilingual staff to communicate with foreign patients.

Currently, no major instance in which a defective medical interpretation has significantly affected a clinical outcome or compensation for loss has been reported. However, given the emerging multilingualism in Japan, quality assurance for language-interpretation services is an issue that should be addressed immediately.

## Purpose and research questions

Although previous studies have identified common errors in medical interpretation and a disparity in quality between trained and untrained interpreters, the potential influence of interpreters' previous experiences and medical background or the specific content of the dialogues between patients and physicians has never been thoroughly investigated. Additionally, little previous research has focused on Japanese–English interpretation. In Japan, no previous empirical study has sought to identify errors in medical interpretation. We thus undertook a preliminary exploration of such errors to obtain insights into the communication between Japanese healthcare providers and patients from different cultural backgrounds in the context of medical settings.

The purpose of this study was to identify the characteristics and patterns of errors in Japanese–English interpretation during simulated medical scenarios focusing on the IC process with the aim of improving future training and education in bilingual health communication. Specifically, we aimed to accomplish the following: 1) describe the frequency and types of errors made during medical encounters involving Japanese–English interpreters, 2) explore the potential influence of the interpreters' experience and medical background on interpretation errors, and 3) explore differences in interpretation errors within the context of specific communications.

## Methodology

### Participants

All study participants were native Japanese speakers who also spoke English fluently. Four (20%) men and sixteen (80%) women were included in the sample. None of the participants were full-time interpreters. As shown in Table 1, 9/20 (45%) participants had more than one year of experience with

language interpretation. Thirteen (65%) participants had received formal or graduate-level training as an interpreter, and eight of these thirteen individuals (72.7%) had more than one year of experience as an interpreter. Five (25%) of the participants were healthcare professionals; specifically, one physician, three nurses, and one physical therapist. Three of nine (33.3%) participants with more than one year of interpreting experience had medical interpreting experience. Only one of the five participants with a medical background had medical interpreting experience.

**Rationale for studying Japanese–English language interpreters**

English is not commonly required for community-level interpreting services directed at foreign residents in Japan, and interpreters for Chinese, Portuguese, Spanish, and Korean are needed more frequently. However, English is a commonly learned and used language worldwide, and Japanese–English interpreters are used for both native English-speaking patients and non-native English-speaking patients in medical settings. Also, due to the large percentage of Japanese people in Japanese-English interpreters overall, in most cases Japanese-English medical interpreting is conducted by the interpreters who are native speakers of Japanese (Komatsu, 2005).

Educational programmes for medical interpretation in Japan are usually offered for Japanese–English interpreters as well as for Japanese–Chinese, –Portuguese, –Spanish, and –Korean interpreters (Centre for Multicultural Society Kyoto, 2011; MEDINT, 2011; Multi-language Information Centre Kanagawa, 2011). Additionally, a study that focuses on Japanese–English interpreters may provide insight for English-speaking clinicians and interpreters who serve Japanese patients outside of Japan.

**Study procedure**

This study was conducted in Tokyo between March 2009 and April 2011. Participants were informed about the outline of the study approximately a week in advance and were provided with information on a simulated case based on the scenario. In real situations, with the exception of those involving emergencies, interpreters are usually given basic information about the assigned case so that they can prepare. In this study, participants were informed that the patient was a girl on an anti-cancer drug and needed a change in regimen (the name of the new drug was given) and that the interpreter was needed for the IC process between the physician and the patient's mother.

The communication between the physician, the patient's mother, and the interpreter during the simulated medical encounter was audio-recorded, and the interpreted utterances were transcribed verbatim for analysis.

