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Culturally sensitive document design for an Eastern Asia audience: Comprehension and preference

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The Rochester Institute of Technology

Department of Communication

College of Liberal Arts

Culturally Sensitive Document Design for an Eastern Asia Audience:

Comprehension and Preference

by

Merridith Smith

A Thesis submitted

in partial fulfillment of the Master of Science degree

in Communication & Media Technologies

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CULTURALLY SENSITIVE DOCUMENT DESIGN FOR AN EASTERN ASIA AUDIENCE:
COMPREHENSION AND PREFERENCE

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Abstract

An investigation into Eastern Asia audiences in China, Japan, and Korea determined how intercultural communication affects non-native readers' comprehension and perception of a document design. The study, an after-only experiment, used a small-sized sample from people who were In-Country Reviewers (ICRs) and knew of medical products in Eastern Asia and had knowledge in the area's local language. The subjects read an indigenously or non-indigenously designed document, and self-reported their comprehension and preferences for formatting style. Although the statistics showed no significant difference between the groups, on any variable tested (language, comprehension, and format), the qualitative data that were gathered can be interpreted as Chinese, Japanese, and Korean cultures preferred to read technical documents formatted horizontally and left to right.

Keywords: culture, document design, international communication, intercultural communication, preference.

Culturally Sensitive Document Design for an Eastern Asia Audience:**Comprehension and Preference**

Technical documents have a lengthy history; however, the profession of technical communication is relatively new (Hayhoe, 2006). Over the past 60 years technical communication “has grown significantly in North America and western Europe, but it has only begun to make inroads in Asia and eastern Europe in the past two decades” (Hayhoe, 2006, p. 141). As the profession becomes more global, existing research may no longer be adequate as guides for addressing culturally different audience needs in technical communication. For example, assumptions made about document design need to be revisited with a focus on what the differences are between the rest of the world and what North America and western Europe are accustomed to. Certain document design styles might be effective to use in one culture, but not another.

Researchers and theorists have recorded and argued the impact of document design on the reader’s perception and comprehension; but almost all of these works were written by Westerners and focus only on North American and European documents and readers. Current assumptions about document design cannot be presumed to also apply to “cultures whose characters are not the Roman alphabet, whose reading orientation is not left-to-right and top-to-bottom, and whose design principles and graphics are based on different aesthetic systems” (Hayhoe, 2006, p. 142). Cultural differences and similarities in document design, and communication should be considered and the decisions should accommodate the target audience. Documents nowadays should be designed to fit the target audience’s culture and improve non-native cultural communication effectiveness and comprehension, in addition to the current theories and instructions offered to technical communicators.

In 1995 Nancy Hoft acknowledged there was little research on international technical communication (Hoft, 1995). Ten years later Flammia's review of US textbooks on intercultural communication reported that none of the texts included guidelines for written communication (Flammia, 2005). Flammia states, "Timothy Weiss has pointed out that the greatest problem faced by translators is poorly written source documents" (2005, p. 402), however another important problem needing research is document design. As communication experts have stated time and time again, know your audience. However, there is little published research and instruction for Westerners on the topic of document design for cultures in Asia and eastern Europe. In addition, Asia and eastern Europe are only beginning to research and develop technical writing courses and instructions on International Technical Communication.

Hayhoe discussed the notion of "Technology novice experience" (1999, p.139). In his words, beginners confront the "strange new world of computers" or attempt to perform unfamiliar tasks, but their lack of knowledge about and comfort with the task can make them feel like "strangers in a strange land" (Hayhoe, 1999, p.139). The novice is unable to cope with the technology that was intended to empower them (Hayhoe, 1999). Because the social or cultural environment can significantly influence communication, and Asian and eastern Europe are only beginning to develop technical writing courses, one might make the assumption that their familiarity with technology is limited (Hayhoe, 1999).

Barnum and Huilin recognize "the commonplace assumption has been that documents need only be translated into the appropriate language to be effective. Some companies are now beginning to recognize that documents intended for international markets need not just translation but localization" (2006, p. 145). Localization has multiple meanings, but one definition is, "substantive changes to the types of examples, graphics, choice of colors, idiomatic

expressions, metaphors, and so forth” (Barnum & Huilin, p. 145). As important as these strategies are in reaching multicultural audiences, they do not effectively address the very different cultures of the United States and for example, China, and the impact these cultural differences have on how information is presented, understood, and used (Barnum & Huilin, 2006). Cultural differences not only affect how product information is understood, but also how communication within organizations is understood. The latter point has been well documented in articles and books (Barnum & Huilin, 2006).

Hayhoe feels that just as technical communicators must deal with the differences between subject matter experts and users, they must also deal with the linguistic and cultural differences between themselves and users in various countries, but technical communicators must first be aware that differences exist (Hayhoe, 1999). Then technical communicators must understand exactly what the differences are. Finally, international technical communicators must identify and use strategies that enable all who are involved in creating, translating, and localizing information products to work together smoothly to help users understand the information (Hayhoe, 1999). In a sense, adapting to the differences in document design may act “as a bridge between cultures” (Ding, 2004, p. 174).

However, how effective are those documents in other countries if a key component of audience analysis is being ignored – document design? If the ways in which cultures read differently (for example East Asian and American) is not accounted for in the design, the comprehension and perception of the document is not as effective as it could be. These considerations leave one to wonder: What differences are there in reader comprehension and self-reported affective response between documents using indigenous and non-indigenous language? What differences are there in reader comprehension and self-reported affective

response between documents using indigenous and non-indigenous design formats? To what extent does non-indigenous reader comprehension and self-reported affective response improve when the document is culturally congruent?

Rationale

In recent years my professional career as a Technical Communication Specialist has exposed me to many new issues in communication that I was not aware of during my undergraduate work. During my Bachelor of Science studies, the most that was talked about in regards to translations and writing for different cultures was limited to “translation spread”: the concept that when a document is translated, the content on the page could appear to expand because different language fonts/words take up more room on the page. There was no discussion on how different cultures write documents in different ways. The design of the document itself depends on the audience, but the curriculum did not teach anything other than writing for Western cultures. Nowadays, I work with an international audience writing for a Johnson & Johnson company, and have become more familiar with the ways in which culture is transferred into language, discourse, document design, and organization. I see the growing need for people to understand how to write documents more effectively for global audiences, yet there is little research to help guide me in my pursuit to gain this knowledge. By completing this study, I tested and added to the current knowledge base that is growing around the subject of document design in international technical communication.

The curriculum provided in technical communication nowadays lacks the research to help us understand how document design’s effectiveness is mediated by culture. We have been taught to know our audience, but have no documented guidelines for producing documents to be used by different cultures (Matveeva, 2008). We force our western and European document design

standards and pedagogy on cultures who do not even read in the same direction that we do (left to right versus right to left). Marketers have recently realized that other cultures require different marketing strategies, but technical writers have yet to fully jump on the cultural bandwagon. Bridging the gap between cultures can help advance the profession and research in international technical communication, and provide a more updated, comprehensive approach to document design.

As the world population grows, more and more cultures interact with one another more frequently. Some countries may seem more ignorant than others when trying to enter new global markets because they ignore the ways in which we differ from each other culturally. Understanding the different cultures and accepting writing/document design preferences that differ from our own is an important lesson to learn. More people need to be aware of the cultural design differences, and how to accommodate for those differences when writing for a global audience. As professionals, we can increasingly test, update, or add to the current knowledge base that is growing around the subject of document design in international technical communication.

Literature Review

Culture influences the ways in which we communicate. And the world still has much to learn about this subject. Cultural influences first gained recognition in business communications more than 30 years ago. Marketers were the next professionals to consider cultural influences in their communications, and research was published about the topic. Today many technical communicators are just now beginning to explore the world of intercultural communication, as it affects non-native readers' comprehension and perception of a document. A review of the

representative, published research and theory on culture's effect on communication helps trace technical communication's growing interest in being culturally sensitive.

Business

In 1993 Thrush cited two major changes in business and industry within the United States that made it imperative for technical communicators to become aware of cultural differences in reading and writing. The first was an increase in international business (Thrush, 1993). In 1982 Lathan cited that more than 35,000 U.S. workers were employed overseas by foreign-owned businesses, and more than 30,000 U.S. companies were exporting products abroad (p 16). In December of 2009 the U.S. Census Bureau reported that the exports to China were a record \$8.4 billion, indicating that the number of United States exports continued to increase. Second was the change in the U.S. workforce (Thrush, 1993). Americans increasingly began to work for companies that were owned by foreign investors, and U.S. companies employed more people from various cultural backgrounds (Thrush, 1993).

