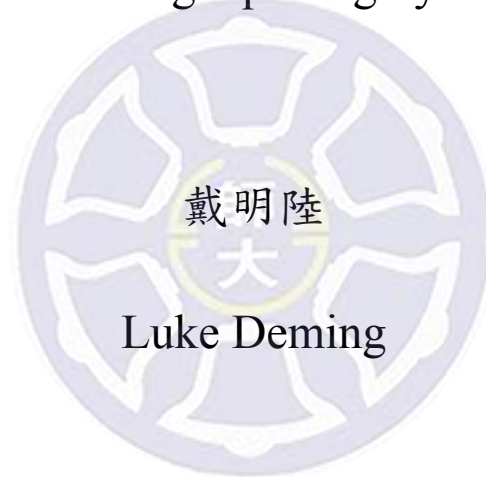國立臺灣師範大學翻譯研究所碩士論文

A Thesis Presented to the Graduate Institute of Translation and Interpretation

National Taiwan Normal University

圖像在翻譯過程中所扮演之角色

The Role of Looking Up Imagery in Translation

戴明陸

Luke Deming

指導教授：胡宗文 博士

Advisor: Daniel Hu, Ph.D.

中華民國 106 年 6 月

June 2017

Acknowledgments

I used to be a regular monolingual white kid from Freeland, Michigan—a small American town between farmland and suburbia where nearly 100% of the population is white and the only "ethnic" thing about us is the Chinese restaurant. Please keep this secret, but I once believed it'd be best if the world would just speak English, and my only reason for studying Spanish for two years in high school was because I wanted to play basketball or soccer at a Division I university (my Spanish teachers gave me better grades than I deserved). I guess I cannot deny the Chinese belief of fate (緣分) anymore—I only made it to Division II, but I ended up becoming fluent in Mandarin Chinese and I now play soccer in Taiwan's Premier League. Taiwan has turned me into a bicultural kid, which I am eternally grateful for. So, I'd like to thank anyone, both Taiwanese and foreigners, who played a part in my international transformation.

I originally came to Taiwan for what was supposed to be a 4-month long exchange visit at Shih Hsin University (世新大學). I ended up extending my stay to one-and-a-half years because I knew that I wanted something out of Taiwan but I didn't know what yet—I realized I had to become fluent in Chinese yet I didn't know what doors that'd open for me. I knew I didn't want to just teach English, but the only advice I ever got from locals was to be an English instructor. One day, during my time at NTNU's Mandarin Training Center, I was on the 5th Floor when I saw this middle-aged white man teaching a class of Taiwanese students. I remember standing outside that classroom for what must've been 20 minutes—I was shocked because he was able to conduct class in perfectly fluent Chinese. That man is Chris Findler, my role model. Many Taiwanese people mistakenly believe that white people like us can't learn Chinese, but Chris has always been my inspiration for proving that stereotype wrong.

I'd like to thank Kurt and Jennifer Deming, my father and mother. My father's lesson of always respecting others' customs and languages is why I've spent nearly eight years learning Taiwan's culture and Chinese. My mother was originally not happy that I wanted to live in Taiwan permanently, but over time she has become a huge source of emotional support. My most touching memory was when she told me to not throw away my Chinese language skills when I was deciding if I wanted to keep going down the path of translation or just move back home and work for my father.

I wish I didn't have to pay 33,000NT a semester for the last four semesters just to write this infuriating thesis, but I'm still grateful to Taiwan's government for the scholarship that covered my tuition and living expenses during my first two years. Oh boy, those first two years were much less stressful.

As for the Taiwanese translation community, I'd like to thank Darryl Sterk for teaching me why the only way to be a good translator is to be a perfectionist. Professor Su's methods for using Google to check for natural usage have been instrumental, and I've always appreciated his guidance. I am, of course, grateful for my advisor Daniel Hu—he's always had my back and he gave me the ok for a thesis that no other advisor would want to touch with a 40-foot pole. Last but not least, I have put at least a white hair (definitely not gray—I checked) or two on Professor Liao's head, which makes me a bit sad because I respect him so much and he's invested a lot of time in me. Despite all the trouble, I'm truly grateful for his help over the last four years.

I save the last paragraph for my fiancée, Sophie (嘉芸). I don't know if I love translation, but I definitely love her, so I'm grateful to GITI for allowing us to be classmates during our first year. Sophie is probably the only person who gets me—maybe that's because she spent the first 10 years of her life in upper New York and she understands what it's like to have to quickly learn how to adapt to Taiwan when all

you know is the USA. You know you're blessed when your future wife is not only cool-headed enough to stop you from making another hot-headed decision, but she's also your editor; a faster, more accurate, and more polished CE translator; and she puts up with your silly desire to play soccer whenever possible. I look forward to life's adventures and having lots and lots of babies together, Sophie.

中文摘要

翻譯與其他語文領域常常討論圖像的用途與影響，但是翻譯系所在翻譯具有畫面感的文字時，往往只著重語言間字對字的翻譯，而不太會利用圖像來增進譯者對此畫面的理解。譯者較少用圖像性的方法來理解原文的意思，但是若使用像 Google 圖片之類的工具，就可以比較兩個語言中的對等詞彙以協助翻譯，譬如說可以使用圖片來理解「朱紅」與「scarlet red」的差別，或「天空藍」與「sky blue」的些微差別，藉此選擇恰當的翻譯。遇到充滿圖像性的文字時，除了字典與其他以文字為主的資源以外，也可以用圖像工具來理解文字描繪的圖像樣貌。這篇論文旨在探索中文母語譯者與英文母語譯者使用的翻譯策略與圖像工具。

研究者訪談了八位研究生，受試者來自國立臺灣師範大學翻譯研究所與國立臺灣大學文學院翻譯碩士學位學程，其中四位為來自美國的英文母語者，其他四位為台灣的中文母語者。訪談問題涵蓋受試者使用的圖像工具、翻譯時使用圖像資源的經驗，使用圖像工具的好處與壞處、希望可以改善圖像工具的哪些面向或功能、希望未來會發明什麼樣的圖像工具等問題。過去文獻中並沒有研究者進行類似的訪談，因此這篇論文的訪談問題與受試者回答對翻譯研究應能有所貢獻。希望本篇論文能讓讀者初步理解譯者如何使用圖像工具與非文字性翻譯策略。

關鍵詞：翻譯、口譯、圖像、Google 圖片

ABSTRACT

When it comes to fields that focus on the written word, which includes translation studies, the role of imagery is a common topic. However, in translation programs imagery is almost always only discussed from a textual perspective. In other words, in classroom settings we seldom talk about trying to "visually" understand what source text speakers see when they encounter image-laden words in their own language. But, by using tools like Google Images, we can do things such as visually comparing color equivalents of Chinese and English and then, by considering images, choose appropriate translations. Essentially, instead of just relying on translation dictionaries and other text-based resources, we can use tools that allow us to see what image-laden words actually look like in the real world. This study aims to explore the strategies and visual tools Chinese and English speakers use when they translate.

This study interviewed eight graduate students from the translation and interpretation master's programs at National Taiwan University and National Taiwan Normal University. Four of the students are native English speakers that grew up in the United States of America, while the other four students are native Chinese speakers that grew up in Taiwan. The interviewees were asked about what visual tools they use, their experiences using visual tools, what they like/dislike about the visual tools they use and how they would fix them, and visual tools they would like to see created. These questions and their answers are essentially ground-breaking for translation research, as interviews like these have never been carried out before.

This researcher hopes that this study will be a helpful start to finally understanding how translators use visual tools and other non-textual strategies when they translate.

Keywords: translation, interpretation, imagery, Google Images

CONTENTS

Chapter 1   Introduction

1.1   Relationship Between Imagery and Translation

As translators or language experts that focus on written language, have we forgotten about the power of physical imagery and even the mental images that are constantly bouncing around in our brains? Or could it simply be innocent neglect? Over 100 years ago Wundt (1912) stated that "all thought processes were accompanied by images" (in Park and Hopkins, p. 429), and since then there has been a considerable amount of research on the effects of imagery on cognition and language. It could be argued that there was still a dearth of research on this subject in the past, but contemporary research that studies the brain and its relationship with language learning, linguistics, and translation is one of the many examples that show language experts and researchers are not limiting themselves to just the words that appear on the paper and computer screens before them. But, as translators and language experts, are we still neglecting imagery far too much? Just because written language tends to be black and white, does that mean we should be excluding anything that has color? In short, words may usually appear in black on white paper, but is there not colorful imagery within those black words?

The worn-out cliché "A picture is worth a thousand words" is ironically probably not said enough in the translation world—which is a world where we typically focus on changing written black words from one language and turning them into written black words in another language (interpretation, i.e. spoken translation, is a whole different field that this thesis will not investigate much). Lay people who say the above common phrase about the power of imagery recognize that pictures and imagery have many advantages over written text, but we as translators, who are both language learners and experts, are probably guilty of too often forgetting that images play a big role in the languages we use and produce. To be fair,

translators turn one written language into a different written language, and so in probably 99.99% of all situations taking an image, printing it out, putting some glue on it, slapping it onto our translation, and then saying this image represents what the written source text is expressing would be deemed as unacceptable (and we might just lose our job while we are at it). For example, using an image of a middle-aged adult taking his/her dying parent to the hospital might be the best English translation for the almost untranslatable Chinese term 孝順 (which is translated as the almost culturally incomprehensible "filial piety" on Mandarinspot.com and as "to show filial piety and respect for one's parents" in *Far East Pinyin Chinese-English Dictionary* (see Yeh, p. 618). Furthermore, I have yet to meet a native English speaker that understands the term "filial piety"—foreigners that have learned Chinese for some strange reason are quite familiar with that term though. Non-standard translation behavior like the picture-for-text examples mentioned above will most likely be met with rebuke at the very least and a lawsuit in the worst-case scenario. Also, current research in translation and related fields may not be writing about radical solutions like the one above about substituting imagery for text, but it is clear to see that the role of imagery in translation and language in general is finally being taken seriously by translation scholars, who are dramatically expanding the scope of research in their field by researching subjects rarely touched upon until a couple decades ago.

Although the field of translation can be dated back to translation efforts involving classic texts, such as the Bible, the vast array of Chinese classics, and ancient Greek and Latin literature, the field of translation studies does not enjoy a long, storied history that so many fields in the natural sciences and social sciences do. In fact, translation studies was essentially a field without a name until American scholar James S Holmes bestowed the field with the name translation studies in his seminal 1972 paper "The Name and Nature of Translation Studies" (Munday, 2012, p. 10). How far has the translation studies community come since

then. Not only have traditional concepts, such as literal vs. free translation, dynamic equivalence vs. formal equivalence, localization vs. foreignization, and native speaker vs. non-native speaker, been examined and discussed in great detail, but topics like machine translation, translation errors, and language corpora also have a great variety of research now. Perhaps even more encouraging is that the field is growing increasingly abundant with novel research: eye tracking and translog (a program that records a user's inputs on a keyboard) are two of the many topics currently being researched.

Considering the above, it seems quite clear that the translation community is both willing to accept and in need of less traditional research that will continue to push the field forward. Imagery and visualization did have a minor presence in the 20th Century; scholars like Arthur Koestler and Danica Seleskovitch raised issues and concepts about imagery and visualization in the 1960s and 1970s, respectively. But, research never accumulated to a significant amount. So, essentially while the topic is far from revolutionary, imagery and visualization is actually one of the many new areas of translation research, as it was not until recently that this area started to receive some well-deserved attention by scholars, such as Paul Kussmaul and researchers at Spain's University of Granada.

Research on imagery and visualization is starting dialogue and creating questions, allowing opportunities to ask ourselves new questions about the role of imagery and visualization in translation. So, although using physical images in the target text that are not present in the source text may not be acceptable to most clients and readers, we can ask if using imagery as a tool to learn language can help us translate better? Just like how children and many adults use picture books and picture dictionaries to learn new words, can translators use imagery to help them translate better? Can looking at images not only help us understand the source text better, but also help us produce more accurate, vivid, and interesting

translations as well? Fortunately, research on translation and visualization is moving past just asking questions, as it is now starting to provide us with answers that come from research.

1.2 Research Question and Purpose

This study focuses on qualitative information garnered through interviews, and thus it strives to answer three seemingly simple questions by considering the findings: 1) How are translators using imagery to help with their translation work? 2) How do they feel about using imagery to help them translate? 3) For translators, how helpful is using imagery as a language tool? The end goal of this study is to see if there is a need to create a bilingual Chinese-English visual database that will act like a visual dictionary by providing multiple images for any word searched for. This database will help language users get a better understanding of the words they are reading on paper and computer screens; this visual database would be an improvement over current visual dictionaries/databases because it provides multiple images per word (instead of just one image per word), offers Chinese and English (instead of being monolingual), and has some type of filter that ensures images are reflective of the word searched for (search systems like Google do not have a filter system suited towards accurate language use). Essentially, people could use this visual database to look up words and view images that are representative of the words they search for. For example, by using the visual database, users could look up the word 旗袍 (often translated as "cheongsam", which is sometimes the translation for men's 長衫/*changshan*), and the results would ideally be many pictures of women wearing differing types of 旗袍. By providing multiple images per word, this visual database could offer images for a wider range of words than current visual databases/dictionaries, which tend to only provide one image per word, with some words not even having an image at all. Furthermore, hopefully the variety of

images would help users understand the differences between cheongsam for men (*changshan*) and cheongsam for women (*qipao*).

1.3 Introduction of Future Online Visual Database

So, what would this visual database look like? Well, first it would be online-based; an increasing amount of dictionary publishers around the world are no longer printing dictionaries, and it seems obvious that most language tools are web-based or are moving in that direction (such as online corpora, thesauruses, and translation memory). Therefore, something along the lines of a recent project by Ben West and Felix Heyes, two artists/designers from London, would be a good place to start. An article called "Google – The First Google Image for Every Word in the Dictionary" (2012) posted on the website creativeapplications.net states that the two men "replaced the 21,000 words found in your everyday dictionary with whatever shows up first for each word in Google's image search." The end result was a 1,240-page book called *Google* (2012), which looks like a hardcover dictionary except that every page in the book only displays images of the words they searched for (the only words in the book are found within the images—so it is essentially a wordless dictionary full of image after image). Alexander Scholz, the writer of the above website's article, explains the relationship that modern convenience and the power of technology has with the search engine Google and this project: "[It's] the sad reality of shrinking attention spans, collective media fatigue or how an expert reference book is no match for the convenience of Google...". While this may seem critical or dismissive of an innovative project, even co-creator West gives an honest description of the project: "It's really an unfiltered, uncritical record of the state of human culture in 2012. I would estimate about half of the book is revolting medical photos, porn, racism or bad cartoons" (Scholz, 2012). West's above statement shows that search engines like Google have a lot of info, but they also do not have

much of a filter. The future online visual database would surely need a better filter than Google's.

In addition to the book *Google* being print-based (which makes it more inconvenient to carry as well as look up images; it also is limited to 21,000 words), there are three other drawbacks of the creative, visionary, and completely visual dictionary mentioned above. First, readers most likely will not be able to look at an image and know what word it represents. For example, there might be a picture of a bright sun in the sky, but even though the book's images are organized in alphabetical order for the words that were put into the search engine, how sure can a reader be that the sun represents "sun" and not something else like the emotion "happy", the word "weather", or one of the other 21,000 words in the dictionary? An anonymous commenter on the website mentioned in the above paragraph makes a helpful comment about a possible improvement: "It would be better if the word were printed under each image as a caption. While I can understand not having the word - and letting the viewer form their own impression - it would be interesting in a different way to also have the word to contemplate" (Scholz, 2012). This flaw reveals that the future database needs to be online because print-based resources would be difficult to carry and finding words takes too long in an era where a click of the mouse gets unlimited results. Furthermore, the database needs to have words in the same space as their corresponding images, for images do little to help us if we do not know what word they are tied to.

The second drawback is that an ideal visual database could provide more than one image per term, which is what this *Google* book and many other visual dictionaries fail to do. The clothing item 旗袍 (*qipao*) can range from a long, classy dress for formal events to a small, revealing dress for life's more intimate occasions—by knowing that range users will be better able to understand all the different styles and purposes of 旗袍 (a history of the evolution of 旗袍 could also be shown in images). Third, ideally there needs to be some type

of filter so that users will be able to view images that are representative of the word that they search for (and not images that are completely unrelated or even offensive/shocking). A possible filter could be what Wikipedia does—users upload information and other users serve as fact checkers that will delete or edit any incorrect or offensive information. While Wikipedia is often criticized for being susceptible to posting incorrect information and not being truly peer-reviewed, studies by peer-reviewed journals *Nature*, *Journal of Clinical Oncology*, *The Guardian*, *PC Pro*, *Canada Library Association*, and *Library Journal* have proven that Wikipedia is as accurate as articles in scholarly journals and encyclopedias. Adam Riess, a professor of astronomy and physics at John Hopkins, says Wikipedia is "Remarkably accurate. Certainly better than 95% accurate" (Wolchover, 2011). While Wikipedia still has to raise a lot of money to run its website, its user self-checking system is highly efficient and it keeps costs down. The visual database this study talks about could consider the filter Wikipedia uses to keep costs down and increase accuracy. Despite the presence of lewd and shocking images on the web, user-run sites like Wikipedia show that most of the world will care about ensuring we have access to accurate, representative images.

I have talked to other translators and found that many use Google Images to look up images for words they come across in translation assignments, but the problem with search engines like Google Images and this *Google* book is that the pictures shown are often completely unrepresentative of the search term. If image search engines could consistently provide relevant imagery, there would be no need to develop a better visual database or even use visual dictionaries. In other words, if 旗袍 were searched for, Google would ideally allow users to see images of different types of 旗袍, and images that are irrelevant to 旗袍 would not appear. So, the best way to describe an ideal visual database would be something like Google Images, but with imagery that accurately reflects the word searched for. How could the makers of the visual database be sure that the images reflect the word that is

searched for? On top of allowing users to provide and edit content, there probably needs to be some type of filter mechanism and/or imagery organization team that can make sure images are representative of words searched for, which would be very difficult to form and most likely extremely expensive. Furthermore, this filter mechanism might make buying photos a necessity and meta data experts will likely need to be employed to create the filter system. Every year, Wikipedia asks for donations because there is so much that goes into running that platform, including everything from running the website to ensuring quality control, meaning even users need checks and balances. The team and/or filter mechanism would ensure the images are representative of the words they are supposed to reflect, making users confident that the imagery they are viewing is reflective of the word that they searched for. Furthermore, they would not have to spend time looking through unrepresentative or even offensive imagery in order to find imagery that looks representative.

It is a safe assumption that almost all serious language users and experts look up words in dictionaries, databases, corpora, and other tools to read definitions, example sentences, collocations, and other explanations. While some tools and resources are created by individuals or small groups, which might make the information they provide subjective in nature, many tools and resources have bigger research teams that carry out thorough research and do their best at ensuring users find accurate answers to their questions. But, what if language users could also look up the images of words to get a better understanding of that word's imagery and even meaning? For example, if we look up the visual Chinese word 彩霞 on Mandarinspot.com (a Chinese dictionary), we will see the definition "clouds tinged with sunset hues". But, when we use Google Images to view what 彩霞 really looks like we see what 彩霞 really is (we do not just see words, we see reality). So, when we translate 彩霞 into English, should we translate it as the 'colorless' "clouds tinged with sunset hues", or

should we translate it in a way that attempts to express all the yellows, blues, purples, oranges, and reds we see in the sky as the sun slowly goes beneath the horizon?

Chapter 2 Literature Review and Tools Introduction

2.1 Training Imagery and Relationship with Non-written Languages and Language History

Translators seldom focus on non-written languages probably because there is no money to be made if there is no text to translate; but, maybe non-written/spoken languages (i.e. those that do not have any written system) have a lesson or two to teach people like us who are fortunate enough to be literate. Now, if a member of a non-written language community tries to "write" something down, it will very likely be done in some type of picture form, right? It is well known that many groups in this world, such as many Native American tribes in North America, do not (or did not until more recent times) have written language—their language is/was entirely spoken. Concerning Native Americans in North America, John Rehling, who currently works at Carnegie Mellon University, says that all tribes except the Mayans and their neighbors near the Yucatan Peninsula had non-written languages before the Europeans arrived. The history of these languages should be a hint that, similar to cave drawings, we should consider the imagery a language expresses and not just the black-and-white words we transcribe it with.

The story in Taiwan is similar; Cliff Vost on the website of the island nation's Academia Sinica expresses that "[n]one of Taiwan's aborigines had a written language". Taiwan's second largest language, Taiwanese Hokkien (commonly known as Taiwanese, which is not Mandarin Chinese), also technically does not have a single established writing system. But, the modern world has found a way to write down previously spoken-only languages. For example, Chinese characters can be used to represent Taiwanese Hokkien. A great Taiwanese Hokkien-Mandarin Chinese resource is Taiwan's Ministry of Education's 台灣閩南語常用詞辭典 (lit. "Taiwan Minnan Language Commonly Used Words Dictionary"),

which is a dictionary that can be used to learn Taiwanese Hokkien pronunciations of Mandarin words as well as find Taiwanese Hokkien equivalents for Mandarin characters, such as offering 讀冊 (Taiwanese Hokkien) as an equivalent for 讀書 (Mandarin Chinese for "read a book or study"). Different forms of pinyin have been used to create writing systems for Taiwanese Hokkien and aboriginal languages as well. Overall, the evolution of turning a spoken language into a written one can be seen in the problematic issue of Taiwanese Hokkien's transcription inconsistencies. Transcription methods for this language include Chinese script, Mandarin Phonetic Symbols (i.e. Bopomofo or 注音), pinyin, or some other means; the problems due to these varying transcription systems can be seen in Taiwanese language scholar Robert Fox's article "Taiwanese Opera in English: Translating Liao Chiung-chih's Chen San Wu Niang" (2013, p. 4-10). In short, if a language cannot be written, it would seem that the only way messages could be recorded (before the time of video and sound recording) would be through some type of imagery. Furthermore, if native speakers of a spoken-only language can learn (without reading text) and use the language to express vivid imagery it would seem that imagery would play an enormous role in language learning.

While studying non-written languages and language history often takes us back to the beginning of human communication, such as detailed drawings being found in French caves that are thought to date back to 35,000 years ago (Carney and Levin, 2002, p. 5), it is also helpful to consider language from the beginning of a human's life—as in early childhood. There is a lot of research on children's literature and language learning that involves pictures in children's books and other mediums, and scholars in this area include Fang, Levin, Levie, and Carney; much of the work in this field will be covered in detail under the Non-translation Imagery Research section. Despite there being research that shows there is some truth to concerns that pictures in children's books may distract children and negatively influence word identification and language acquisition, in addition to the majority of research supporting the

use of imagery in children's books, Fang's work shows that pictures "facilitate [children's] understanding of the written text" and have many other advantages as well, such as stimulating creativity and leading children to interact with the text more (1996, p. 136-137). As translators, we typically translate into our mother tongue, and one of the first ways we learn the words of our first language is by reading books with pictures that help us understand the text (the pictures at the very least interested us enough to keep turning the pages). So, before we started reading picture books, what influenced us as we learned our mother tongues as children? Well, of course family members, friends, and the world around us provided us with the sounds of language, and imitating sounds surely helped us learn new words. But, people signaling objects and saying what they are (like our mothers pointing to a ball and saying "ball") as well as our own observation of the world around us surely are the reasons why we could fluently speak our first language even before we started reading it.

2.2   Introduction to Non-Imagery Online Language Tools

So, what do non-written languages, the origins of human language, and early childhood reading that involves pictures have to do with imagery in translation? It would seem the answer would be 'very little', and that the dearth of evidence on imagery in translation and other related fields in addition to a lack of tools that provide imagery for language learners would make this research article an unwise endeavor. In fact, most of the major tools that translators are using and experts are researching and developing are unrelated to imagery. For example, corpus linguistics plays a big role in translation studies, and many translators (especially those translating into their second language) use corpora to produce a more natural and accurate target language. Even though tools can help non-native speakers translating into their second language write like native speakers, there do not seem to be many tools that help non-native speakers see the images in the minds of native speakers (or see the

images behind the written words). While there is a lot of work needed to be done to develop Chinese language corpora because there are so few Chinese-based corpus systems (e.g. the English-Chinese Parallel Concordancer, or E-C Concorder, and Chinese Word Sketch, or CWS, are successful examples), the English language has many corpora: such as the Concordancer for Academic Written English (CARE), MICASE, COCA (Corpus of Contemporary American English), Compleat Lexical Tutor, and Cambridge International Corpus (CIC). Translation memory is another big field, and it involves essentially zero imagery; SDL Trados, Microsoft Translator, and memoQ are good examples of translation memory. Once again, Chinese seems to be lacking tools for translation memory.

The situation for translation tools/dictionaries (such as Foreignword.com and Dictionary.com's Translate) that provide Chinese-English translation is better, but unfortunately they are also lacking to some extent (many major online translation dictionaries do not have Asian languages). But, there are relatively good Chinese-English online dictionaries such as Mandarinspot.com, MDBG.net, Chinese-dictionary.org, Mandarintools.com, Cdict.net, and Taiwan's Ministry of Education's dictionary at http://dict.revised.moe.edu.tw (it is fair to say that all Chinese-English online dictionaries still need to significantly expand their Chinese vocabulary). Quite surprisingly, according to the NIST (the USA's National Institute of Standards and Technology), Google Translate was rated as the number one machine translation tool for Chinese-English and English-Chinese translation in 2008 (in Lee & Liao, 2011, p. 118). Google Translate is not only faster and more accurate than its competitors (some of which need subscriptions or to be bought, like corpora), but it also is free as well.

Overall, the lack of resources for Chinese-into-English translators is understandable because demand for western books and American TV/movies from Chinese speakers around the world far outweighs the English-speaking audience interested in Chinese media and

entertainment. But, this lack of resources needs to be acknowledged, as it will prove to make the creation of a visual database for Chinese and English even more difficult. For example, corpora exist because of samples from millions of written articles—corpora would not exist if they had to be built entirely from scratch. So, if Chinese is lacking resources for text-based resources, it will only make building something for the visual aspect of language that much harder.

2.3   Introduction to Visual and Picture Dictionaries

The section above features only online-based tools and resources, and that is intentional: online tools and resources have steadily been taking over the language tools market ever since the invention of the Internet. While much talk has been given to the "death" of the newspaper and print magazines, such as *Newsweek* (which is now only available online), and major dictionaries like the *Oxford English Dictionary* (OED), which will not print any future editions, are not going to be printed anymore as well (Flanagan, 2014). A host of smaller dictionaries like Macmillan's are also done with print publishing, too (Rundell, 2012). Many of the online-based tools covered in the section above are not really possible in print form: translation memory is a computer-based tool and corpuses have so much data that is updated so frequently that being print-based is infeasible. While there are arguments for the usefulness of many language and translation tools/resources that are paper-based, especially ones with a specific purpose such as teaching readers how to translate or learn a language, it seems like there is an obvious digital trend that most translators are working with rather than fighting against, and for good reason as online and computer-based tools are faster, bigger, more powerful, and usually more convenient. The following paragraphs will include examples of both print-based and online-based imagery tools and resources.

Although the digital trend has influenced many language tools and resources, print-based language tools that provide instruction with the help of imagery can still be found. A good example of a print-based Chinese-English visual dictionary is the *Mandarin Chinese-English Bilingual Visual Dictionary* (2008). The dictionary claims on its cover that it has over "6,000 words and phrases", and the production team apparently has read up on research about imagery and language acquisition, for it states that "[t]he use of pictures is proven to aid understanding and the retention of information" (Wilkes, p. 8). The dictionary has a long list of different areas and topics that are introduced with both words (in English, Simplified Chinese characters, and Hanyu Pinyin) and pictures: people, appearance, health, home, services, shopping, food, eating out, study, work, transportation, sports, leisure, and environment. There is also an index at the back of the book. If a reader can find a way to memorize all the content, he/she surely will not have too many holes in his/her Chinese.

Aside from the dictionary providing an exhaustive vocabulary scope and the pictures being engaging, accurate, and helpful, the book also has a few drawbacks. The dictionary uses mainland Chinese, so the Chinese is simplified and the vocabulary is mainland-focused: for example, the word asthma is usually 氣喘 in Taiwan, but this dictionary writes it as 哮喘 (p. 44). While this is a disadvantage for Chinese speakers who use Taiwan Chinese or another type of non-mainland Chinese, this researcher believes that the dictionary's biggest drawback is that no word is ever given more than one image. For example, in the *house* section, the picture is of a western house with a lawn, which is almost never seen in Taiwan and far from commonplace in China. Therefore, readers will not be able to see what a typical house in China looks like, and they also will not be able to see different types of 屋簷 (eaves) or 煙囪 (chimneys) and other parts of houses that typically look different in China. In addition, many words do not have images at all, such as 車庫 (garage) and 信箱 (mailbox) (p. 58). While being print-based might make including a picture for every word an impossibility, it

would be nice if there could at least be one picture provided per single term so that readers using the dictionary can understand what mailboxes or garages look like in China (or in the minds of Chinese speakers). Even better yet, a variety of pictures for one term would make readers more familiar with the diversity of mailboxes and garages present in China.

Another good example of a Chinese-English picture dictionary is the *Everyday Chinese-English Picture Dictionary* (2014) (note: the first edition of this book was called *Illustrated Chinese-English Dictionary*, which was published in 2008). This book has many advantages for those who speak and deal with Taiwan Chinese because the dictionary includes Traditional Chinese characters and vocabulary used in Taiwan. The dictionary also includes simplified characters and mainland Chinese vocabulary in addition to providing Hanyu Pinyin for both the simplified and traditional scripts—Taiwan-based resources tend to be kind and also include simplified characters and different word varieties and pronunciations used in China, but mainland Chinese resources rarely return the favor. For example, the word "trash" (垃圾) is transliterated as (lè sè) in the traditional list, but under the simplified list it is written as (lā jī) (Chen, p. 20-21). In addition to featuring both mainland Chinese and Taiwan Chinese, this dictionary's other advantage over the *Mandarin Chinese-English Bilingual Visual Dictionary* is that there are interactive DVD-ROMs and MP3 for self-practice purposes. Another nice feature of this picture dictionary is that it includes many explanations or introductions to Chinese/Taiwanese culture; such as explaining the evolution of cheongsam (旗袍) and that Chinese people first started wearing cheongsam in the 17th century when the Manchu government created a law that women were required to wear the dress (p. 90).