**Setting and scenario**

A simulated medical encounter was created for the participating interpreters so that their performance could be examined from a common baseline. The scenario was developed by the first author, who is a registered nurse, a professional medical translator, and who has a Master of Arts degree in English Language; the scenario was reviewed by an independent medical doctor. The scenario was developed to reflect the IC process on the basis of previous studies using paediatric medical encounters (Flores et al., 2003; Simon et al., 2006). The scenario involved a discussion between a Japanese physician with low English-language proficiency and the non-Japanese-speaking mother of a seven-year-old female patient who required a change in her anti-cancer regimen. The role of the physician was played by a Japanese man who did not speak English, and the role of the patient's mother was

played by a Japanese woman who spoke English fluently. The scenario was scripted and the actors were instructed to follow the script.

The scenario included the following elements: disease names, terminology referring to drug side effects and medical procedures, and QOL (Quality of Life)-related issues such as changes in the patient's appearance due to the treatment as well as the child's social, financial, and educational problems.

**Analytical approaches**

***Units of analysis***

The dialogue between the physician and the patient's mother was coded using the Roter Methods of Interaction Analysis System (RIAS) (Roter, 2008). According to the RIAS, the smallest discriminable speech segment to which a classification may be assigned is designated as an utterance, which is therefore established as a communication unit. Interpretation accuracy was evaluated for each of the utterances in the scenario. The following are examples of utterance units:

> Unit example 1: "*Sou, yuketsu desuga, syukyo tekina riyu nado, kore ha daijobu deshoka?* [And, for blood transfusion, do you have any religious problem with blood transfusions?]" (Physician)
> Unit example 2: "Blood transfusion is OK with us." (Client)
> Unit example 3: "*Sou desuka* [Okay]." (Physician)
> Unit example 4: "Also, health insurance… it will take another long period of time for her treatment…" (Client)

Additionally, the utterances in the original scenario were assigned to one of three communication categories also based on the RIAS coding. The following three categories, presented with examples, were used for the analysis:

> 1) Medical exchanges: asking questions, providing information and counselling related to medical and therapeutic topics.
> Physician: (in Japanese) *Kanari ippann teki ni tsukawarete iru kougan zai desu* [This is an anti-cancer drug that has been used quite commonly.]
> Interpreter: This is the very general drug, for the anti-cancer drug.
>
> 2) Socioemotional exchanges: asking questions, providing information and counselling related to psychosocial issues and affective responses such as showing concern, empathy, and agreement.
> Client: She pretty much wanted to go home, so…
> Interpreter: (in Japanese) *Musume ha totemo ie ni kaerita gatteiru monodesu kara* [My daughter wants to go home very much, so.]
>
> 3) Process category: utterances that facilitate communication such as asking if the patient understands, repeating, paraphrasing, and orienting.
> Client: What is that again?

> Interpreter: (in Japanese) *Soreha nan desuka. Mou ichido itte kudasai* [What is it? Please say it again.]

***Measurement of interpretation errors***

To measure the participants' interpretation accuracy, a method of error analysis developed in a previous study was employed (Flores et al., 2003). The accuracy of the interpretation of each utterance in the scenario was examined, and errors were categorized into one of the following five types:

1) Addition: The interpreter adds unspoken words or phrases to the interpretation.
2) False fluency: The interpreter uses words or phrases that are incorrect/non-existent in a particular language.
3) Omission: The interpreter does not interpret words or phrases that were uttered.
4) Substitution: The interpreter substitutes words or phrases.
5) Editorialisation: The interpreter's personal view is added to the interpretation.

As for the omission, the following are examples of errors which are considered as this type of errors:

> Doctor: (in Japanese) *Hakkekkyu ya kesshoban ga hettari hinketsu ga arawareru kotoga arunodesu* [You may have a decreased white blood cell count and blood platelet count and anaemia]".
> Interpreter (into English) "Your white blood cell count may be decreased. You also may have anaemia."

In this translation, the interpreter omits "blood platelet count," which is considered as an error of omission. What follows is an additional example:

> Patient: (in English)"Also, health insurance… it will take another long period of time for her treatment…"
> Interpreter: (into Japanese) *Hoken no kotomo…* [Health insurance, too…]".

In this translation, the interpreter omits a large part of the original message, which constitutes an error of omission.