Even though Thrush (1993) identified these changes as imperative to technical communicators in 1993, Western business professionals had already encountered and realized years ago that other countries did not necessarily communicate in the same ways as Westerners did. Because people in U.S. companies were increasingly multicultural, and the number of global company interactions was increasing, Western business cultures were negatively impacted in daily business situations. For example, coworkers or business partners witnessed an increase in business communication conflicts. Westerners failed to realize that it was culturally insensitive to be upfront with information in a business setting. The Westerner's communication style offended their multicultural colleague because the multicultural coworker favored being discreet

in that communication setting. To improve global company interactions, interest in organizational cultures increased and research started to emerge.

Hofstede, an influential Dutch psychologist, presented a significant theory about the way in which culture affected how businesses communicate. Hofstede aimed to demystify the “organizational culture construct” and change it from a passing fad into a regular element of the theory and practice of the management of organizations (Hofstede et al., 1990, p. 314). One study by Hofstede (1990) discussed organizational cultures, and whether the differences between cultures could be attributed to unique features of the organization. Hofstede wanted to determine if organizational cultures could be “measured” quantitatively, on the basis of answers of organizational members to written questions, or could they only be described qualitatively? He also aimed to discover to what extent could measureable differences among the cultures of different organizations be attributed to unique features of the organization in question such as the organization’s history or founder’s personality (Hofstede, 1990)? To answer these questions Hofstede (1990) gathered data from twenty units from ten different organizations in Denmark and the Netherlands. His project consisted of three stages: in-depth interview of two to three hours, standardized survey questionnaire consisting of 135 pre-coded questions to a random sample, and questionnaires followed up by personal interviews (Hofstede et al., 1990). Data came from in-depth interviews of selected informants and a questionnaire survey of a stratified random sample of organizational members. Data on task, structure, and control characteristics of each unit were collected separately. From this research Hofstede reported the concept of independent dimensions to culture that he based off of an earlier project by himself, the “first author that covered differences among national cultures” (Hofstede, p. 287).

Hofstede found that the differences among these twenty units could be explained by six factors, relating to established concepts from organizational sociology that measured the organizational cultures on six independent dimensions. Researchers and professionals, from different fields including business, marketing, and technical communication, still apply Hofstede's techniques and theory today to help operationalize cultural affects on communication (Marcus & Gould 2000; Callahan 2005; Corbu 2009). Many of them select one or more of the five cultural dimensions: power distance (large vs. small), uncertainty avoidance (strong vs. weak), individualism vs. collectivism, masculine vs. femininity, and Confucian dynamism (Hofstede, 1990). However, Hofstede's research neglected to consider how language and culture influence cognition. Cole (1996) described how "Human thinking and human culture are assumed to be intrinsically intertwined" (Cole, p. 34). Therefore, more research was needed to explicitly determine the influence of culture.

In 2000 Ulijn and St. Amant extended the insight into cultural communication factors in business by presenting the results of an experiment involving how individuals from China, the Netherlands, Germany, France, and Italy perceived a videotaped example of intercultural business negotiations. Ulijn and St. Amant hoped to better understand how culture explicitly affected the way individuals from different international backgrounds perceived the same professional communication situations; specifically how individuals from different cultures perceived questioning and pausing/interrupting behavior (Ulijn & St. Amant, 2000). Subjects were given a sheet that contained short definitions and examples of the five kinds of questions identified by previous research (open questions, reflecting questions, closed questions, leading or suggestive questions, or directive questions). The subjects were then instructed to watch a videotaped Dutch-Chinese negotiation and record every time they observed an instance of one of

the question types or time-use types, as well as to record which party used this question or time-use type (Dutch or Chinese).

The Ulijn and St. Amant (2000) results indicated that perception score differences depended significantly on the Germanic/Latin dichotomy, so intercultural perception differences were seen. This combined data from Chinese, Dutch, and neutral observers indicated that culture had some impact on how individuals perceived negotiation behavior, especially in relation to the use of reflecting questions, the perception of how often and when pauses occurred, and the use of interruptions (Ulijn & St. Amant, 2000). This study's results showed the importance of negotiation in communication; how culture explicitly affected how different individuals perceived and interpreted the same situation. If culture could affect how individuals perceived and interpreted the same business situation, perhaps the same conclusion could be drawn about individuals that were recipients to marketing materials.

Marketing

Not only was communication in business being affected, but cultural influences on marketing communication were also being seen (Frank, 1987). As more businesses spread out over the world, companies applied their findings about intercultural business communications to the field of marketing. Companies found that products being sold and marketed in other countries should have their advertisements, messages, or designs customized to reflect the target market in that country, or else the brand could suffer.

Jane Frank (1987) compared three examples of direct marketing sales letters that were similar in function, format, content, and targeted recipient but originating in different cultures (India, England, and the United States) and companies. Frank felt this was important to research because as English spread around the world, new problems related to the varieties of English

used by copywriters and their targeted audiences emerged (Frank, 1987). Frank analyzed the grammatical, syntactic, and rhetorical features of marketing sales letters to argue that culturally-bound sets of expectations and rhetorical structures could present difficulties to a Native English speaking audience because they may be perceived as an unusual application of the general principles they understand to be governing discourse (Frank, 1987). Frank presumed that although communicative failure may be attributed to or provoked by socio-cultural differences and barriers to interpretation, an understanding of cross-cultural miscommunication should be extended beyond an investigation of the factors used in her research to an examination of the differences in pragmatic meaning (which frame, and underlie all discourse). Although Frank's approach was potentially useful to estimate and contrast sociolinguistic differences they "may not be descriptively or definitively adequate" and a test was never done on her impressions (Frank, 1987, p. 25). This impressionistic study provided some insight into how culture affected marketing sales letters, but more empirical research needed to emerge.

In addition to direct marketing sales letters, Corbu (2009) reported empirical research on global brand image in four different cultural contexts: China, Romania, France, and the United States of America. Corbu investigated brand image by means of Geert Hofstede's individualism scale for four different global automobile brands and one local (national) brand (one for each country). Corbu (2009) asked first year students at different colleges from well known universities in the four countries to complete a self-administered questionnaire about brand awareness. Companies such as Mercedes, Toyota, Porsche and Chrysler were chosen (Corbu, 2009). The research showed that in collectivist cultures opinions are more homogeneous, and therefore brand image should be more prominent and coherently constructed than they are in individualistic cultures (Corbu, 2009). Strong personality images were built rather in

individualist cultures than in collectivist ones, and national popular brand images are more prominent than global ones. Corbu (2009) concluded that brand images were stronger in individualistic rather than collective cultures. Research was now indicating that brand images could be dependent on the culture, and those brands should recognize how culture can explicitly change the perception, and recall of a brand by an individual. However, both of these marketing studies (Frank 1987; Corbu 2009) lacked empirical data. More empirical research was needed to scientifically report the effects of culture on marketing communication, and although many are moving in that direction, there is still much work to be done.

Technical Communication

Documents are now translated into multiple languages, and dispersed to many cultures and countries. Technical communicators, almost in parallel with marketers, picked up on the notion of tailoring messages to culturally specific guidelines, and began to develop culturally sensitive habits when designing documents for international audiences. Much of the research on culture's affect on international technical communication describes how to alter the words that compose the document (Gerritsen et. al. 2007; St. Germaine-Madison, 2006). Since the audience technical communicators write for is changing (international business is increasing, and the U.S. workforce is changing), a technical communicator's understanding of how to create effective documents must also change. As Thrush stated, the probability that documents technical communicators prepare will be used by people of widely differing linguistic and cultural backgrounds has increased dramatically over the past 20 years (Thrush, 1993).