The *Everyday Chinese-English Picture Dictionary*'s main drawback is probably that the pictures are drawings, which are cute (they are not drawn for children, but they do appear as if they have come from children's books). The dictionary's pictures are not pictures of real things and people like the *Mandarin Chinese-English Bilingual Visual Dictionary*; the

pictures in *Everyday Chinese-English Picture Dictionary* seem like they prioritize entertainment over language acquisition. Credibility is another issue because the amount of English mistakes makes one question how much input the production team had from native English speakers who are learning Chinese: "if one simply memorizes new vocabulary by rote, it inevitable[sic] makes the learner feel dissatisfied, and after a long time it becomes easy to lose patience and interest", and "[t]his book will definitely be a great tool for learners; [missing noun and verb] not just contribute to understanding and memory, but they will find learning Mandarin can be very interesting" (Chen, 2014, p. 4). While the cover of the *Everyday Chinese-English Picture Dictionary* states the book has "102 units of daily life topics and over" (another usage error), the downside is that the dictionary only has "2,100 commonly used words" (also stated on the cover), which is far less than the *Mandarin Chinese-English Bilingual Visual Dictionary*'s "6,000[+] words and phrases". The *Everyday Chinese-English Picture Dictionary*'s obvious English grammar and usage mistakes at the very least make the book appear unprofessional and in some situations might cause comprehension issues for readers. For example, it is quite ironic that in the "Letter From the Editor" section there are mistakes that stick out like a group of sore thumbs:

> Most importantly, Everyday Chinese-English Picture Dictionary is written by experienced teachers of Mandarins[sic], who understand the needs of foreigners studying Mandarin by provide[sic] the most practical terms used in daily life. It is why it has become one of our most popular books in[sic] worldwide for the past 6 years!"
>
> (Chen, 2014, p. 4)

A quick grammar check shows that English is not the editor's strongpoint; "Mandarins" should be spelled "Mandarin", the "in" before "worldwide" should be omitted, and "by provide" should be "by providing". The book's four English editors (Danni Wang, Rick Goodman, Will Mounger, and Carlo Harris) missed a lot of mistakes, which makes me

curious if they did sloppy work, are not native speakers (only Danni Wang has a Chinese surname), were not given the time or resources to do careful work, were not consulted to check certain areas of the English, or some type of combination of the above reasons. English mistakes like the above might mean that the book provides a lot of good, authentic Chinese instruction as the team is mostly non-native speakers. But, readers should probably expect to run into problems and kinks while using this book due to the writers possibly not understanding the situations of foreigners studying Chinese. Essentially, a teacher that cannot put himself/herself in the shoes of his/her students is likely a bad teacher, so a dictionary for foreigners learning Chinese written by people that have never had to overcome the seemingly insurmountable task of learning Chinese as a second language will be a flawed resource. At the very least, the production team's poor English comprehension should cause issues from time to time.

Like every other visual dictionary I have encountered, the *Everyday Chinese-English Picture Dictionary* and *Mandarin Chinese-English Bilingual Visual Dictionary* share the same shortcoming of only providing one picture per word. Dictionaries tend to give more than one explanation per word, so it would be nice to see an image-based dictionary provide more than one image per word. Just like many words have multiple meanings, there is often a diversity of images behind a single word. For example, if we take a look at 湯匙 (spoon or soup spoon) on Google Images, we will see a variety of spoons, featuring different lengths and widths, shapes and sizes, colors and materials, and functions (like spoons for drinking and those for holding dumplings). Only by looking at multiple images of 湯匙 can we truly understand all the different types of spoons in Chinese culture and the various functions they serve. A quick look at Google Images shows that Chinese spoons can be very different than western spoons, and this difference is best explored by looking at images.

Just like the picture book market is dominated by children's books, although comics and other genres like graphic novels mix literature and imagery do have large adult audiences, picture dictionaries for English learners also tend to be geared towards young readers (Note: picture dictionaries tend to be of two types; those geared towards native English speakers and those with a focus on English for second language learners. I have yet to find a picture dictionary that teaches foreign children Chinese, which makes sense because most foreigners start learning Chinese after they have become adults. Chinese picture dictionaries for native Chinese speakers also strangely seem to be lacking in Taiwan, potentially revealing how Chinese speakers view the education of their own language.). A good example of a Chinese-English bilingual children's picture dictionary is DK's *Children's Illustrated Dictionary* (translated in Chinese as 兒童美語圖解字典); it appears as if the dictionary was originally only in English and that Chinese translations have been added for Taiwanese young readers and their parents. Monolingual English dictionaries (that may have Chinese translations added for readers in Taiwan, China, and other Chinese speaking communities) are more than just a "handful": DK's *Children's Illustrated Dictionary*, *The Kingfisher Children's Illustrated Dictionary & Thesaurus*, *Oxford Illustrated Children's Dictionary*, *Scholastic Children's Dictionary*, American Heritage Publishing Company's *Curious George's Dictionary*, and Goodman's *Let's Learn English Picture Dictionary*. The pictures in these dictionaries seem as if they aim to entertain the young learner so he/she continues to flip through the pages, but the link between text and image is surely for language learning purposes. Overall, these dictionaries can help young language learners (especially if they have the support and guidance of their parents) develop a strong vocabulary base with few holes.

In addition to there being more illustrated children's dictionaries that are not included in the above list, there are also illustrated dictionaries for more specific areas, topics, and genres. For example, there are picture dictionaries for animals (Martyn Page's *The Visual*

Dictionary of Animals, 1991), plants (DK's *The Visual Dictionary of Plants*, 1992), dinosaurs (Helen Roney Sattler's *The Illustrated Dinosaur Dictionary*, 1983), and other areas (such as DK's *The Visual Dictionary of the Earth* and *The Visual Dictionary of the Human Body*). These topic-specific dictionaries seem to be targeted to both adults and children, and they offer value in that they allow readers to explore a topic in greater depth. This in-depth-ness may cause lay readers to learn about words that they will seldom use again, but for those interested or working in a particular field, particularly for experts engaged in a skilled occupation where they need to use their second language, this amount of detail will prove extremely helpful.

Although there does not seem to be much of a market for printed Chinese picture dictionaries for non-native Chinese-speaking children (and foreigners in general), it should be noted that an English speaker, in order to learn Chinese, can use an English dictionary that has been translated into Chinese for Chinese speakers learning English (e.g. a reader can look at the translations as a way to learn Chinese). This may not be an optimal situation, but a bilingual Chinese-English dictionary can be useful for any Chinese or English native speaker. Overall, foreigners learning Chinese will arguably face difficulties learning Chinese in Chinese-speaking countries because everything from public signs to services have English text and workers that can speak English, much of the local population will speak to them in English (often before knowing if a foreigner can speak Chinese or not), and jobs often revolve around English education (making learning Chinese difficult). But, when it comes to resources, foreigners have enough to learn the Chinese language if they are creative in how they use the limited yet sufficient resources.

There are many web-based picture dictionaries that offer what print dictionaries cannot: convenience (no need to carry dictionary), speed (can find search results within seconds), content-filled (not limited to the size of books) and usually free (compared to the

sometimes-pricy print dictionaries). The Visual Dictionary Online (2015), which was created by Merriam-Webster, first printed 20 years ago, and is now available online, is a good example. It offers a long list of areas: astronomy, earth, plants & gardening, animal kingdom, human being, food & kitchen, house, clothing & articles, arts & architecture, communications, transport & machinery, energy, science, society, and sports & games. The online picture dictionary states that it has 20,000 terms and 6,000 full-color images (meaning there is less than one image per three words), and it also has a search function to look up words. In the Overview section the website makes a statement that many translators have probably dealt with before: "When you know what something looks like but not what it's called, or when you know the word but can't picture the object, The Visual Dictionary has the answer. In a quick look, you can match the word to the image". If this dictionary is able to or can help people develop the ability to quickly recall the word for the image they are imagining, then the dictionary surely will make translation a more efficient profession. Another advantage of the dictionary, according to the website, is that it does more than just show a picture: "The Visual Dictionary is an indispensable visual reference that goes beyond object identification to answer questions about function, significance and purpose". Interactive tools have been shown to be more helpful than non-interactive ones, so this dictionary's interactive features are a major advantage over print-based dictionaries. The weak points of the dictionary are that at most it only includes one picture per term and many of the pictures are unclear. For example, in the *soccer* section, an arrow points to a shin guard beneath the player's sock, but only people with soccer experience could notice the shin guard, which almost completely blends in with the sock. Aside from the website needing to work on its links, organization, and other user-friendly issues, the pictures provided could also be improved significantly. However, overall this website is a good visual dictionary that should serve as a model for any visual dictionary/database.

It seems that The Visual Dictionary Online by Merriam-Webster has a fraternal twin called Visual Dictionary: The Visual Reference (2015). The dictionary can be found at ikonet.com, and it features English, French, and Spanish. It is organized into categories just like the Visual Dictionary Online is; categories include: astronomy, Earth, vegetable kingdom, animal kingdom, human being, food and kitchen, house, do-it-yourself and gardening, clothing, personal adornment and articles, arts and architecture, communications and office automation, transport and machinery, energy, science, society, sports and games, and Play! The interactive game feature *Play!* allows users to match words to the different locations on an image, such as matching the different words that describe a guitar to a picture of a guitar. The Visual Dictionary Online by Merriam-Webster also has a game like *Play!*, and an example is matching countries to their locations on a map of Europe. In addition to similar website layouts, vocabulary, and topics, the site's similarity to the Visual Dictionary Online can also be found in images being identical—such as the soccer player in Visual Dictionary Online being exactly the same as the one on Visual Dictionary: The Visual Reference. The Visual Dictionary: The Visual Reference's *Virtual Human Body* is the site's distinguishing feature; users can look at different bodily systems, such as muscles, the nervous system, the digestive system, the cardiovascular system, skeleton, and other parts and systems in the body. By scrolling over different parts of the body, users will see the names of these different body parts. Overall, Visual Dictionary Online and Visual Dictionary: The Visual Reference are equally useful online picture dictionaries that share the same drawbacks such as poor organization, bad links, unclear pictures, and not being the best in terms of user-friendliness. Yet, both websites seem to be the cream of the crop for online visual dictionaries as they are very useful, interactive, and creative websites.

The Visual Dictionary (2014) at infovisual.com is another example, and it offers more than just English, too—Spanish and French join in on the action. The online picture dictionary

offers good pictures just like the two visual dictionaries mentioned in the above paragraph, and the vocabulary is quite extensive. It also offers topics for vegetables (which it spells incorrectly as vegetal), animals, human body, music, transport, and clothing. Except for the *Lexicon* feature that lists all the words in alphabetical order, The Visual Dictionary offers nothing that the two dictionaries in the paragraph above do not. One of the site's many drawbacks is the *Search* feature. Searching for basic words, like "ball" (2 results for "crank gear" and "joints in human body"), "grass" (1 result for "vegetable seeds"), and "country" (1 result for "bodice") produces few results, and the results often do not seem all that related to the word searched for. The site has been around since 2005, but it looks like it has not been updated since 2014. Just like the *Everyday Chinese-English Picture Dictionary*, the website has spelling errors all over the place, and the home page is a good example of bad English:

> Visual Dictionary, to learn by way of image[sic] with thematic, clear and precise pages, with concise and rigorous texts, multilingual, the[sic] InfoVisual will become an academic resource. Different from an encyclopedia or from a[sic] traditional online dictionaries, thesauri and glossaries [missing a verb at the very least] because the images replace the words.
>
> A teaching website of reference which will be able to find an essential place as a good link on your site. For general questions or if this is your first visit, consult the help section.

Aside from the English being awkward and not colloquial, a quick grammar check shows that the "a" before "traditional online dictionaries" should be omitted, the picture dictionary is already an academic resource (it does not need to "become" one), image should be "images", and there is a missing period after "section". So, while it is good that non-native English speakers have input on the English portion of the website (as non-native English speakers have to work harder to learn the language compared to native English speakers who grew up

around their mother tongue), the lack of polish hints that native English speakers were not involved in this project. To be fair, maybe the French and Spanish sections are better. Nonetheless, the website's English mistakes are a clue that the online picture dictionaries Visual Dictionary Online and Visual Dictionary: The Visual Reference are more professional. It seems obvious that The Visual Dictionary comes in a distant third place when compared to the two dictionaries mentioned above.

SpinFold's Visual Dictionary at spinfold.com is building an online visual dictionary that is different than the pack. SpinFold's visual dictionary has some very vivid pictures that fittingly depict the words they are describing; a good example is the word "lagoon", which has an aerial view photograph that shows a lagoon being cut off from the bigger body of water beside it. The dictionary's other big advantage is that by clicking on the word or its picture, the site then takes you to another page that lists what the word is (verb, noun, adjective, etc.), its pronunciation (no audio file provided unfortunately), other forms of the word (such as the verb "laud" can also be used as the adjective "laudable"), and synonyms. There are also quotations by famous people and example sentences provided at the bottom of the page. Drawbacks of the visual dictionary are there is only one picture given per word and there is no search function, so if users want to find a word such as "camouflage" they need to click the letter C and then scroll through all the C words until they find it. The dictionary's pictures are a start in the right direction for what an ideal online imagery database could be, but the amount of words provided is very limited and the organization is haphazard to say the least. However, SpinFold's Visual Dictionary has a lot of potential and the site is constantly being updated; this visual dictionary was launched in 2013 so we might need to give it some time.

Another type of interesting visual dictionary is online dictionaries that bring a new definition to the word "imagery"—when you search for a word, the image that appears is

something that looks like a combination of illustrated chemical compounds and spider webs. Essentially, these sites allow you to search for a word, and then the dictionary shows results for other words that are synonyms, words that are associated to the search word, or related in some way to the word searched for. A good example of this kind of website is Snappy Words: Free Visual Online Dictionary at snappywords.com. If a user searches "ball" on Snappy Words, a group of words that branch off the word "ball" (including musket ball, ball/clod/glob/lump, and the formal dance term "ball" appears in a whole different group of related words) will appear. By scrolling to the right the user can see another group of ball words that are related to sports such as handball, lacrosse ball, and soccer ball. This kind of visual thesaurus seems like a great tool for users looking for similar words, connections, synonyms, and links. Furthermore, visual learners that struggle to grasp meanings from traditional dictionaries, thesauruses, and other written tools should benefit from using it. The website discusses its purposes:

> The Snappy Words interface queries the WordNet lexical database developed by Princeton University and made available for students and language researchers. This dictionary groups synonyms into synsets through lexical relations between terms. These meanings and semantic relationships are revealed graphically by the interactive web technology made available by Snappy Words.

Snappy Words also claims that the site "helps you find the meanings of words and draw connections to associated words". Overall, it seems that Snappy Words performs the functions of dictionaries, thesauruses, and others written language tools, but it does it in a visual, and interactive, way.

Thinkmap Visual Thesaurus at visualthesaurus.com offers pretty much the same language tool that snappywords.com provides, but the main difference is price. Thinkmap Visual Thesaurus allows only a limited amount of searches before a user is forced with a

decision to subscribe to the website or come back at another time, while Snappy Words is free. However, Thinkmap Visual Thesaurus not only offers English, Dutch, German, Italian, French, and Spanish, but it also gives examples of words being used as nouns, adjectives, verbs, and adverbs in a similar fashion to corpora. In addition to claiming to have "over 150,000 words and 120,000 meanings", the website also allows users to look up a word's history and print results of a search. Snappy Words only offers English, and it does not function like a corpus. But, Snappy Words does display if words are nouns, adjectives, adverbs, or verbs; provides what domain a word is (topic, usage, region); and shows participles, derivations, and verb groups. Overall, Thinkmap Visual Thesaurus may be a little more powerful and professional as it is a paid-for service, but Snappy Words provides almost as much yet does it for free. These two websites have slight differences, which means dedicated language users might see a need to use both sites.

There are two more visual thesauruses that bear a close resemblance to Snappy Words. The first is Visuwords: Online Graphical Dictionary at visuwords.com, which is almost identical to Snappy Words in both its layout and that it only offers English. The main difference between Visuwords and Snappy Words are the slight differences in the layout's organization, which will be the main factor in users choosing one site over the other. An exciting development is Visuwords just launched a new visual thesaurus (which is essentially the same as the "illustrated chemical compounds and spider web" platform found on other resources) where the imagery is visually breathtaking, as it seems like the user has entered outer space when he/she looks at the results. It would be nice to see other visual thesauruses also try to make their imagery more visually pleasing. The other visual thesaurus is WordVis: The Visual Dictionary at wordvis.com. Similar to other visual thesauruses, WordVis's distinguishing feature is that it works like a dictionary—on the left-hand side the site provides definitions for the word searched for. Overall, there are many visual thesauruses to choose

from, and it seems like it is up to users to decide which visual thesaurus(es) best fits their needs.

In recent years, there have been extensions, software, and downloads developed that allow computer or cell phone users to scroll over or click a word and instantly be provided with a definition, translation, and so forth. This technology is often free and has sped up the learning process for users. Mandarinspot.com has a download that allows users to do this too, but those who choose not to download the app can use the annotation feature to look up a few paragraphs of Chinese text—the results show lines of Chinese text and the pinyin and tones for the Chinese characters appear below these lines. While this is not exactly imagery, the way the text appears, especially with red and black contrasting each other, has image-like qualities. A good example of technology like this that provides imagery is Image Dictionary, which is a Chrome extension that finds images from Google whenever users right click on a word. Android has developed a dictionary app for cell phones that provides pictures as well. Imagery technology like Image Dictionary and Android's app are few and far between as of right now, but more development in this area would most likely be given a warm welcome by anyone that uses imagery for language learning purposes. Unfortunately, Chinese-learning resources are less numerous and underdeveloped compared to English-learning resources, so we will probably need to wait for more English resources to appear before we will start seeing Chinese ones.

The visual dictionary Shahi at blachan.com is, along with the *Google* book project that is full of only images, what this researcher sees as ideal inspirations for a future imagery database. Shahi combines Wiktionary content with images from Flickr, Google, and Yahoo. Users can look up English words and definitions will pop up for the word that explain how the word is used as a noun, verb, and in other forms. Users can also select a group of images to appear from Flickr, Google, or Yahoo. Although the site does not provide definitions for

Chinese words, images will appear when Chinese words are searched for. For example, images for the Chinese word 好 ("good") will show up if one puts the Chinese word into the search box, which means this visual dictionary has potential to be turned into a bilingual one. Shahi is clearly a creative and visionary visual dictionary that is combining imagery with a dictionary, causing me to wonder if the future of language tools is in combining them (i.e. taking a dictionary, thesaurus, corpus, collocation machine, imagery, and other tools and morphing them together into one entity). In short, Shahi offers the convenience of combining a dictionary and web imagery into one tool, which is convenient, but the lack of a filter makes it problematic in the same fashion as using Google Images often results in heaps of unrepresentative images.

Most of the examples in this section are for English, and that is because Chinese seems to be lacking visual dictionaries/databases and tools of that nature. For example, online Chinese picture dictionaries are not just lacking—they are also way behind in development when compared to English. 圖像字典 at sun.yatsen.gov.tw offers imagery for words in categories such as nomads (遊牧民族), the Great Wall (長城), geography of different dynasties (各朝地理), information on when dynasties were in power (各朝帝系表), historical figures from different dynasties (各朝人物), factors/statistics/images from the systems of different dynasties (各朝制度), and cultural concepts (文化概念). This Chinese online dictionary, which was created by the Taiwanese government, is a nice start, but it is very Chinese history-centered, the search function is not very useful, and the vocabulary is extremely limited. It does not seem like a useful tool except for the very limited audience that wants to see imagery in the topics provided—most foreigners learning Chinese would not find this resource helpful for learning everyday Chinese. Sadly, this was the only real image tool I could find online. This difference between English and Chinese might be about the Chinese

language tending to mostly produce paper-based resources, but, nonetheless, this discrepancy shows just how unequal the interest is in learning these two languages.

The disparity in imagery tools between these two languages is less of a reflection of Chinese speakers not researching and seeking to create tools and is instead more of a reflection on just how much both native and non-native English speakers put into the development of English language tools. This researcher may have missed some Chinese tools because he is a native English speaker from the USA (he also does not read Simplified Chinese all that well, which means he might not have seen tools created by mainland Chinese), but the disparity is still, nonetheless, an honest reflection of reality. On the other hand, the amount of tools available for native and non-native English speakers is fantastic for those learning and studying English, and this should be seen as a positive since English is and will continue to remain as the world's lingua franca.

2.4 Imagery in Translation Research

While seldom discussed in academic research, the role of imagery and visualization in translation is by no means a new topic. Renowned late French interpreter Danica Seleskovitch mentions visualization as an interpretation strategy in her 1978 book *Interpreting for International Conferences*. In her book, Seleskovitch devotes two small sections to explain the importance of visual imagination or visualization, which she also calls descriptive images:

> The technique used in interpretation to relay a descriptive message, i.e., visual imagination, is relatively easy to apply provided the described object or a similar one is known to the interpreter. Understanding a descriptive message thus requires *greater knowledge* than is required to understand a line of argument. (p. 50)

Her general point is that interpreters often need to be able to visualize what they are hearing in order to then produce a message that the audience can visualize. She is also communicating

the same old message that usually falls on deaf ears of those outside the translation community—there is much more to translation and interpretation than just turning words in one language into words in another language.

Although Seleskovitch writes that visualization plays an important role in many types of interpretation situations, she also mentions areas where "mental imagery" is less helpful, such as with processing "a series of events" (p. 50). A series of events could be the steps of a family's unfortunate journey from war-torn Syria to a European country or a breakdown of the events at a crime scene. While one could argue that using visualization during a series of events could still be helpful, Seleskovitch's point reveals an important truth about imagery and visualization that gets picked up in later research—imagery and visualization might not always be useful and they have the potential to be harmful to the quality of translation.

Seleskovitch's most interesting point about visualization may be her explanation that the images in the brains of the interpreter, speaker, and audience may all be different, and this is due to differing personal experiences. However, it is imagery, nonetheless, that ultimately helps in getting the message across:

> The interpreter's image may be very different from the speaker's because the interpreter may not possess the speaker's and listener's specialized knowledge of the subject. The interpreter's careful analysis is, however, sufficient to enable him to evoke the original image in the mind of the listener. (p. 49)

The above point is just another example of how using visualization someway and somehow can result in successful interpretation. Overall, Seleskovitch does not explain how one should visualize or what one should visualize, as she only emphasizes that using visualization during the act of interpretation is important for comprehension and production. Furthermore, Seleskovitch does not cite nor conduct any qualitative or quantitative research, and it seems like she is relying on her own experiences and observations as well as what she has learned

from other professionals in her field. Sadly, Seleskovitch has already passed away and many questions she directly or indirectly posed have mostly gone unanswered, only being brought up briefly by scholars like Kussmaul. Overall, although imagery has gotten increasingly more attention over the years, visualization in many ways has been left untouched since Seleskovitch left us.

As for 21st Century research, which has pushed the study of imagery and visualization in translation past theoretical arguments to conducting real research that produces tangible results, Paul Kussmaul (Kußmaul in German) and researchers at the University of Granada's Faculty of Translation and Interpretation in Spain are currently the most notable scholars (at least for research published in English). Kussmaul, a German academic, focuses on a variety of aspects that involve visualization and imagery, including visualization and imagery in dictionaries and technical writing (2005b). Kussmaul also serves as an important historian, as his work frequently mentions imagery and visualization scholarship published decades earlier. For example, Kussmaul's translations include Arthur Koestler, who in 1966 wrote in German that "creative thought is visual thought" (in Kussmaul 2005b, p. 383).

In addition to German scholarship, Kussmaul has also introduced some of Seleskovitch's French work to the English-reading translation community, and by doing so we are informed of how she and her research partner Lederer recommend visualization as a teaching method and say that visualization is a type of deverbalization. Kussmaul relays a vivid story from Seleskovitch's and Lederer's French article "Pédagogie Raisonnée de l'Interprétation" (1989), which argues how properly visualizing a scene of starving African children will ensure that the interpreter does not make an unforgiveable error (please see the Sample Images section). Essentially, interpreters should imagine a scene with "a little child with bony legs and arms and a blown-up belly, a picture often seen in the media". The two French scholars claim that, apparently, it is easy to make a linguistic error in French in which

you accidentally say that these kids "have forgotten their manners" instead of relaying their destitute poverty. By visualizing the scene they argue that you are more much likely to accurately communicate the message that they have "forgotten how to eat" because of food shortages (2005a, p. 1).

While Seleskovitch's points about visualization seem to mostly be concerned with interpreter accuracy, Kussmaul's work focuses on "creative translations" just as much as accurate renderings, as his work seems to hint at the link between visualization and creativity:

Visualisations can occur at certain stages in the comprehension process, and they may lead to creative translations. Creative translations can for our present purposes be defined as translations that show changes when compared with the source text, thereby bringing in something that is novel. (2005a, p. 1)

It is important to note that Kussmaul does not see creative and correct/"adequate" (a term he uses) as being mutually exclusive. He sees visualization and imagery as a method for "problem solving", which is a good indicator that he places a lot of importance on accuracy. Furthermore, although he does not make the claim directly, it seems that Kussmaul does not belong to the literal translation camp nor does he share the common belief that a translation cannot be as good as the original. Overall, Kussmaul's points on visualization expand Seleskovitch's scholarship, because to him visualization can lead to more than just accurate translations—it can also lead to creative work and help solve thorny areas in the source text.

Like Seleskovitch, Kussmaul also sees the potential pitfalls of using imagery or visualization during the translation process: "Translators might visualize things that are only in their minds but not in the text in front of them…" (2005a, p. 1). By being honest about the weaknesses and problems with using imagery and visualization, the translation community can lay a foundation for effective strategies and methods that do use imagery/visualization. It is important that translators are aware of ineffective strategies that incorporate

imagery/visualization and situations where imagery/visualization is not useful or potentially harmful because translators want to work quickly and be accurate—if they suffer from insufficiency and inaccuracy, they probably will not survive in this cutthroat profession for very long. In simpler words, knowing when to use imagery and visualization and when not to is a sign of a professional translator.

Seleskovitch did a lot of theorizing, yet Kussmaul takes it to the next level by suggesting that we carry out research that will produce tangible results. Kussmaul seeks to see how imagery can play a role in creative translations by carrying out a unique experiment: "We might show (prototypical) pictures or give verbal descriptions of scenes to one group of subjects but not to another group and compare their translations. The problem, of course, is to keep the groups as a variable stable" (2005a, p. 1), meaning that both groups need to be quite large for statistical reasons. Overall, Kussmaul is curious if translators who have been trained in "visualization techniques" are better than translators who have not received such training (2005b). This experiment also has the potential to prove if using imagery plays a role in accurate translations and/or if imagery can lead to translation error.

Kussmaul often talks about visualizing a scene when translating, which incorporates elements of using imagery as a tool. He talks about "point of view, focus, prototypicality and Fillmore's scenes-and-frames", and using this to "describe visualisations in greater detail" (2005a). As for stimuli that may lead to accurate and creative translations, Kussmaul suggests four types: "(a) looking at real pictures, (b) looking at suggestive frames in the source text, (c) looking at suggestive scenic details in the source text or (d) imagining scenic details reconstructed from memory". Kussmaul also mentions that by visualizing or looking at a scene, this may "lead to adequate and creative translations" (2005b).

Kussmaul is quite ambitious, as he is currently seeking to use modern technology to do something that seems impossible—"observe visualisations normally hidden in the minds

of the translators". Kussmaul also hints at the possibility of using cognitive semantics to see "what types of mental visual images exist" (2005a, p. 1). Seeing what is going on inside the brains of translators sounds like something from a sci-fi novel, but Kussmaul is all science, suggesting the use of translog files, think aloud protocols, dialogue protocols, and retrospective interviews as ways to find out more about how visualizations affect translators. These experiments are a great start to proving or disproving the importance of imagery and visualization, because theories in this area are finally being tested. The biggest flaw with Kussmaul's work is that there are a lot of proposals for quantitative research, but in the end his research is still mostly qualitative discussion or observations. However, he has laid a strong foundation for quantitative research for the translation community, so it is up to us to carry out many of the proposals he makes.

A quick look at the University of Granada shows that this Spanish public university (which has 88,000 students) is no slouch—it offers excellent translation and interpretation education and pumps out a great amount of research for the field of translation studies. The university is unabashedly international: the Erasmus Programme is an international exchange student program that brings in over 2,000 European students every year, the university's Center for Modern Language accepts 10,000 international students every year, and the university was voted the best Spanish university in an international students poll carried out in 2014 ("La Universidad de Granada, la Mejor de España por los Estudiantes Internacionales", 2014). It is easy to see that the university focuses on both language education and translation, and the diversity of students enables the university's Faculty of Translation and Interpretation to teach a long list of languages: Spanish, Arabic, English, French, German, Chinese, Greek, Italian, Portuguese, Russian, Dutch, Polish, Galician, and Czech. The university publishes two magazines (*Sendebar* and *Puentes*), and it carries out research and development work in addition to having several research groups. Besides offering translation and interpreting

programs for the undergraduate levels, the faculty also offers a Degree in Applied European Languages. At the graduate level, the master's degree in translation offers specializations for legal translation, translation technologies, audiovisual and multimedia translation, and Arabic-Spanish translation in addition to the master's degree for conference interpreting. There is also a Doctorate in Languages, which is called Texts and Contexts (and it specializes in translation and interpretation research). Essentially, the university's size and prestige as well as the translation program's resources and focus on imagery research/education means that the University of Granada will serve as the foundation for present and future imagery/visualization research.

International and boasting a team of translation researchers, the University of Granada's translation program is the most prolific in terms of output on research concerning imagery. In addition to providing translation courses that "place special emphasis on the importance of visual and graphic information in texts" (Tercedor-Sanchez, Lopez-Rodriguez, and Robinson, 2005, p. 9), the university is also publishing research on the text-image relationship, including articles on advertising, scientific and technical translation, multimedia, translation instruction, and making imagery accessible for the visually impaired. Much of this research focuses on the more recent trend of the translation community moving away from a text-centered approach. According to Tercedor-Sanchez and her team, today's translators often have to translate more than just text: "Today's professional environment has new implications as regards to work demanded from the translator. These include the shift towards new concepts of translation that include focusing on non textual information to produce translation or technical writing solutions" (2005, p. 9). The University of Granada is not alone in its emphasis on imagery in translation, as they mention that scholar Maria Tymozcko also recommends that translation courses nowadays must get past traditional definitions of translation and "assess the new sorts of activities that are being demanded from the translator"

(2005, p. 9). The University of Granada's researchers have such a broad amount of research on imagery that it is difficult to summarize what their focus is, but perhaps this indicates what these researchers believe—there is more to translation than just text.

While Kussmaul seems to focus on using imagery to understand or comprehend the text, which can be labeled as input, the University of Granada also places emphasis on the output, as the researchers there take the translator's target audience into consideration, too. Accuracy is undeniably important, but research by the university tests the common translation standard that (textual) accuracy is everything. The research team proves their point by providing an example of a newspaper advertising campaign in the UK's *The Financial Times* and then comparing how the same campaign would work in Spanish and Latin-American cultures. The advertisement contains a picture of Che Guevara next to the slogan "Business Revolutionaries" (please see Sample Images section). While this could be problematic for Spain and Latin-American countries because of a history full of bloodshed, cultural issues, and ideological stances, this advertisement "worked well for the newspaper's audience in the UK because of the exotic effect of the drawing and the image-slogan play (based on the unusual collocation of "business" and "revolutionaries")" (Tercedor-Sanchez, Alarcón-Navío, Prieto-Velasco, and López-Rodríguez, 2009, p. 152). This example reveals an important truth about translation—an accurate translation is not a guarantee that it will be well received by the target audience. Therefore, in order to produce a successful advertising campaign in Spain and Latin America, the Spanish translation of this ad needs a new physical image and possibly a different slogan.