***Statistical analysis***

Errors were analysed via descriptive statistics. Analyses were conducted using SPSS software, ver. 19.

## Results

### Characteristics of interpretation errors

The original scenario contained seventy-two utterances (thirty-four medical exchanges, thirty socio–emotional exchanges, and eight process-related exchanges). We identified 1,242 utterances in the verbatim transcript. The time required to complete the scenario ranged from twelve to twenty-three minutes, with an average time of eighteen minutes. In total, 799 errors occurred, and the average number of errors per interpreter was 40.0. The average incidence of each error type is shown in Figure 1.The largest

proportion of interpretation errors were omission-type errors. False-fluency errors were the second most frequent, but errors of omission occurred almost twice as frequently as did false-fluency errors. Also, Figure 2 shows the percentage of each error type within the total number of errors.

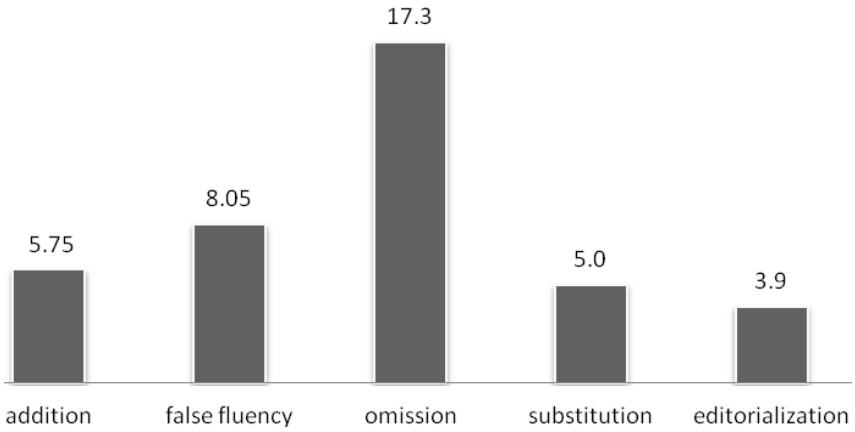


*Figure 1. Characteristics of errors: mean values of the frequency of each error type per interpreter*

**Errors according to interpreters' experiences/medical background and content of communication**

Table 1 shows the background and error frequency of participating interpreters. Interpreter K, who had more interpreting experience but lacked a medical background or formal interpreter training, made the fewest errors (*n* = 19) of all participants. Interpreter G, who had formal training and more than one year of interpreter experience, made the second fewest errors (*n* = 24). Neither of these two interpreters had medical interpretation experience or a medical background. Interpreter T had the highest error count (*n* = 61), and Interpreter O had the second highest (*n* = 53). These interpreters had less than one year of experience, were not healthcare professionals, and had received no interpreter training.

| Partici-pant ID | English language qualification | Interpreting experience ≥ 1 year (medical interpreting experience) | Interpreting training experience * | Medical background | Error # |
|---|---|---|---|---|---|
| A | TOEIC 930 | yes (no) | yes | no | 29 |
| B | unknown | no (no) | yes | no | 44 |
| C | STEP** 1st grade | yes (yes) | yes | yes | 45 |
| D | STEP 1st grade | yes (yes) | yes | no | 36 |
| E | graduated from a college in UK | no (no) | no | yes | 52 |
| F | TOEIC 940 | no (no) | yes | no | 35 |
| G | STEP 1st grade, TOEIC 985 | yes (yes) | no | no | 24 |
| H | STEP 1st grade | yes (no) | yes | no | 37 |
| I | research work in English overseas | no (no) | no | yes | 34 |

| | | | | | |
|---|---|---|---|---|---|
| J | studying in Australia; nursing licensure in Australia | no (no) | no | yes | 30 |
| K | TOEIC 980 | yes (no) | yes | no | 19 |
| L | professional translator | yes (yes) | yes | no | 34 |
| M | STEP 1st grade | yes (no) | yes | no | 30 |
| N | studying in Australia | no (no) | no | yes | 49 |
| O | TOEIC 850 | no (no) | yes | no | 53 |
| P | TOEIC 745 | no (no) | yes | no | 51 |
| Q | TOEIC 975 | no (no) | yes | no | 42 |
| R | natural bilingual of Japanese and English | yes (no) | yes | no | 42 |
| S | TOEIC 890 | no (no) | no | no | 52 |
| T | TOEIC 915 | no (no) | no | no | 61 |