St. Germaine-Madison (2006) investigated how different web designs were assessed for the level of effectiveness of the documentation itself. Specifically, the research question was, "How effective are instructions for electronic documents in the areas of translation and

localization for the Mexican-American audience in the United States?” Sixty examples of technical instructions for electronic equipment were examined for availability and quality of Spanish translations that were written in the United States in the past five years. Most households in the United States use electronic products of some kind, so St. Germaine-Madison decided to focus on those instructions. She, however, did not look at instructions for any older equipment because the documentation might not have been an accurate reflection of current technical communication practices. The results of the study indicated that overall, the Spanish translations of user manuals had “serious problems with the availability and quality of Spanish translation of documentation for electronic products” (St. Germaine-Madison, 2006, p.191). She recommended that whenever possible, a translation into Spanish should be included, and it is good business to include appropriate Spanish translations (St. Germaine-Madison, 2006).

Building off of that principle, technical communicators have realized that translations alone cannot provide clear information. In 1979, Chrissie Maher founded the Plain English Campaign. The Plain English Campaign, as its website states, campaigns for “clear and concise information” for all (Plain English Campaign). In addition, it provides *The a to z of alternative words*; a guide that gives hundreds of plain English alternatives to replace the hard-to-understand words and phrases that so often occur in technical writing. The guide provides a way to use “everyday words” and phrases as a step towards clearer writing (Plain English Campaign).

Simplified or plain English can reduce the number of words used by westerners to help provide a more precisely translated document; which means it is less likely that jargon is used and could lead to confusion in another culture. For example, *Simplified English: The new language in International Business* states the word ‘axis’ has multiple meanings that can be misunderstood if not clearly defined; it could be a straight line around which a body rotates, the

second vertebra of the neck, or it could mean a wild animal found in India (Simplified English, 2004).

Gerritsen, Korzilius, Van Meurs, and Oorsprong (2007) were inspired by Thrush's (2001) study results that "phrasal verbs, were, indeed, a problem for even advanced learners of English as a Second Language," and carried out a comprehension study in the Netherlands of words discouraged by the Plain English Movement (PEM) and those recommended by the movement's institutions (Thrush, 2001, p 294). Gerritsen et al. restricted themselves to the guidelines of one of the institutions chosen, namely the Plain English Campaign (PEC). The importance of the research was noted on the very first page of the article, basically stating that receivers of messages nowadays must be thought of as users of English as an international language. The researchers felt this led to "special demands on the English used, for what is comprehensible to a native speaker of English need not be so to a non-native speaker of English" (Gerritsen et al., 2007, p. 319). In addition, Gerritsen et al. (2007) called attention to the fact that it was not common knowledge that non-native speakers of English may require a different kind of English than native speakers do (Gerritsen et al., 2007).

First Gerritsen et al. conducted a small-scale preliminary study. The researchers wanted to make sure that native speakers of English and native speakers of Dutch considered the same words to be difficult. They determined this by means of a survey of students. Since the preliminary study revealed that native speakers of English and native speakers of Dutch considered the same words to be difficult, Gerritsen et al. moved on to answering their questions about comprehension and word preference. This strategy should have been identified as a limitation of the study; because it can cause sensitivity to the experiment itself.

The two main research questions were answered by means of an experiment. The second phase, consisting of the experiment, was where half of the participants were randomly assigned to read and respond to a text with Latin-based English words, the second half were to read and respond to a text with PEC recommended Germanic English words. Although the results of their preliminary study and experiment showed that recommendations for transparent usage of English (such as the PECs), made for better comprehension in the Dutch, but this “cannot be the last word on guidelines in international English” (Gerritsen et al., 2007, p. 330).

St. Amant and Zhu (2006) focused on the rhetorical factors affecting American perceptions of Chinese-created traditional Chinese medicine (TCM) web sites. The limited study tried to determine what cultural rhetorical factors might affect American users’ perceptions of information presented on Chinese created TCM Web sites through the use of interviews, survey, and textual analysis (St. Amant & Zhu, 2006). The purpose was to gain an initial understanding of what particular communication patterns seemed to be the most problematic for American users. The results revealed that there were three core problem areas in relation to culture and design, and provided accompanying explanations for what caused such problems (St. Amant & Zhu, 2006). By understanding the kinds of problems to expect and why these problems occur, technical communicators can better perform writing and research tasks for non-Chinese audiences.

Barnum and Huilin (2006) aimed to review the reason why China’s cultural values shape the way in which documents are viewed, created, and used in China versus in the United States. Their content analysis study found a significant difference in the two organizational approaches used (Barnum & Huilin, 2006). The American writer presents his or her point of view first (deductive order), develops it during the essay, and restates it in the end for emphasis. In

contrast, the Chinese writer presents the topic, develops it in an inductive or spiral pattern in the body paragraphs, and concludes with his or her “opinion,” less strongly stated than the American writer’s “position” (Barnum & Huilin, 2006, p 153). In addition, headings are less common in Chinese documents. The article suggested that Chinese writers gave up using headings altogether out of respect for Mao’s supposed dislike of them (Barnum & Huilin, 2006).

Barnum and Huilin’s study (2006) can be used so that technical communicators in the United States and other Western cultures may gain insight into the cultural bases for Chinese writing strategies so as to better craft documents for Chinese users (Barnum & Huilin, 2006). In addition, their research hoped to inspire technical and professional communicators in the United States. They hoped technical and professional communicators would learn differences in writing styles, organization, and approach on the basis of culture, thereby improving the understanding of how to change communication styles to suit the appropriate context and users, and improving communication effectiveness (Barnum & Huilin, 2006).

Researchers Faiola, Matei and MacDorman responded to this call. Results of an online experiment (Faiola & Matei, 2005b) demonstrated that participants from the same culture as the Web designer performed tasks more quickly. In 2008 Faiola and MacDorman completed an in-lab experiment where subjects were asked to explore and reflect upon the quality of six Web sites. The cultural preferences of participants were found to concur with their developed cultural cognitive processes (Faiola & MacDorman, 2008).

Another study by McCool (2006) argued that internationalizing documents required fundamental re-architecting of online information, not just localization of surface features. McCool (2006) believed the process of overlaying cultural dimensions on information architecture could be a new approach toward internationalization and localization. Although

practical work has been done with regard to culture and online information, rarely have these investigations incorporated the deeper current of culture (McCool, 2006). He feels this fact is unfortunate because core cultural values, those dimensions which influence how we perceive and ascribe meaning to the world (Hofstede 1999), are possibly the most important factors for understanding audiences unlike ourselves (McCool, 2006). The cultural values represent the fundamental mechanics by which we determine reality. Although cognition may influence us in particular directions, the imprint of environmental influence must not go unnoticed. Through a combination of information architecture and cultural dimensions the most relevant cultural values can be determined (McCool, 2006).

Carliner (2000) also seemed to adopt this thinking. His concept of information design broadened the role of technical communicators beyond the traditional boundaries of writing and page design (Carliner, 2000). Hackos et al. (1997) found that in developing on-line documentation, traditional needs analysis methods do not give us enough detailed information about the users of the products to design documentation that adequately meets their needs (Hackos et al., 1997, p.102).

In closing, McCool (2006) can be used to iterate that differences in writing patterns across culture have been known for nearly a century, with the most important and enlightening work appearing during the past 50 years (McCool, 2006). Approaches to communication and writing are not universal. Writing and designing instructions and other technical information for diverse audiences are not confined to translation and surface features of culture (color, currency, and time). Rather, effective internationalization and localization goes beyond these outer features of culture (McCool, 2006).

In order to expand the existing research beyond these outer features of culture, this study asked three research questions; what differences are there in reader comprehension and self-reported affective response between documents using indigenous and non-indigenous language? What differences are there in reader comprehension and self-reported affective response between documents using indigenous and non-indigenous design formats? To what extent does non-indigenous reader comprehension and self-reported affective response improve when the document is culturally congruent?

Methods

To best answer the questions asked above, this study was completed as an after-only experiment. Subjects were a census of people who were In-Country Reviewers (ICRs) and knew of certain U.S. medical products in Eastern Asia, and had knowledge in the area's local language. The subjects were asked to read a Japanese, Korean, or Chinese translated PDF document that had been altered to reflect the design format used in that culture, and self-report their comprehension, and preferences for formatting style in two parts; Impressions of a Document Part 1 and Part 2.

Both parts of the questionnaire were offered in Word format so that the responses could be collected in a timely manner, and could be easily understood. Hard copy questionnaires would have taken much longer to gather and hand written responses may have been less legible. Interviews conducted via phone or video did not seem like the best option because none of the ICR's native spoken language was English, and scheduling interview times that were convenient for both parties would have been difficult.