While imagery and visualization can be discussed in how they help translators both comprehend the text and produce accurate/vivid/creative translations, the University of Granada also has a lot of research that explains how text and imagery often cannot be separated from one another. This can be seen in the great amount of research from the

university that focuses on scientific and technical texts. According to Tercedor-Sanchez and her team, "Images are often part of the textual structure of Scientific and Technical texts. The understanding and interpretation of the text often depends on the way the interface between the text and the image is established" (Tercedor-Sanchez et al., 2009, p. 143). It goes without saying that an image can help explain text and that text can help explain an image. But, the most logical relationship is that text and imagery complement one another, which usually makes the document easier to comprehend.

The University of Granada is not a pioneer in the image-text complementary relationship though, as issues concerning the text-image relationship have been explored in many other fields for decades. As mentioned before, Fang's work on children's literature shows that pictures "facilitate [children's] understanding of the written text" (1996, p. 136-137) and Kussmaul has cited many examples of the role of imagery in dictionaries. By looking at the University of Granada's innovative courses and research, it is clear that they are quite familiar with research in other fields that explores the text-image relationship. We too should recognize this potentially inseparable relationship between text and imagery, because it is a good indicator for why the translation community needs to start taking imagery and visualization very seriously.

The University of Granada, like Kussmaul, also has lists that label the roles of imagery/visualization. The university's following three-item list clearly defines the role of imagery in language comprehension:

a) the presence of images is not fortuitous in the text

b) the image directs the reader's attention to a particular aspect on the text

c) images can be classified by register, level of expertise and geographical relevance (Tercedor Sanchez et al., 2005)

While this list may seem oversimplified or obvious, it does draw attention to points we should be taking seriously. First, when images are accompanying text we should not assume that they are unimportant (which we very often do with translation research), because their presence ranges from important to critical. Second, our research also probably neglects how an image captures the attention of a reader. Last, just like spoken and written language, imagery has rules. For example, in certain situations an image may be seen as offensive (e.g. the inappropriateness of showing a dissected frog picture to kindergartners), experts can often understand pictures that laypeople cannot, and imagery in different geographic locations can have different meanings/functions (like a photo of an old Chinese woman with bound feet would be surprising or novel to Americans, whereas the same picture would trigger the emotions of middle-aged Chinese who likely know someone suffering from bound feet).

Unfortunately, for English speaking translators and academics without the right language combinations, there is a linguistic barrier for those who are interested in learning about the role of imagery and visualization in translation. Much of Kussmaul's research in German has not been translated into English, and the University of Granada does have a lot of research in English, but they produce even more research in their native tongues of Spanish. Fortunately, Kussmaul and the University of Granada can find a way to get their work translated into academia's lingua franca, but there needs to be a big effort if the late French conference interpreter and researcher Danica Seleskovitch, who died in 2001, is going to have her French research translated into English. Fortunately, no one is better qualified to translate translation-centric research than the host of today's translation experts and students.

Both Kussmaul and the researchers at the University of Granada recognize that there is a dearth of research on imagery and visualization in translation studies. In Tercedor-Sanchez et al.'s "Images as Part of Technical Translation Courses: Implications and Applications" (2009), the research team writes, "Despite its ubiquity, little attention has been

paid to the analysis of images for a successful understanding of the source text or to the development of description strategies for an effective rendering of the target text, particularly in multimedia environments" (p. 2). Kussmaul seems to have a more optimistic outlook when he mentions that "[t]here are occasional hints in the studies on professional translation that visual clues are indeed used" (2005b, p. 381). Nevertheless, the word "hints" is a clear indicator that there is not enough research that zeroes in on imagery/visualization. I believe a good start to filling this gap in the research would be to start hearing the opinions and experiences of people doing actual work—the translators.

2.5   Translation Research on Evaluating Translation Quality

This thesis's foundation is qualitative research and most translation research on imagery and visualization is qualitative in nature, but I also recognize the importance of quantitative research—and so does Anthony Pym, a celebrated translation scholar. This thesis, unfortunately, does not carry out experiments that produce quantitative data, but this research topic's next step is conducting translation experiments that evaluate the role of imagery on translation quality. For this reason, we need scoring standards.

Pym makes the argument that quantitative data is crucial if we are going to make sure translation education gets the resources, environment, and educators it needs in order to flourish. His "Translation Error Analysis and the Interface with Language Teaching" (1992) is most commonly known for its binary error/non-binary error distinction, but what often goes unnoticed is that it was published at a time when departments of language and literature in Spanish universities were trying to keep translation as their own instead of forming graduate programs exclusively for translation and interpretation. Pym, who was and is still an Australian professor teaching English and Spanish-English translation in Spain, explains the rationale of the anti-translation specialization side: "the departments of language and literature

have traditionally taught translation anyway…so why should translation have a separate institutional location?" (p. 2). Overall, the debate featured different language departments giving their own opinions and complaining about potential students being taken away. Even today, I personally have heard from multiple people that National Taiwan University's Department of Foreign Languages and Literatures is in a struggle with the university's Graduate Program in Translation & Interpretation because of the resources and student figures involved. Therefore, if there is an effort by the translation community to create an imagery database, we should be aware that there likely will be other fields joining the fray. While we hope they will provide constructive help, the above situations show that there invariably will be power struggles between different fields over resources, input, and control of the database. Therefore, in order to have a fair shot during these power struggles, quantitative data will prove useful.

Pym's summary of the above situation should be read by anyone who thinks qualitative research is enough: "And nowhere, at no stage, [was] there any reference to concrete data or empirical research of any but the most haphazard kind. Spain has since made its centralized decision – a mediocre but democratic four-year model – on the basis of opinions, not data, for better or for worse" (p. 2). A major problem with debate based solely on opinions and qualitative research is that there are a lot of questions posed but developing methods to find answers is both difficult and controversial, making it easy for existing institutions, as they typically do not want to see changes made. Even good quantitative data will have to deal with "power structures" like Spanish academia, which back then wanted translation to continue being a way of learning foreign languages and thus "ignor[ing] or dismiss[ing]" quantitative findings as "propaganda" was a common tactic (p. 2). Pym believes that empirical research should not replace opinions and debate, but that research should provide "enough facts and figures for democratic debate to develop in a mildly intelligent

way" (p. 2). Overall, Pym's focus on quantitative data helping decide what is best for translation and interpretation may be partly why the website http://www.betranslated.com/translation-schools.html shows that in Spain 18 programs now exist for translation, many of which are graduate programs—it seems someone eventually started doing some quantitative research.

The following two questions were part of the debate Pym was involved in: 1) "do courses in translation require a special institutional location?" and 2) at "what level of university education should specialist courses in translation begin?" (p. 3). The problem for Pym at that time was that empirical research was not being cited because it essentially did not exist. With such little quantitative data, many educators felt emboldened to argue that translation should remain part of a "broad humanist education" and that promoting early specialization should be avoided. On the other end of the spectrum, Pym explains that a hardline requirement for students needing to have a "perfect command of foreign languages" before they learn to translate would result in empty classrooms for translation studies (p. 2-3). Despite this belief, many of those on the pro-translation specialization side are seeking to help translators with deficient skills by getting them better education and tools—this thesis, in fact, seeks to convince translators that they should use images in order to have a better command of the foreign language source text. The complicated situation above, for which Pym attempts to define the relationship between translation education and foreign language courses, is why Pym wrote his paper. Surprisingly, the most celebrated result just so happens to be the binary error and non-binary error distinction.

Carrying out empirical evaluation for teaching and learning translation is made difficult because of how many fields, like foreign languages and education, are involved in translation; assessment methods are often subjective in nature; and getting "representative samples and control groups" is quite difficult (p. 1). This situation is why Pym created a

definition for translational competence that serves as the foundation for his binary error/non-binary error distinction. Basically, translational competence is a "union" of the following two skills: "The ability to generate a [target text] series of more than one viable term for a [source text]" and "the ability to select only one [target text] from this series, quickly and with justified confidence, and to propose this TT as a replacement of [the source text] for a specified purpose and reader" (p. 3) This definition is excellent because it separates translation from language learning by arguing that just one word in the source text can and should have more than one appropriate translation, and then the translator himself/herself must choose what to replace the source text with based on the purpose of the text and the reader. So, a translator must consider if he/she should try to translate more "faithfully", like in law translation where the source text and target text need to be close to 100% identical. Or, maybe one is a literary translator, so he/she must focus on entertainment by making the target text highly readable. Of course, a single foreign language word often has many different definitions or meanings that learners should become familiar with, but conscious choices made by the translator for how to write the target text make this an effective definition.

After explaining that translators must know everything from grammar, rhetoric, and terminology to world knowledge and even how to get paid, Pym sums up that translation is "a process of generation and selection between alternative texts"; Pym believes this definition should be the foundation of what is taught in translation classes, as it is not commonly taught in language courses (p. 4). This thesis focuses on imagery helping improve translation accuracy, whereas Kussmaul is interested in how imagery helps produce creative translations. Translational competence just so happens to be a term that helps us evaluate both accuracy (right or wrong) and creativity (different possible translations).

Pym is a teacher of both English and Spanish-English translation, which seem to have influenced his simple distinction of binary error vs non-binary error. Interestingly enough,

Pym originally had come up with 14 types of errors that were connected to some of the following causes: "lack of comprehension, inappropriateness to readership, [and] misuse of time"; levels, like "language, pragmatics, [and] culture"; and translation phenomena, including over-translation and under-translation. As for the term equivalence, Pym argues that it has been overused and misused to such an extent that it no longer has any real value to us. He also questions how much help can be provided by the complexity of discourse analysis, as it has confusing concepts like "discursive and semantic inadequacy" (p. 4). What really makes things tricky is a single translation mistake can be tied to more than one type of error. For example, writing "this situation is bollock" for American readers has two problems tied to the word "bollocks" (which literally means "testicles")—first, it is a spelling error because bollock is missing an "s" at the end, and, second, bollocks is a British English word, meaning it is probably inappropriate for an American readership. The incorrect spelling makes it a binary error, because for these types of errors "there is only right and wrong" (p. 4). For non-binary errors, there are at least two right answers and then a heap of wrong answers, so, instead of "bollocks", using the words "retarded" or "bullshit" is arguably more appropriate for American readers, who are very likely to be unfamiliar with the term "bollocks". Pym explains non-binarism by saying it is when we come across a translation and say "It's correct, but…", meaning it is not necessarily wrong but it is not the most fitting or appropriate solution (p. 5). Overall, it can be argued that a convoluted grading system for translation might be better than a simple system of errors being either binary or non-binary, but Pym's simple distinction offers many advantages, like clarity, simplicity, and convenience.

Pym criticizes a literalist approach, or fundamental binarism, where there is only one answer and thus every "error" is given the same punishment (p. 5). For example, translating "這是胡扯" as "This is bullshit" could be marked as wrong because in some dictionaries "bullshit" is not defined as "nonsense". But, an open-minded person would realize "bullshit"

has a range of meaning, including the connotation of "nonsense". Therefore, Pym's opinion of translational competence is that we should discuss or contemplate the appropriateness of "this is bullshit" rather than quickly giving it the same punishment as a simple grammatical mistake, such as confusing singular and plural or the wrong verb tense.

Pym never determines a grading system for binary and non-binary errors, but his article makes it seem like he would take off more points for binary errors, which he draws lines through compared to non-binary errors—they get a wavy or straight underline, meaning the teacher and student will discuss it later. Lee and Liao (2011) carried out a translation experiment on how Google Translate (which served as the machine translation representative) benefitted accuracy, and they used Pym's distinction for the grading of individual sentences, deducting 2 points for a binary error and 1 point for a non-binary error (p. 120). Their study's translation passage contained 11 sentences, with each sentence being worth two points, so it would seem binary errors might have been too harshly punished, as an understandable and creatively translated sentence with one grammatical flaw would receive 0 points despite its brilliance. Furthermore, deducting even 1 point for a non-binary error is debatable, because non-binary errors are much more subjective in nature. Nevertheless, there is a lot of room for debate when it comes to error point deduction, but Lee and Liao are similar to Pym in that they, too, see binary error mistakes as less forgivable.

Lee and Liao translated and incorporated error classification methods created by 賴慈芸, a professor at National Taiwan Normal University's Graduate Institute of Translation and Interpretation. In their study, binary errors were either *misunderstanding of source text* (like words or meanings) or *faulty rendition of target text* (including syntactic errors and omissions), while non-binary errors were *improper word use* ("improper collocation, register mismatch, vague expression, inability to convey the message") or *insufficient transfer competence* ("over-long modifier, logic inconsistency, over-use of pronouns, superfluous

words") (p. 113). While this is very thorough, it would not be difficult to come up with even more details for the above binary/non-binary error distinctions. Nevertheless, in the future we can consider 賴慈芸's error classification definitions and Lee's and Liao's point-scoring system while developing a grading system that allows us to quantitatively compare the translations of the experiment group and control group.

Pym's article often draws lines between what should be taught in foreign language courses and what should be reserved for translation classes. Binary errors seem to be for language courses, because they hint at language inadequacies, whereas non-binary errors are more debatable and thus more appropriate for translation courses. However, despite Pym's personal opinion being that translational errors are non-binary, he also recognizes that not all non-binary errors are linked with translation (p. 5). Furthermore, he realizes that non-binarism will pop up in intermediate and advanced language courses, while binary errors will happen during translation classes. Pym is not focused on how these "errors occur, but how one should proceed with their correction", which may sound like treating the symptoms instead of the cause, but, to Pym, teaching translation is the "transfer of translational competence from teacher to student" (p. 5), and that requires teaching students how to translate correctly instead of teaching them why they goofed up. Overall, Pym believes that translational competence occurs when "translational non-binary errors are produced and converted into their opposite"—he calls this process translational knowledge (p. 5). The idea of correction is particularly important, because if there is no solution, especially for non-binary errors, then grading is much too subjective and, thus, essentially useless.

Pym advances an idea that translation courses should have a lower limit and upper limit for what they cover. The lower limit is where translation courses begin and language courses largely end—at this point students should have a good command of the language pair's vocabulary, usage, and grammar. The upper limit is where he thinks translation

teaching should end and where the job begins for academic experts, who get paid to write at length about subtleties and nuanced variants as well as show off one's expertise in a search for the absolute best term or dismiss all options because the source text is "untranslatable" (p. 8). It is not that Pym does not see this "land beyond the point of diminishing returns" as useful, but he recognizes the reality that professional translators, and those who teach them, have to worry about efficiency and dollars per character, as they were not fortunate enough to get one of the few positions in academia (p. 8). The role of imagery in translation can range from helping make sure translators are not producing non-binary errors (like mistranslating) to exceeding the upper limit. For example, looking up images of 晚霞 and translating it as "sunset clouds of blue, red, and purple" may be more creative and accurate than "afterglow" or "sunset clouds", and one could argue at length why the former options are better than the latter. However, this debate is essentially useless in the world of professional translation, where both these translations pass the accuracy benchmark.

Pym provides good examples of binary errors and non-binary errors in a translation of a Spanish restaurant menu. For instance, translating the Spanish dish "tapas" as "covers" or "lids" is a binary error, and it is clear the translator misread (possibly thinking "tapas" looks like "top") or got bad information; Pym sees this kind of mistake as not being a translational issue (p. 5-6). The following translations are in non-binary territory, for they are "adequate on one level or another", but a little discussion proves that there are better choices (p. 5). "Hors d'oeuvres" works, but the term "entremeses" pops up in the menu and it must be translated as "hors d'oeuvres", meaning there is a potential awkward repetition situation at hand. "Something to nibble…" is untraditionally creative, but there is not enough space on the menu, whereas translating it as "amusegueules" is awkward too because it is a borrowed word from French—Pym sees it as "selling Spain to English-speakers in French". Lastly, "snacks" is arguably accurate but maybe "too multiculture-specific" for "tapas". The criticism of these

translation choices varies from printing limitations to the purpose of texts, and Pym states that discussing their inadequacy is a "way of teaching translation, producing translational knowledge" (p. 6). In the end, Pym supports both "small portions" and simply leaving it as "tapas" on the English menu because English tourists would probably love to learn a bit of Spanish on their trip. Overall, by being honest about the merits and drawbacks of every translation option, we can try to find the most accurate and/or appropriate word, which is an absolutely relevant endeavor. However, in the real world, Katz's (1978) statement that "the difference between two different but equally correct translations should be insignificant anyway" has a lot of truth to it, as translating "tapas" as "snacks" or "small portions" is truly irrelevant if English-speaking tourists are able to relieve their hunger with good food.

Discussion of non-binary errors has a limit though; Pym clearly has been in translation classrooms where discussion of a single translated word has gone on so long that wasted time makes the debate counterproductive. To Pym, binary errors ideally need to be corrected quickly with little to no explanation because students can almost always find the answer by themselves, whereas discussion of non-binary errors and translation choices ends once "significant differences" have all been addressed because, like Quine's (1975) honest assessment that "arguments between translators could be continued indefinitely", non-binary error discussion is mostly subjective (p. 6). The problem with indeterminism is that two successful professional translators might dismiss the other's translation, which is what you see in academia when two titans argue over translation choices. This is why Pym believes that the upper limit of translation education, as well as when classroom discussion should move onto the next problem, is when "each successive unit of time corresponds to a decreasing production of knowledge", meaning time is being spent yet little is being learned (p. 6). In short, the room for debate is why punishment of non-binary errors is so controversial, whereas for binary errors the mistake is clear and thus the punishment should be harsher.

While I do agree with Pym's assertion that "any impediment to [translation] teaching will come not from the total number of errors, but from the total time required to correct them" (p. 7), I understand the reality that certain language pairs, like Chinese-into-English, will have the vast majority of its translators working into their non-native language. I have been in Chinese-English translation courses where 90% of class time was devoted to binary errors because my non-native English-speaking classmates did not have an excellent command of English grammar and proper usage, which are even difficult for near-native level English speakers. Many of my classmates graduated from the foreign language departments of the finest universities in Taiwan, so if their English is inadequate then who will fill the seats of my department's translation courses? Therefore, whether it is native English speakers that have forgotten grammar rules taught long ago in their elementary school days or non-native English speakers that struggle with the basics because of their native language's influence, I believe that Pym's opinion about correcting binary errors is a bit idealistic because most people are unable to fix their own weaknesses by themselves, as they can't even find their own issues until someone points them out. So, while Pym laments that translation is mostly taught on what Andre Lefevere (1985) calls the "locutionary" level, I personally do not see this as bad, because Taiwan's biggest problem with Chinese-into-English is poor English, not poor translation skills (p. 7).

Pym's belief that the focus of translation courses should be on the non-binary level runs counter to the mainstream. Lefevre (1985) explains this by arguing that translation teachers feel the only way they can judge competence is by grading the students' language, as only penalizing binary errors is the safer and less controversial way because "standard reference texts" give them authority (in Pym, p. 7). On the other hand, determining which words are non-binary errors and then punishing them accordingly is a controversial endeavor. For example, deducting points for "the dog sit" having a missing "s" is rather objective and

thus free from being questioned, but a student can easily make a convincing argument that deducting one point for using "arse" (British) instead of "ass" (American) is unfair even though the readership is American. In Taiwan's CE classrooms, I believe that we need to spend equal time on binary errors and non-binary errors because Taiwanese students still have more to learn about the foundation of their second language before they are ready to master its nuances.

Pym recognizes that non-binary errors and translation equivalents are subjective in nature, which is why he mentions the benefits of exchange programs and international students (every year GITI brings in a couple new international students, who are typically native English speakers), as they can help provide what Catford (1965) calls "competent bilingual informant[s] or translator[s]" (in Pym, p. 8). Unfortunately, a perfectly bilingual person is often not available when professional translators need one, and in classroom settings asking a native speaker for an answer will not truly solve a non-binary error, because time needs to be devoted to discussing and negotiating non-binary errors to the point where all students agree or at least respect their differences (p. 8). The binary error and non-binary error classification system in Lee's and Liao's paper is very useful because it gives us quantitative measurements. However, their rules for non-binary errors can be unfair or unnecessary. For example, who says using too many pronouns is bad if it does not make it harder for the reader to comprehend the text, and are not some of the most famous writers celebrated for their vague expressions, superfluous words, and endlessly long modifiers? This controversial aspect may be why Pym never developed a points deduction system in this paper. Nevertheless, we should consider Pym's binary/non-binary error distinction as well as past grading systems because only a proper grading system can get us quantitative results.

Pym has been criticized for focusing on finding and penalizing errors instead of seeing translation with a glass half-full perspective. In a positive light, even a flawed but mostly

correct translation gives millions more people access to knowledge—that should be celebrated. For this reason, Pym asks if we should award points for good work instead of only taking away points for mistakes, and he even admits that since he started adding points for good work that he enjoys correcting tests more (p. 10). The idea of rewarding excellence is important to the role of imagery and visualization in translation. For example, translating the colorful 晚霞 as "sunset clouds painted purple, orange, and red" instead of the black-and-white "sunset clouds" will help English readers picture the natural phenomenon that is not in their native language. Both of the above translations do not deserve a points deduction, but the former more accurately catches what native Chinese speakers see, right? So, why not add points for creative expressions that are both correct and arguably more accurate? When translators know that they will be rewarded for accurate yet creative translations, this surely will encourage them to strive to be more accurate and creative in the future instead of just fearing potential mistakes.

The question is should we start from zero and add on points for excellence or should we start from 100 and take points away for errors? Or, maybe we can add and subtract whenever necessary. Pym raises a good point that translation students making loads of "basic language errors" is not acceptable, as they are about to become certified professional translators and thus could seriously damage their field's reputation if they do sloppy work. Errors do take away from how readable and accurate a text is and they must be addressed because they do not go away by "turning a blind eye" to them, but creative translations can be arguably more precise and surely more enjoyable to read than accurate but bland translations. Pym advocates that we should learn from errors, and this is why he admits his own and welcomes students to teach him about his own translation weaknesses (p. 10). Simply put, Pym's hope is that translators make fewer errors as they become more experienced. Which begs the question, should we also become more creative as translators as we get more

experience, for we understand the source text better and have since freed ourselves from the shackles of "literalist fidelity"?

Pym's binary error and non-binary error distinction may create more questions than answers, but when we grade translation experiments in the future Pym's concise yet effective classification method should still serve as the foundation. As for how to deduct and/or reward points, Lee's and Liao's two-point deduction for binary errors and one-point deduction for non-binary errors is a helpful start. But, maybe the grading system should also consider adding on points for good work. Coming up with ways to classify aspects worthy of adding points to will take time though, as there is not a precedent for this in the translation education community.

2.6   Non-translation Imagery Research

Although it is arguably a blessing in disguise, the major issue for translation-centric research on the role of imagery and visualization is that almost all the secondary sources come from non-translation experts in language-related fields, such as adult language learning, children's literature and language learning, and linguistics. For those who don't take imagery and its research seriously, maybe they should ask Paula Berinstein, author of *Finding Images Online* (1996) and imagery scholar who is an expert in the fields of information and computing. She has stories to tell about picture librarians at the Los Angeles Times Editorial Library as well as clients hungering for imagery; a screenwriting client once sought Berinstein's assistance for finding information about mass polio vaccinations from the 1950s, telling her "If you can't find the facts, just get me some pictures. Kids lined up waiting for their shots—that kind of thing. I can write from those" (Berinstein, 1997, p. 40). Having just pictures may seem insufficient to tell the stories and facts of those vaccinations done over six decades ago, but all these pictures had a lot of information to share: how the medical experts

treated the children; the body and facial expressions of doctors, nurses, and patients; medical equipment; and what the environment was like.

The research for the fields mentioned above is very applicable to translation and interpretation because translators are language learners themselves. However, a major issue of the secondary sources cited by translation researchers like Kussmaul and the team at the University of Granada is that they often date back decades ago, hinting that more recent non-translation imagery-and-visualization-related research is becoming more and more nuanced and thus less related to translation and interpretation. I also struggled to find much post-2000 research. Now, it is a possibility that there is a lot of relevant new research, but Kussmaul, the University of Granada, and I were unable to find it.

While "outdated" secondary resources is a potentially problematic issue, this older research is still useful to know because it sets a foundation and develops main ideas and concepts that more recent research elaborates on in detail. Furthermore, the results and concepts of the newer research seem to back up past findings that show imagery and visualization is useful in language learning; a good example is Carney's and Levin's (2002) study that finds research results from the 1970s and 1980s, which asserts that text illustrations generally increase learners' performance, are still supported by research from the 1990s (p. 5). Furthermore, translation research uses these older sources, so we should be knowledgeable about them. The amount of sources that are well over ten years old may be slightly alarming, but the evidence back then points towards imagery and visualization being helpful, and we can be confident that previous research results aren't being turned on their head as we speak. Essentially, it is possible that there have been some new discoveries but it is extremely unlikely that there have been any large-scale overhauls in knowledge.

The stereotypical image of a translator is likely an adult sitting in front of a computer, not a wide-eyed child reading storybooks. But child language learning and children's

literature has a closer relationship to translation than one may think, as children and translators are both language learners. For example, there is an incredible amount of children books with pictures in them, which makes it easy to see why there is so much research devoted to the role of imagery in children's picture books. Therefore, exploring this relationship could be very useful for understanding how translators might use imagery or visualization to understand the source text. By grasping the role of imagery in children's books we can get a better understanding of the role imagery can and does play in translation.

Upon first glance, pictures in children's storybooks may seem to be mostly about entertaining the reader, but a closer look reveals that the pictures are also essential for linguistic reasons and arguably sometimes even more important than the text when it comes to children's language learning. Scholars like Tomlinson and Lynch-Brown (1996) state that illustrations are "essential to the enjoyment and understanding of the story", revealing the interdependent relationship between text and pictures (in Fang, 1996, p. 130). Fang's 1996 study "Illustrations, Text, and the Child Reader: What are the Pictures in Children's Storybooks for?" explains the purposes of pictures in children's storybooks by discussing the different functions of pictures as well as the varying types of pictures found in children's storybooks; Fang recognizes that there are other types of children's books, including picture storybooks without text, alphabet books, counting books, and concept books, but he focuses on picture storybooks because they are "the most common among young children" (p. 131). Unfortunately, since then, Fang's work has never directly focused on children's storybooks again. Furthermore, the most relevant academic article on children's storybooks dates back to 1988 with "The Importance of Illustrations in Children's Books", which was part of a book entitled *Illustrating for Children*.

What is most noteworthy about Fang's article is that the pictures in children's storybooks often do more than just illustrate what is going on in the text, as the pictures can

also amplify, extend upon, or add something new that is not in the text. For example, the pictures in Waber's *Ira Sleeps Over* (1972) show readers the "interesting and somewhat unorthodox lifestyle" of Ira's parents that is not expressed in the text (Fang, p. 133), and we *only* learn about the father's horrible driving skills in Rylant's *The Relatives Came* (1985) through the pictures, which show the father crushing a mailbox and a fence with the car (p. 134). Illustrations can even contradict or tell a slightly different story than what the text expresses, such as in Hutchin's *Rosie's Walk* (1990) when the text says the hen, Rosie, is going on a "peaceful stroll" but the illustrations tell another story—a fox is in the background, waiting to strike. Fang writes that "[i]t is as if Rosie (the printed text) is unaware of the fox (the pictured text)" (p. 134). This relationship between text and pictures in children's storybooks hints that the role of imagery in translation is a complicated one, because imagery can do more than just show what the text looks like. Essentially, if a translator comes across imagery in the source text, he or she should be careful when determining the purpose of the imagery, as the pictures might be there for another reason than just explaining the text's meaning.

That being said, of course pictures help readers imagine cultures and contexts that they are most likely unfamiliar with, such as in Binch's *Boundless Grace* (1995), which has many pictures of Gambians' daily lives. These illustrations help readers "picture" the setting of the story (p. 132). The above situation seems to indicate that pictures can visually explain things that we cannot understand by just reading text, and therefore translators can consult imagery to better understand text they are unfamiliar with. At second glance, there seems to be a close relationship between child readers needing pictures to understand certain aspects of a story with adult translators needing to see imagery of something in the text they are unfamiliar with.

Fang's paper has much more than just examples that show how pictures in storybooks help young readers visualize things that they are reading in the text. One section of his paper separates the roles of illustrations/pictures in children's storybooks into the following distinctions: establish setting, define and develop characters (as "illustrations help develop characters by depicting situations and emotions immediately familiar and credible to children", p. 132), extend or develop plot (because the text is limited in length, "the plot of a story is often advanced by illustrations", p. 133), provide a different viewpoint, contribute to textual coherence, and reinforce text. The points of providing a different viewpoint, establishing the setting, and helping with textual coherence seem particularly important to translators; essentially images already in the text as well as consulting imagery can both help translators better understand the text in a more multifaceted and concrete fashion.

Fang also has five major points about the relationship between illustrations and child readers: 1) illustrations "entice children to read and interact with the text" (Fang, p. 137), 2) picture books "stimulate and promote children's creativity" (p. 137), 3) pictures provide "mental scaffolds" for readers and help with comprehending the text (p. 138), 4) illustrations help "foster children's aesthetic appreciation of art and beauty" (p. 139), and 5) pictures help "foster children's language and literacy development (p. 140). Point 5 indicates a direct relationship between text comprehension and pictures, and "mental scaffolds" seem to be something that incorporates visualizing situations and scenes. Point 2 might be connected to imagery making translators translate more creatively. But, even less relevant points, like Point 1 and Fang's convincing argument that by increasing children's "aesthetic appreciation of art and beauty" children become better readers, are still worthy of consideration.

As for those who question Fang's article and other research that argues that pictures are helpful for children's language learning, they should consider Liao's thesis "The Influence of Translation, Picture Clues and Written Contexts on Taiwanese Sixth Graders' Word

Recognition in English Learning" (2006). This paper focuses on elementary school students that learned 20 new English vocabulary words on their own, and the experiment divided students into three groups: translation group (which had Chinese translations for the English words), picture group (which had images that accompanied words), and the context group (which had text above and below the word for comprehension purposes). Furthermore, students were also separated into three different English proficiency levels: high, mid, and low. The picture group did best with the "immediate word recognition" test, yet for the retention test that took place two weeks later the translation group by far had the best results, especially in the mid and low level proficiency groups. It is interesting that 88% of the picture group liked their assigned study method, whereas only 66% of the translation group and 50% of the context group enjoyed their assigned study method. The researcher suggests that high proficiency students are given picture clues and written context, intermediate students have access to picture clues, and low proficiency students are provided with picture clues and translations (p. 1). In short, pictures clearly have the capability to help readers learn what something is right away, but visual information may be less beneficial for long-term retention. So, students must realize that despite imagery being an enjoyable and easy-to-process learning resource, they should incorporate other aspects, like translation and context clues, if they really want to retain the meanings of words.