*Table 1. Participants' qualifications/medical background and number of errors*
** Formal/graduate level training at professional-purpose*
*** Society for Testing English Proficiency (STEP; in Japan, the first grade is the highest level)*

Interpreters with less previous experience made more errors of all types (Figure 2). As shown in Figure 3, we found that participants with medical backgrounds made more errors in total. However, addition, substitution, and editorialisation tended to occur more frequently among interpreters who lacked a medical background.

Representative examples of specific errors included the omission of questions about side effects; the omission of the information that the patient (the speaker's daughter) was taking an anti-cancer drug; the erroneous addition of intensifiers, such as "very" and "really"; editorialising about the patient's (the speaker's daughter's) feelings about her mother; and the use of incorrect English medical terminology (e.g. using the incorrect term "side effection" for "side effects", substituting the mother's English utterance of "overwhelming" with the Japanese term for "very moving"). The following are some examples of conversations that included interpretation errors.

Example 1 (addition-and substitution-type errors):

> Client: "I see… I understand why my daughter needs to change her medicine, but what is Oncovine?"
>
> Interpreter [in Japanese]: "I understand. I understand about that. Why does my daughter need to change her drug? But what is Oncovine?" (Interpreter N)

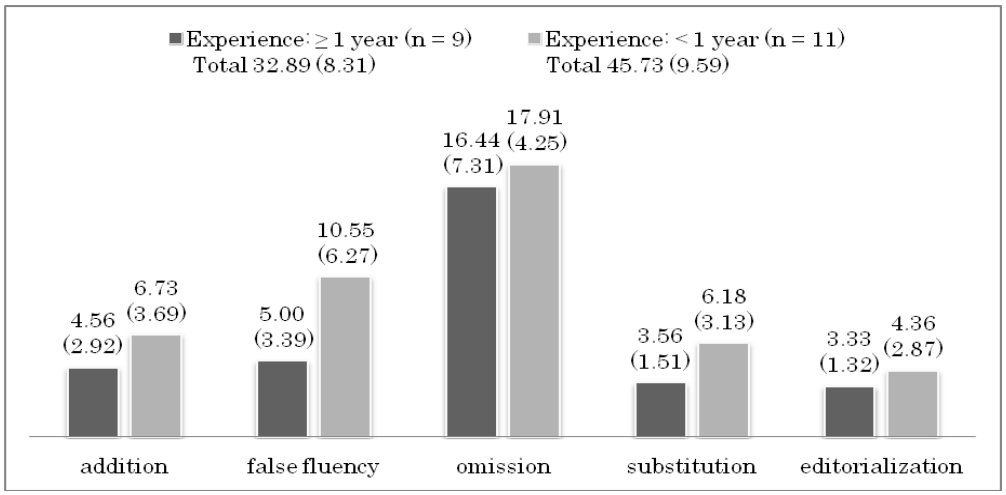


*Figure 2. Mean values (SD) of errors made by interpreters more/less than 1-year interpreting experiences*