In preparation for Part 1 of the questionnaire, a Western formatted document written in English was sent to a translation vendor to be translated and altered to meet the formatting

preferences for that language (in this experiment, Chinese, Japanese, and Korean). Since Eastern Asia cultures tend to read vertically instead of horizontally, the text was changed to read vertically (The Columbia Encyclopedia, 2010). In addition, Eastern Asia audiences read from right to left instead of left to right, if the text is presented to them vertically, so the text was altered so that it was written as so (The Columbia Encyclopedia, 2010). Lastly, Eastern Asia audiences do not prefer to use bold or italics within their documents because the characters can bleed into one another, therefore decreasing readability and comprehension, so the document was altered to remove all use of bold and italics.

In Part 1 half of the subjects from the census were randomly selected to view the translated Western formatted document (control), and the other half were randomly sent the translated Eastern Asia formatted document (experiment). Splitting the subjects into two groups made it possible for the researcher to evaluate if there were any significant differences between the two groups with regards to preferences, and comprehension. The subjects were given a two-part questionnaire: Part 1 questionnaire (in English), and the control/experiment document at the same time via email to measure comprehension and preference, and Part 2 questionnaire (in English) sent via email three days after receiving the completed Part 1 to measure preference. Part 1 questionnaire aimed to measure comprehension differences between the two documents, and both questionnaires aimed to measure differences in preference for formatting style; the questionnaires were not translated. By providing a version of the document that was, from the surface, thought to be culturally congruent for that region, the researcher was able to determine if there were any differences in comprehension when the preferred format was not congruent with the traditional reading style for that culture.

Several questions in Part 1 were close-ended and ordered, while other questions were open-ended to ensure that the census accurately measures comprehension and not memory. The same questionnaire was sent to the subjects, regardless of the type of formatted document for both Part 1 and Part 2. See Appendix B for a copy of the Part 1 questionnaire. In order to ensure the Part 1 questionnaire was as complete as possible, a pilot test was completed by people who resemble the ICRs (speak/write same native language, but level of product knowledge was not the same). In Part 1, Section 2, Question #7, two out of the three pilot subjects responded they found the question confusing, and the questionnaire was revised accordingly.

In Part 2 a follow up questionnaire was sent to the subjects, regardless of the type of formatted document. Several questions in Part 2 were open-ended, while a couple of questions were close-ended and ordered to ensure that the census accurately measured preference. See Appendix B for a copy of the Part 2 questionnaire. A pilot test was not completed, but feedback was provided by one of the pilot subjects prior to Institutional Review Board (IRB) approval and the questionnaire was revised accordingly. Due to the fact that this after-only experiment included human participants, all materials were submitted to the IRB prior to carrying out the study.

The questionnaire instruments were designed to operationalize the experiment's dependent and independent variables. In order to be able to determine if the subject was in the control or the experimental group, subjects answered two questions in Part 1, Section 1 that pertained to the layout/design of the document they received (Part 1, Section 1 questions 10 and 11). Subjects responding they received the document designed vertically, read right to left with no bold or italics, were identified in the experiment group.

Two items in Part 1, Section 2 (Part 1, Section 2 questions 2 and 4) measured which language the subject received; subjects were asked to check a box next the appropriate Publication Number (identifying the language with the last two characters) in Part 1, Section 2 question 2 and were then asked to check the box next to Chinese, Japanese, or Korean in Part 1, Section 2 question 4 to indicate which language they read. Since subjects could respond inaccurately in regards to the document they were given (Part 1, Section 1 questions 10 and 11, and Part 1, Section 2 question 2 and 4), the coders used a coding scheme which revealed the subjects who were in the control group or the experiment group (R = experiment, RI = control) and which language they received (to ensure they were sent the correct language) instead of using the above mentioned questions.

The subject's comprehension of the document was measured based on several of the responses in Part 1, Section 2 of the questionnaire (Part 1, Section 2 questions 1-7). Close-ended unordered questions in Part 1, Section 2 (Part 1, Section 2 questions 1-5) asked explicitly about when the document was issued, the Publication Number for the document, the document's purpose, the document's language, and what needs to be verified on the system to measure comprehension of the document. Open-ended questions then followed (Part 1, Section 2 questions 6-7), asking about specific information contained in the document to test the comprehension and not the recall of the document that the subjects read. For example, subjects were asked to type, in the order as they appear, the five headings used in the example table within the document.

Subjects were also asked two close-ended unordered questions in Part 1, Section 1 (Part 1, questions 8-9) about how difficult it was to comprehend the information contained in the document based on the format provided (vertically right to left vs. horizontally left to right).

Because the two questions in Part 1, Section 1 (Part 1, questions 8-9) could be based on opinion and did not use the same category of ordinal data, they were not included with the measurements for comprehension or the rest of the questions that measured a subject's affective response to the document.

The subject's perception of (affective responses to) the text was measured in Part 1, Section 1 of the questionnaire using a series of close-ended unordered and ordered response belief statements about the design and format, and language of the document (Part 1, Section 1 questions 1-7, 12 and 13). Different preferences for vertically right to left designs, horizontal left to right designs, and the use of bold and italic fonts in Eastern Asia characters were measured based on the responses provided. Questions 1-7 in Part 1, Section 1 measured the design and format preferences, while questions 12 and 13 measured preference for the use of bold or italic characters within the language. In addition, subjects' responses to open-ended questions in both instruments (Part 1 Section 1 question 16, Part 1 section 2 question 8, and Part 2 questions 1 and 2) gave the opportunity to gather supplemental qualitative data about the technical documents that were read, and how technical documents were formatted or written in those cultures. The end of the Part 1 questionnaire asked subjects open-ended questions in order to provide demographic information to be used for statistical purposes.

The subject's perception of (affective responses to) the text was also measured in Part 2 of the questionnaire. Part 2 of the questionnaire consisted of a series of close-ended unordered choices about the document they read in Part 1 (Part 2 questions 2-4), as well as close-ended ordered response belief statements about what factors played into their responses (Part 2, question 5). Different preferences and factors were evaluated based on the responses provided in Part 2. In addition, open-ended questions were included in order to sequester additional

qualitative data about preference (Part 2, questions 2a and 3a), as well as qualitative data about whether or not the responses provided by the ICRs reflected their native language's reading style (Part 2 question 4a).

Once respondents completed and returned the questionnaires, they were coded for data analysis by two individuals using the content code book (see Appendix C); one of those people was the researcher. Because of the open-ended questions provided in the questionnaire, the content code book was completed after the subjects returned their questionnaires. Intra-coder reliability was tested for; 10% of the censuses returned were coded again one week later to ensure that the respondents' answers were coded the same as the week before. Inter-coder reliability was also tested; again 10% of the censuses returned were coded again one week later by the opposite coder to ensure that the coding instructions were clear and reliable.

Summing up, the methods chosen for this study were carefully selected because they best helped to answer the questions being posed about Eastern Asia cultures. The subjects had to be split into two groups so that the differences could be compared. By providing two different formats for the same content, differences in comprehension and preference could be evaluated and some assumptions could be made based on the answers that were provided by the subjects. The after-only experiment allowed the subjects to read the documents and self-report their preferences, and it also allowed the researcher to evaluate responses for comprehension differences. Other methods, such as observation, or even interview, were just not possible given the cost and location restrictions (it would have been very hard to schedule phone or video interviews given the time difference between the United States and Korea, China, or Japan). In addition, offering the subjects the chance to respond at their own will, instead of through conversation, helped to limit confusion that can occur when trying to understand what someone

else is trying to say in a different dialect. The chance for miscommunication to happen within the instruments was greatly reduced by providing input fields for written (typed) responses.

Results

The Mann-Whitney U-Test was used to compile statistical data on the census responses that were collected from the In-Country Reviewers (ICRs) during the after-only experiment. The statistics aimed to determine if there was any difference in comprehension, or preference between the control groups and the experiment groups for each language and cultural format that was sent out with the census. The statistics revealed that there was no significant difference between Japanese, Korean, or Chinese affective responses to the design format used in the experiment, the language that was used (for example, use of bold characters) or their comprehension.