In 1979, Joel R. Levin published a highly influential article entitled "On Functions of Pictures in Prose", which has inspired many other imagery researchers. Levin hypothesizes the following functions of pictures in prose: decoration, remuneration, motivation, reiteration, representation, organization, interpretation, and transformation (p. 203). Using an illustrated book based on the hit Disney movie *Frozen*, an example of decoration could be showing the storm that killed the girls' parents and remuneration can be done by drawing Kristoff buying something for his sled after receiving money from one of his ice customers. Motivation can be

depicted by a flashback where a worried Elsa is thinking back to her childhood when she almost caused Anna to die; therefore, she doesn't want to return to Arendelle for she fears she may hurt her sister again. Reiteration can be done by showing the silly snowman Olaf repeating "Yeah, why?" on a page with four picture frames (he'd be repeating "Yeah, why?" with a similar look but every picture would have a different background). Representation and interpretation seem to be almost the same, but a possible distinction could be representation being more concrete, whereas interpretation seeks to explain something. Therefore, a representation of Kristoff's childhood as an orphan depicts images that show he is an orphan, while interpretation pictures may reveal images of his childhood, revealing why he leads a solitary life. Organization could be done by a series of pictures that show the evolution of Anna's and Elsa's childhoods from being close friends as young children to adolescent sisters that never spoke with one another. Transformation has a host of possible meanings, but one way could be showing walls being built and then the castle getting closed off after Elsa's magical powers are discovered for the first time.

One of Levin's most notable arguments is that illustrations are helpful for children when they are reading, but that the effects of visual imagery are not consistent when it comes to prose learning. That being said, it seems that pictures help children with low comprehension yet recognize enough words (p. 213). As having high comprehension yet low word recognition is an impossibility, the above point creates more questions when it comes to comprehension and recognition. First, if a child does not know many words, does this mean that the pictures are merely decoration and nothing more? Second, if a child knows many words and has high reading comprehension, are the pictures unnecessarily taking up space? It is not a coincidence that as children's reading comprehension and word recognition increase as they get older, they also end up reading books with fewer and fewer pictures. Essentially, children tend to start out with books with pictures on every page and little text, then they

slowly make their way to a point where there is a picture every few pages, and by the end only the text remains. In other words, the imagery that appears next to text seems to steadily disappear as the target readership age group gets older. So, other than comic books and graphic novels, books for adults rarely feature imagery, whereas children's books seem to be overflowing with imagery. Translators should consider this evolution, especially while they are improving their second languages.

G.R. Bodmer's (1992) "Approaching the Illustrated Text" puts particular emphasis on the "tension" between text and pictures, which exists for two reasons (p. 78). First, illustration is a "reading" of the written text that is done by the artist. Second, we as "viewer-readers" go back and forth from reading the text to looking at the pictures, and the way we respond to text is different than how we react to pictures. After stating the common theme that illustration expands, explains, interprets, and decorates the text, Bodmer goes on to say that the pictures are a "'text' in itself" and that they tell a "slightly different story" than the text (p. 72). Bodmer later argues that the artist is essentially a critic, explainer, enhancer, and interpreter who produces his or her own version (or vision) of the story, so the pictures in an illustrated book only show us "how one person read the story" (p. 78-79). Bodmer's points about illustrators are slightly unrepresentative because authors often are very involved in or have control over the illustration process (and many authors do their own artwork). For example, graphic novel writers typically produce a storyboard with the text and have a rough idea for what the pictures will look like. As a result, you will not see artists high-jacking a graphic novel by drawing whatever they please. Therefore, it is probably more helpful to focus on the relationship between the pictures and text of a book than looking to see how pictures tell a different story than the text.

Bodmer raises seven questions to call attention to the tension between text and pictures:

1. Does the illustration tell the same story as the words? What has been added or changed?

2. Can the words tell the story without the pictures?

3. Can the pictures tell the story without the words?

4. What is the style of the artwork? How is color used? What do style and color contribute to mood, description, or storytelling?

5. What is the physical relationship between the pictures and printed text? Do they overlap, or are they separate?

6. What is the tone or mood of the pictures?

7. What is the goal of the illustration? (p. 78-79)

These seven questions raise some pertinent issues. Of course, pictures "add" to the text by doing something, such as explaining the text or just decorating it (often putting in elements not explicitly stated in the text), but how much are we considering that pictures can actually influence or even change a text? The effect of the artwork's style and color on mood, description, and storytelling is also extremely important. For example, a story about the death of a loved one may struggle to teach a child about how to deal with grief if only text is used, but pictures that help set the mood of the piece can probably effectively portray this message. Colors also resonate with children, so a happy book probably needs bright colors and a sad story needs darker ones. Style can also play a role in targeting the age of the reading audience; an example could be pictures of physically-grotesque monsters may work for older readers but they will frighten off younger children. As for the location of text and pictures on the pages, because of past experiences, we probably assume that text and pictures are always organized in a way where the text is in a different section of the page than pictures. However, newer books, such as David Wiesner's *The Three Pigs* (2001), have physical interaction between text and pictures. For example, the three little pigs actually leave the confines of the

book, resulting in one of them having its foot cover the letter "H" and many of the words in a paragraph are scrambled when the dragon pokes his head out of the house. Essentially, we may not be giving enough consideration to the goal(s) of illustrations. Of course, pictures are drawn in order to increase the readers' interest in the book, but these pictures can also have other purposes, like trying to establish the story's mood or even doing what Bodmer refers to as "undermining the story" (p. 73). A good example of "undermining the story" is Nathan Lane's and Delvin Elliot's *Naughty Mabel* (2015). The main character is a dog whose refined words are much different than her disgraceful behavior. The naughty dog introduces herself to the readers by elegantly saying "Hello, darlings. Allow me to introduce myself. I'm Mabel. Mabel of the Hamptons. And this is my humble abode", but we find out she is actually an uncontrollable pet that goes on to create a huge mess. The sense of sarcasm created by the pictures and text telling different stories works in English, but it might be hard to translate this book into languages where sarcasm is not very humorous. Overall, as translators we probably do not have the right to change or adjust pictures, but we should be aware of their relationship with the text.

Bodmer makes many other interesting points. First, he brings up the adage "don't judge a book by its cover" to explain that we immediately begin responding to the work the moment we pick it up and look at the cover. Just like how many readers will first skim different parts of the book or glance at the ending before reading it from the beginning, Bodmer points out how impatient readers tend to look at pictures first: "Although the pictures are, ideally, meant to be "read" at that point in the text where they are positioned, no one can help leafing through the book, soaking up the sense of the story through the illustrations" (p. 72). A parallel can be drawn with translators who first look at the text's pictures so that they can better understand the topic they are translating. This, however, will affect their understanding of the text before they even translate the first word.

Bodmer expresses that reading an illustrated work causes us to look back and forth from text to pictures, making us participants of the story (p. 78). The majority of movies come from works of literature, and often we will hear how the movie is just not as good as the book. What happens when a book does not have pictures though? Are readers still participating in the story by thinking up imagery with their imaginations? My guess would be yes. And, maybe this explains why people are often not satisfied with the movie version of a book they had already read. Essentially, what they imagined when they read the book was different than what the movie depicted. Thus, concerning how much effort it takes to use one's imagination to understand the text, if pictures make it so that translators need to imagine less, then does this mean a group of translators will produce similar translations of the same text when there are pictures, while their translations will vary more when there is only text?

Bodmer differs from other researchers in that he treats text and pictures like they are equals. Concerning picture books without text, Bodmer claims that a text or storyline does exist, and that it was created by the artist's imagination and recreated by the reader-viewer. Despite this, he still believes that a riveting text can make up for poor visuals while amazing artwork cannot save a poorly written text; in other words, "elaborate art can overpower a small story". Nevertheless, his insight that the pictures in children's books "help bridge the gap before a child learns to read; a picture's more abstract and emotional appeal is a doorway to the literal communication of the written words" (p. 72-73). It would seem that pictures are actually more concrete (or easier to see/imagine), whereas text is more abstract because children have seen images since birth but they only learned to read text later on. Furthermore, besides photos, pictures can appear strikingly similar to what things look like in the real world, while text is just a way of expressing the world through another medium. Aside from this, the emotional appeal of pictures is supported in other imagery fields. Furthermore, the term "doorway" is especially fitting—by reading text accompanied with pictures children will

eventually improve to the point where they do not need pictures anymore. Translators are not child readers, but it seems that both children and adults can benefit from seeing imagery.

The role of imagery in children's language learning is a complicated one, but overall pictures help "maximize text comprehensibility" when pictures (which are concrete "first-order symbols" that children are familiar with) are put alongside the text (which is a more abstract "second-order symbol" that is not as connected to their real-life experiences) (Fang, p. 138). Words may be less abstract to adult translators, but sometimes a single picture can explain a confusing text, and adults have often seen something with their eyes but have never read about it before. The concrete vs abstract debate is brought up in other areas that explore imagery, and the interviewees discussed this topic in depth as well.

Literacy educators like Chall (1967 and 1983) and Elster (1995) are concerned that pictures may distract children, and this then negatively affects their ability to identify words and acquire the language (Fang, p. 136-137). There are even education experts that advocate for language learning books that intentionally seek to teach children without using pictures. Despite this counter opinion, an overwhelming amount of research indicates that the imagery is helpful to child learners. Nonetheless, being honest about the benefits and disadvantages of imagery is important because imagery could be very useful for translators in certain situations yet disadvantageous in others. Unfortunately for translators, who often translate articles written for adults, the text does not provide them with pictures. Yet, by being aware of the benefits and potential issues with consulting imagery, they can turn to imagery when necessary or stick to the text when imagery is not needed. Overall, children's language learning research is helpful for translation research because translators often are translating from a language they are still learning. However, we still cannot just take all the evidence from children's language learning research and assume it is 100% applicable in the field of

translation. But, we can use this research as a starting point because the results at worst can give us hints and at best can tell us about how translators process language.

Translators in almost all cases are adults, therefore research concerning adult learning is arguably much more applicable to translation studies. Alesandrini's "Pictures and Adult Learning" (1984) is unfortunately a three-decades old article, but it was revolutionary at the time and is still frequently cited today, as it discusses a clear three-type classification method for instructional pictures: representational, analogical, and arbitrary. This article also focuses on the different roles in the learning processes for these three picture types, and there is an emphasis on specific topics, such as concept learning, learning from prose materials, and learning from expository text. Alesandrini's research work is important because she has contributed so much knowledge to the topic of imagery in language learning, and her articles share information from other heavyweights in this research field, including Levin and Levie.

Although Alesandrini's article has many engaging points, the most interesting one is a lot like the old adage "give a man a fish and you feed him for a day; teach a man to fish and you feed him for a lifetime". Alesandrini claims that giving pictures to students helps them learn the material, but they will perform even better if you tell them to draw the pictures themselves (p. 67). Drawing pictures involves interaction, and interactive imagery resources have been proven to be more helpful than non-interactive imagery resources in studies mentioned later on, so translators should also consider if they need to draw images in order to better understand the text, and maybe they can use interactive imagery resources to get a better grasp of the text, too.

Alesandrini also compares leaners who are visual-based to non-visual-based (which is brought up by a few of this thesis's interviewees, too), how well learners know the subject matter, and there is a comparison between high and low ability students. These points indicate that whenever translators are considering if they should consult imagery or when they are in

the process of looking for appropriate imagery, they should be aware of how well they know the subject matter and what kind of learner (visual or non-visual) they are. Essentially, a translator who is not an expert in the medical sciences yet is working on a case about heart disease would likely benefit more from a general picture indicating the different sections of the heart rather than a complicated visual of a heart designed for cardiologists. Furthermore, for the everyday translator, a non-realistic heart drawn to teach lay readers about the heart's functions would arguably be much more helpful than a photograph of a real dissected heart (p. 64). As for the non-visual learner translator, it would probably be better for him/her to read about the heart rather than look at images.

Alesandrini states that "[r]epresentational pictures are those that share a physical resemblance with the thing or concept that the picture stands for" (p. 63). Representational pictures are said to play a role in the "potency of visual memory" by Yuille and Marschark (1983) and are helpful for giving examples when teaching concepts (p. 63). However, the range of representational pictures is much larger than just photographs and realistic drawings; the terms realism and realistic are used to describe how concrete (such as models and colored photographs) or abstract (including simple line drawings and graphic symbols) a visual is. For example, the art from a comic strip is classified as representational, and it portrays characters and settings in ways that is a mix of concrete and abstract. The category for representational pictures stretches all the way to completely abstract or intangible concepts, such as depicting heat by having a metal being melted by a hot flame, or even "concrete associates", like an hourglass that represents the concept of time. These are both examples of representational imagery that represent abstract/intangible concepts (p. 64). On top of being proven to not be as helpful as other types of pictures in other studies, Alesandrini points out one specific problem with using representational pictures—they may cause us to misinterpret reality. In 1929, Whitehead coined the term "the fallacy of misplaced concreteness" to describe imagery

examples that made electrons traveling around a nucleus appear as if they were a planet orbiting the sun; essentially, turning atoms into something concrete and tangible can cause us to misunderstand their actual nature (p. 64). Nonetheless, representational pictures have the power to help learners get a better understanding of what concrete things looks like and what abstract/intangible things or concepts can do or represent.

Other than drawing pictures being more effective than just being provided with pictures alongside the text, the most interesting parts of this article are that mental imagery may be better than pictures and despite learners preferring to have more concrete pictures, life-like pictures seem to lose out to less concrete pictures. A 1978 study by Dwyer showed that simple line drawings are most helpful, whereas "detailed visuals", like photographs, do little to help with learning (p. 66). Alesandrini writes, "detailed visuals, such as photographs, may be very interesting to view and may provide the learner with an accurate portrayal of reality, but they have limited instructional potential unless the learner is familiar with the content or is adept at interpreting visual information" (p. 66). Dwyer also found that pictures generally facilitate adult learning, but no facilitation happens if the learner is familiar with the material. As for the other side of this, if the material is too complex realistic imagery may not facilitate learning as well (in Alesandrini, p. 64). This article does mention forming mental imagery being better than text providing learners with pictures, which can be connected to the use of visualization during translation or interpretation, but there is very little discussion given to this topic. However, it does beg the question of *is visualization better than physical imagery?* And, *is imagining something with our own minds better than using our eyes to see something?* And if that is true, *is it because visualization causes more active thinking, which is better for processing?* Questions like this still remain unanswered today and likely will not be answered for many years to come.

Alesandrini's article discusses more than just pictures or imagery that are supposed to directly represent what the text would look like if it were visual, as she writes at length about analogical pictures and arbitrary pictures. Concerning analogical pictures, Alesandrini writes, "[a]n analogical picture conveys a concept or topic by showing something else and implying a similarity", and that they are particularly helpful for abstract or intangible objects/topics because a direct portrayal cannot be done (p. 68). Furthermore, new information is said to be remembered better if it can be related to prior knowledge (p. 68). Alesandrini gives one example of the molecules of a metal being represented by sticks connected to disks, indicating chemical bonds (p. 69); a metallic crystalline structure certainly does not look like a "tinker toy model", but for non-experts this visual may help them finally understand something that chemists easily grasp. In fact, analogical pictures were actually more helpful than the analogies themselves in a study on Moby Dick where parts of a "'sword mat' loom", such as the warp and woof, were compared to the abstract concepts of necessity and free will (p. 69-70). This article's 1980s publishing date and the imagery research field's focus being almost exclusively centered on representational images makes it hard to say just how effective analogical pictures are, but it seems like in many cases analogical pictures can be just as helpful if not more helpful than representational pictures.

The term arbitrary would seem to not be helpful for a translator looking up imagery for text that he/she cannot understand, but the category of arbitrary pictures is rather large and arguably quite helpful. Pictures in this category are considered to be "arbitrary or 'logical' because [they] do not look like the things they represent but are related logically or conceptually". Arbitrary pictures "include graphs, flowcharts, networks, maps, tree diagrams, and other schematized charts and diagrams" (p. 70), and by "abstractly portray[ing] the essence of new concepts", abstract pictures facilitate learning (p. 73). For instance, an American who is trying to understand the way Taipei City Government (which often uses

British terminology) is organized could look at a flowchart to see aspects like how powerful a director-general is compared to other positions and what organizations have authority over smaller departments. A subcategory for arbitrary pictures includes "structured overviews, networks, structural outlines, hierarchical mapping, and tree diagrams", and their advantage is that they show the content's "hierarchical organization" (p. 70). A good example is a family tree; it often does not show pictures of loved ones, but it clearly organizes who came from who and the history of the family. Seemingly more helpful for vocabulary learning and less helpful for overall text comprehension are structured overviews, as they can indicate relationships between "new concepts and familiar concepts, and they are often used to show key vocabulary from a text" (p. 70). Learners can also "graphically organize" a text by showing important relationships, such as comparing and contrasting, or they can even do flowcharting so that they understand the links or connections between different things (p. 71). The advantage of creating over receiving rang true again; studies in this text showed that students who were trained in mapping and flowcharting outperformed those in the control group (p. 72) and another study revealed that a graphic organizer is probably not helpful unless learners "generate it themselves or manipulate it in some way" (p. 72).

Berinstein's 1997 article "Moving Multimedia: The Information Value in Images" is a decade newer than Alesandrini's, and although it is not organized into three convenient categories (representational, analogical, and arbitrary), the strength in Berinstein's piece is that Berinstein's Image Taxonomy (BIT) provides a long list of image types or categories. What is also special about this article is that it was published in the 1990s during the beginning of the rise of the Internet, and the writer is an expert on finding images online, too. Her book *Finding Images Online* (1996) and article "Images in Your Future: The Missing Pictures in an Online Search" (1997) are old yet still helpful for translators doing online image searches. Especially in the past and even true in the digital world of today, many

people mistakenly believe that, when compared to text-based resources, multimedia is "a pandering to lazy people's desire for eye candy" (p. 40) and/or that pictures are merely a decorative item with no other purpose. But, Berinstein's professional and academic experience as well as her plethora of examples that show companies spending big money for imagery-related services should convince readers to start "look[ing] at images in new ways" because there is so much to see that you might not notice at first glance (p. 41).

Rather than choose a side in the imagery vs text battle, Berinstein makes the smart choice of remaining neutral by expressing that there is no need to choose one over the other, because using them together is even more effective: "Images convey information in ways different from and supplementary to those of the text" (p. 41). After discussing how imagery and text have their own distinct strengths and weaknesses when it comes to communicating information, Berinstein writes a powerful summary about imagery:

> Images exert exceptional power because of the way the brain processes visual information—directly, and all at once. Going straight to the brain, images bypass and transcend slower language processing, allowing us to communicate even when we speak different languages, or no language. (p. 42)

Although she does not quote any experts or scientific researchers, her point about children first learning a visual language, which then "integrate[s] with verbal language" (p. 42) later on, is still quite believable. Berinstein then argues that no one ever makes a jump to only using verbal language, meaning visual language stays with us our entire lives. She builds upon this argument by claiming that we forget that we are translating from visual language when we use verbal language, as we have become so fluent with verbal language that we do not even realize we are using visual language at the same time. This idea of verbal language makes sense because the world still has many spoken-only languages. It is also a reminder

that translators should be more cognizant of the imagery presiding in the verbal language they are using.

Berinstein makes other points that also seem to involve the translation world. First, her point that "most images…do not require translation, but text always does" is debatable, but her counter example of non-Americans probably not knowing that the elephant in American politics represents the Republican Party shows just how much a single image conveys and how outside cultures will likely not understand images from a culture they are unfamiliar with (p. 43). Her other point that verbal language can only be processed sequentially (which makes processing slower) whereas visual language processing is faster as it can be taken in all at once is a tried and true principle. Essentially, we can look at and understand a painting quite quickly, but reading a passage that describes all the painting's details would take much longer to process, and, in order to comprehend the text, we would most likely need to read from top to bottom instead of randomly moving our eyes about the canvas.

One of the other two controversial points that Berinstein makes is that "[o]nly words can convey abstract concepts and logic" (p. 43); any art museum curator would love to explain how many of the art pieces on display vividly express abstract ideas. The author's other unique argument is that while writers are generally in complete control of what is included and what is not, because they get to choose the words they write, photographs can actually contain information that is unintentionally included. For example, Berinstein shares a story of a photograph of the United States Capital dome's reconstruction that has an interesting person in the crowd—John Wilkes Booth, the man who would go on to assassinate President Lincoln (p. 43). This discovery can shift the photo's focus from being about a construction project to a historic event. Therefore, in addition to considering how text and images might portray abstract and concrete things/concepts in different ways, translators should also be aware that photographs might have elements in them that were not intended by

the photographer or article writer. Overall, Berinstein makes a lot of controversial yet convincing points, many that are basically theoretical, but her sentence "…images can capture reality in a way that words cannot" (p. 44) is a succinct way of saying that images can hold their own and should be used alongside text in the world of communication. In short, sometimes using imagery is more convenient or efficient than text/spoken words, so why explain what something looks like when you can just show a picture?

Berinstein's BIT classification system may not be very organized, but this is reasonable, as she argues that images often can be included in more than one category. The major benefit of her classification system is that she provides a good amount of examples under every category. The first category is *instructional images*, which include plans, blueprints, and product assembly instructions. *Explanatory images* include diagrams and instructive pictures, like how a lunar eclipse is formed. *Documentary images* are the largest category, and images range from clothing designs and pictures in news articles to crime scene photos and general pictures that present what something looks like. According to Berinstein, there are four major uses for documentary images: education (e.g. showing the surface of the moon to Earthlings), communication (e.g. showing a client an interior design drawing), supplementing or clarifying verbal information (e.g. having a picture of how an engine works after a written description), and making records for later use (e.g. yearbook pictures). Another type of image is *locational images*, which range from maps and star charts to visuals for chemical structures. These types of images are very helpful for visual learners who do not process verbal instructions very well (p. 44-45). In short, the picture categories above are very informative and thus will prove the most helpful for translators seeking to better understand the source text.

According to Berinstein, when people think about images they typically envision *the decorative image*. Decorative images include "eye candy" that is slapped onto everything

from packaging and travel brochures to birthday cards and newspapers, and the purpose of this eye candy is "add[ing] visual interest, decorat[ing]…eas[ing] the effect of text on the eye, [and] attract[ing] attention". However, decorative images also supposedly can be used to guide the "eye", or reader, through the text (p. 46). Berinstein also points out two things that at first glance would not seem to be classified as decorative images—the borders on pages help with organization and illuminated manuscripts may only be seen in modern day children's books, but this ancient format is a good example of blending together text and imagery. In summary, translators should be careful with decorative images because their main purpose is entertainment, so they might not be the most appropriate or representative for dealing with confusing parts in the source text.

Translators should also be cognizant of the following image categories because they communicate more than just one thing or concept. The author calls one category *the statement*, and these pictures are used to communicate a message or point of view that is often political, social-minded, personal, spiritual, or educational. For example, pictures of a deadly war scene can communicate the message that war is bad. Berinstein lends the name *the story* to pictures that "tell stories", and we often see them in anything from children's books to graphic novels and even photojournalism. The last image category is *emotional images*, which serve the purpose of making an emotional impact. Causing us to have different emotions (e.g. happiness, sadness, or pity) and reactions (like laughing or crying) and often seeking to manipulate us, the range for this category stretches from pictures for charities that help underprivileged people, movie posters, religious icons, erotic images, and cartoons to what she calls "you-are-there pictures" (which are those pictures that transport you to a different environment, like outer space or the Wild Wild West) (p. 46-47). These pictures contain emotional content and subjective qualities, so while they are helpful, they should also be used with caution.

Below are some of the more untraditional categories. *The graphical representation of numbers and concepts images* "visualizes abstract information", such as graphs and charts as well as web page icons, symbols, logos, trademarks, and advertisements, for they show the "personality and identity of a company" (p. 45). The next type of image is *the making-the-unseen-visible image*, which concerns visualizing the "invisible world" or allowing us to see something in a different way. The range of images in this category goes from X-rays and microscope photos to radar images. The next type of image is *preservation images*, including copies, microfilm, and digital files, and this type of image is connected to the *surrogate rule*. This rule implies that copies of pictures protect the original image in addition to allowing more people to access the image (p. 45). The above types of images may not seem like traditional sources of imagery, but they are very important because they make us able to see what is essentially invisible and they also preserve things so that we can view them in the distant future even if their accompanying text is later erased.

Berinstein's article may be poorly organized and it lacks scientific studies that prove what categories of images are more effective, frequent, or useful, but the author is both a scholar in this area and also very active in the business world, which gives her article credibility. Berinstein's piece touches upon the importance of images being seen as "visual assets" (p. 47), as the companies she has worked with use images for visual corporate histories, documentation, annual reports, and other documents they show to clients. Many of these companies even spend heaps of money on digital imaging systems and visualization software (which are often 3-D) (p. 48). Even lay people use images in ways they might not even realize, and in order to make their lives easier they could use images while carrying out the following tasks: brainstorming, getting context, learning about a task, analyzing data, avoiding the process of creating something already available (or "reinventing the wheel"), showing what you are imagining in your mind, learning how to do something, keeping up

with the times, getting your way around, seeing places without physically going to them, and following instructions (p. 49). Overall, Berinstein's article is convincing in that it shows imagery should be used alongside text, as imagery has unique strengths that enable it to communicate in ways or with efficiency that text just cannot match.

Emily E. Marsh's and Marilyn Domas White's "A Taxonomy of Relationships Between Images and Text" (2003) has an overabundance of research merit because it is a more organized, farther-reaching, and newer version of articles mentioned above. Plus, it actually physically shows image examples instead of just writing about them. Better yet, the taxonomy for relationships between images and text is strikingly similar to this thesis's goal of someday creating an imagery database that will meet the image needs of users.

One of this paper's central themes is that imagery and text are inseparable. This is backed up by how people who work almost exclusively with images, like art historians, must use text in order to retrieve images (p. 663). Furthermore, unless some type of amazing technology is developed that allows us to look for images with images, we will continue to need to use text to look up imagery. On top of this, text and images often interact and complement each other in a way that makes us better understand one if it is accompanied by the other. Unfortunately, this piece, like many other articles, seems to put emphasis on images being used to add to the text and not the other way around; for example, in the abstract, the authors write the following about the article's research question: "[H]ow does an illustration relate to the text with which it is associated, or, what are the functions of illustration?" (p. 647). Even though imagery can play the lead role (while text takes the supporting role) in many different types of documents, in translation documents imagery is most likely supplementing the text or being consulted in order to better understand the text.

Although it needs to be noted, it seems rather obvious that the interactive relationship(s) between image and text are important for more than just translators. The

taxonomy proposed by Marsh and White seeks to cover all "subject areas" and "document types", and a variety of research articles from children's literature, dictionary development, education, journalism, and library information design are cited. In addition, information retrieval, document design, advertising, and web page design are covered as well (p. 647-650). With so many fields interested in image-text relationships, it only makes sense that combining all available resources into one convenient package (e.g. an image-text taxonomy) should surely be better for all than the present situation, which according to Marsh and White is research and information spread across different fields and "at times hidden within documents that do not focus directly on the relationship between images and text." Furthermore, uncovering the research requires reading experimental research, literature reviews, content analyses, and even essays and books that tend to use observation and introspection methods (p. 648). Marsh and White address this gap by coming up with 49 image functions—many of them receiving detailed examples—and the relationship of imagery to text is sorted into one of three categories: little relationship, close relationship, and extend beyond text. An imagery database with the above 49 functions would be very helpful for professions that utilize imagery, as they could find relevant images without spending much time looking for them.

For those who question whether exploring image-text relationships is just as useful for the business world as it is for academia, they should be aware that when creating documents (from newspapers to brochures and, especially nowadays, web sites) one must consider more than just prose, because images, font types, color, and spatial issues all factor in. In fact, Karen Schriver's (1997) call to web developers in the smart technology era to start paying attention to images still has merit despite being 20 years old: "We have almost no knowledge about how to best structure the relationships between words and pictures on the Web…It's the interplay of prose and graphics that ought to concern us" (in Marsh and White, p. 647). Marsh's 2002 doctoral dissertation was never published, and as a result this thesis is unable to

give an example for every one of the taxonomy's 49 image-text relationships nor does it address anywhere near to the 954 image-text pairs that appear in that same dissertation. Nevertheless, the dissertation's lofty goal of seeking to "identify and predict the effects of (image-text) combinations" for documents is something we as translators should consider whether we are consulting images or dealing with documents that incorporate both text and imagery (p. 647).

The taxonomy is the article's most special feature, but its literature review is also worth writing about. When it comes to education, images have been tied to helping with retention of text, pictures in children's books have a host of different purposes, images have instructional value and thus are commonly seen in textbooks, and pictures in dictionaries are incorporated in order to assist the user with understanding both definitions and word usage. Furthermore, library and information studies experts look at the value of images for multimedia, images play a big role in newspaper layout (and retention of articles), and imagery seems to be an important part of technical communication (p. 648-650). Concerning the methodology section, it should be noted that web pages are the data source and that only drawings and photographs are considered. Therefore, motion imagery and "true-to-life animations" are not included because of their complexity (p. 652). Furthermore, the image-text pairs are considered not just by how close they are in the document but by their relevance to each other (this is important because images can often be located a distance away from the text they are connected to) (p. 652).

For the sake of clarity, I have reproduced the table below:

A. Functions Expressing Little Relation to the Text	B. Functions Expressing Close Relation to the Text	C. Functions That Go Beyond the Text
A1 Decorate	**B1 Reiterate**	**C1 Interpret**

A1.1 Change Pace	B1.1 Concretize	C1.1 Emphasize
A1.2 Match Style	B1.1.1 Sample	C1.2 Document
A2 Elicit Emotion	B1.1.1.1 Author/Source	**C2 Develop**
A2.1 Alienate	B1.2 Humanize	C2.1 Compare
A2.2 Express Poetically	B1.3 Common Referent	C2.2 Contrast
A3 Control	B1.4 Describe	**C3 Transform**
A3.1 Engage	B1.5 Graph	C3.1 Alternate Progress
A3.2 Motivate	B1.6 Exemplify	C3.2 Model
	B1.7 Translate	C3.2.1 Model Cognitive Process
	B2 Organize	C3.2.2 Model Physical Process
	B2.1 Isolate	C3.3 Inspire
	B2.2 Contain	
	B2.3 Locate	
	B2.4 Induce Perspective	
	B3 Relate	
	B3.1 Compare	
	B3.2 Contrast	
	B3.3 Parallel	

	B4 Condense	
	B4.1 Concentrate	
	B4.2 Compact	
	B5 Explain	
	B5.1 Define	
	B5.2 Complement	

This taxonomy, which is a result of hours upon hours of hard work and brilliant organization, does have its controversial aspects. First, how can we objectively know how closely related an image is to its text? And, what if the same image actually meets A, B, and C and/or different functions at the same time? Second, some of the categories seem like the same thing. For example, are not B4.1 Concentrate and B4.2 Compact pretty much the same words? And, can B3.1 Compare really be that much different than C2.1 Compare? To be fair, the authors do give space to explaining their organization rationale. All in all, any taxonomy is never going to satisfy every party that uses it, but Marsh and White do a convincing job while only using 25 pages to explain their creation.