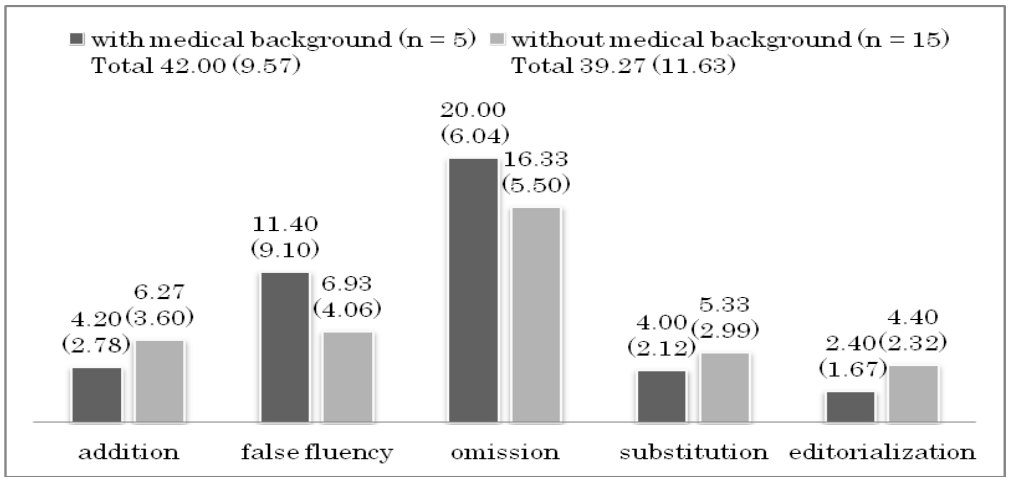


*Figure 3. Mean values (SD) of errors made by interpreters with/without a medical background*

The interpreter made additions and substitutions to the original utterance of "I understand why my daughter needs to change her medicine" with the translation of "I understand about that. Why does my daughter need to change her drug?", consequently providing confusing information indicating that the mother understood the physician's message but also stating that the mother did not understand the reason for the change in the medication regimen.

Example 2 (omission- and false fluency-type errors):

> Physician [in Japanese]: "This is an anti-cancer drug that has been used quite commonly. In your daughter's condition, this drug will be quite effective."
> Interpreter: "This is the one of the anti-cancer agents. This medicine, this medicine will affect very much to your daughter." (Interpreter O)

The interpreter omitted the information that the drug is commonly used and erroneously translated the Japanese words for "effective" into the English word "affect", which has a completely different meaning.

Example 3 (false fluency-type error):

> Physician [in Japanese]: "…and one serious side effect is called bone marrow suppression.'
> Interpreter: "And then, severe side effect is, severe, it maybe happen severe side effect, it is bone marrow restraition." (Interpreter E)

The interpreter used an incorrect word for "bone marrow suppression".

Example 4 (omission-type error):

> Physician [in Japanese]: "In this condition [if you experience bone marrow suppression], you may easily catch a cold leading to pneumonia because your resistance would be down."
> Interpreter: "If that side effect happens, the person will get, likely to get infected." (Interpreter C)

The interpreter omitted a large part of the utterance.

Example 5 (editorialisation-type error):

> Client: "She pretty much wanted to go home, so…"
> Interpreter [in Japanese]: "And, also, when it comes that she cannot go home and play, I think she will be disappointed about it." (Interpreter K)

In this interpretation, the interpreter extended the source message during translation in an attempt to speak for the patient's mother.

Patterns of error occurrence were also examined according to the content of the communication (i.e. medical, socio-emotional, and process-related exchanges). A mean of 17.7 errors (52.1% of thirty-four utterances interpreted in the scenario) were made during medical exchanges, 18.5 errors (61.7% of thirty utterances) were made during socio-emotional exchanges, and 3.8 errors (47.5% of eight utterances) occurred during process-related interactions. The frequency of each type of error according to communication content is shown in Figure 2. As in the total pattern of errors, omission errors occurred most frequently, irrespective of the content of the communication. The highest percentage of omission errors was made during process-related exchanges, although only eight utterances were included in this category.