Since subjects could respond inaccurately in regards to the document they were given (a limitation of self-reported responses), the coding scheme which revealed the subjects who were in the control group or the experiment group (R = experiment, RI = control) was used to group the responses. Therefore, the responses to two questions in Part 1, Section 1 that pertained to the layout/design of the document they received (Part 1, questions 10 and 11) were not used to determine if the subject was in the control or the experimental group.

All of the subjects chose the two items in Part 1, Section 2 (Part 1, questions 2 and 4) correctly (ensuring the subjects received the correct languages), so the coders were able to only use the coding scheme (R or RI) instead of using the above mentioned questions to determine which language the subject received; in Part 1, question 2 and in Part 1, question 4.

The subject's comprehension of the document was measured based on several of the responses in Part 1, Section 2 of the questionnaire (Part 1, Section 2 questions 1-7). Subjects

were also asked two close-ended unordered questions in Part 1, Section 1 (Part 1, questions 8-9) about how difficult it was to comprehend the information contained in the document based on the format provided (vertically right to left vs. horizontally left to right). Because the two questions in Part 1, Section 1 (Part 1, questions 8-9) could be based on opinion and did not use the same category of ordinal data, they were not included with the measurements for comprehension or the rest of the questions that measured a subject's affective response to the document.

The subject's perception of (affective responses to) the text was measured in Part 1, Section 1 of the questionnaire using a series of close-ended unordered and ordered response belief statements about the design and format, and language of the document (Part 1, Section 1 questions 1-7, 12 and 13). Questions 1-7 in Part 1, Section 1 measured the design and format preferences, while questions 12 and 13 measured preference for the use of bold or italic characters within the language. In addition, subjects' responses to open-ended questions in both instruments (Part 1 Section 1 question 16, Part 1 section 2 question 8, and Part 2 questions 1 and 2) gave the opportunity to gather supplemental qualitative data about the technical documents that were read, and how technical documents were formatted or written in those cultures.

The subject's perception of (affective responses to) the text was evaluated in Part 2 of the questionnaire. Open-ended questions were included in order to sequester additional qualitative data about preference (Part 2, questions 2a and 3a), as well as qualitative data about whether or not the responses provided by the ICRs reflected their native language's reading style (Part 2 question 4a).

In regards to the first research question, "what differences are there in reader comprehension and self-reported affective response between documents using indigenous and

non-indigenous language?” no significant difference was reported for comprehension ($p = 1.00$), or language ($p = .100$). The comprehension variable and language variable pulled from Part 1, Section 2 questions 1-7 and Part 1, Section 1 questions 12 and 13 respectively, reported no *U* data, and no significance.

When subjects were asked if they thought it was difficult to read bold heading or body text in Eastern Asian characters, 3 out of 12 responses were either USUALLY YES or SOMETIMES while the remaining 9 responses were either ALMOST NEVER or NEVER. However, that number jumps to 5 out of 12 responses when subjects were asked if they thought it was difficult to read italic heading or body text in Eastern Asian characters, while the remaining 7 responses were ALMOST NEVER. As a result, a few subjects found it difficult to read bold or italic text in Japanese or Chinese characters, while a majority of subjects did not self report a difficulty reading bold or italic text.

For the second question, “What differences are there in reader comprehension and self-reported affective response between documents using indigenous and non-indigenous design formats?” no significant difference was reported for comprehension ($p = 1.00$), or design/format ($p = .700$). Again the comprehension variable was measured from Part 1, Section 2 questions 1-7, but the design formats variable was measured from Part 1, Section 1 questions 1-7. No *U* data were reported, and no significance was found between the two control or experiment groups.

Another variable was evaluated, perception of comprehension (measured from Part 1, Section 1 questions 8-9), to determine if there were any differences between the two groups and how they perceived their comprehension based on the document they were given. Was the document perceived as easy to comprehend because it was formatted a certain way? No *U* data

were reported, and no significance was found between the two control or experiment groups ($p = 1.00$).

The last question, “To what extent do non-indigenous reader comprehension and self-reported affective response improve when the document is culturally congruent?” had to be answered through qualitative data analysis on Part 2 question 4a, and reflecting on whether the comprehension variable revealed any significant differences between the two groups. There was no significant difference with regards to comprehension ($p = 1.00$) when the document was congruent with the traditional reading style for that culture, and all subjects self-reported in Part 2 question 4a that their preferred reading style reflected their native language’s reading style, even though the preferred reading style did not match the expected traditional reading style (vertically formatted read right to left). Therefore, it can be concluded that the way the document was formatted had no impact on comprehension, but all subjects preferred to read a technical document horizontally read left to right instead of vertically read right to left.

No significant differences were found between Japanese, Korean, or Chinese affective responses to the design format used in the experiment, the language that was used (for example, use of bold characters) or their comprehension. Although only one Korean ICR responded to the census, the subject was consistent with the other Eastern Asian cultures that self-reported a strong preference for reading technical documents that were formatted horizontally and read left to right. Japanese ICRs also stated that in their culture documents like novels or magazines are formatted vertically and read right to left.

As the world population grows, more and more cultures interact with one another more frequently. Understanding the different cultures and accepting writing/document design preferences that differ from our own is an important lesson to learn. More people need to be

aware of the cultural design differences, and how to accommodate for those differences when writing for a global audience.

As this research has shown, other cultures may have the same preferences for design format, or language, and understand the contents of that document even if the document's design is not congruent with the previously known traditions of that culture. Perhaps some cultures may be adopting preferences from other cultures over time as they interact on a more frequent basis. Still, it is important to take the time to be sensitive to other cultures and evaluate the audience being targeted, and make sure that their preferences for design and language are collected. It is important to learn about the document design and language similarities, while also being sensitive to the differences between cultures.

This study only provided data and statistics specific to Western design format and cultures in Japan, Korea, and China. Other cultures may not respond in the same way that these subjects responded, so more research needs to be done to help other technical writing professionals be aware of how documents are written and formatted in cultures all around the world. As professionals, we can increasingly test, update, or add to the current knowledge base that is growing around the subject of document design in international technical communication.

Discussion and Conclusion

As Hayhoe (1999) would argue, despite the influence of mass media, there is no universal language, no common culture that will guarantee mutual understanding. Despite the miracles of technology, there is no tool that will ensure that we understand everyone else on the planet or that we are understood in return. Perhaps such technological advances are not possible (Hayhoe, 1999). However, what might be possible (and necessary) is sensitivity to the fact that linguistic and cultural differences exist. They have an impact on the way we communicate in a world

where boundaries are increasingly not intended to keep people and ideas in or out. As we develop this awareness and sensitivity, we will become increasingly at ease with the notion that we can speak, listen, read, write, understand, and be understood (Hayhoe, 1999).

It is my hope, as it was for Barnum & Huilin (2006) that I can inspire technical and professional communicators in the United States. I hope that technical and professional communicators learn differences or similarities in writing styles, organization, and approach on the basis of culture, so that we can improve the understanding of how to change communication styles to suit the appropriate context and users, and improve communication effectiveness (Barnum & Huilin, 2006). Traditional needs analysis methods do not give us enough detailed information about the users of the products to design documentation that adequately meets their needs (Hackos et al., 1997), and therefore new cultural based questions should be added to audience needs analyses. Researchers, and technical and professional communicators might just be surprised at how many similarities there are between cultures these days, but they will never know until the information is gathered and presented to them.

Major Findings

As stated above, the statistics showed no significant difference between the groups of ICRs who received the control document and those who received the experiment document, on any variable tested (language, comprehension, and format). However, the qualitative data that were gathered from the open-ended response strongly suggested that Chinese and Japanese cultures preferred to read technical documents in Western format; horizontally and left to right. Although only one Korean ICR responded to the census, they agreed with the other two cultures that they preferred to read a technical document that was formatted horizontally and read left to right. In addition, when subjects were asked if they thought it was difficult to read bold heading

or body text in Eastern Asian characters, a few subjects found it difficult to read bold or italic text in Japanese or Chinese characters, while a majority of subjects did not self report a difficulty reading bold or italic text.