The first image discussed by the authors is found *twice* on the US Rewards for Justice's official web site. This image shows a man wearing a medical mask who is organizing an enormous pile of bones from Rwandan Genocide victims. The picture is an example of B (being closely related to the text) when it is the sole illustration for the following sentence on the Rwandan Genocide page: "In 1994, during a 100-day period approximately 800,000 Rwandan Tutsis and moderate Hutus were brutally murdered in the Rwandan Genocide" (p. 655). The carefully sorted and stacked pile of bones "concretizes" (B1 Concretize) the tragedy, showing the results of the atrocities committed. Furthermore, the image and text complement one another (B5.2 Complement) by informing the reader about

just how appalling the genocide was. The same picture is a fitting example of A (expressing little relation to the text) when it appears on the War Crimes page around text that tells users they can click on links to see various international war crime incidents. The text is rather emotionless, whereas the piles of bones in the picture is sure to stimulate the emotions of the user (A2 Elicit Emotion). The writers even extend the picture to be representative of C (functions that go beyond the text), as the horrifying image shows a man, who is trying to avoid contamination by wearing a mask, sorting an alarming amount of bones in a rather emotionless manner. This then "intensifies the description", thus making the event an important one (C1.1 Emphasize).

Regardless of the context, a translator doing a case on the Rwandan Genocide would benefit from seeing the picture above; it would help them better understand the horror of the genocide by being able to physically see results rather than just reading descriptions and numbers. In short, the same image is able to cover categories A, B, and C in addition to expressing a host of different functions, which tells us that the image's functions change whenever the text changes (p. 654). Translators should take note of this situation, because a single picture can represent multiple text segments. Therefore, they should not fear seeing the same images pop up on Google Images despite the fact that they are using different search words. Overall, just like how the same sentence can mean different things in two written pieces, the same image can mean something different in different contexts.

One of imagery's biggest advantages is that it can take complicated text and/or things that are unobservable to the human eye and then make them concrete and thus easier to understand. The second picture discussed by Marsh and White makes radio waves observable for readers of a NASA (National Aeronautics and Space Agency) teacher's guide, and it does this by relating things people do not typically know much about (ionosphere and different frequencies of radio waves) to what they understand (radio towers, satellites, spaceships, and

earth). For example, the satellite in the picture helps readers understand the location of the ionosphere in the atmosphere (p. 655). Despite the image making an unobservable process visible, Marsh and White argue that the picture is very closely related to the text. As a result, they tie the image to "translating" the written form into the visual form (B1.7 Translate). This is further extended to "inducing perspective" (B2.4 Induce Perspective), because the picture shows us that low frequency waves are reflected in the lower ionosphere, high frequency waves make it higher before being reflected in the ionosphere despite getting close to passing through the atmosphere, and very high frequency waves pass through the atmosphere (p. 656). The waves of different frequencies are compared, meeting another function (B3.1 Compare), and making invisible waves observable by depicting the waves and their properties meets requirements for C (C3.2 Model a Physical Process). Overall, the radio waves example is probably the most useful image for translators to consider because it makes a confusing situation understandable. As translators, we look up things to better understand the source text and/or target text, and images that make unclear text easy to understand is often a god send for us.

Translators could probably directly translate the next example by Marsh and White without needing to look up images, but the image part of the document produced by the National Transportation Safety Board surely makes the complicated traffic accident easier to grasp. In the text, we read the account of the driver of the semi-trailer truck that collided with a van; in addition to saying he "braked, skidded, and jackknifed into the opposing lane" when he saw that a van was in his lane and driving towards him, he also described the van's headlights coming through the fog (p. 656). The short paragraph also lets us know that 11 out of 12 people in the van were killed after the truck struck its right side, the van was going 55mph to pass two cars, and a few other details. Modeling a physical process (C3.2.2), the black-and white picture of the event is an over-head view that depicts State Route 180's

center and shoulder lines and it contrasts the van and semi-trailer truck by showing them from both *pre-crash* and *at impact* locations with arrows indicating their movement (B3.2 Contrast). Marsh and White state the diagram is an abstract model (even though it makes the accident concrete and understandable) because the image is not to scale, the fog is not displayed, and the two cars that get passed by the van are not shown. Omitted details allow for the picture to focus on what happened (B4.1 Concentrate) but not the *why*—through the picture we do not know why the van is in the wrong lane because the slower cars being passed are not shown. If we only look at the picture, we also will not know why the drivers reacted like they did nor do we see the aftermath of the event in terms of so many people losing their lives. Marsh and White connect this focusing of details to Category A (3 Control) as well as influencing/developing the reader's perspective on the traffic incident (B2.4 Induce Perspective). Quite simply, this event's most confusing aspect is how the accident happened, while the motivations of the drivers and weather that day can be easily understood just by reading the text. It is hardly a coincidence that the article's producers chose an image that would explain the accident's most complicated aspect.

A second look at this example may make one question if B4.1 Concentrate and A3 Control are all that different from one another; however, what we learn from this example is that translators can look up imagery to understand certain parts of the text. For instance, maybe a translator is trying to translate the text, so he/she looks up images to get an example of how the crash occurred. Images of injured and dead humans and marred vehicles is not unrelated to the text, but what the translator needs is a diagram of the traffic incident so that he/she can produce an accurate and clear target text. Essentially, images that do not focus on the functions the translator needs clarification on can be almost as useless as images completely unrelated to the text. Therefore, it is important that translators find images that focus in on the aspects of the text they do not understand.

The fourth example provided by the researchers comes from the *National Atlas*'s web site; the two images shown are congressional district maps made by the Department of the Interior. The maps show the boundaries of eight congressional districts for the state of Arizona in addition to cities, major roads, and rivers. The text indicates that there are two formats for the maps: one type allows for better viewing on a computer screen whereas the other is for "high quality color prints" (p. 657). This may not seem like an important point, but for clarity and accuracy purposes translators should consider if the images they are viewing on Google Images were designed for the Internet, because if they are fuzzy or unclear they may be meant for printing purposes. Therefore, the future imagery database should contemplate whether or not it will only offer images suited for the Internet. As for their functions, the maps meet both Category A by "engaging" and "directing the attention" of the reader (A3.1 Engage) and Category B by being a sample of the numerous maps mentioned in the text (B1.1.1 Sample) (p. 657). Translators need to look up maps from time to time to better understand the source text and even the target text, so they should make sure that they are looking up the type of map they need. For example, national maps range from showing mountains, rivers, and other terrain to just indicating major cities and capitals, meaning that translators should be cognizant of what qualities or aspects a map is focused on.

The fifth example is an illustration for kids that will be taking an Internet privacy quiz on the US Federal Trade Commission's web site. "Are you a safe cyber surfer?" is the only text segment for the illustration, which is a fictional turtle standing on his hind legs on a surfboard. Compared to the text, the image itself is actually quite deep with symbolism that both children and adults might not pick up on; for example, "surfing the web" is represented by the turtle surfing on the ocean (B3.3 Parallel). The turtle, who is named Dewie, pops up throughout the web site in different poses, and his role is to pique interest in children viewers (A3.1 Engage), "personify" the web site's message (B1.2 Humanize), and "sensitize children

to concerns about Internet privacy" (p. 658). Online safety is a big deal in today's world, where Internet use has caused thousands to lose money due to schemes and many have even been physically harmed because of criminals that exploit the World Wide Web to stalk their prey. So, teaching children to value safe Internet use involves keeping their interest with things like cool illustrations and games. Realistic images and horrifying pictures might be effective for adults, but children who are exposed to these disturbing images might not benefit from the material because it would terrify them, resulting in them becoming disengaged and thus likely not actually using the Internet any safer. Furthermore, they may stop going online all together and thus be disconnected from the world, which is a major disadvantage for their futures.

Just like how writers consider audience, people must also consider what images they should use for their intended viewers. Essentially, concerning the above Internet safety example, in this situation children should come away knowledgeable about Internet safety and feel confident that if they follow the necessary steps then they will be safe from harm; it appears that Dewie the Turtle is helpful in making sure this goal is achieved. When translators consult images, they too should consider the intended audience(s) of the image(s) they are looking at, as Dewie is more than just a cute turtle. The imagery database must consider different audiences as well.

A timeline that shows the technological achievements of the USA's NASA (National Aeronautics and Space Administration) from 1915-2003 proves how motion imagery is sometimes clearly superior to static imagery. The image talked about in detail is the Ames 40x80 full-scale wind tunnel becoming operational in 1944. This wind tunnel was crucial to R&D, as it allowed larger and faster aircraft to be tested instead of using models at low flight speeds (p. 659). The photograph is one of 53 images on the 10-page timeline that organizes aviation accomplishments from the very first to most recent. Along with the date that comes

before the explanatory text, the photograph of the wind tunnel helps readers "locate" when the achievement happened (B2.3 Locate). The writers also say the "two modes of presentation (i.e. text and photograph) complement each other to convey the nature of the accomplishment" (B5.2 Complement). The photograph also gets the reader's attention (A3.1 Engage) and "changes pace in the timeline" so that readers will move on to the next accomplishment (A1.1 Change Pace). The images in this list are essentially indispensable, because without them only the most experienced aviation experts would understand the content. But with them, novices can be both entertained by and educated on this topic.

I am surprised by Marsh's and White's interpretation for this photo for two reasons. First, while I think it is an interesting concept, I personally do not agree with the term "change pace", as I feel the photos help break up the monotony of just reading text, and this stimulation of providing image and text side by side keeps the reader interested enough so that he/she makes his/her way through the entire article. Second, the airplane takes up most of the photo's upper half, and, although people are on the ground and the roof can be seen, the photograph does not seem to depict the wind tunnel's actual dimensions. Despite saying that the wind tunnel is "difficult to show in the photograph", I am surprised that Marsh and White never question why the web site does not try to use a video or GIF for this achievement (p. 660). Being able to see (and even hear) the wind's effects would surely help viewers understand how important the Ames Wind Tunnel is to the history of American aviation. However, the image as it presently is just does not seem to accurately reflect how powerful and enormous that wind tunnel was. Nonetheless, a flawed photo is often better than no photo at all, and the image will surely help readers better understand the text about the wind tunnel. This example shows that translators should try to find better images (or videos) whenever something they are looking at is not adequate enough to help them fully understand the

situation. Furthermore, as stated before, an ideal imagery database needs both static and moving images, and even having elements such as sound would be helpful, too.

Marsh's and White's image taxonomy is more complete than previous taxonomies, which tended to focus on a specific category like children's literature. Surprisingly, it has been 14 years since this article was published, but just like back then still "no accepted method exists for describing relationships between images and text" (p. 660). This is important because, as the authors argue, an image-text taxonomy could be useful for many professions, such as producers of illustrated documents who collaborate with commissioned artists. As for the Digital Era we currently live in, web designers and all other involved parties could make sure that page layouts are effective; for example, Marsh and White recommend that the image-text pair on a home page should probably have a "type B relationship", but not A or C (p. 661). Also mentioned is information storage and retrieval, because a database with image-text pairs can have an efficient and helpful system where retrieval of imagery and text is combined. Despite working with images, visual information professionals apparently prefer search systems that show images in their original context, as images are typically tied to the text they come from (p. 662). Therefore, the ideal imagery database will need both text and images. Overall, an imagery database based off this article's 49 functions would be helpful because it would cover different disciplines and help create a shared language for image-text pairs. Furthermore, the article combines research, theory, and practice, so both the academic and professional worlds will benefit from trying to develop tools based off its classification model.

For some reason or another, it seems the word imagery is used as a synonym for pictures, which are static (or non-moving). Images are something that we can see, so labeling imagery as only being non-moving is an unnecessary reduction. A case in point, Dictionary.com's definitions for the word "imagery" never mention that imagery cannot move.

That being said, dictionary definitions do not seem to be helping with this distinction. For example, Dictionary.com's definitions of "figurative or descriptive language in a literary work", "pictorial images, as in works of art", and "images collectively" do little to convince readers that there are two types of images—images that do not move and those that do.

Berinstein's article actually touches upon moving pictures, such as mentioning film noir, but the advantage of Ok-Choon Park's and Reginald Hopkins's "Instructional Conditions for Using Dynamic Visual Displays: A Review" (1993) is that it gives focused attention to both static visual displays (SVD), which have "no movement or object manipulation", as well as dynamic visual displays (DVD), which are "manipulation of stimuli" or "pictorial or graphical movement" (p. 427). Furthermore, these DVDs have "dynamic features", which Klein (1987) says includes visualization, motion, and trajectory, and they offer an advantage in that they can show plausible events, actions, and concepts or ideas that can/will change over time (p. 430). It is not that SVDs cannot represent events, actions, and ideas that change, but DVDs can more naturally represent the ways things move in real life, and their ability to show movement makes complex situations more concrete and easier to understand. Park and Hopkins refer to a 1991 study by Reiber and Kini that explains how much easier and more effectively the brain can process DVD data compared to SVD data. Essentially, the brain's visual system can see the motion and then encode the information into the "imaginal subsystem of memory", whereas for static images students need to expend effort forming "mental images" for the connections between different motions because the images are presented separately (p. 430). In short, a student can better understand how a fight scene is carried out in a video than in a comic book because a video depicts all the motions, but in a comic book images are presented individually and so the brain must imagine what happens between these different images.

Unfortunately, this piece was written in 1993 and multimedia has changed a lot in these 20+ years, but it reviews studies on DVDs that date back to 1912, making it a good piece for imagery research history. Thus, it shows how research trends have evolved and hints at just how much technology has changed our world. In addition to discussion for the roles and influences of DVDs and SVDs, "SVDs plus motion cues" (which add in motion elements of DVDs, such as pop-up arrows) are also talked about. The importance of motion helping comprehension is a theme found in other parts of this thesis, and research findings show that SVDs with motion cues are better than plain SVDs and are about as effective as DVDs—essentially, a little bit of motion makes a big difference and too much motion often leads to comprehension issues. This paper also details the more recent development of computer-based instruction (CBI), which often allows for the user to interact and manipulate programs, whereas DVDs and especially SVDs do not allow for much manipulation and involve little interaction. It should be noted that the interactive and adaptive features of CBI and intelligent tutoring systems (ITS) make them very intriguing and possibly the best mediums for media instruction (p. 430-431). Overall, the importance of users being able to interact with the content is not addressed much in this article, but there is enough length given to it to suggest that the more a user can interact with the content, the better the content will be retained/understood. Therefore, an ideal imagery database should include both SVDs and DVDs in addition to interactive features so that learning is optimized.

Park's and Hopkins's analysis is that DVDs are in general more effective than SVDs (p. 427). Despite this, their review shows many studies where DVDs are not found to be significantly more effective than SVDs. There is a plethora of reasons for why 12 studies did not find a significant difference for DVDs while 15 studies did, such as the argument that "the use of DVDs should be determined selectively" (p. 427), as well as a major shift in the focus of the psychology community from mostly the behavioristic paradigm for the majority of the

20th Century until there was an almost complete shift to the cognitive paradigm in the 1970s (p. 436-437). This shift may explain why more recent studies have shown there to be no significance for DVDs, whereas studies from the 1970s and before usually tended to find a significance for DVDs. Surprisingly, the researchers discredit the more recent research for ignoring earlier research on this topic in addition to not taking important "theoretical rationales" into consideration, like learning variables, the task's learning requirements, and medium characteristics (p. 439-440). A good example is verbal explanation and animation were not helpful for students who were very knowledgeable about the subject because they could look at SVDs and know exactly how the situation will unfold (p. 434). It should be noted that no studies included in this report showed SVDs being more helpful than DVDs, but it is very likely that a handful of situations or learner types where SVDs are superior to DVDs could be discovered if time was devoted to this issue.

Park's and Hopkins's study does not go into depth about the difference between text and imagery, but it does touch upon the topic while zeroing in on psychology. Furthermore, it specifically focuses on memory. Like Bodmer, the researchers also mention Paivio's dual-coding theory (1971), which states that "information in memory is represented by two types of codes: image and verbal" (p. 429). A couple sentences later the terms verbal (propositional) and nonverbal (pictorial) are used to distinguish between two types of memory codes. The idea that mental imagery, scenes of the imagination, and dreams are only made up of image scenes and/or image scenes before they are combined is mentioned by Kosslyn (1980): "mental images in essence are percepts that arise from memory rather than from ongoing sensory stimulation (in Park and Hopkins, p. 429). Paivio's insight on how the language system (verbal) and nonverbal system work differently is discussed, but the most relevant point is that "nonverbal representations encode simultaneously or in parallel" whereas "verbal representations encode sequentially" (p. 429). Essentially, the brain can deal

with different parts of a single image or multiple images at the same time, but this kind of sensory overload would be impossible for the brain's verbal system (note: this is also talked about in Bodmer's article). A good example would be a map with directions drawn on can be processed all at once but giving directions and describing the map verbally in a few seconds would be almost completely incomprehensible.

Just like Bodmer, rather than do a comparison of what is better (i.e. images or text), Park and Hopkins point out that the two are better together because they complement one another (p. 430). The researchers describe this relationship by mentioning "referential connections", which are links between the verbal and nonverbal systems that join verbal and imaginal codes together and often lead to actions like creating images for words and giving names to pictures (p. 429). For example, by seeing a tree and teaching the word "oak", a student can associate the tree with the word "oak" and know that this tree is an oak tree. In addition to referential connections there are also "associative connections", and they link words to other similar/related words in the verbal system and link images to similar/related images in the nonverbal system (p. 429-430). The referential and associate connections activate things in the same or other system, and this is important because if something is coded into both verbal and imagery forms then it will more likely be remembered, retained in the memory longer, and will be more accessible, as the verbal form can activate the nonverbal form and vice versa. This study mentions a 1991 study by Mayer and Anderson that suggests visual depiction and verbal explanation should be shown at the same time because of referential connections. This may sound like sensory overload, but in this case two types of information lead to better comprehension. The 1991 study is not revolutionary as studies carried out in 1924 and 1927 state that the optimal situation is when DVDs are paired with verbal instructions (p. 431). Furthermore, a 1988 study by Rieber and Hannafin uses three different "orienting conditions: textual, animation, and textual plus animation" (p. 433), and a

study by Carpenter and Just (1992) indicates that animation is only helpful if it also has verbal explanations (p. 434). These studies show that images by themselves can help us understand text, but images will be even more effective if they are paired with explanatory text.

The end of Park's and Hopkins's article lists and describes the applications and most beneficial uses of DVDs and animation. While certain points, such as animation should only be used when it is relevant to the learning task and that novices might not understand the animation's motion, cues, and detail, may seem obvious, predictions about the future importance of interactive graphic applications, intelligent tutoring systems, and creating a "total learning environment" complete with a simulated world that can be explored by users are spot on if we consider education trends in the 21st Century (p. 440). Therefore, the following five points about applications should be taken into consideration. (1) Graphical animation can "explicitly represent highly abstract and dynamic concepts…including time-dependent processes" as well as show trajectory situations; this proves imagery can be helpful in the conveyance of abstract things. The above point pops up in (4), which states that animation can show motion in essentially invisible systems, like the flow of blood in the body or an electronic system's current. (2) DVDs are helpful with problem solving instruction and (3) DVDs/animation are beneficial when it comes to teaching troubleshooting functions and showing how mechanical or electronic systems work. (5) Indicates animation can be a substitute for verbal communication (like for deaf children), but, more importantly, animation can also be an aid, confirming the point that *why separate the visual and verbal when they are better together?* (p. 441-442). Overall, an effective imagery database needs to have images with and without motion, interactive qualities, and users should be able to use the database for both concrete and abstract text/concepts.

In addition to applications, there are also lists for the instructional roles and instructional conditions of DVDs. For example, it is easy to see how DVDs can help learners

form mental images, but the motion of DVDs is also important for helping guide and direct the student through what is being taught (p. 442-443). This is similar to one of the article's most salient points, which states that DVDs can depict the "sequential actions in a procedural task" (p. 443). Essentially, a DVD that teaches the assembly of a piece of furniture can show how the different steps link together, making assembly a lot easier compared to a SVD that only has steps. We have enough evidence to claim that visual displays are powerful and effective, but studies show that "sufficient verbal explanation" is also necessary, as verbal explanations can focus the students' attention on what needs to be learned and a lack of explanation often results in connections not being made (p. 444). Therefore, there is a reason that a DVD that teaches the furniture assembly process also needs verbal explanation; of course, viewers being visual or verbal learners plays a role, but the motions showed in the DVD might be too complicated for any viewer if there is no verbal explanation for important or complex steps. Fidelity is also important. Aspects like slow motion and cartoons might have their strong points, but they can also result in false conclusions being made about how the situation will play out in the real world. But, too much fidelity can be a barrier to learning too, so DVDs that are too fast or show a process that is too complex might not be helpful, especially for novices. Therefore, the learner's background is also important; high ability students can process more complex and faster speeds than low ability students can—thus, the speed and complexity of DVDs should be based on the viewers' level(s) (p. 445). Overall, DVDs have their advantages, but we should not forget about SVDs, including all the helpful static pictures that show up in Google Images. It may have been nearly 100 years ago, but Freeman's points in 1924 still ring true today. Motion's effectiveness might be over-rated, as static imagery like slides and pictures are very useful, but motion pictures surely do "have a distinctive part to play" (p. 445). With a lot of research showing SVDs (especially those with motion cues) being just as helpful as DVDs, the ideal imagery database would need to find a

balance for SVDs and DVDs so that different users can find imagery that fits their learning type and ability. Furthermore, the database would benefit from adding verbal explanation and text to these images.

The topic of imagery and textual content being concrete or abstract frequently popped up in both academic articles and during this thesis's interviews; Prabu David's "News Concreteness and Visual-Verbal Association: Do News Pictures Narrow the Recall Gap Between Concrete and Abstract News?" (1998) does a good job of producing quantitative data and informative discussion for the issue of concrete vs abstract. David is clearly aware of relevant research, as this article, which focuses mostly on gain in recall due to the addition of a picture to a news story, mentions similar studies in the fields of education, psychology, marketing, and mass communication. In addition to recall, comprehension, problem solving, inference making, and skill acquisition also benefit from adding in pictures (p. 182). He also mentions important terms, such as desired learning outcomes and intended functions of pictures, as well as how past studies sought to help their readers via free learning, forced learning, or mental imagery (p. 182). Overall, if we are going to create an ideal imagery database, David's article is helpful because we need to know about research from different fields, the diverse ways pictures can help readers, and the various functions of imagery.

Unfortunately, this article is nearly 20 years old, making it seem antiquated as it predates the downfall of the printed newspaper and the rise of Internet news. Furthermore, this study comes well after research on representative pictures in news recall essentially disappeared sometime in the 1970s—by the 1980s and 1990s they were replaced by the role of TV in learning (p. 183). TV and print media are fundamentally different mediums, but text-based translators can consider certain aspects of TV-based research, such as recall increasing whenever "redundant video" is added to the audio (p. 183). This supports David's prediction that the addition of pictures to news articles will improve recall (p. 182).

Nonetheless, in a world where news articles seem to be getting shorter, giving birth to the era of click bait journalism with its flashy cover photos meant to lure readers to text that is often either unrelated or shallow, the issue of imagery in news is arguably even more relevant today.

One of David's main arguments is that "graphics and text" have an inseparable relationship and that pictures help "[augment] verbal or textual information" (p. 180). He proves this by carrying out three experiments that find that adding representative pictures to news stories improves recall and that concrete news items are better recalled than abstract news items (p. 180). Although these results help prove the usefulness of looking up imagery (particularly concrete imagery) when translating, the answer to *does looking up abstract imagery help translators?* seems rather uncertain (to be fair, using a resource is almost always better than not having any access to that resource). Despite David and the interviewees being indifferent towards abstract imagery and text, David's findings prove that the role of visual-verbal overlap aids recall in *both* concrete and abstract news. So, even though concrete news stories benefit more from a news picture being added to them than abstract news stories do, translators should still consider looking up abstract aspects of the source text (p. 180).

This article is unique in that it looks at concreteness and abstractness in both pictures and texts, as it aims to explore the prevailing notion that "verbal information that is not generously peppered with riveting graphics is [seen as] dull and boring", meaning that "image-rich concrete stories should have a significant edge over image-poor abstract stories" when it comes to learning (p. 180). In other words, when we talk about imagery in text, we could say a novel by Louis L'Amour has such good imagery that we can imagine ourselves as seeing and feeling what the first-person narrator senses, whereas a complicated writing by Stephen Hawking will likely be considered hard to understand due to its abstract (and essentially imageless) nature. But, does L'Amour's accessibility and imagery make his writing

more important than Hawking's? David recognizes that concrete text and imagery might be easier to understand, but neglecting "substantive issue-driven abstract stories" in the present could severely impact our knowledge base of the future. Therefore, in order to help abstract stories get on equal footing with concrete stories, David suggests that by adding images the concreteness of abstract news will increase and this will then improve recall (p. 181).

How relevant a picture is for a news article seems to influence how much more the reader learns, which is called cognitive gain by David (p. 181). He explains that an article's picture(s) is chosen purposefully, so factors such as how much effort was put into producing and selecting the photo as well as the luck of being "at the right place at the right time" both play a role (p. 181). The association (or relevance) between picture and text is called visual-verbal overlap (or redundancy), and this overlap borrows concepts from a familiar source—Paivio's dual-coding theory. Essentially, if a news story is very concrete and the picture is very concrete, too, then there will be a high degree of overlap (p. 181). Apparently, the more overlap there is, the easier the text is to comprehend. A fitting example would be an article about an Italian appetizer that has a picture showing what the food looks like. However, what about an abstract article about rising inflation that features an equally abstract picture, like money that is being inflated with air? David never argues that this kind of (abstract) overlap could be beneficial, and so maybe it is not helpful or even potentially harmful for comprehension. In fact, the introduction gives a bleak outlook for abstract events, saying that an event about rising inflation "does not lend itself to explicit visual portrayal" and that an effective news image can only improve recall by "offer[ing] concreteness" to a relatively abstract story (p. 181).

Without providing evidence, David also proclaims that "only relevant pictures have a positive effect on recall" (p. 182). Like the Che Guevara business magazine advertisement, many TV commercials run counter to David's argument; a fitting example is the monkeys in

the office series by Career Builder that was shown during the 2012 Super Bowl, which is also an entertainment contest for companies that try to outdo each other with funny and creative commercials. The idea that monkeys that are partying in the office, smoking cigars, and lighting furniture on fire has any relevance to using Career Builder's platform to find new career opportunities seems like quite the stretch, but by being funny or innovative companies hope that viewers will remember the commercial and then use the company's services in the future. However, being able to remember the commercial but not the company's name may mean that the commercial was good entertainment but a bad advertisement. Overall, David makes a solid point that relevance is important and that some pictures are more helpful than others, but there are many real-life examples that show recall can be improved by images that are rather unrelated to the text.

Just like articles about children's literature, David examines different types of pictures, including representative and decorative. He does this to show that, when it comes to recall, some pictures are more helpful than others (p. 182). For example, a decorative picture (e.g. a pretty flower next to text) may make the text more interesting, but it does little to help with recall because it has little relevance to the text. Even representative pictures have their shortcomings; although a picture of a new super-fast train may help "reinforce the text" and make the article more concrete, it will do little to make the article more "coherent or comprehensible" because the image does not teach the reader much about the train's technology (p. 182). When it comes to coherence and comprehensibility, David hints that information graphics, which provide functions such as organization, interpretation, and transformation, are often more helpful to recall than representative pictures. This study unfortunately does not go into information graphics, nor does it explore picture types proposed by Levin that have been proven to be more helpful than representative pictures, but this makes sense, as, apparently, news articles tend to include only include representative

pictures (p. 182). This is why David narrows the scope of his study to only representative pictures and photographs. Despite this limitation, we can take this study's results and expect that more effective types of pictures will benefit readers to an even greater extent.

This article gives a better summary of Paivio's revolutionary (1986) Dual Coding Theory (DCT) than any other article I came across. As talked about before, a major element of DCT is that recall improves with the addition of pictures to text; Paivio and Csapo (1973) explain DCT with the picture-superiority effect. The 1973 study used a list of items that had pictures or words. A single item would be shown to a participant, and if it were a picture the participant would say the name of the picture, whereas if the item was a word the participant would read that word out loud (p. 183). An unrelated task took place after the items were shown, and then participants were asked to do free recall of the study items, meaning they were not prompted or given hints. Participants ended up doing a better job of recalling pictures than words (p.183), and this phenomenon was deemed the picture-superiority effect. DCT is also tied to the concrete-abstract debate; a study by Paivio, Walsh, and Bons (1994) showed that there is better recall for concrete words than abstract words (p. 183). Essentially, concrete nouns like basketball and sunshine will be better recalled than abstract nouns like religion and decency. Therefore, translators should keep in mind that they will recall concrete words better.

In 1986, Paivio explored this advantage for pictures over words, and he ended up proposing a dual-coding framework that states that the visual and verbal elements of stimuli activate two "independent and interconnected subsystems in memory" (p. 184). Basically, when a picture is named, both the visual and verbal systems are triggered, whereas when a word is named only the verbal system is activated. The concept of interconnectedness, which occurs when the visual and verbal subsystems are activated at the same time, is why there is better recall for text that is accompanied by pictures than words all by themselves (p. 184).

Overall, when it comes to language learning, less is not always better than more, so having a picture alongside text should prove helpful for aspects like recall and comprehension. Essentially, translators should realize that viewing a picture to better understand a word is not sensory overload but a linguistic advantage.

So, compared to concrete words, why do abstract words benefit less from DCT-related phenomena? Well, this theory assumes that visual stimuli can trigger the verbal system and verbal stimuli can activate the visual system (p. 184). It should be noted that Anderson (1974) found concrete words are recalled better than abstract words in sentences and Johnson (1974) found similar results for paragraphs, which helps prove the theory that a text's concreteness is linked to how well it is recalled (p. 184). Furthermore, compared to text, Nelson, Reed, and McEvoy (1977) argue that pictures enjoy the advantage of having "richer sensory codes" (p. 184). The term "imagistic" is often used, and essentially this term explains that concrete words are full of images and thus automatically activate the visual system, whereas dual-coding does not aid abstract words all that much because they are not chockful with images, resulting in the visual system not being triggered (p. 184). The concept of concreteness is tied to the four hypotheses David makes, and then proves, in this study, which are 1) adding a news image will improve recall of a news article; 2) concrete news is better recalled than abstract news; 3) news concreteness is correlated positively to how imagistic a news article is; and 4) when a picture is added, concrete news benefits more than abstract news (p. 184-187).

This study's foundation is tied to Paivio's DCT, which, unfortunately, is hard to prove with science at its current state, explaining why so many question the theory. One of the naysayers is Pylyshyn (1973), who does not believe that the brain needs to be divided. We are unable to physically open a live person's head and explore what is going on inside, and even with modern equipment it still is very difficult to know what the brain is doing and thinking.