In medical-related exchanges, more errors in utterance were observed with technical terms for medical and drug information. As Figure 2 shows, omission errors were markedly noticeable in the socio-emotional and process-related exchange categories (46% and 75%, respectively). As stated above, utterances in the socio-emotional category included those asking questions, providing information, and showing concern, whereas utterances of confirmation, repeating, paraphrasing, and orienting were included in the category of process-related exchanges. The results show that short utterances were noticeably omitted in translation. Examples of omission errors in short utterances within the socio-emotional category were "I see", "OK", and "*soudesune*" (let me see/Well). Fourteen (70%) interpreters made omission-type errors in these utterances (13/20 or 65% and 15/20 or 75%), respectively. Omission errors in the process-related exchanges category were particularly marked for the words "*Onko*?" (the utterance by the client to

repeat and confirm the name of the drug spoken by the physician), "*soudesune*" (yes/right), and "and…". For each of these three utterances, sixteen (80%), seventeen (85%), and fourteen (70%) interpreters, respectively, made the omission errors.

No major correlation was observed between the number of errors and either the content of communication or the interpreters' backgrounds.

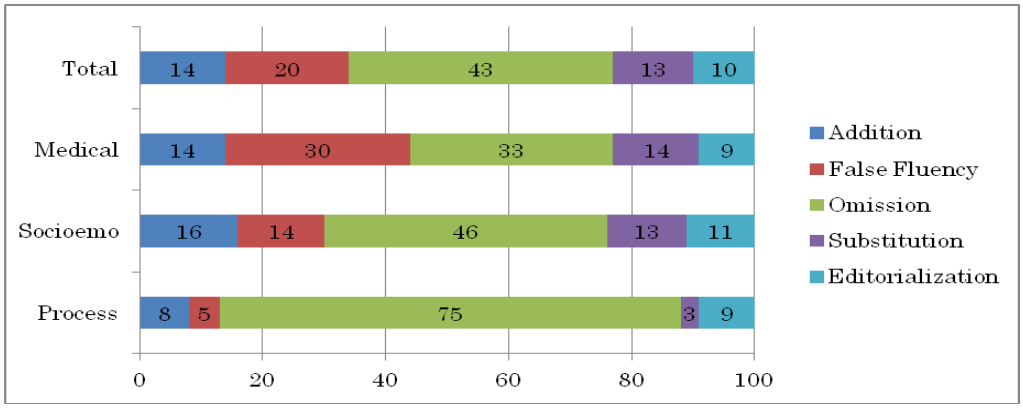


*Figure 2. Percentage of error types within the total number of errors and each utterance category.*

## Discussion

### Characteristics of errors

The pattern of error occurrences in this study was generally consistent with the findings of Flores et al. (2003), and underscores the difficulties that interpreters must overcome. Errors of omission were the most prevalent among all error types. False-fluency errors were the second most prevalent, and substitution errors were the third most common. However, the pattern characterising the occurrence of addition (the fourth most common), and editorialisation (the fifth most common) errors differed from that reported by the previous study, in which addition-type errors occurred least frequently.

The high frequency of omission-type errors lends legitimacy to the criticisms of current interpretation quality, because communication is not effective when information is incorrectly conveyed. The lack of interpretation skills is largely responsible for the frequent occurrence of omission-type errors. The most basic of these skills is retention capability, which refers to the interpreter's ability to memorise each utterance and to take notes effectively. Addition-type errors may be reduced by efforts to examine and enhance the code of ethics governing interpretation in healthcare settings, which obligates medical interpreters to translate all utterances without adding or deleting information or providing their own opinions (Healthcare Interpretation Network, 2007).

Many of the false-fluency errors occurred in the translation of medical terminology. This problem may be resolved by interpreters' acquisition of more substantive medical vocabularies, which will require a training programme that includes "periodic performance evaluation" (Flores et al., 2003, p. 11) to monitor vocabulary fixation.

Similarly, substitution errors can also be avoided by the provision of training in language interpretation, as well as enhanced foreign-language proficiency. These errors probably resulted from interpreters' limited knowledge of vocabulary and phrases, or lack of understanding of the grammatical structures of both languages.

Interpreters can correct errors involving editorialisation by carefully reviewing and acquiring familiarity with the code of ethics for medical interpreters. Interpreters need to recognise that fidelity is the first priority in their assignments, and that they must not include their own thoughts or opinions in interpreted utterances.