In addition, even though these findings suggest that Eastern Asian audiences prefer to read technical documents formatted horizontally left to right, only a small group of subjects from each population were represented in the sample. The subjects may not reflect other age groups that were not part of the sample, or even other technical professionals; the data can only provide insight for the sample of subjects that responded. Also, other cultures and areas of the world were not part of this study. Other cultures may respond differently in a similar study. For instance, it would be interesting to investigate how subjects in Arabic cultures respond to a similar group of questions and documents. Would they prefer the Western format, or would they prefer the traditional format for that culture?

These findings led to the hypothesis that other cultures may be in different stages in their document designs. At one time the cultures in this experiment (Chinese, Korean, Japanese) may have responded that they preferred to read technical documents that were formatted vertically read right to left, instead of formatted horizontally left to right. If previous researchers had documented document design preferences from people in those countries, this study could have looked to see if there was a change over time. This experiment only recorded data from one specific time period during the months of March and April 2011. Who is to say in a few months more of their preferences may change? Therefore, it is recommended to keep re-evaluating preferences on a regular interval.

As more countries become more technologically developed it may be that their preferences change as they interact with other cultures that are dissonant with their own (for

example, adopting the technical reading style/format preference of Westerners). This experiment found support for the statement proposed by McCool (2006), “Because approaches to communication and writing are not universal, writing and designing instructions and other technical information for diverse audiences are not confined to translation and surface features of culture” (McCool, 2006, p 180). The subjects responded with data that I was not expecting for their culture. Perceptions about a culture may not be what you are expecting, and you need to look beyond the surface of the culture to be sure of the reader’s needs. Being sensitive to the fact that linguistic and cultural differences exist and realizing that they can have an impact on the way we communicate will help us become increasingly at ease with the notion that we can speak, listen, read, write, understand, and be understood (Hayhoe, 1999).

Project Limitations

This experiment used questionnaires that recorded people’s opinions and beliefs, therefore the observations provided by the subjects could be biased. The questionnaire was not translated, as many of the ICRs are required to be able to read and speak in English. In addition, the subject response rate may not be a representative of the census since only 50% of the people responded, a limitation of the census.

Some of the documents that were returned by the translation vendor, in the traditionally culturally congruent design format, still had bold or italic text left in them and this was not caught prior to the census being sent out. Therefore, some of the answers provided by the subjects were not able to be used (for example, Part 1, Section 1 question 11). In future research about this topic, the researcher should ensure that the documents are returned following the translation request instructions prior to carrying out the experiment (for example, confirming that

they removed the bold and italic text in the documents that are formatted vertically and read right to left).

Some minor limitations also involved some of the wording used in the questions, or whether or not a pilot test was conducted on the instruments. In Part 1, Section 2 question 7, two out of the three pilot subjects responded they found the question confusing, and the questionnaire was revised accordingly. Even after revising the question there was still confusion, so that question may not have returned accurate results. In addition, a pilot test was completed for Part 1 of the instrument but not completed for Part 2. Even though feedback was provided by one of the pilot subjects prior to IRB approval, and the questionnaire was revised accordingly, it may have been beneficial to run Part 2 through a pilot test to be sure none of the other pilot subjects found the questions or format of the instrument confusing (if time allowed).

Finally, the research was limited to only a very small population of the world: Eastern Asia (China, Japan, Korea). The sample size was too small to generalize beyond the sample used in the experiment, so this research should be categorized as more of an exploratory study. Since only 14 subjects fit the requirements to receive the census, a very small sample size was the only option. It may not be accurate to try and project these findings onto larger sample sizes in the same countries, since a majority of the subjects were 30-64 years of age. Subjects in other age categories, education levels or professions, etc. may respond differently. Future research could be done utilizing the existing methods, but it is recommended that the sample size be expanded to fit a larger population of people who read technical documents in China, Japan, and Korea. The research did not include other cultures that also require investigation, but future revisions could explore and help capture any one of the many cultures out there in the world.

Heuristic Dimensions

The method for carrying out an after-only experiment has been identified and the limitations explained. In future revisions of this research, it would be suggested that some of the questions should be revisited for clarity, and a pilot test should also be conducted on Part 2. For example, a better statement to offer around perception of comprehension (Part 1 Section 1 questions 8 and 9) might be, “This document is easy to comprehend,” rather than “This document is easy to comprehend because it was formatted vertically read right to left,” or “This document is easy to comprehend because it was formatted horizontally read left to right.”

Also, the research proposed in this paper was only intended to help provide answers about Eastern Asia document design comprehension and preferences. More scientific research is needed for other cultures, and even the cultures discussed in this experiment require further investigation. Eastern Asian cultures have different age groups, professions, education levels, and technical expertise with computers that can affect the responses subjects may provide for the same instruments. Even though these findings may continue to change as more research is done, other cultures also need to be examined and recorded so that technical communicators can continue to strive for clear and concise instructions for any culture.

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Appendix A: Search Procedures

Date	Method/Term(s)	Database/Journal	Timeline	Number of Results	Takeaways
12/7, 8, 9/2009	searched on "document format" and "culture" and "technical communication"	EBSCO	All	??	9 articles downloaded
1/4/2010	searched on "document design" and "technical communication"	EBSCO/ProQuest	All	??	4 articles downloaded
1/5-6/2010	"content analysis" and "international communication" or "intercultural Communication"	ProQuest Platinum Database	All	??	one article
1/5-6/2010	"content analysis" and "international communication" or "intercultural Communication"	Comm & Mass Media Complete	All	??	one article (same as above, but found in another location)
1/5-6/2010	Reviewed several articles in Technical Communication, and also looked at some of the	Technical Communication	2006-November 2009		took away several articles
1/14/2010	Searched on "global documentation"	ProQuest Database	All	Returned only 6 results	Downloaded one article to follow-up on
1/14/2010	Reviewed several articles in Technical Communication, and also looked at some of the	Technical Communication	2006-November 2009		took away several articles
1/16/2010	searched on "intercultural communication" and "survey"	EBSCO	All	returned 1813 results	downloaded two articles relevant to my research proposal
1/16/2010	searched on "international technical communication" and "survey"	EBSCO	All	returned 35 results	downloaded 7 articles relevant to my research proposal one article was of significance
1/16/2010	searched on "international technical communication" and "Hofstede" and "survey"	EBSCO	All	returned 5 results	downloaded 1 articles relevant to my research proposal one article lead to a direct reference to Hofstede
1/16/2010	searched on "intercultural communication" and	EBSCO	All	returned 64 results	
1/16/2010	searched the STC website for <i>Technical Communication</i>	Technical Communication	February 1995-November 2009	obtained 7 articles	found the articles in my printed journal online, so I could have the electronic version
1/16/2010	"global technical Communication" and "document design"	EBSCO	All	nothing returned	
1/17/2010	"technical writing" and "international"	EBSCO	All	returned 292 results	took away one article
1/17/2010	"marketing" and "intercultural"	EBSCO	All	returned 230 results	took away one article
1/17/2010	"technical communication" and "localization"	EBSCO	All	returned 9 results	took away one article
1/17/2010	"technical communication" and "internationalization"	EBSCO	All	returned 4 results	took away one article
1/18/2010	"technical communication" and "document design" and "comprehension"	EBSCO	All	returned 3 results	took away one article
1/19/2010	Reviewed several articles in Technical Communication, and also looked at some of the	Technical Communication	February 1995-November 2009	n/a	took away two articles to read
2/2/2010	Searched on "usability" and "culture"	EBSCO	All	returned 243 results	took away one significant article

Appendix B: Questionnaires Parts 1 and 2**Impressions of a Document: Part 1 of 2**

Section 1

First, we would like to learn your impressions on the way items were arranged in the document you read.