Therefore, DCT is a theory that can only be proven by tests, as we cannot clearly know where the visual system and verbal system are located in the brain. Despite these issues, as early as 1994, neurophysiological research, like work done by Kounios and Holcomb, has helped prove that pictures and words activate different neural areas, meaning there could very well be two independent systems (verbal and visual) (p. 185).

So, what is an abstract word and what is a concrete word? This question is seldom addressed by people who frequently write about and research these two concepts, but thankfully David helps provide some clarity. With the assistance of Yuille and Madigan, a familiar face joins the fray—Paivio (1968); to them, concreteness is "any word that refers to objects, materials, or persons" and abstractness is "any word that refers to an abstract concept that cannot be experienced by the senses" (in David, p. 185). Therefore, anything from ball and house to vibration and sweet-smelling could be classified as concrete; words that can be seen and heard are probably the most accessible because not much technology exists yet that allows us to smell, taste, or feel words, and this is why in nearly all cases this thesis talks about concrete words in the visual sense. Unfortunately, other than saying abstract stories concern "broad ideas", David never provides clear definitions for abstract news vs. concrete news, writing that concreteness and abstractness vary depending on the story, the way an article is written, and the reader's interpretation (p. 185). His unclear distinction is further muddied when he says concrete examples and personalization are frequently seen in abstract stories while abstract articles are "often tied to concrete news pegs" (p. 185). It would have been helpful if David could have provided real examples to back up his beliefs, but the definitions by Paivio, Yuille, and Madigan will work for this thesis and David's points convey that concrete and abstract is a spectrum—so every news story, and other types of text as well, will be a mix of concrete and abstract, and thus not wholly concrete nor completely abstract.

Paivio expresses that concreteness involves "sensory experience", and he adds that concreteness and sensory experience are highly correlated and often seen as mental imagery (in David, p. 185). At that time, and this is still true today, the common assumption is that "concrete stimuli have intrinsic imagistic attributes that can evoke mental images in the mind's eye" (p. 185). So, a word like sunshine does not need a picture to "evoke mental images" in our minds. Apparently, abstract words do not have these intrinsic imagistic attributes. I, however, personally believe that abstract words like "love" or "democracy" do actually have these intrinsic imagistic attributes, and as a result we will think about experiences of family love and hardships and romantic times and breakup when we see or hear the word "love", and when it comes to democracy we might think of government buildings, political speeches, elections, protests, and war.

David, on the other hand, does not see eye-to-eye with me. He believes we must give more consideration to how much external images benefit recall of concrete news because "concrete stimuli automatically evoke mental images", whereas "mental images are not readily available" in abstract news. He does add that an external image might "somewhat offset" the scarcity of mental images in an abstract news piece though (p. 185-186). David also sees the effectiveness of external images being dependent upon "the degree of association between the visual and verbal elements of news". Essentially, whereas concrete news "lends itself to visual portrayal", the visual and verbal (or written) elements of abstract news stories will be less associated (p. 186). For example, an abstract story that teaches Taiwanese children about ancient Taiwanese history provides zero "literal redundancy", but adding in concrete pictures of ancient tools, clothes, and living structures might help improve recall. However, a concrete story, like a piece about a plane fire, will have more association between the picture and text and thus will be better recalled.

David's four experiments seek to answer more than just recall of the text. He also tests interest and comprehensibility of the text; interest, informativeness, and vividness of the photo; degree of overlap (or association) between the photo and text; and, when it comes to predicting news recall, how do news concreteness and picture attributes compare (p. 187)? Recall is important but so are issues like comprehensibility and even interest; essentially, we need to consider multiple factors for the benefits received when we look up pictures to understand text because we still have much to learn about the interplay of text and imagery.

Experiment 1 sought to check how a "literally redundant picture" would help recall of a concrete text (p. 187). A story about 30 celebrities nominated for an award was prepared in a set of cards where every celebrity had his/her own card; each card had one paragraph dedicated to his/her accomplishments and notable roles. Half the celebrities had a color head shot like media stories and the other half did not have pictures. First there was a pilot study, which will not be written about here, and then the real study was carried out. 24 participants read the story without knowing they would be tested on memorizing celebrities, and then they were shown the cards of the celebrities. Next, there was an unrelated task and then participants were asked to say as many celebrities as they could. If they could not remember a celebrity's name, they were encouraged to say relevant information, like shows or movies the celebrity starred in. On average, participants remembered 14.71 celebrities, and 8.75 were ones with pictures and 5.96 had only text. The picture superiority effect was proven by a paired t test, and the results show that pictures were helpful but not crucial to recall (p. 187-189).

In Experiment 2, the news story explained how the space program's R&D investments have transformed into everyday technology we now enjoy. Clip art pictures were added to 32 word items that were divided into two groups of 16 based on their concreteness. Apparently, the 16 pictures for concrete items were "literally redundant", whereas for abstract items they

were "related semantically" (p. 189). An example for concrete is a computer chip for "computer chip" and a roller coaster for "g-force research", while space craft for "exploration" and Declaration of Independence for "document preservation" served as abstract examples (p. 189). These abstract examples are particularly useful because they give us an idea of how related an abstract picture should be to its corresponding word. Furthermore, imagining the Declaration of Independence being preserved under dim yellow light as it sits inside a vault where the temperature, air, and moisture content are controlled may even be more useful for remembering the ins and outs of document preservation than a picture that is more "concrete". Once they were done reading the cards, which they did at their own pace, participants read unrelated news stories. Following this, they were asked to recall as many benefits as they could and then to write about them as much as possible (p. 190).

The scoring for this study is controversial because it has different standards for concrete and abstract. David argues that literal redundancy means that recalling either the picture or central idea of a story earned a score for concrete items, but for abstract items pictures were merely "semantic cues", so points were given for recall only if an answer had ideas or words that "captured the abstract concept" (p. 190). His argument for this strict scoring rule is that "the purpose of this study was to examine how pictures improve text learning". David provides an example that recalling a "semantically related picture cue", like a space craft, without mentioning any "sufficient detail" from the text would not earn a score (p. 190). Just like in Experiment 1, text-only (5.46) were recalled less than text with pictures (7.38). As predicted, concrete items (7.84) were recalled better on average than abstract items (5.00), which was proven to be statistically significant. Abstract items were less likely to be recalled, but it is difficult to determine how much a role strict standards played in point scoring and thus led to this 2.84-point difference average (p. 190-191).

If we assume that Experiment 2, like Experiment 1, shows that it is better to use pictures than not and if we consider that Experiment 2's results hint that abstract items are not drastically far behind concrete ones when it comes to recall, then it would seem that using pictures for abstract items is better than not. In the General Discussion section, David argues that the abstract benefits of the space program were "fairly specific", and this, therefore, benefitted recall. However, even David seems to allude to the reality that abstract items also benefit from pictures: "the addition of pictures, even if not literally redundant to the news copy, produced a significant gain in recall" (p. 191). Overall, for translators that question the helpfulness of consulting images for abstract items, they should consider not limiting themselves to only looking for pictures that are connected to concrete text.

Experiment 3 sought to test participants on something similar to real news. So, a group of concrete and abstract news stories were selected from 100 news stories that each had a color photo, and the stories were from national and regional newspapers instead of local news because "familiarity" might skew results (p. 192). Students read as many stories as they could in 30 minutes (averaging 15 to 20 stories per student) and then rated each story they read on an imagery scale from 1 "story does not form a strong mental image" to 7 "story forms a strong mental image". The 16 stories with the lowest scores were chosen as abstract representatives, while the 16 stories with the highest scores were the concrete representatives. Furthermore, of the two lists, which each had an equal number of concrete and abstract stories, one was text-and-picture and the other was text-only (p. 192). Each story was around 100 words long, and four graduate students in journalism edited them to ensure that each story only had one key point, as a point was awarded only if the participant recalled the story's central point. Participants could make errors in recall about minor details, but mentioning details of the photo but not the central point was not sufficient enough to earn a point. Two graduate student coders gave scores and they would consult if there was not a consensus (p.

192-193). Students on average recalled more text-and-picture (6.29) than text-only (3.80); concrete items (6.21) also outperformed abstract items (3.88). Concrete items averaged a gain of 1.95 when pictures were added, whereas abstract items only gained an average of 0.54 (p. 193). Concerning the figures above, David argues that these findings support the idea that news concreteness, on top of being connected to recall, is very important to visual-verbal association (p. 193).

There are two questions that go unanswered. First, for abstract items, when pictures are added there is a 0.54 bump in recall. Is this figure statistically significant? If it is, then abstract items truly do benefit from pictures to some degree. And, Experiment 3 used abstract stories that were seen as the least imagistic mentally and concrete stories that had the best imagery. So, did this extreme play a role in why in Experiment 2 concrete items (3.46 without picture and 4.38 with picture) and abstract items (2.00 and 3.00) averaged about a one point increase with the picture-and-text condition, while in Experiment 3 the average figures diverged significantly for concrete (2.13 and 4.09) and abstract (1.67 and 2.21)? The answer to this question may involve a phenomenon that the concreteness of an abstract term or story will influence how much adding a picture will aid the reader (p. 191).

Experiment 4 was similar to Experiment 3 in that the 32 text-and-picture news items from Experiment 3 were used, and the 24 participants took 40 to 60 minutes to evaluate each item according to 11 questions. In fact, David writes that Experiment 4 "served as a manipulation check for news concreteness in Experiment 3" (p. 193). The first three questions had 10-point ranges for the news photo: *not at all vivid* (1) to *very vivid* (10), *not at all informative* (1) to *very informative* (10), and *not at all interesting* (1) to *very interesting* (10). The next six questions also had 10-point ranges and they concerned the text: *abstract* (1) to *concrete* (10), *difficult to understand* (1) to *easy to understand* (10), *very few images come to mind* (1) to *many images come to mind* (10), *extremely difficult to create images* (1) to

extremely easy to create images (10), *not at all vivid* (1) to *very vivid* (10), and *not at all interesting* (1) to *very interesting* (10). The last two questions were about how much the photo and text overlapped: *photo does not capture the content or meaning of the text* (1) to *photo captures very well the content or meaning of the text* (1), and *photo does not capture the mood and the emotion expressed in the text* (1) to *photo captures very well the mood and the emotion expressed in the text* (10) (p. 194). The number of questions above represents just how complicated the image-text relationship is, as we need to consider the concreteness of the text and image as well as factors like how entertaining, informative, and emotional the text and image are. In short, adding a picture to a text does much more than just help provide an alternative explanation.

The results of the data for this experiment would take a lot of time to elaborate upon in detail, so giving a summary of abstract items averaging 5.7 on the abstract/concrete scale while concrete items had 7.0 will have to suffice. This difference of 1.3 may prove that abstract stories from Experiment 3 were not that drastically different than the concrete stories when it comes to concreteness. Despite this, David provides statistical figures that prove a text's vividness, how much images are evoked when it is read, and how easily images are evoked all correlated with news concreteness. Concreteness was also strongly correlated to how much the text interests readers and increases reading comprehensibility. Concerning the picture portion of the experiment, content overlap (i.e. text and picture), mood overlap, and the vividness and informativeness of the picture as well as how much the picture interests viewers were all highly correlated (p. 195). Overall, David says news concreteness "has a strong influence" on the "imagistic potential" of the text, reader interest, comprehensibility, vividness and informativeness of the photo, and how much the photo and the text overlap. David also says when the "effect of concreteness on news recall was factored out" that none of the other variables caused any variance (p. 195). Overall, as translators we often have to

translate documents that we are bored by and/or unfamiliar with, yet we need to translate at a professional level. Therefore, if we are working with an abstract text that is not very interesting nor easy to comprehend, we must strive even harder to make sure we are capturing the source text's meaning in our target text.

The General Discussion section states that results from Experiments 1, 2, and 3 suggest that adding "representative pictures" helps with recall (p. 197). Translation memory is a popular tool among translators, but being able to remember something you read is still an important skill for translators. Therefore, translators that only look up textual resources should consider adding imagery to the list of things they look up. Paivio's DCT predicts that concrete news is better recalled than abstract news, and Experiment 3 clearly confirms this, so translators should be aware that when it comes to understanding abstract text they might need to take more time for comprehension. David is honest in writing that, even though Experiment 3 confirmed his prediction that concrete news benefits more from photos than abstract news, Experiment 2's results did not support the hypothesis. He explained that one or more of the following aspects could have played a role: the "news items were simple", "a stimulus constraint" or instructions during retrieval may have had an influence, or the experiment's retrieval task caused participants to "think more" and thus better recall ended up skewing the results (p. 197). This all can be debated at length, but the most important part is that abstract news seems to benefit from pictures to some extent. So, even if a picture only helps an abstract writing a little, a bit of an improvement is most likely worth the effort. In simpler terms, why not look up images for abstract terms? At the very least, you will get a bit of something out of it.

David also looks at the concrete vs abstract debate in a way that shows he is not biased. He questions if "the interaction between concreteness and visual-verbal association" is connected to news professionals not doing their best to find "suitable images for abstract

stories". He also wonders if better recall for concrete items is "a manifestation of a bias in the retrieval process" that prefers concrete over abstract or if it is a "cognitive process in memory underlying the association between visual and verbal information" (p. 198). Despite a minority of readers that prefer more abstract text for certain reasons, such as they like learning about new things and/or being challenged intellectually, David's Experiment 4 suggests that concrete news is seemingly more interesting to readers than abstract news and easier to comprehend and recall as well. However, David also claims that concrete news is only "perceived as more interesting than abstract news in the copy-only condition" (p. 198). This hints that, as translators, when we come across abstract text we should consider looking up pictures because this will increase our interest in the text, and when interest increases other factors like recall and comprehension seem to increase, too. Nevertheless, decades ago Paivio's DCT proved that we learn better with text accompanied by pictures rather than text all by itself, and David's study provides new insight that looking up images is helpful for both concrete and abstract text.

2.7   Summary

Kussmaul and the researchers at the University of Granada are pushing the field of translation studies forward in terms of the role(s) imagery and visualization play in translation, but what is missing is the individual voices of translators. How do they view the use of imagery or visualization in translation? How do they use imagery and visualization tactics when they translate? How do imagery and visualization influence their work? What tools are they using? How would they improve these tools? What tools do they wish existed? The answers to these questions will be a helpful start to expanding this research area, as there is essentially zero research that tells us the opinions and experiences translators have with imagery and visualization. By sharing the voices of individual translators, this study seeks to

expand the focus for future research. At the very least, the opinions and experiences garnered from this study will make the translation field at least a little more knowledgeable about the roles of imagery and translation.

Therefore, this study has an end goal of not just bringing to light the importance of imagery and visualization in translation but also starting discussion that there is a need for better imagery tools. Google Images and other search engines that offer image-searching tools provide an abundance of images at a single click of the mouse, however these tools do not have the filters necessary to provide consistently accurate results. The frequency of image results being barely related or completely unrelated to the search term is much too common of a phenomenon. For example, if a non-native English speaker looks up the word "trousers" on Google Images but is presented with images that mostly are "skirts", this could potentially mislead the non-native speaker about the true definition of trousers and thus possibly cause an inaccurate translation. The same problem could arise if an (unofficial) dictionary wrote a definition of trousers as being "a one-piece garment extending downward from the waist and not joined between the legs, worn especially by women and girls…" (from dictionary.com). This definition may sound like trousers to a non-native speaker, but it is actually the description of a skirt. The need for reliable text-based tools, such as dictionaries, is without question, as accurate language production depends on them. So, why can we not demand the same of image-based tools?

We live in a world where news headlines tell us of the next prestigious dictionary going out of print, like *Oxford English Dictionary*, which declared that it will not make its next edition in print. The digital world we live in also craves speed. Digitalization and speed may be the current trend, but accuracy is a historical mainstay, so ideal imagery tools will need to have some type of filter as well, like how a dictionary or corpus feature the contributions of language experts. Overall, in addition to learning about their experiences and

opinions with using imagery and visualization while translating, the interview results section will also allow us to see if the interviewees themselves are imagining and even yearning for an image-based tool that does not exist yet.

Chapter 3   Methodology

3.1   Explanation of Research Methods

This study's primary research is one-on-one interviews, and so only qualitative research methods are incorporated. Questionnaires are not used because there is so little existing information from translators on how they use imagery/visualization, and therefore the controlled aspect of questionnaires would stifle how much we can discover. Also worth noting is that a small two-group experiment was originally planned, but a master's thesis does not warrant enough pages for that addition. As for secondary research, published research in translation, linguistics, child education, language acquisition, and other fields that are related to imagery are analyzed and cited in the Literature Review section. The combined research approach of interviews and research articles allowed this researcher to produce more diverse yet in-depth research results that have unearthed new information about imagery and visualization in translation.

As mentioned above, the study conducted one-on-one semi-structured interviews with translators studying in the translation and interpretation master's programs at National Taiwan Normal University (NTNU) and National Taiwan University (NTU). This study used purposive sampling to find interviewees because the Taiwanese translation education community is not a sizeable one. As for the interviewees, there are four native English speakers and four native Chinese speakers. The interviews asked all of the following questions: do you consult imagery while translating, how often do you consult imagery while translating, how helpful do you feel imagery is for producing translations, what kind of tools do you use for consulting imagery, and do you use any visual dictionaries and, if you do, what kind do you use? Furthermore, the interviews also allowed the interviewees to respond in-depth to the questions posed. So, while the questionnaires would have given us quantitative

information, particularly percentages, these interviews were a better option for this study because they will help uncover both groundbreaking and vital information that can be used for further research on imagery in translation.

3.2 Research Methods for Interviews

This thesis conducted one-on-one semi-structured interviews with a total of eight interviewees: four native English speakers and four native Chinese speakers. These interviewees are students from either NTNU's Graduate Institute of Translation and Interpretation (GITI) or NTU's Graduate Program in Translation and Interpretation (please see the Interviewee Basic Information table, which is located below this paragraph). I allowed the interviewees to choose what language they wanted to conduct the interview in, and the interviewees ended up choosing their mother tongue. Therefore, I translated the interview content that was in Chinese into English. On top of studying translation and interpretation, the interviewees have also done paid translations before, making them ideal interviewees as they have been trained in translation and they have professional experience, too. I chose not to interview professional translators mostly because I want to learn from less experienced translators that are likely still exploring new ways to translate and utilize language resources. Furthermore, the rise of the Internet has provided quick and powerful tools (like Google Images) that younger translators are more likely to be familiar with, whereas experienced translators may be more attached to the pre-Internet days, where they could only rely on reference texts to get answers.

Interviewee Basic Information

Interviewee	Gender	Age	Nationality	Native Language

Interviewee E-A	Male	46	USA	English
Interviewee E-B	Male	28	USA	English
Interviewee E-C	Female	30	USA	English
Interviewee E-D	Male	26	USA	English
Interviewee C-E	Female	26	Taiwan	Mandarin
Interviewee C-F	Female	26	Taiwan	Mandarin
Interviewee C-G	Female	26	Taiwan	Mandarin
Interviewee C-H	Male	37	Taiwan	Mandarin

This thesis used purposive sampling (or convenience sampling) to find interviewees because the Taiwanese translation community is not a sizeable one. The interviews feature prepared questions (please see Interview Guide in the appendix), and the interviewees were encouraged to go into detail with their responses as well as explain their opinions and experiences in any way they wanted. Although the questions were asked in numerical order, the interviews were conducted in a flexible manner, as I probed the interviewees from time to time and the interviewees were also allowed to ask questions. This flexibility made the interviews conversation-like, with the dominant speaker being the interviewee.

As for the actual interview process, I (tape) recorded the interviews and took notes as well, and I have chosen aliases to represent their names in this document. Essentially, any name that starts with Interviewee E (like Interviewee E-C) is a native English speaker and any name that starts with Interviewee C (like Interviewee C-A) is a native Chinese speaker. The interviewees were given consent forms, which request their permission to be recorded as well as provide an overview of the study, potential risks, remuneration (which was a small gift), and other pertinent details. The interviews were supposed to be a maximum of one hour long, and most interviews ranged between 35 to 50 minutes, with one outlier taking around 90

minutes. Although a diverse range of content was obtained in these interviews, I was able to start seeing patterns and similarities in the interviewees' responses, meaning saturation standards were met to at least some extent.

This study borrows qualitative data analysis approaches, but I did not carry out detailed coding nor did I use software. Despite this, much of the inspiration for the interview analysis comes from Sieber's work found in Bryman's *Qualitative Research 2 (Volume 4: Qualitative Data Analysis)* (2007). Sieber's concepts of analysis and data collection, identifying themes, and provisional testing of hypotheses in addition to his "rules of thumb" can be detected in my analysis (in Bryman, p. 10-11). Furthermore, the three steps in Bryman's book concerning the development of qualitative concepts have been consulted in addition to other important concepts, such as synthesis, recognition of patterns, comparison or recognition of variation, recognition of new instances, expansion of scope, and generalization (p. 39-41). Although all the above provided inspiration for my analysis, I did not follow all of the directions or requirements provided by researchers.

The process for post-interview work is as follows. Interviews were first transcribed, and then they were read from top to bottom to check for written mistakes and first impressions. I then tried to focus on individual translation processes and strategies; similar words, concepts, opinions, and experiences that multiple interviews indicated; and differences in strategies, experiences, and opinions between translators. I paid especially close attention to repetition of content, as I looked for identical or highly similar content that different translators shared.

Overall, I put most of my emphasis on finding similarities and commonalities as well as stark differences between interviewees. While it may be seen as problematic, in the Interview Results section I choose to be explicit about my own experiences, opinions, and strategies, as I felt that by doing so I could check my own biases, be honest with the readers

about where I am coming from, and help add to the content. Writing my own experiences, opinions, and strategies also allowed me to clearly indicate interview content that was similar or different than my own experiences, pre-conceived theories, and concepts. Although it is unlikely that the interviewees knew about imagery or visualization-based research before the interview took place, I paid close attention to locating interview content that was similar to or different from research that I have read. In short, my approach to analyzing the material from the interviews gave me the flexibility to organize my findings in a way that will help contribute to the field's knowledge of how translators view and are using imagery and visualization strategies.

Chapter 4   Results and Discussion

4.1   Introduction

I was quite surprised to find that the interviewees and I have so many nearly identical experiences and opinions, such as wasting time looking for appropriate imagery, wishing image searches could have a filter so that the images would accurately reflect what was being looked for, and even imagining future imagery tools that would be better than what is currently available. These similarities in opinions and experiences may be due to the semi-structured interview approach, as I most certainly revealed my own biases, opinions, and experiences during the interviews (I also know the interviewees personally, so it is quite possible that I inadvertently talked to them about this research study since I came up with it nearly three years ago). I also must admit that the example images were often proposed by me and I did not consider scientific theories for what images I chose, so my biases and western experiences definitely shaped the interviews. Furthermore, although I feel it is highly unlikely, I still may have unintentionally pushed the interviewees to agree with my own opinions. Nonetheless, I have not found any research that shows what imagery resources translators are using, therefore these interviews will undoubtedly add a lot of important information to the field's knowledge base. The interviews' content also has proven useful in proving or disproving my own biases and beliefs, such as my belief that we all use Google Images for our imagery needs. In the following section, which features interviewee responses, I will share some of my own opinions and experiences alongside the interview content as a way to check my own biases and to add to the diversity of the field's knowledge base.

4.2   Interview Results

4.2.1   Finding Equivalents for Concrete/Observable Images

Most of the interviewees gave numerous examples for when they use imagery, and, not surprisingly, they usually consult imagery when they come across tangible or physical objects; these objects would be considered "concrete" in the David study cited in the Literature Review section. Interviewee E-A one time looked up images for a temple's four 龍頭, which are faucets that literally mean "dragon's head" if you simply read the characters for their modern day meaning. But, Chinese is a tricky language, and, therefore, a non-native Chinese speaker might be surprised to find that the results on Google Images show something much different than his or her imagination might have thought up; according to Interviewee E-A, the faucets in the temple were actually shaped like the turtles of Chinese lore. Being able to see imagery of these faucets saved Interviewee E-A from possibly writing "faucets that look like dragons" instead of the correct meaning that takes the word 龍頭 back in time to a different era. Language, especially Chinese, is not always as straightforward as it seems, so one may think he or she understands a word, but, just like checking a definition in a dictionary, a look on Google Images often can show you what a word really means.

Translators must be aware of both major and minor cultural differences between translation equivalents for a concrete word. Interviewee E-B mentions he has used imagery to look up basic things, such as a bookcase and a "grabber claw" (which is a pole with a claw and handle that can be used to pick things up off the ground), whereas Interviewee E-A has used Google Images to get a better understanding of a "two-stripe, one-star" Taiwanese police officer badge as well as a mortise and tenon in a Taiwanese temple. Looking up images in Interviewee E-B's case can help him understand smaller cultural differences between items that exist in both cultures, while for Interviewee E-A the police officer badge and mortise and

tenon are more tied to Taiwanese culture, so an image look-up is crucial.

The situation above can also be true for native Chinese speakers, as English has many terms and phrases that do not have (true) equivalents in Chinese and cannot be understood very clearly without a visual aid. Interviewee C-E was unsure what "standing square" meant when she was reading about a leg exercise movement in English. According to her, the concept of being "square" (meaning standing "straight" in this situation, as if the body's posture has become like a square or rectangle from the shoulders to the feet) has a rough equivalent in Chinese, but its meaning is still quite a bit different. She explained, "I wanted to know the difference between its meaning and what I thought it meant. So, I wanted to look it up." In short, looking up images allowed her to visualize how standing square means that one's shoulder length is exactly as wide as the distance between one's feet.

Interviewee C-E also mentioned how despite the exercise movement "squat" having a close equivalent in Chinese, which is 深蹲 or 馬步, pictures in Chinese and English were quite different, meaning a translator might have to add content in order to help the target text readers see exactly what the source text readers see. Therefore, when it comes to movements she is extra careful in understanding minute differences: "I pay special attention to movements, because English movements are often quite different from the Chinese [versions]. [By looking up images,] I can see what it looks like and then express it in Chinese in a very colloquial way." Just like Interviewee E-A, seeing these images did not seem to help her find a Chinese equivalent, but understanding what native English speakers see when they read the word "squat" provided her with a solid foundation for thinking up an appropriate Chinese translation.

While doing a group translation effort, Interviewee E-C actually ran into a situation where not even her three native Chinese-speaking Taiwanese groupmates understood the Chinese four-word term 自然造景. My Google search of 自然造景 on May 17, 2016

showed only 25,200 results where the four characters appear side-by-side, explaining the response of Interviewee E-C's partners: "[They said] first of all, that Chinese doesn't even make sense. Because how can a 造景 (created scenery) be 自然 (natural)？造景就是人工的 (created scenery can only be artificial)." However, they knew that 造景 was related to Japanese rock gardens and they were translating a promotional pamphlet for a Japanese hot spring resort. A look at the pictures on the resort's web site showed rock gardens alongside palms and Japanese shrubbery. Interviewee E-C said that the resort, which is inside a national park, attempts to "blend the natural and the artificial together", and after looking at the images her groupmates felt the writer was trying to express that "the resort blends in well with the natural scenery". This example not only shows that translators should be looking up images in both their native languages and second languages, regardless of what direction they are translating, but it also indicates that looking up imagery can be helpful for newly created words that have yet to make their way into dictionaries. Furthermore, going directly to the source instead of Google Images is often the more effective image look-up strategy.

Interviewee E-C also explained how images can make the translation process become intersemiotic, meaning that you essentially do not even need to consider the language anymore if you can see the image:

> But then imagery is something that doesn't rely on words. It's sort of, you know, independent from the two [languages]. But, it also can be a conduit between the two. If you're using a reliable source, and if that image, that picture, whatever it is, is truly accurate then you almost can...but if you're translating Chinese into English you kind of don't really even have to worry—maybe for two, or four, or whatever characters, you don't even have to really worry about the Chinese anymore because you have the mental image.

Interviewee C-G made a similar point about using solely imagery when writing English

translations for plants in the Chinese classic Dream of the Red Chamber. She stated that imagery makes the translation process convenient, especially when you can directly describe in words what the image looks like. Essentially, words do not need to be translated if the translator can just describe the image(s) in the source text. An example of this could be "black ice"; a translator could, instead of trying to find a Chinese equivalent (which probably does not exist), just simply write down a description that expresses what the image looks like. So, when a translator is completely unable to understand a piece of visual text, maybe the best option is for he or she to write down what he/she sees in the images the search engine finds.

In addition to explaining the types of concrete words they look up, some interviewees also mentioned parts of speech: nouns, adjectives, verbs, etc. For Interviewee C-H, he saw nouns as being his preferred type of word to search for: "I think [looking up images] is something you can do often—if you don't really know what a word is, and if it just so happens to be a noun, you can go look it up...because right now the Internet is very convenient." Unfortunately, I did not ask him to elaborate on why he specifically mentioned nouns and not anything else, so there are many questions that went unasked. For instance, does he see nouns as being concrete and thus able to be looked up on Google Images? Words like "democracy" and "politics" are nouns but they are abstract. Does he not mention verbs because a video or GIF is often needed to understand a verb's motion? He actually talked at length about Oxford Dictionary's pictures helping him understand the differences between squeeze, squash, smash, and press, and he also explained how a video allowed him to understand different types of smiles. The above examples are all verbs, so it seems like they too can be better understood by looking at (dynamic) images. And, what about adjectives? Are they seen as too abstract and thus not able to be looked up via imagery resources? Can adjectives like "sorrow" and "jubilant" not be better understood by looking at images? Parts of speech were not addressed in previous research, but maybe that means they are a topic worthy of exploration.

Overall, Interviewee C-H's use of the word "noun" created a lot of questions that are given no definitive answer in this thesis. That being said, it seems like the way he uses the word "noun" (he later referred to the words he searches for most frequently as being "physical things") means that he sees nouns as being concrete and therefore more ideal to look up. So, maybe the concrete/abstract distinction can be considered in another way. It would seem parts of speech like articles and adverbs are not as useful to look up on Google Images as nouns and verbs, but we need to start discussing specific examples if we want to get to the bottom of this. Exploring this topic should help us better understand what kinds of words are most useful to look up with Google Images and which types we should just stick to dictionaries for.

In summary, while the above interviewee responses indicate that looking up imagery often does not give you a ready-to-use equivalent (like a dictionary will), consulting imagery is important for accuracy purposes because it helps you better understand the source text. In addition, a translation dictionary might provide an incorrect word (or the user might use the word out of context), but if the images searched for reflect the word being used, a competent translator should be able to think up an appropriate equivalent. The interviewees seem biased towards concrete words, which begs the question—why not look up abstract words?