The interpretation errors presented in the results of this study might have had clinical consequences. The exchange of confusing, erroneous, or incomplete messages about medical and drug information between interlocutors can lead to misunderstanding about the treatment and the direct endangerment of patients' lives. To avoid such outcomes, medical interpreters should master the integrated interpreting skills described above.

***Differences in errors according to interpreters' backgrounds***

As the results show, the best medical interpreters in our study had no medical backgrounds, but more interpreting experience. Although the size of the sample used in this study was small, which limits our ability to generalise the findings, it appears that the strongest contributor to interpretation errors is actual interpreting experience. This result might be regarded as predictable, but it has not been demonstrated by any other empirical study in Japan. Hospitals and clinics should be aware of interpreters' experience when using them. Interpretation training also seems to be associated with error occurrence. Study participants received interpretation training focused on conference interpreting or its equivalent. In Japan, formal interpretation training currently concentrates on conferences or business/tourism settings rather than on community settings. Therefore, it was difficult to recruit participants with training in interpretation in medical settings. Correlations between the type of interpretation training and interpreters' performance should be examined.

In our findings, interpreters with medical backgrounds tended to make more errors. However, we could identify no specific factor attributing the quality of interpretation to the status of healthcare providers. Previous studies have demonstrated that the use of a bilingual healthcare provider as an interpreter does not guarantee superior interpretation services (Elderkin, Silver & Waitzkin, 2001; Moreno, Otero & Newman, 2007). Previous research also found that more errors occurred during the interpretation of technical content (Simon et al., 2006). In this study, however, the number of interpretation errors involving medical content did not necessarily exceed those in other content categories. Rather, errors occurred slightly more frequently in the content of socio-emotional exchanges, in which more idiomatic phrases were used, than in medical exchanges. These results may suggest that an individual's status as a healthcare professional should not be the most important requirement for their service as a medical interpreter. Indeed, when interpreters encounter unknown medical terms, they may readily find them in a strategically placed dictionary. However, conveying idiomatic phrases and expressions in both Japanese and English may be a more difficult, but more important, task for interpreters.

Further investigation is required to determine the relationship between interpreters' medical backgrounds and interpreting errors, the findings of this study have implications for the training and education of medical interpreters in Japan, where interpreters have historically dedicated more attention to learning technical terms.

***Errors according to the content of communication***

One notable finding of the current study was the prevalence of omission-type errors in all communication contents, especially within socio-emotional and

process-related exchanges. The importance of this level of communication (e.g. asking if a patient understands, repeating, paraphrasing, and orienting) in a medical consultation has been indicated in previous studies of health communication, which stated that verbal responses such as "Yes", "Uh-huh", "OK", "Is that right", or "I see" smooth conversations and facilitate communication between clinicians and patients (Beckman & Frankel, 1984; Mukohara, 2006). Because "confidence building between physician and patient is critical for proper medical services" (Mukohara, 2006, p. 3), small talk and utterances exchanged between physician and patient that express assurance or confirmation should not be overlooked, especially in healthcare communication. Nonetheless, as the results of our study show, interpreters often omitted or minimised the significance of process-related utterances. This finding may indicate that interpreters considered these utterances to be less important in achieving mutual understanding between patient and physician.

The omission of minor words or brief phrases that may convey empathic or validating signals between interlocutors, and attempts to focus more narrowly on technical terms, should be avoided when facilitating communication during a medical encounter. No utterance made in a medical consultation should be ignored based on the interpreter's own assumption that "this word spoken by the doctor is not really relevant to medical matters". Medical interpreters should complete their duties based on, and in compliance with, the ethical code which obligates them to translate every utterance, as well as the framework for health communication. The significance of omitting utterances in the process-related and socio-emotional exchange categories requires further study.