1. Do you think that technical documents, such as this one, should be designed with help from someone within the intended culture? For example, this Japanese Technical Bulletin would be designed by a Japanese ICR, and not a United States technical author. (Please check one)

 Yes No

2. I prefer to read a document vertically and right to left? (Please check one)

 Strongly agree Agree Neutral Disagree Strongly disagree

3. In my opinion my boss prefers to read a document vertically and right to left? (Please check one)

 Strongly agree Agree Neutral Disagree Strongly disagree

4. In my opinion people in my company prefer to read a document vertically and right to left? (Please check one)

Strongly agree

Agree

Neutral

Disagree

Strongly disagree

5. I prefer to read a document horizontally and left to right? (Please check one)

Strongly agree

Agree

Neutral

Disagree

Strongly disagree

6. In my opinion my boss prefers to read a document horizontally and left to right? (Please check one)

Strongly agree

Agree

Neutral

Disagree

Strongly disagree

7. In my opinion people in my company prefer to read a document horizontally and left to right? (Please check one)

Strongly agree

Agree

Neutral

Disagree

Strongly disagree

8. Is this statement true, false, or not applicable (NA)? "This document is easy to comprehend because it is formatted to read vertically right to left." (Please check one)

TRUE

FALSE

NA

9. Is this statement true, false, or not applicable (NA)? "This document is easy to comprehend because it is formatted to read horizontally left to right." (Please check one)

TRUE

FALSE

NA

10. Is this statement true or false? "This document was formatted to read vertically right to left." (Please check one)

TRUE

FALSE

11. Is this statement true or false? "This document was formatted without the use of bold or italic fonts." (Please check one)

TRUE

FALSE

12. In your opinion is it difficult to read bold heading text in Eastern Asia fonts? (Please check one)

ALWAYS YES

USUALLY YES

SOMETIMES

RARELY

ALMOST NEVER

NEVER

13. In your opinion is it difficult to read bold body text in Eastern Asia fonts? (Please check one)

ALWAYS YES

USUALLY YES

SOMETIMES

RARELY

ALMOST NEVER

NEVER

14. In your opinion is it difficult to read italic (slanted) heading text in Eastern Asia fonts? (Please check one)

ALWAYS YES

USUALLY YES

SOMETIMES

RARELY

ALMOST NEVER

NEVER

15. In your opinion is it difficult to read italic (slanted) body text in Eastern Asia fonts? (Please check one)

ALWAYS YES

USUALLY YES

SOMETIMES

RARELY

ALMOST NEVER

NEVER

16. How do you emphasize important information? (Please write a response in the space provided below)

Section 2

You are now almost half-way done with the questionnaire. Next, we would like to ask you some questions about the information contained in the document you read. Please answer the following questions to the best of your ability.

1. When was the document you read issued? (Please check one)
 - November 2, 2009
 - June 22, 2009
 - July 06, 2009

2. What was the document Publication Number for the document you read? (Please check one)
 - J33150_EN
 - J33150_JA
 - J33150_KO
 - J33150_ZH

3. What is the purpose of this document? (Please check one)
 - To notify you of new assays.
 - To provide instructions on how to determine when new assays are available for your system.
 - To describe regulatory requirements for assays in your country.

4. In which language was the document you received? (Please check one)

Chinese

Japanese

Korean

5. What must you verify on the system to ensure the assay is available in your country (Please check one)

The assay is listed on the ADD History Chart

The assay appears on the SAMPLE PROGRAMMING screen.

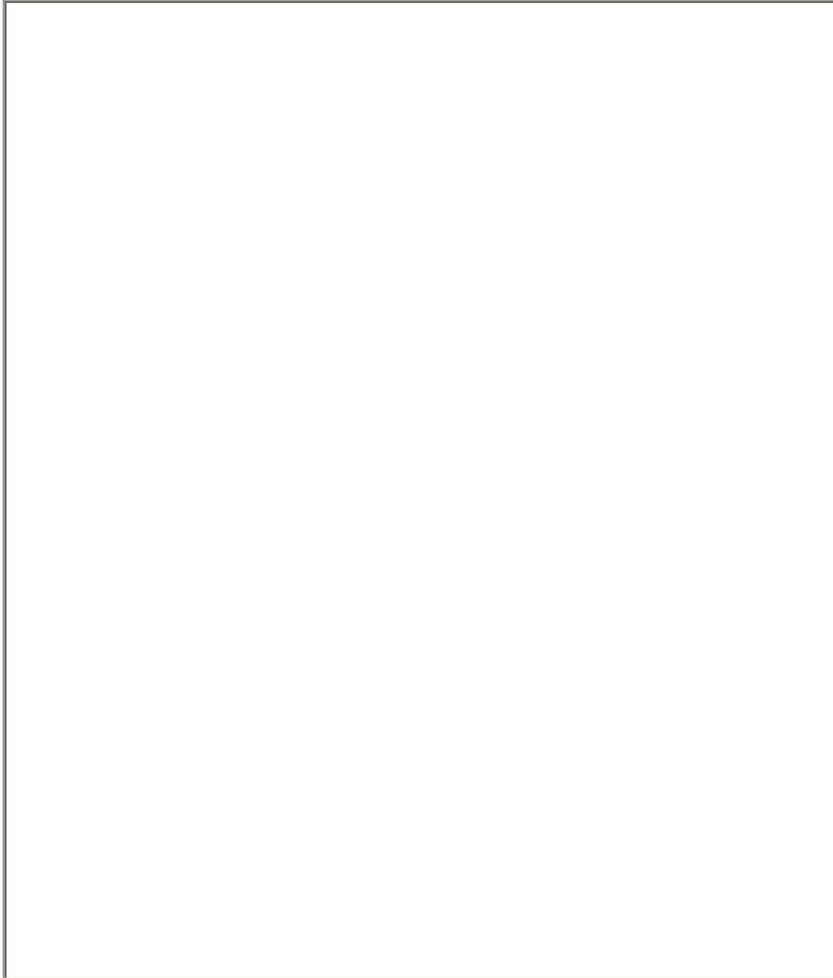
The assay is listed on the ADD History Chart, and the assay target appears on the SAMPLE PROGRAMMING screen.

You can order the assay through your local distributor.

6. Where must this Technical Bulletin be filed (Please write a response in the space provided below)

7. What are the five headings in the example table? (Please list, in the space provided below, all of the items in the first row at the top of each column in the table, in the order as they appear. For example, "DRV.")

8. Please provide any additional comments you have about this document, and the way it is presented in the space provided below.

A large, empty rectangular box with a thin black border, intended for the user to provide additional comments as requested in the preceding question.

Section 3

Finally, we would like some information purely for statistical purposes. Please type your response in the boxes provided below.

Age (please check one):

18-29

30-49

50-64

65+

Location:		
Native Spoken Language:		
Native Reading/Writing Language:		
Job Position:		
Education level obtained (please select one*):	none	
*If you selected Other, please indicate education level in the text box:		
How often do you use English (or any Western language) in your daily life or at work? (please select one)	ALWAYS	
How often do you use or type on a computer? (please select one)	ALWAYS	

Impressions of a Document: Part 2 of 2

We would like to learn more about your impressions on the document you read.

1. What was the document Publication Number for the document you read? Please choose one of the answers from the drop-down menu. J33150_EN
2. I preferred to read a document vertically and right to left? Please choose one of the answers from the drop-down menu. Yes

If yes, why did you prefer to read vertically and right to left? Please write a response in the space provided below.

3. I preferred to read a document horizontally and left to right? Please choose one of the answers from the drop-down menu. NA

If yes, why did you prefer to read horizontally and left to right? Please write a response in the space provided below.

4. In your opinion does the way you read a document reflect your native language's reading style? Please choose one of the answers from the drop-down menu. NA

Why or why not? Please write a response in the space provided below.

5. Which factors affect your preference? Please rate each of the following factors below (check one).

Japanese/Korean/Chinese traditional characters

- Does not at all affect my preference
- Slightly affects my preference
- Neutral
- Somewhat affects my preference
- Very much affects my preference

The existence of English alphabets

- Does not at all affect my preference
- Slightly affects my preference
- Neutral
- Somewhat affects my preference
- Very much affects my preference

The existence of Arabic numbers

- Does not at all affect my preference
- Slightly affects my preference
- Neutral
- Somewhat affects my preference
- Very much affects my preference

The existence of a chart

- Does not at all affect my preference
- Slightly affects my preference
- Neutral
- Somewhat affects my preference
- Very much affects my preference

Impressions/beauty of the documents

- Does not at all affect my preference
- Slightly affects my preference
- Neutral
- Somewhat affects my preference
- Very much affects my preference

The use of space (space of the paper)

- Does not at all affect my preference
- Slightly affects my preference
- Neutral
- Somewhat affects my preference
- Very much affects my preference

Others; please list in the space provided below, and rate each factor listed:

- Does not at all affect my preference
- Slightly affects my preference
- Neutral
- Somewhat affects my preference
- Very much affects my preference

- Does not at all affect my preference
- Slightly affects my preference
- Neutral
- Somewhat affects my preference
- Very much affects my preference