4.2.2   Is Looking Up Images for Abstract Words Useful?

Abstract concepts like "democracy" arguably cannot be truly seen or visualized even with the aid of images. "[I'm] not going to go search images for an abstract idea like [democracy]," Interviewee E-B explains: "[Searching for imagery is] basically like trying to find some sort of, like I was saying, a physical object. Something that's tangible. It can show you what it is, as opposed to having to read a description, which could lead to more confusion" (please see the Sample Images section, which shows two concrete images and two abstract images). As for Interviewee C-F, she made a clear summary about a disadvantage of

looking up abstract images: "For more concrete things, I'll look up images. Because if it's abstract, then the results of an image search will be a bunch of different pictures and then you won't understand what the thing is." In short, Interviewee E-B's above point invokes the old cliché "a picture is worth a thousand words", but, in this case, he means that a visual image is often much easier to comprehend and visualize than a wordy text-based definition. Interviewee C-F may have explained it the best when she said that "imagery will make things concrete".

Interviewee E-D mentioned that while he does not disagree with looking up images for abstract concepts, he tends to search for things that are concrete yet foreign. I showed all the interviewees an example of the Chinese architecture design *sanheyuan*, which is a U-shaped building that surrounds a courtyard, and he felt that was a good example of what he looks up: "Like, something that's an object or a concrete thing, but it's not a thing I've heard of or know very clearly what it is. And reading about it in a dictionary definition would take a lot of [time]." Interviewee C-E made a similar comment about definitions in dictionaries for words related to animals or physical objects, like plates, bowls, and dishes, being hard to visualize: "I think that for dictionaries, sometimes [when it comes to their definitions] I'm completely unable to understand what the thing is." Part of the reason Interviewee E-D mostly looks up concrete words is to save time, which plays a big role in translation being, or not being, a lucrative career: "I think that part of why I do it more with concrete things is just because in doing a translation one of my main goals is finishing. So, it's time-saving. But, I feel like [looking up abstract things] would be definitely rewarding. I don't negate the use." He then explained that the advantage of being able to look up pictures of a concrete image, like *sanheyuan*, would be a lot less taxing on the brain than reading explanatory definitions. As Interviewee E-D pointed out, a major benefit of finding effective imagery is that it allows

you to see an image "clearly", helping you visualize the source language's word(s) and, thus, saving you from mental exhaustion.

Interviewee E-C made a strong point about the drawback of searching for images more abstract in nature. She explained that her native Chinese-speaking partners might look up images of a word like "politics" in English, resulting in something like the following conclusion: "But [the word] means this. Because I found this and I saw this picture." A major hitch of using images to determine a word's meaning is that many words have multiple meanings. This can be problematic Interviewee E-C argues, as Google Images often only shows the "most popular result or most common [meaning]". For example, she pointed out the word "politics" in English has a broader meaning range than Chinese's 政治, which is pretty much just "government politics". Therefore, native Chinese speakers may not be aware that politics in English can also include other meanings, such as office politics, school politics, and language politics.

Interviewee E-C expressed that she is tired of "language politics" in Taiwan, and she explained this rather abstract concept by saying that in this country her white skin results in her being treated differently than her Taiwanese friends. Even though she is a very fluent Chinese speaker, Air-B&B guests that come over to stay in her and her two Taiwanese roommates' house will speak to her in English, while they speak to her roommates in Chinese. She even deals with her own "internal language politics"; this issue revolves around her deciding if she should speak to a Taiwanese person in English, which she says would likely make that person like her more but then she questions if she should be trying to curry the favor of people who only want to be her friend because of her native language. The above situation is highly complex, so non-Western foreigners in Taiwan would need both experience and time to be able to wrap their head around what she is going through—looking at a few "concrete" images will, therefore, not be sufficient. In fact, after seeing Interviewee E-C get

spoken to in English by the first few guests, her roommates finally understood what it would be like to be a white foreigner who wants to be a normal person that speaks the country's main language. Interestingly enough, they now both talk to her in Chinese—probably because they came to understand the language politics Interviewee E-C deals with. But, your average Taiwanese person almost certainly cannot be expected to understand just how big the range of politics is, even language politics, and this is because in English politics is an abstract yet broad concept that cannot be understood at first glance.

Overall, it seems that consulting concrete images is more helpful than abstract images, which are harder to process. But, does that mean abstract images are never worth looking up? Like the interviewees, Tercedor-Sanchez makes a similar point in that images that are not tangible or clear have their disadvantages: "Ambiguous images are difficult to interpret since they normally can be understood in different ways" (Tercedor-Sanchez et. Al, 2009, p. 149). Yet, in 1963, Gropper made a point about abstract images that still stands today: "Although abstract concepts cannot be directly portrayed, they may be portrayed indirectly by showing their effects, results, instances, or exemplars" (in Alesandrini, 1984, p. 64). For example, the abstract concept of light waves becomes clearer when a prism is used to disperse the light. Gropper's viewpoint is arguably supported by findings in David's article, which indicate that, although they are not as helpful as concrete images, abstract images might be quite beneficial. This is why translators should still consider giving abstract words and images a chance.

4.2.3 Using Imagery When a Word in One Language has Many Equivalents in the Other

Sometimes a word in one language can have two or more meanings, whereas in the other language the word simply has one meaning. Interviewee C-F talked about a homework assignment where she had to translate "willow tree" into English; this would have been easy

if it was not part of a poem and if this tree also did not mean "depart" in Chinese. Essentially, this Chinese poem uses a willow tree to refer to someone leaving, but in English willow trees tend to symbolize qualities such as fertility, learning, growth, and harmony (see willowplaceforwomen.com). Furthermore, the second character in willow tree (楊柳) is pronounced exactly the same as the Chinese character for "stay". The cultural and linguistic aspects make this translation seem impossible, but she did not give up. Instead, she chose to look up imagery like "willow trees blowing in the wind", and then she used that imagery to inspire her English translation, which added in some content to express the Chinese meaning.

As for the above phenomenon, both English and Chinese are full of examples. This thesis mentions numerous examples where English has many terms that Chinese does not have (like many terms for pots and pans in English but not in Chinese) and vice versa (such as many cooking terms in Chinese but fewer in English). A commonly spoken topic in the Taiwanese translation community is that Eskimos have over a hundred ways to say the word snow. While there is debate as to how many words they have (see Robson), no one argues that Inuit has fewer words for snow than "warmer" languages, like English or Chinese. Because Eskimo life revolves around snow, it only makes sense that they have numerous ways to distinguish it. Interestingly enough, it is also said that areas where snow never falls do not have a word for snow. Essentially, translators must be aware of the linguistic role a culture's environment plays.

Concerning this phenomenon, Interviewee C-F gave a particularly clear case of something she just learned about—how to say "church" in English. For countless centuries, the English language has been exposed to Christianity, which has been the dominant religion in much of the western world for nearly 2,000 years. China, on the other hand, did have contact with Christianity as early as the 7th Century but it did not really begin to have many missionaries until a few centuries ago. Therefore, it is no coincidence that English has many

different ways to define church (and this depends on this religion's many denominations): cathedral, chapel, sanctuary, parish, abbey, mission, and synagogue. However, in Chinese Interviewee C-F says it seems to be either 教堂 (often a Catholic church) or 教會 (typically a Protestant church): "The Chinese 教堂 has many different translations in English, and there are different specifications [in English]". The above terms in English have different sizes, functions, and appearances, whereas 教堂 and 教會 cover almost any situation in Chinese. She explains, "When Taiwanese people think of 教堂, they think it's something that's Protestant or Catholic—as if they're the same. But, later on I found out that in the west there are many terms with differences. It is just like you said—there are differences between Catholicism and Protestantism." In addition to mentioning 大教堂, which is cathedral in English, she explains that Taiwanese people often "unconsciously think" that 教堂 in English is "church" without considering whether the building's denomination is Catholic or Protestant. To put it bluntly, it is quite easy to see that Chinese is limited when it comes to terms for "church"—for instance, instead of creating a new word for cathedral, a "big" is simply put in front of "church".

There are many examples of Chinese not distinguishing between the most central divide in Christianity: Protestant and Catholic. Interviewee C-F mentioned that England is a Protestant nation, but the "abbey" in Westminster Abbey is translated into 教堂 (西敏聖彼得協同教堂) instead of the translation she finds more appropriate—修道院. Westminster Abbey's Chinese name is actually a translation of the site's formal name (the Collegiate Church of St Peter at Westminster). Furthermore, Westminster Abbey is so ancient that it was originally Roman Catholic until King Henry VIII changed the nation's denomination, and the abbey is not truly an abbey in the traditional sense of the word, meaning that the Chinese translation may actually be more accurate than the English name. Nonetheless, China and

Taiwan have never been Christian nations, whereas modern England was essentially built by Christianity. Overall, there may be a Chinese source that features translation equivalents for all the different terms for church, but, when it comes down to it, Taiwanese people tend to use either 教堂 or 教會, with little concern for whether they are referring to a Catholic or Protestant church. They should not be blamed—with Christianity making up only around 5% of the island's population, how can we expect them to understand the rich history of the west's most powerful religion?

Interviewee C-G mentioned 陽台 (balcony), which is essentially an all-inclusive term in Chinese but when it comes to English there is an assortment of varieties. I am not an expert in the history of architecture, but it seems like balconies have not been an integral part of Chinese architecture, whereas in western architecture for centuries balconies have been very prevalent across a host of different regions and, thus, there are many kinds: terrace, veranda, deck, porch, patio, portico, mezzanine, colonnade, entresol, and princess balcony. However, "陽台", in most cases, can be the Chinese translation for any type of "balcony" that is on the second floor or above. In Interviewee C-G's case, she found out that English seems to take its balconies rather seriously: "There was terrace and other types of balconies in English. Some were outdoor types and others were not. Compared to Chinese, there were many more clear distinctions. So, I kept on looking at pictures to see where the balconies were different from one another." Ideally, taking a look at Google Images should help translators pinpoint a close equivalent in the target text, but sometimes a search leads to more questions than answers.

Interviewee C-G admitted that she could have translated the term in English into 陽台 or something that "means roughly the same thing" by simply looking at a text-based resource, but the translation would have been problematic: "Translating 陽台 directly wouldn't be wrong, but the Chinese 陽台 and English balcony are different, because there are many

different types. So, if I look up images I'll be more descriptive when I describe the 陽台—if it's an outdoor 陽台 or whatever kind of 陽台 it is." Essentially, inaccuracy/lack of fidelity will be a problem if everything similar to balcony in English is translated into 陽台 in Chinese. For example, a terrace can be at ground level (which Interviewee C-G was unaware of before I told her), but it can also be raised or even a roof terrace. The following quote from her sums up how Taiwanese translators might struggle when they come across "balcony" in the source text: "We tend to believe that 陽台 is balcony, but what does a balcony look like exactly? I'm not really all that sure." The different forms of balcony in English means that, regardless of language direction, the translator should try to produce a target text that catches the spirit of the source text. For example, if a translator comes across 陽台 in a CE translation, he or she should probably first closely study the text, search images in Chinese, look at different types of balconies in English, and then choose the most fitting balcony type in order to produce the most accurate translation possible. On the other hand, EC translation is rather easy for the lazy translator (陽台 is the one-size fits all option), but a more thoughtful translator can try to add in description so that the Chinese reader will see a similar image to what the English reader visualizes.

Interviewee C-G provided many thoughtful responses that showed her dedication to her craft. In addition to finding three different types of 陽台 when she looked it up in English, she also invented the term "露天的陽台" for "terrace" and she classified 陽台 as being either inside or outside. By acknowledging whether it is an inside (室內) or outside (戶外) balcony and/or adding helpful description for the Chinese readers, the translation is arguably more faithful than simply writing 陽台. Interviewee C-G offered another example of where additional research (especially with photos and even videos from YouTube) could be the difference between a grossly mistranslated word and a fitting description that helps

establish scenery. She said the famous scene in *The Sound of Music* where the Captain and Maria dance on the terrace would likely be translated as "garden" (花園) by Chinese speakers. But, if the play is being translated into Chinese, some description for this "garden" would help the reader picture the main characters as dancing on a hard floor surrounded by statues and tall, trimmed bushes rather than skipping through rows of plants, flowers, and trees. Basically, whenever balcony or a similar word comes up, it would be prudent for Taiwanese translators to consult imagery in order to find the most exact term(s), because "garden" (花園) may be the best option to describe the terrace if you have a two-character Chinese limit, but if adjectives and other descriptive words are added the reader should be able to better picture what the scene truly looks like when the play is performed in the west.

In summary, when a translator comes across a single term in one language that has a range of equivalents in the other, he or she should consider looking at images to better understand the minor differences between equivalents. Just like a Taiwanese person might need to read up on how Catholic cathedrals are different from Protestant churches, looking at pictures to compare similar words can be key to finding the most appropriate translation. Simply put, images are most useful not because they help us find equivalents (that is what translation dictionaries are for), but because they allow us to see the minor differences between equivalents and then discover descriptive words we can add to make a more fitting translation.

4.2.4 Consulting Imagery to Understand Differences Between Close Equivalents

Of course, imagery can be helpful when equivalents are not to be found, but it may be even more useful for finding subtle differences between two equivalents, as 100% equivalents are rare. For instance, looking up "clothes" on Google Images will show everything from hats

and shirts to pants and socks, while searching for "衣服" will mostly show results of upper body garments. Interviewee C-F, a third-year translation student on the verge of finishing her thesis, shared experiences from her first and second year at GITI. She saw clothes and 衣服 as being equivalents until I asked her if clothes in Chinese typically refers to garments for the upper torso. She said that Taiwanese people instinctively think about clothes for the upper body whenever 衣服 pops up:

> Basically, when we're talking we'll distinguish between upper torso clothes (衣服) and pants (褲子). "Today, I wanna go buy clothes (衣服)", so I'm talking about shirts. If it's about pants, I'll say, "Today, I wanna buy a skirt" or something like that. Or, maybe it's like "Hey, you need to remember to wear clothes (衣服) and pants"— sometimes moms will talk to their young children like that. In Chinese, clothes and pants seem like they're separate [categories].

Interviewee C-G, a fourth-year student that does mostly EC translation and is currently working on her thesis, added, "I think a western-style dress (a one-piece dress that typically goes from the shoulders until at least the mid-thigh) can be considered as 衣服, as long as it's a one-piece dress. 'Your 衣服 (clothes) are good looking', but you're only wearing a one-piece dress, so [they're] definitely talking about your dress." Essentially, anything that is a one-piece clothing item and starts from the upper torso can be called 衣服.

Consulting imagery could help a translator avoid the pitfall of translating a one-piece dress as "clothes", which would be strange in English because clothes is typically plural (so there must be two pieces of clothing). Therefore, when working into Chinese, we should be cognizant of "clothes" needing to be translated into upper torso or lower torso garments, like 褲子. A dictionary will rarely provide us with a one-size fits all equivalent, as our translation should mostly be determined by the text's situation—so an image look-up would be a good

choice if we want an accurate equivalent. And, maybe that is one of the best features about imagery—it helps us think up equivalents.

I, just like many foreigners in Taiwan that speak Chinese, have found out after using a Chinese word confidently for years that I surprisingly did not completely understand it, because I fit the Chinese term into a word I already knew in English. One of those words is 裙子, which I always assumed was "skirt", as dictionaries like Mandarinspot.com fulfilled my bias by only providing "skirt" for 裙子. However, one day a Taiwanese person pointed out that 裙子 can also mean "a full-length dress". Interviewee C-H is a native Chinese speaker, yet he too mostly saw 裙子 as being "waist down": "I think the word "裙子" mostly focuses on the bottom [half]." As for something that is body-length, he would call that 洋裝 (often translated as "Western-style dress"; 洋 means "western"). My fiancée, who is Taiwanese, said both 裙子 and 洋裝 can mean "dress": "It can be both, but, technically, I think [裙子 is] supposed to be skirt." In English, "skirt" is always waist down, whereas "dress" is a garment that goes from the upper body to the lower body.

A Google Images search with "skirt" will produce images of skirts that start from the waist and go until at least the thighs and at their longest can even touch the ground; as for dress-like images, the text will either say it is a dress with a skirt or that the one-piece dress has a skirt-like bottom. Plugging "裙子" into Google Images will produce mostly images of skirts that go from the waist down, but a minority of the images will show what would be considered a "dress" to westerners. Interviewee C-H further muddied the distinction by describing 半身裙子 (lit. "half-body skirt"), 全身裙子 (lit. "full-body skirt"), and 連身裙 (a dress that goes down the entire body). Overall, a lack of clarity on the Chinese side means that precise translation into English or Chinese should probably involve some looking up of imagery as well as close inspection of adjectives around the piece of clothing.

Just like in the previous section, translators can use search engines to look up images to educate themselves on finer differences between equivalents. This process is especially important for languages like Chinese and English that have not had contact until more recent centuries, resulting in even greater differences between equivalents. Essentially, a culture influences its language, and this means that people who speak different languages will see different images. For this reason, we cannot expect equivalents to mean exactly the same thing, and, thus, the images behind these equivalents will be slightly different, too.

4.2.5 Using Imagery to Create Translations for Words Without Equivalents

Many words do not have ready-made equivalents in the other language. For example, 晚霞, which is commonly found in poems and literary prose, is incredibly difficult to translate because, according to Interviewee C-F, there are many different types (e.g. colors and tints) of this environmental phenomenon. Interviewee C-G added that 晚霞 is most beautiful on the night before a typhoon comes—apparently, the color of the sky turns a gorgeous purple. English, however, does not seem to have many songs and poems that describe colorful clouds at sunset, so non-native Chinese speakers will most likely have no direct experience with the word, making the task of coming up with an equivalent highly challenging. All hope is not lost though—using imagery can make life easier for the translator by helping him/her add content into the English target text that reproduces the images present in the Chinese source text.

Interviewee C-H and I talked about 三合院 (*sanheyuan*) being another word without a true equivalent in English. A quick look at *sanheyuan*, a three-wing building structure with a bamboo tile roof and courtyard in the middle, should reveal why it does not have a translation yet—quite simply, this kind of structure does not exist yet in the west. Translators often use pinyin as a stand-in for Chinese terms that do not have an accepted translation, and

words such as *fengshui*, *kung fu*, *cheongsam*, *dim sum*, *kowtow*, *mahjong*, *tofu*, *typhoon*, and *yin yang* are examples of English words transliterated from Chinese that many westerners are familiar with. However, the transliterated words that westerners know is just a drop in the bucket of Chinese's total vocabulary—*sanheyuan* is one of the thousands of words foreigners will not have knowledge of.

Despite this reality, it is still accepted practice to use transliteration whenever one comes across a term that does not have an official translation. Thus, the lazy translation for 三合院 is *sanheyuan*, which is rather ineffective because English readers will not know that *san* refers to "three", *he* is supposed to represent "together" or "joined", and *yuan* means "courtyard". So much meaning is lost in translation when you only use pinyin. For instance, I once simply translated 三合院 as *sanheyuan*, but the assignment's editor, Chris Findler (a graduate of GITI), suggested that I add the following description: *sanheyuan*, a U-shaped three-wing structure with a courtyard in the middle. For English readers that have never seen this type of building before, the above description should help them with visualizing it. Interviewee C-H was impressed by this translation:

> I think writing it like this makes it very clear, and it also could be considered a kind of learning [opportunity]. You read it and then realize "Oh, you can write it like that?" I, for example, like to collect examples like this. If there's something like this, I'll remember it later on. For the rest of my life, I can use this [method].

Interviewee C-H's excitement actually reveals that our language resources are still quite deficient, as he is constantly finding ways to translate something that ideally should already be in a translation tool. But, a lack of resources makes translation a specialist career, because anybody can consult resources but only experts can come up with solutions when there are no available ready-made answers.

Interviewee C-H's comments reflect that he recognizes that, by utilizing imagery, we can create description in the target text that helps readers visualize what source text readers are seeing when they read the text. When we come across words without equivalents, like 晚霞 or loogie (which dictionary.com says is a "mass of phlegm and saliva that is ejected from the mouth"), we can simply use phonetics to transliterate the sound of the word, but a better last resort option may be using imagery and visualization to help us come up with description for the target text. Essentially, for a word like 三合院, using only transliteration or finding a seldom used academic-esque translation buried in an archaic source will most likely prove inadequate in helping English's lay readers.

4.2.6   Using Imagery to Better Understand the Source/Target Text

Interviewee C-F's examples of what she looks up, which tend to be plants, architecture, and material objects (like implements), seem to indicate that she is not just looking for equivalents, as she is also looking to better understand the English source text. Similar to Interviewee C-F, Interviewee C-G mentioned that recently she was translating a biology text, and she looked up terms separately in order to be able to observe their differences. Interviewee C-F explained, "Sometimes I think images are better, in that they're easier to understand [than text resources]. For example, in English, when I don't understand the names of certain plants, I'll look them up in a dictionary. Ok, let's say it's a certain flower; because I look up images I'll be able to understand what the flower looks like." I ended up asking Interviewee C-F if she searched for images in the source language and then matched them with equivalent images in the target language, but her unsure response hinted that she did this rarely, if ever. Nevertheless, her habit of looking up images does reveal her professionalism to understand the source text so that she can be confident in her target text translation being accurate.

Interviewee C-F also explained that searching for images plays a role in her translation strategies and decisions: "For example, if you go to the National Palace Museum there's a type of implement called a spittoon (痰盂). In the past, when people would spit they'd use this container. So, when I don't really know how to translate implements [like a spittoon], I'll look up images." She does not need to spend money on admission or waste time on a trip to visit the museum though, as the museum's web site provides images of cultural relics. The web site has two major advantages: first, she can directly use the English translation, and, second, she can read what the relic was used for as well as see what it looks like. While there are many bilingual web sites like this in Taiwan, Interviewee C-F lamented that far too often the elaborate Chinese version is partnered with an English version that is mistake-filled, limited, and often non-existing, making these web sites not very suitable translation resources: "Sometimes, because they want to save money, they'll make the Chinese really well done, but when you go to the English version there won't be any translations. So, you'll feel like you're going to have a nervous breakdown." Fortunately for her, the National Palace Museum seems to have enough of a budget to produce an excellent English version.

After stating that there is even more of a need to look up images when she is doing CE translation, explaining that "if I'm translating from Chinese into English, I'll be sure to look up images to make sure that what I [originally] comprehended as the Chinese meaning is correct, and then I'll translate it into English", Interviewee C-F went on to express that when she is translating into English she will consider adding in content that explains the implement's appearance or how it is used. When a convenient equivalent is not to be found in a text-based resource, she sees value in looking up images for Chinese implements and architectural terms that she does not understand how to use or what they look like. Interviewee C-F's comments are interesting on many levels; she looks up images of words in the Chinese source text, even though she is a native Chinese speaker, because she is honest with herself in that there are

many things about her own culture that she is unfamiliar with. She is also aware that if she is unable to completely understand a Chinese term, then your average English reader is probably going to be lost without an explanation, which is why she adds in helpful descriptive words that explain function and form for readers that will probably need a little background info in order to understand the content. Essentially, she acknowledged that if she is to help a non-native Chinese speaker understand the content, then she first must understand the Chinese source text herself.

Interviewee C-H's comments about only providing equivalents in footnotes are very similar to Interviewee C-F's concept of offering more explanation in the target text. Interviewee C-H said, "Sometimes, we'll have footnotes about foreign words for Taiwan's Chinese readers where they just give a Chinese equivalent. Maybe I won't understand what [the Chinese word] is. If I see a picture of it, I'm not sure but maybe I can explain in the footnote more about what this thing is." "Party politics" (lit. "政黨政治") is an example of a footnote that has just an equivalent, making it rather unhelpful. Furthermore, this equivalent is not very accurate because 政黨政治 in Chinese can be used to describe the way political parties work and control the political scene, whereas in English this term often means the following definition: "politics based on strict adherence to the policies and principles of a political party regardless of the public interest" (from Dictionary.com). Therefore, directly translating "party politics" as 政黨政治 will likely not help Chinese readers understand the source text's original meaning, so some extra explanation in the footnote is necessary. He went on to explain that one of his translation habits is to clearly express what the source text says, and he does so by both adding in a few words that more fully explain the source text and putting in descriptive footnotes. Imagery is one of the things he utilizes whenever he puts more detail into the target text. Also worth mentioning is that we should not assume the

readers of our translation will have immediate access to imagery resources, so we can help them imagine or visualize what the text is communicating by adding in descriptive words.

Interviewee C-H provided a few examples of him looking up the imagery of clothes in order to better understand the English source text. He explained that the term "blouse" does not really have a Chinese equivalent. That cultural difference probably contributed to why he only had a hazy understanding of what this female shirt looks like:

> I remember a long time ago when I was a student I didn't know what a "blouse" was. So, I went to look it up and realized "Oh, it's something that a woman wears." This method—I'll use it a lot. Just go online and look it up. Especially if it's something related to clothes or accessories—words like that. If I'm not really familiar with it, I'll [go look up images].

He was still unsure of how to translate blouse because no true equivalent exists in Chinese, but being able to see pictures gave him access to western culture and thus allowed him to better understand the source text. While we do not know the result of his work, we can be confident that the knowledge he acquired through Google Images helped him produce a better translation.

Interviewee C-F looks up imagery frequently because of trust issues: "when I look up images I can't just look at a specific few pictures. I need to look at many pictures. If you only look at a couple pictures, or if there aren't enough pictures, you'll wonder 'are the results incorrect?' or 'am I being misled?'" While many may not care to spend so much time consulting imagery, she feels anxious whenever there is a lack of image results: "A disadvantage is if there aren't many pictures, then you might start questioning yourself like 'Did my brain come up with the wrong image?' or 'What's wrong?'" Furthermore, a horde of image results not being similar to what she imagined can also be a bad situation, as she will question herself if the strange results are tied to what she typed into the search box. In short,

the image search process will be time-consuming for her because she cares so much about completely grasping the concept, but this effort is typically still rewarding in the end as it gives her confidence and likely a more accurate translation.

Many interviewees told stories of how they used imagery to either make sure they understood the source text or to check and see if their translation was correct or not; several of these stories can be found in other sections of this thesis. Overall, there is a stereotype that we only look something up when we have absolutely no understanding of it, but the stories of these interviewees run contrary to this, as they echo a main theme that we must also turn to language resources even when we mostly know what something is. Therefore, by being able to fully grasp what we looked up, we can be confident that our translation is accurate. This confidence is critical for translators, as they know that they can only guarantee an accurate translation if they completely understand the source text or target text. Alexander Pope's famous quote "a little learning is a dangerous thing" is very true in the translation world. When people know a little about something, they will often feel as if they are experts on the subject. If a translator has this mindset, then they might feel emboldened to translate in a way that, unbeknownst to them, is actually quite wrong.

4.2.7   Comparing Text Resources vs. Image Resources

Interviewee C-F provided the following comparison for image tools and text-based resources: "If it's something that I completely don't understand, then I think looking up images is faster. But, if it's something that I kind of understand but not really, then looking it up in an encyclopedia [is the better option]." She explained that for *sanheyuan* (三合院) she would consult an encyclopedia because she is somewhat familiar with the term, but for something more foreign she will first turn to images. She went on to express that if she is translating into English then she will sometimes take a look at the image's English textual

content and then, while still avoiding plagiarism issues, use some of it in her translation. Essentially, images are typically tied to text, so instead of only describing what the image shows, we can also use the image's text as inspiration.

Interviewee E-D mentioned that imagery has a slightly different purpose than dictionary definitions, and to him the advantage of imagery is that it allows him to visualize what he is reading: "[s]ometimes reading a dictionary definition isn't enough to help me visualize what's happening". His following explanation indicates the importance of being able to see what is going on in the source language: "I think that, overall, translation is first understanding what's happening in the original text or visualizing it, and so an image or imagery is a way of you directly having an image basically of what's happening." When non-native Chinese speakers are doing CE translation they may not just struggle to understand what is being communicated, as they also may not be able to visualize the situation or object being described. Examples mentioned elsewhere in this thesis, such as seeing lobster have roe and what a Taiwanese police officer badge looks like, show just how much being able to visualize the Chinese helps native English speakers produce more accurate translations. Therefore, by turning to imagery, translators can better visualize what the source text is expressing, and once they understand what is being communicated they can more effectively translate it into the target language.

Interviewee C-G has requirements for what she will look up in text-based resources and what she will search for in Google Images. She tends to use Wikipedia for "difficult material", such as history-related topics, like war or the founding and growth of National Taiwan Normal University (NTNU). As for dictionaries and other similar resources, she turns to them whenever she needs to know more about what she is translating as well as when she comes across abstract words (such as democracy). Her examples are worth considering—for a certain war, Google Images could provide pictures that range from the graphic and gruesome

to maps and from political propaganda to war heroes. She explained that images will prove rather unhelpful for smaller scope issues, like NTNU's history, as most pictures will probably either show the campus's main entrance or what the school grounds look like. In all honesty, images typically cannot provide the depth of knowledge that text-based resources offer, so translators should usually prioritize text resources over images when they need to become more knowledgeable about a topic.

Interviewee C-G often turns to imagery when she cannot find text-based resources, especially in Chinese, which has fewer language tools than English. After explaining that text and imagery complement one another and that imagery helps solidify or make clear what she learned after looking at text-based resources, she stated that one of Chinese's major flaws is that it does not have anywhere near the same amount of text-based resources (e.g. dictionaries, quantity of Wikipedia articles, etc.) as English: "If you want to look something up in a [Chinese] dictionary, because it's like what I just talked about, Chinese won't have it. So, you go to look it up in an English dictionary. You can [try to] search for it [in an English dictionary], but if you still don't know what it is, then you'll just go look up some pictures." In this situation, she is talking about translating into her native language (Chinese), but the issue of being unable to find equivalents in Chinese text-based resources makes both EC and CE translation more difficult than it should be.

Interviewee C-H also pointed out that text and imagery complement one another, especially when they are part of the same resource, like the Oxford Dictionary that he bought for his iPad. Similar to many other dictionaries that are starting to see the value of putting imagery next to text, such as the paper-based Longman Dictionary (which he says has some small black-and-white images in it), this electronic dictionary puts static pictures beside definitions and example sentences. He prefers contemporary dictionaries with their pictures over "wordy" traditional dictionaries of the past: "I think dictionaries now are no longer like

traditional dictionaries, which only have text descriptions. Because now you have lots of these electronic [dictionaries]. So, I think that if a dictionary has pictures or not…I will choose a dictionary with images, which would be better than a traditional dictionary that only has text." Like Paivio's dual-coding theory, Interviewee C-H's point hints that comprehension is easier when text and images appear together.

A dictionary page that really stood out to Interviewee C-H compared the following similar verbs with text and images: squeeze, squash, smash, and press. The pictures were clearly designed in order to show the key differences between words. For example, the picture for "squeeze" shows two fingers pinching a tube of toothpaste, while the image for "smash" had something like a hammer crushing a vase into pieces. To me, squeeze and squash refer to the object being wet or having liquids inside of it, whereas the object in smash and press is typically dry. So, you squash a watermelon but you smash a window. The Chinese translations for these words often do not take wetness into account, says Interviewee C-H: "In Chinese, they're the same (both mean "crush"); 壓碎 and 壓壞 [both work]. Everything is 壓碎, 壓壞, or 壓爛. But, English is different." The nice thing about Oxford Dictionary's images is that, by looking at the images, users can pick up subtle aspects, such as that squeeze and squash involve wet objects while smash and press are usually for dry objects. Essentially, when dealing with verbs, translators should be careful about equivalents. For example, an EC translator can choose 壓碎, 壓壞, or 壓爛 without worrying about an object's wetness, but CE translators must be more meticulous. Definitions and example sentences are helpful for understanding these verbs and how to use them, but text cannot clearly depict the state of the object like images can.