**Implications for training and practice**

The importance of training interpreters to function in medical settings has been documented (Brach, Fraser & Paez, 2005; Hsieh, 2010; Hsieh, Ju & Kong, 2010; Jackson, Nguyen, Hu, Harris & Terasaki, 2011), and the findings of this study highlight the need to refine medical interpretation training programmes to improve interpretation accuracy. Areas of training that must be addressed include the following: 1) interpretation skills, including memory retention, note taking, and translation of various idiomatic expressions; 2) technical competencies, such as knowledge of medications and healthcare, medical terminology, and health-communication theories; 3) cultural competence; 4) the code of ethics; and 5) mastery of medical discourse and an understanding of the "significant role language plays in a medical consultation and other related health settings" (Hale, 2007, p. 36). In the case of errors with potential clinical consequences described in the previous section, we could not determine the difference in errors made according to interpreters' medical backgrounds, due to the small number of participants. However, medical knowledge and clinical experience could be an important factor in avoiding adverse consequences, and training for this population, especially by organisational initiatives, is needed (Moreno, Otero & Newman, 2007).

Finally, the development of a certification system for medical interpreters within the social and cultural context of Japan should be a high-priority task. No official certification process has yet been established for medical interpreters, and a general lack of awareness exists in Japan of the appropriate utilisation of such interpreters.

## Conclusion and future work

This study explored the errors made by Japanese interpreters in a simulated medical scenario involving the discussion of IC in a paediatric consultation. The study results highlighted the characteristics of errors made in medical interpretation by Japanese–English interpreters. Overall, interpreters with more than one year of experience tended to make fewer errors than did those with less than one year of experience. The experience of interpreter training may also be a contributing factor. We also discussed several integral points about the measures that should be taken to correct and reduce interpreting errors.

This pilot study had several limitations due to the small sample size. Further research with a larger sample is needed to determine differences among sample groups. Also, because this study used a simulated situation, the generalisability of our results should be explored in other scenarios and settings, as well as in studies of actual medical encounters. It was difficult to closely analyse communication between interlocutors through interpreters in this scenario-based study of interpretations, because it was not possible to examine the actual consequences of the errors. For example, even after an omission error was made, the conversation continued as outlined in the scenario, and therefore any response based upon the result of the interpretation error could not be observed. Additionally, measures used to assess the accuracy of medical interpretation may require modification to minimise or eliminate ambiguity in order to achieve greater objectivity in future studies. To date, little research has been conducted to validate the method of evaluation, and much room remains for improvement in assessing the accuracy of medical interpretation. The examination of coding reliability may also require multiple evaluators.

Despite these limitations, this study is the first to explore error patterns made by Japanese–English medical interpreters, and the results indicate the need to develop better medical interpretation training programmes. We also suggest that such programmes focus not only on technical content, such as medical jargon, but also on the accurate translation of socio-emotional, contextual, and process-related utterances. The authors will share these findings at a meeting of the Healthcare Interpreting Training Group (HIT), where the participants in the current study receive training in medical interpretation skills. The HIT will then be able to recommend more effective educational programmes to organisations and groups that provide medical interpretation training.

In addition to general linguistic proficiency, interpretation in healthcare settings requires training in specific skills and technical, ethical, and cultural competencies. The patterns of errors made by Japanese–English interpreters indicate the need for integrated training programmes to reduce errors and produce high-quality interpreters. Only in this way will we be able to ensure safe and effective communication between clients with language barriers and healthcare providers. Our results also suggest the importance of using experienced interpreters in medical encounters to avoid adverse clinical outcomes and the need for a formal certification system for medical interpreters.

The next stage of research will require a larger sample to enable generalisation of the results. Additionally, we will also compare trained and untrained interpreters in terms of their commission of general errors and will then investigate differences among trained interpreters according to years of interpreting experience. Finally, we will compare untrained interpreters according to years of interpreting experience to confirm the findings of this

study by isolating the variables of interest. These results will help to determine the optimal number of years of interpreting experience required for accurate interpretation and will thereby benefit users of medical interpreters as well as efforts to develop better medical interpretation training programmes.

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