Appendix C: Culturally Sensitive Document Design Content Code Book**Part 1****Reader perceptions about (affective responses to) the document:****Technical documents should be designed with help from someone in intended culture:**

- Yes
- No

Subject prefers to read vertically right to left:

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Subject's boss prefers to read vertically right to left:

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Subject's company prefers to read vertically right to left:

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Subject prefers to read horizontally left to right:

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Subject's boss prefers to read horizontally left to right:

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Subject's company prefers to read horizontally left to right:

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Subject feels it is difficult to read bold heading text in Eastern Asia fonts:

- Always Yes
- Usually Yes
- Sometimes
- Rarely
- Almost Never
- Never

Subject feels it is difficult to read bold body text in Eastern Asia fonts:

- Always Yes
- Usually Yes
- Sometimes
- Rarely
- Almost Never
- Never

Subject feels it is difficult to read italic heading text in Eastern Asia fonts:

- Always Yes
- Usually Yes
- Sometimes
- Rarely
- Almost Never
- Never

Subject feels it is difficult to read italic body text in Eastern Asia fonts:

- Always Yes
- Usually Yes
- Sometimes
- Rarely
- Almost Never
- Never

Reader perceptions about (affective responses to) technical document design:

Document is easy to comprehend vertically right to left:

- True
- False

- NA

Document is easy to comprehend horizontally left to right:

- True
- False
- NA

Layout/design of the document:

Vertically, read right to left:

- True
- False

Without the use of bold/italic fonts:

- True
- False

Reader perceptions about (affective responses to) emphasize important information:

How do you emphasize important information? these will be formally defined once subjects complete questionnaires):

- Bold, or underline
- Bold, in bracket, change color in red
- Usually bold, or colored text (ex. Red or blue). Sometimes italic text in horizontal format, never in vertical format.
- China always use boldfaced or red word to emphasize important information
- Bold, or different color

Reader comprehension of the document:

Document Issued:

- November 2, 2009
- June 22, 2009 (Expected response)
- July 06, 2009

Document Publication Number (Circle one):

- J33150_EN
- J33150_ZH (Expected response Chinese)
- J33150_JA (Expected response Japanese)
- J33150_KO (Expected response Korean)

Document Purpose:

- Notify of new assays
- Provide instructions on how to determine when new assays are available (Expected response)
- Describe regulatory requirements

Language of the document (Circle one):

- Chinese (Expected response Chinese)
- Japanese (Expected response Japanese)
- Korean (Expected response Korean)

Verify on the system:

- Assay listed on ADD
- Assay listed on Sample Programming
- Assay listed on ADD, and on Sample Programming (Expected response)
- Order through distributor

Where to file document (these will be formally defined once subjects complete questionnaires):

- System Documentation Binder, system binder, or system document binder (Expected response)
- Hospital where have the equipment and the QA in the company.

Five headings in table (these will be formally defined once subjects complete questionnaires):

- DRV, Assay/Gen, Kit/Lot, Ref/Lot, Assay/Lot (Expected response)
- Assay/Gen, Kit/Lot, Ref/Lot, Assay/Lot

- Assay/Lot, Ref/Lot, Kit/Lot, Assay/Gen
- Assay/Lot, Ref/Lot, Kit/Lot, Assay/Gen, DRV
- Technical Bulletin , Determination of new assay for VITROS 3600/5600 systems, purpose, How to use this bulletin, How to determine when new assay are available.

Any additional information? (these will be formally defined once subjects complete questionnaires):

- In the example, T3U is written in the history chart. If the assay is displayed on the System Status screen, we can run the assay on the system. We should order this assay through our customer services or the nearest distribute(I think the translation of "販売店")
- The survey points are extremely out of focus. I believe everyone agrees that technical document should be written horizontally, left to right.
- In Japan, we usually write the statement horizontally for technical documents. In the nevels, we write it vertically right to left. I strongly recommend that you have to write the statement horizontally for technical documents such like this.
- No comment

Total correct (out of 7): _____

Section 3 - Statistical Purposes

Subject's Age

- 18-29
- 30-49
- 50-64
- 65+

Subject's Location (these will be formally defined once subjects complete questionnaires):

- Japan, Tokyo
- Japan
- BeiJing China
- Korea

Native Spoken Language (these will be formally defined once subjects complete questionnaires):

- Chinese
- English
- Japanese
- Korean

Native Reading/Writing Language (these will be formally defined once subjects complete questionnaires):

- Chinese
- English
- Japanese
- Korean

Job Position (these will be formally defined once subjects complete questionnaires):

- Product Manager, Marketing
- Specialist
- Senior Manager
- Assistant Product Manager
- RA&QA manager

East Asians with Education:

- None
- Highschool
- Bachelors degree
- Masters degree
- Some secondary
- Other (these will be formally defined once subjects complete questionnaires):
 - Master degree

How often does subject use English or another Western language?

- Always
- Sometimes
- Rarely
- Never

How often does subject use/type on a computer?

- Always
- Sometimes
- Rarely
- Never

Part 2**Document Publication Number:**

- English – J33150_EN
- Japanese – J33150_JA
- Chinese– J33150_ZH
- Korean– J33150_KO

Reader perceptions about (affective responses to) the document:

- **Subject preferred to read a document vertically and right to left**
 - Yes
 - No
 - Maybe
 - NA
 - **If yes, why** (these will be formally defined once subjects complete questionnaires):
 -

- **Subject preferred to read a document horizontally and left to right**
 - Yes
 - No
 - Maybe
 - NA
 - **If yes, why** (these will be formally defined once subjects complete questionnaires):
 - Because we usually read horizontally and left to right such a technical document.
 - Newspaper, novel and magazine in Japanese are written vertically and right to left. But most of technical documents (literatures) is written horizontally and left to right. It is very rare to write vertically.
 - Technical document should be written left to right.
 - Especially about technical documents, we Japanese people like to read it horizontally and left to right. The reading style of vertically and right to left is used when we read some kind of novels.
 - In China, we prefer to read Horizontally and left to right. That is our reading habit.
 - Chinese custom
- **Does the way the subject reads a document reflect their native language's reading style**
 - Yes
 - No
 - Maybe
 - NA
 - **Why or why not** (these will be formally defined once subjects complete questionnaires):
 - Some terms are unnatural. For example, "利用可能性"
 - I already wrote the reason in answer 3.

- It is easy to understand.
- Same reason as above my answer. When we read technical document such like this, we usually read horizontally and left to right.
- yes,that is our habit.
- because of custom.

Factors that affect preference:

- **Japanese/Korean/Chinese traditional characters**

- Does not at all affect
- Slightly affects
- Neutral
- Somewhat affects
- Very much affects

- **The existence of English alphabets**

- Does not at all affect
- Slightly affects
- Neutral
- Somewhat affects
- Very much affects
- Slightly and somewhat affects

- **The existence of Arabic numbers**

- Does not at all affect
- Slightly affects
- Neutral
- Somewhat affects
- Very much affects

- **The existence of a chart**
 - Does not at all affect
 - Slightly affects
 - Neutral
 - Somewhat affects
 - Very much affects
- **Impressions/beauty of the documents**
 - Does not at all affect
 - Slightly affects
 - Neutral
 - Somewhat affects
 - Very much affects
- **The use of space (space of the paper)**
 - Does not at all affect
 - Slightly affects
 - Neutral
 - Somewhat affects
 - Very much affects
- **Other:** (these will be formally defined once subjects complete questionnaires):
 - **CHARACTERS COLOR**
 - Does not at all affect
 - Slightly affects
 - Neutral
 - Somewhat affects
 - Very much affects

- **Bold**
 - Does not at all affect
 - Slightly affects
 - Neutral
 - Somewhat affects
 - Very much affects
- **The style of paragraph**
 - Does not at all affect
 - Slightly affects
 - Neutral
 - Somewhat affects
 - Very much affects
- **italic**
 - Does not at all affect
 - Slightly affects
 - Neutral
 - Somewhat affects
 - Very much affects
- **Distinguish single-byte characters and double byte characters**
 - Does not at all affect
 - Slightly affects
 - Neutral
 - Somewhat affects
 - Very much affects

Coder (circle one):

- Merridith -MES
- Other – Initials: _____
 - MRB