Unfortunately, the issue of moving images rarely came up, as interviewees tended to talk about static images and I, too, probably put too much focus on still pictures. However, Interviewee C-H talked at length about videos after I asked if the images in Oxford Dictionary

move (which they do not). He went on to add that if the images in his dictionary showed movement that the verbs would be even easier to understand, as the Park and Hopkins (1993) article in the Literature Review argues that a video can typically depict a process that involves motion much better than pictures. For example, a YouTube video of a potter teaching viewers step-by-step how to make pottery is probably easier to comprehend than a series of pictures accompanied by descriptive text. Interviewee C-H recalled watching a video that compared different types of smiles:

> There are smiles of every kind. There was a video that showed you what kind of smile it was. I watched the video...because English isn't my native language, so I think for us [Taiwanese people different smiles are difficult to distinguish]. I think it's hard for me to remember what kind of smile is a big smile and what one is a more subdued smile. But, videos can be an aid to my memory. They can help me remember something [long-term].

The movement into a smile as well as back into a relaxed expression are key for understanding different types of smiles, such as sneer, beam, smirk, or grin. Maybe static images of different smiles next to each other would allow for a better comparison, but for Interviewee C-H the video helped him both comprehend and memorize the above words.

Translators will find that many words that they do not understand cannot be learnt by looking at images. Interviewee C-H explained that he often turns to text resources when he cannot first find the necessary images: "There actually are a few situations where I'll go straight to Wiki to look something up. Maybe [the word] won't necessarily have images for it, so I'll decide to just go try Wikipedia—to see if it has any definitions or something like that." He also mentioned that he has used Wikipedia in the past whenever he encountered war or historical figures in his work. His turning to text resources after Google Images fails to produce relevant results hints at a few possible truths. First, does Google Images require less

mental effort than reading through dictionaries, web articles, and text-based resources like Wikipedia? Translation is a mentally laborious task, so saving energy is important when there are thousands of words left to translate in a document. Second, is processing Google's image results faster than using text resources, as this plays a role in translation efficiency. These advantages may explain why so many utilize Google Images despite it often giving irrelevant results in addition to other issues. Also, his example proves that, in at least some situations, translators may look up words on Google Images before they turn to text resources. So, some of the interviewees may have called Google Images a secondary resource, but that does not mean that they do not use it at first in certain situations.

Similar to Interviewee E-C, Interviewee E-D provided an example of non-native English-speaking Taiwanese not understanding the full range of meaning for the word "despise", and this is probably due to an over-reliance on dictionaries. An American friend in his translation program did research on how Taiwanese people tend to believe that the word "despise" means "belittle", whereas native English speakers typically associate despise with "hate" or "deplore". Interviewee E-D acknowledged that belittle is one of the meanings of despise, but that the "bracket of meaning", or "sphere of meaning", for despise is much more than just "belittle". Furthermore, the word despise usually has a different meaning than "belittle" in most contexts. Interviewee E-D has an idea on what is leading non-native English speakers astray: "That difference probably roots itself in reference material. So, Taiwanese people, if you look at their English, like in dictionaries, they're translating it into belittle. So, it's creating this phenomenon where they all think that word means [belittle]." This small language issue probably stems from Taiwanese people's over-reliance on Taiwanese dictionaries, which are not fully representing despise's many meanings. Possible solutions to this problem include improving Taiwanese dictionaries so that they have more definitions for the word despise and encouraging Taiwanese students to use English dictionaries designed for

native speakers. Or, maybe Taiwanese people could close their dictionaries and check out some images of the word despise—they will probably quickly find out that the word means much more than just belittle. Overall, something needs to be done in order to ensure that non-native speakers understand that words in their second language have "spheres of meaning" instead of just assigning one meaning to every word.

Imagery and text resources are different tools that should be used separately for certain situations, but we should also remember that they complement each other. For issues with depth, images lose out to text, but for aspects such as movements images (especially videos) are superior. It seems like processing images is easier than processing text, so translators should consider if spending the energy necessary to analyze text-based resources will or will not help them translate better. Many criticize Google Images for often showing unrelated results, but text-based resources can also be harmful to our translation work if they are incorrect or if we misuse them. Overall, translators should consider the pros and cons of both imagery and text-based resources when they translate, and by utilizing the pro aspects of these two very different but complementary resources translators should be able to translate more accurately.

4.2.8 Why Translators Do Not See Imagery as Their Number 1 Tool

Despite recalling many instances where consulting imagery and using visualization tactics have been helpful, most of the interviewees do not view looking up images as their main resource or tool. Interviewee E-A views consulting imagery as a "secondary resource", and Interviewee E-B only sees looking up imagery as a language "checker": "I mean, really it's just to check. It acts as a checker for work, at least into Chinese." Interviewee E-C mentions a two-step process for consulting imagery that can change depending on what she encounters:

I think sometimes I look up images not just to understand but to verify. It's like even after I've translated I want to make sure that coincides with, you know, what a Chinese speaker would think of when they saw that word. But, it's like a two-step process. Or, sometimes I'll Google before I translate. That's normally if I don't understand. But sometimes I'll Google after; [then] it's just to make sure.

Interviewee E-A only turns to looking up imagery after he does not get satisfactory results when he first checked an online dictionary or did a general Google search for a Chinese word or "Chinese word combination". Interviewee E-D is similar to Interviewee E-A in that he usually only consults imagery when dictionaries do not give him what he is looking for: "Usually it would be if a dictionary definition, like you said, doesn't quite kind of capture or give me a clear enough sense of what the content is. So, I'll look at a picture just to see clearly what is happening." That being said, Interviewee E-D states that he does not frequently look up images, and it seems like he only checks out images when he needs help visualizing what is going on. In summary, three out of this study's four native English speakers subscribe to the idea that you only turn to images when word-based resources are not getting you what you need.

Some interviewees turn to imagery whenever they get stuck, like Interviewee C-G, who states that "I guess I'd say if I don't know what a word means and if I don't look up images of it then I won't be able to keep translating." She also said, "I'll first check to see if Chinese has something along the lines of terminology—it could be a term I've never seen before. But, if I look up terminology that I can't understand, then I'll go look at imagery." Similar to other interviewees, it seems like imagery is a more secondary resource for her that she utilizes once she has first taken a look at text-based resources: "I can look [a word] up in an English-Chinese dictionary, and it'll give me a Chinese word (equivalent). Kind of like I just mentioned with what was it? Terrace—陽台? I'll be able to translate it so it means

roughly the same thing, but I won't be able to be exactly sure what it means." Once she is at the above stage, where she is close to understanding what the word means, she will then look at images, which makes it seem as if consulting imagery will cause any remaining confusion or haziness about a term to dissipate. Overall, text-based resources can help us better understand an unfamiliar term, whereas images can allow us to more fully comprehend a word we already know. Interviewee C-G's comments reveal whenever text-based resources are not allowing her to 100% understand the term she will turn to imagery, and maybe other translators should be following her lead whenever they need help getting out of a linguistic rut where they understand a term but not well enough to translate it with confidence.

Interviewee C-G's explanation of Google Images' disadvantages echoed the general critique of too many irrelevant images, yet her opinion was more centered on some types of words just not having any relevant images at all due to certain terms being too specific or uncommon: "Some images, it's just not consistent—you just can't find them. So, when it comes down to it you don't know if it's this or that because they're not very similar." She explained that for some words the Google Image results range from only charts and graphs to mostly icons and other unhelpful images. When image results like these follow a look up of text-based resources, it is easy to feel hopeless: "[When this happens] you won't know where to go to find what you're looking for." The worst-case scenario is potentially dangerous, as translators will be looking at images that misrepresent the source text: "Maybe you'll look for the wrong thing, but you won't know, because you'll think that what you're looking at is correct." They still may teach us something new, but, as said before, inaccurate image results can lead to mistranslation and wasted time. Simply put, inefficiency and ineffectiveness are two elements that translators who want to survive in this cutthroat industry must avoid at all costs.

Like Interviewee E-A, Interviewee C-G also mentioned Taiwanese temples, which

have terminology for even the tiniest architectural parts. Unfortunately, it can be very challenging to find temple-related terms and images on the web. This situation may exist because people who are knowledgeable about temples are older (and thus less tech-savvy) and/or temples are a very specific cultural phenomenon, resulting in the web having a dearth of information on Taiwanese temples. Finding English translations for architecture terms is an even harder task. A trip to a temple could probably get us the answers we need (at least in Chinese), but spending this much time to perfect our craft would make us financially poor translators. As mentioned before, Google Images is a good resource but we must always be aware because it will lead us down the wrong path from time to time. Yet, for aspects like Taiwanese temples there will be essentially no path to take, because the lack of images for architectural terms and the absence of translation equivalents will prove problematic.

Another problem with Google Images is that it is loaded with lewd photos that are often completely unrelated to the content searched for. Interviewee E-C mentioned a classic example of searching for the word "swallow" because her near-native level English-speaking classmate felt "slowly swallow" made sense, whereas she believes swallowing is an involuntary motion that cannot be done slowly. Interviewee E-C's image search resulted in no questions answered and a bunch of "X-rated" photos. Of course, safe search filters can be turned on, but the prevalence of adult content on Google Images still plays a role in imagery often being rather inconsistent and, thus, less helpful than text-based resources.

While Interviewee E-A expressed frustration with there being too many irrelevant images, two interviewees had different opinions on whether image results being similar was good or not. Interviewee E-B stated his concern of there being too many images with a similar but not identical appearance: "…you could get a bunch of pictures that are something that is slightly similar, but they're all different. And, then it could lead to confusion or you're not sure what it might be." Mentioning that sometimes "variety can be a hindrance", Interviewee E-B

provided an example where every image on the screen is supposed to be a certain color, yet uncertainty arises because "every picture is just a little bit different color". Conversely, Interviewee E-C had an issue with too much similarity: "[T]here's certain concepts—like you said—'love' or more abstract ideas. But, there's so many different images that can be used to express that idea. Sometimes, when you look at Google Images, like if you look up marigold. You look up that kind of flower—it'll just have almost identical images about that flower." Interviewee E-B's and E-C's differing viewpoints on slightly different yet mostly similar imagery intrigues me because I never thought of it before, as little differences could result in the translator being able or unable to put a finger on what a word or a word's range of meaning really is. But, even though I think their points have a lot of merit, my opinion is right in line with Interviewee E-A—I want to get a bunch of images that are relevant to the word I looked up, meaning I can deal with a variety of similar pictures because they can help me zero in on a word's imagery.

Interviewee E-B may be a native English speaker, but he does not have much professional translation experience. NTNU's GITI program is more into-Chinese centric because the overwhelming majority of its students are native Chinese speakers. As a result, Interviewee E-B translates into Chinese more frequently. Unlike Interviewee E-A, who is usually checking imagery for the Chinese source text, Interviewee E-B is constantly checking his own Chinese translation "to make sure I'm getting the right thing". Essentially, Interviewee E-A is using imagery to better understand the source text whereas Interviewee E-B is consulting imagery to make sure that his translation is representative of the source text. Viewing imagery in order to grasp a Chinese word is important to translators like Interviewee E-B, because it can give them confidence that they understand the Chinese word and/or are using the word correctly. In short, there are many tricks for translators working into their

second language, such as consulting parallel texts, searching for similar sentences in the target language, and understanding the other culture through imagery. The above interviewees' experiences show the power of using imagery—translators can consult images in order to make sure that they understand the source text and/or have written an accurate translation.

Despite imagery often being a secondary resource, many of the interviewees still see it as one of their most valuable tools. Interviewee E-B explains, "I wouldn't say [Google Images] is my last resort, but it's just a tool in the toolbox. Accompanied with other things, other tools, it can be useful. But I wouldn't just rely upon that." As for Interviewee E-D, he expressed a general idea that more information at your disposal is better than less: "I think any information is helpful. I mean, just more information makes it so you can make a more educated, I guess, guess at what you're working with. You can better figure out what the situation is and then translate it more closely." Interviewee E-C mentioned "if I don't understand something, I always look things up first in a dictionary and then if I don't understand what the dictionary says, or what Pleco (a phone app Chinese dictionary for non-native speakers) says, then I look up images". She added that when it comes to a concept or something scientific like "how to generate solar power" she often prefers Wikipedia over Google Images, because Wikipedia has text that explains the concept or process in addition to providing at least one reliable image at the top of the article, whereas she would need to scan through a bunch of pictures with Google Images. Overall, points made by Interviewees E-B and E-C reveal that translators' strategies are typically much more complicated than "first look up text-based resources and if unsuccessful turn to image searches", as translators use different methods depending on the situation. Nevertheless, imagery still does not seem to be the first option.

Interviewees E-A and E-B have basically identical answers for how often they use imagery compared to text-based resources. Interviewee E-A says he only consults imagery

about 10% of the time and Interviewee E-B estimates it is probably a "10-to-1 ratio". Interviewee E-A definitely sees a lot of value in consulting Google Images though:

> You get a comprehensive understanding of the source text that you're translating. You can find images of word combinations in Chinese that aren't readily available in a dictionary or translation dictionary. You can check your understanding of the source language—that this is in fact what you understood it to be. And, of course, the caveat is that you have to be certain that the image that you are looking at does relate to that word, so you oftentimes have to look at textual references, too, for that word.

His above comment is helpful in that it shows the power and potential of using imagery to understand the text. Yes, it can make your translation more accurate and vivid, but if you are not careful it can also lead you down the wrong path of images, causing you to mistranslate something and/or waste a bunch of time with nothing to show for it in the end.

Interviewees seemed pretty well aware of the productive power and potential pitfalls with using imagery. Interviewee E-B says, "…for something like Google Images, there's no real 100% way to make sure that it is accurate. So, it's more just like a tool for checking that I would turn towards if I [was struggling]." Interviewee C-F gave an accurate description of how using Google Images can actually be a hindrance when the image results are different from what the translator's imagination visualizes: "With Google Images…sometimes the results will be images completely unrelated to what you're looking for. So, you'll wonder 'What is this?' If there aren't enough results you'll start getting nervous—kind of like you're screwed. It's also not the most consistent." Overall, being unable to completely trust Google Images is slightly problematic, but in its worst moments Google Images' lack of consistency and unrelated image search results are enough to make a translator even more unclear about content in the source text.

Interviewee C-G is now in her fourth year at GITI, so her days of group work are essentially over because she no longer needs to take classes, but her comment below hints that she sees consulting others as better than viewing images. She explains, "If it's English, I won't have anyone I can ask, so my only option is to use Google. I think Google Images is really convenient. You can come to understand what something is pretty fast." She reiterated many times that Google Images is helpful, but her opinion seems to allude to the reality that asking a qualified person (like an English native speaker) would be better, as he/she could verbally explain what she does not understand and that person could also help point out representative images. The benefits of group work include learning and translation accuracy and this topic is covered at length by Kussmaul, so I find it interesting that to Interviewee C-G asking someone else is her first option. And, once again, imagery was not the go-to-tool.

The interviewees' points about imagery being a secondary resource and their qualms with Google Images' inaccuracies/inconsistencies are interesting because they reveal a lot of potential meanings: 1) Do imagery or online image searches, in general, lack the same authority that dictionaries and other text-based tools enjoy?; 2) Do we tend to see image searches as inferior to text-based searches? (like dictionaries and corpora). If the answers to these questions are yes, we need to ask another question: Compared to text-based resources, will imagery always be inferior and less authoritative or is imagery not a primary resource because the tools we currently have are not good enough? Maybe we are being too picky, as Interviewee C-E seemed mostly satisfied with Google Images: "I don't really dislike anything about [Google Images]. I think it's very useful." In a positive light, Google Images being considered a secondary resource by some interviewees does indicate just how important images are to translators, but this situation is also a clue that maybe the problem is not imagery—it is the resources themselves.

The interviewees described imagery with the following words: checker, verifier, and secondary resource. It is interesting that imagery seems to always be part of the discussion but never the first option, so exploring this situation is worthwhile. As for me, I do not see looking up imagery as a tool that I turn to only when text-based searches do not give me the information I am looking for; in fact, both I and the interviewees look up imagery for many reasons, including language learning and cultural exploration. Furthermore, none of the interviewees could remember imagery causing them to mistranslate, but when it came to assisting them they had numerous examples and many spoke glowingly of pictures helping them with accuracy. So, it seems that the interviewees' issue with Google Images is its unreliability, which causes them to work slower. Overall, quality is important in translation, but so is speed. When most translators are paid per character in the source text or target text, being able to translate fast is often the difference between translation either being a lucrative career or a decent side job.

4.2.9 Pros and Cons of Consulting Imagery Being a Time-Consuming Activity

Compared to other interviewees, Interviewee C-E has an interesting attitude towards using imagery for language-learning purposes; while she sees looking up things that are "foreign" to her as beneficial, she also considers the wasting time part of imagery searches as being both useful and enjoyable. In terms of its helpfulness, she feels that imagery helps her understand concrete objects, such as dishware. For example, 鍋子 can mean anything from a frying pan to a soup pot, whereas 杯子 can range from wine glass to coffee cup: "in English there are many different types of pots and pans, and there are many different types of cups with their separate names. But, in Chinese 鍋子 are just 鍋子—it doesn't matter if they're like a frying pan or something else, they're always just 鍋子." Despite this phenomenon, there is actually a plethora of cooking method terms in Chinese, such as 燒、燁、燙、煨、燉、

滷、蒸、燻、烤、熏、炸、煎、炒、爆、清炒、煸炒、滑炒、乾煸、軟炒、拌、凍、腌、燴、溜、and 燜, whereas (American) English uses relatively few terms: cook, boil, fry, simmer, etc. Like the previously mentioned example of Eskimos having more words for snow than other "warmer" languages, when a language has a lot of words for a certain concept (like cooking) then you can assume its culture values it. As a result, knowing subtle differences between physical objects can be difficult if you only use text resources, as two slightly different objects can be almost impossible to describe verbally in the other language, which is why imagery is so helpful for many cultural aspects.

Interviewee C-E's reason for clicking on images to read the linked content and searching for new images reveals her curiosity, as the imagery look-up process is educational for her: "You can learn new things. You can see some more...for example, I look up an animal. I look up the word, and then I can learn some things about that animal. Because I really like to [learn new things] ...I don't really like just translating. I like learning new things when I'm translating." Searching for imagery can be a time-consuming activity, yet in many ways accumulating a host of images in your brain is a type of investment. Essentially, knowledge acquired in the present can help with producing more accurate translations in the future in addition to developing a quicker work pace. There is a lot of room for debate when it comes to whether imagery is a good investment financially, but if it makes the job more pleasant then we should consider that aspect as well. Interviewee C-E offered up a poignant summary for the value of looking up imagery: "I think it's very interesting. In fact, this is learning. You can learn a lot more this way than just translating directly."

Looking up imagery can be a long trip down the rabbit hole though. Interviewee C-E admitted that, instead of just searching for a specific image and then moving on once she understands, she often spends a lot of time on cultural explorations where she clicks on image after image, which can lead to hours of lost work time. She says, "Sometimes you'll start

looking at images and you'll get curious about something, so you start looking at other things. You'll get further and further away from translating. Sometimes you'll look something up, and then you'll want to keep looking other things up. So, it's very time-consuming. It will distract me." Interviewee C-G mentioned a similar example: "A bad part [about Google Images] is that it can slow down your translation speed, because you keep on looking at interesting pictures or something like that. It's just like when you talked about *sanheyuan* (三合院). Maybe you'll look up *sanheyuan* to see what it looks like, and then suddenly you'll start looking at other things." Of course, a slower pace means that one will have a harder time meeting deadlines as well as be unable to take as many cases, so imagery can, in fact, be dangerous financially. Also problematic is that being distracted might mean that by the time one is done looking at images he/she already will have forgotten about what he/she was originally searching for.

Interviewee C-F did not mention directly that looking up imagery can be a time-consuming process, but during our interview she revealed that she both spends a lot of time viewing pictures and wants to protect her eyes from computer screens. First, she is more old school in that she enjoys looking at 圖鑑, which essentially is an illustrated encyclopedia that typically goes into depth about a certain topic. For her thesis, she consulted an illustrated encyclopedia that depicted and explained all the plants that appear in the Chinese classic *Dream of the Red Chamber*. This illustrated encyclopedia provides a picture along with an explanation (including things like a plant's family and genus and what kind of fruit it grows) for different types of "roses, lilies, daffodils…". She may be old at heart, as she prefers paper-based reading material over digital documents, but her explanation was that looking at a computer for long periods of time is exhausting for her eyes, making her feel like she is going to become "cross-eyed". There is research on how the UV light and blue light emitted by computers is harmful to our eyes, and this is why you see anti-blue light glasses on the market

and computer applications like f.lux that try to make computer use a healthier activity. Paper-based resources are maybe more natural and thus healthier for the eyes, but time is still a major factor though—paper-based resources usually require much more time to locate images than online tools like Google Images, which already slows translators down.

Interviewee C-F is honest about these illustrated encyclopedias' strengths and drawbacks. They are not as fast nor convenient as web-based resources like Google Images, and they cannot be revised as frequently as online resources can, which can be updated with new scientific findings at the click of a mouse. However, topic is important, and she argues that things like plants and insects do not change all that much over time (not like quickly evolving smart phones and laptops), so decades-old illustrated encyclopedias for topics like plants are still very useful today. She also believes that she can look at paper-based illustrated encyclopedias longer than web-based resources, as she can gradually make her way through the book page-by-page. Furthermore, she sees them as more convincing—their pictures are very big and their explanations are quite clear. The ease of perusing through these illustrated encyclopedias may explain why she has a tendency to add in extra description, which she says happens after she uses her imagination to visualize what a plant looks like in real life. In short, Interviewee C-F was the only interviewee to champion paper-based resources over online-based resources, yet her preference forces us to consider paper's benefits, including being more trustworthy, easier to read, and better for the eyes.

Many interviewees expressed their dedication to making sure that the images they choose to focus on are representative of the text, but they also realize the disadvantage of this effort—it can be incredibly time-consuming. As stated above, Interviewee E-A mentioned that the worst-case situation is that he looks at a bunch of images and comes away without a better understanding, making the effort "a waste of time". But, he also expresses his willingness to make sure he gets it right: "The problem is there's a lot of fluff in there. A lot of

stuff is unusable, or it's not the right thing, or it's kind of associated with it in some way. So, it's not filtered out. You can't be certain. You have to spend a little bit of time to be sure." Celebrity photos seem to be common image results, and Interviewee E-D explained that he often comes across faces of entertainment stars that "consume all the images" when he is trying to visualize what a word looks like. He expressed that despite there often being "irrelevant images", in the end he is usually able to find what he needs: "Because just when you scroll down, via how many images are of the same thing, you can kind of guesstimate how, I guess, likely that it is what the concept is." Interviewee E-D finished his explanation of Google Images' strengths by saying its "big sample sizes" is what makes it an advantageous resource. In conclusion, the vast number of pictures can be cumbersome, distracting, and even misleading, but that variety also tells a more diverse picture of what a concept is and that diversity is often what helps users better understand what they are searching for.

Overall, Google Images clearly has the capability to both help and harm, which includes slowing down one's translation speed. The interviewees and I know what we are getting into when we turn to Google Images, but we continue to use it despite the amount of time it can take to find accurate/relevant images. Essentially, we are aware that we will spend a lot of time either (1) searching/scrolling through pictures in order to completely understand the text content we looked up or (2) checking out images for mostly curiosity's sake. Yet, we still value consulting imagery because it helps us be more accurate and, in the long-term, it makes us much more knowledgeable.

4.2.10 Looking Up Images First and Then Reading Text

Interviewees E-C and C-E both gave examples of looking up images and then going to read textual content so that they could understand more about the source text. For example, Interviewee E-C did not know that lobster have roe that can be made into caviar until she

translated a Chinese food review. After first looking at images on Google and then reading some lobster caviar articles in English, she became much more knowledgeable about something that maybe only culinary experts are familiar with. Perhaps Taiwanese people are more knowledgeable about sea food, as they live on an island, than someone from the USA's south, like Interviewee E-C. Nevertheless, looking up images and then reading the linked content proved helpful for her. As for Interviewee C-E, she expressed that she tends to click on images so she can read about the text behind the picture: "If I go to look up something, even though I don't really trust myself, I also don't completely trust information on the Internet. So, after I find images with Google, I'll look at a picture's web site to see the description on the web page. This way I can trust it more." This process helps her decide if she should consider the image or not, and it also results in her knowing more about what she looked up. To put it simply, reading an image's text content has lots of benefits, ranging from boosting your confidence in your translation and understanding of the text to learning more about something you were once unfamiliar with.

Interviewee C-H expressed that he too clicks on imagery to see the "text behind the image", and his reason for doing so is to make up for Google Images' disadvantage of frequently producing irrelevant images:

> I think the good parts [of Google] definitely outnumber the bad parts. Because, there is a small minority of cases where you might be misled. But, I think in most cases it is helpful…Or, I could say it in another way—maybe you Google something and lots of results pop up. I think you'll want to, one-by-one, click on the image and look what's inside because you need to determine if what you're looking at could be wrong. I think we shouldn't say every [image] is right, as I think we should determine [if it's right or not].

He did mention that he tends to focus on images that "pop up the most" and that he clicks on the links for their text because an image is often describing something in the text. Hoping to find detailed description about the image, the text is often a deciding factor in whether he considers the image or not. His remarks about "distrusting" Google are similar to Interviewee C-E's comments, but Interviewee C-H differs in that he seems to read the text behind every image in order to vet which images are appropriate and which ones should not be considered. Simply put, while Interviewee C-E does not have complete faith in Internet-based information and so she wants to click on images to read their text, Interviewee C-H's strategy seems to revolve around ensuring that Google's worst issue, that it often provides irrelevant images, will not cause him to mistranslate.

Translators have strategies for when and how to use imagery, but what may go unnoticed is that they also have strategies to ensure that imagery will not cause them to translate incorrectly. There are a few quick methods for avoiding misleading images, including adjusting Google's search settings and using search operators (like " ", *, and :). But, sometimes the best method is also the slowest, and this is why many interviewees emphasize the importance of looking at an image's textual content.

4.2.11 Imagery Allows Access into a Foreign Culture

One of translation's major challenges is that most translators are working with one language that they do not thoroughly understand because they did not grow up in that culture. Interviewee E-B is not of Chinese ethnicity in the least bit, yet he enjoys a unique background where he has experienced Chinese culture at home because of his family's incredible history. His maternal grandparents were born and raised in Asia (his grandfather in Shanghai and his grandmother in Hong Kong), and they brought elements of Chinese culture back with them when they moved to the United States as young adults. In fact, his grandparents were actually

in Shanghai when the Japanese invaded during World War II, they were put in Japanese internment camps for three years, and his grandfather did not leave China until he was 26 years-old. Despite not growing up speaking Chinese, Interviewee E-B has many memories of his family enjoying meals at home where they ate dim sum with chopsticks. Furthermore, he has been told a lot by his grandparents and mother, who all had deeply immersed living experiences in Asia. Interviewee E-B recognizes this unique advantage, which is not enjoyed by the overwhelming majority of non-native Chinese-speaking translators:

> That is part of the reason why I think learning English is easier. A lot of resources out there. And the amount that western culture infiltrates the east, as opposed to eastern culture infiltrates the west. Like, they've grown up with some of the same stuff we have, but we do not grow up with much of anything that the east has.

Interviewees E-B enjoys the advantage of being exposed to Chinese culture for years, and his experiences very likely play at least a minor role in translation accuracy. Furthermore, all of this study's native English-speaking interviewees benefit from living in Taiwan. But, for translators that do not have the luxury of living in the country of their second language, imagery seems to be a major resource for leveling the playing field.

This study's native English speakers still have barriers to overcome though, which includes dealing with a low-immigration country's social structure that is designed for its own citizens. Interviewee E-B hinted at how Taiwan's translation and interpretation programs are, in general, geared towards native Chinese speakers, and Interviewee E-D's description of NTU's program explains this imbalance in even greater detail. Interviewee E-D mentioned how internship experiences that are offered to NTU's translation program seem to always be for Taiwanese students (or native Chinese speakers), and there was a situation where the department head selected two Taiwanese students for an event in Hong Kong that was originally supposed to be earned by filling out an application. One professor told him that

"Our program…it's set-up…it's designed for Taiwanese students". This is backed up by the fact that, as of this interview's date, NTU's interpretation program had never had a non-ethnic Chinese interpreter and the program's conference interpretation track does not offer simultaneous interpretation into English until the second semester. Furthermore, the second semester simultaneous interpretation class almost exclusively focuses on English into Chinese. Essentially, NTU's students will not start practicing heavy amounts of simultaneous CE until they are in their second year, which is a big disadvantage for native English speakers, as they need to be able to do high quality simultaneous CE in order to compete in the marketplace.

Interviewee E-D expresses this imbalance in his own words: "Like, all of our classes—they do into Chinese first. It's catered towards their needs." This imbalance is everywhere in the Chinese-English translation world, such as 誠品's (Eslite) foreign language learning room having only a few shelves dedicated to non-native Chinese learners compared to the English learning books that fill up over 80% of the room. Interviewee E-D and I pondered whether this one-sided situation exists in schools located in the United States (such as Monterey) or England, where the countries' main language is English. Would these countries' translation programs have a better balance between native English speakers and native Chinese speakers? Interviewee E-D is stuck in Taiwan though, so in order to compete against local interpreters who enjoy an education structure catered to their language needs, he will have to find tools, like Google Images, that help him have at least a fighting chance against native Chinese speakers.

Interviewee E-C has a very vivid tale of imagery helping her understand ancient Chinese culture. Her male friend is growing out his hair, and he has tied it up in a bun at the top of his head. Her Taiwanese classmate saw a picture of his hairdo and it reminded her of the Chinese idiom 懸梁刺股, which is an idiom that dates back to ancient China when students were preparing for the imperial exams. Essentially, in order to study for the test as

much as possible, many test takers would tie their hair to a pole above them, and if they dosed off the pain of their scalp being pulled would wake them up so that they would get back to work. To add insult to injury, the second two characters of this idiom mean ("stab the thigh"), so test-takers could also punish themselves by stabbing their upper leg with a sharp object in order to remain studying. While this custom is much less prevalent today, a Google Images search does show modern renditions of it, making it seem that most Taiwanese are familiar with this idiom. After Interviewee E-C's favorite Chinese dictionary Pleco did not help her grasp the idiom's meaning, she only finally understood what her classmate was saying when they looked it up on Google Images. She explained her inability to understand the idiom may be due to her being a more visual learner (she later mentioned her learning style is a mix of visual and kinesthetic), but then she made a point about theories related to the three different types of learners (which are visual, auditory, and kinesthetic) being overturned in recent research. Nevertheless, this example shows how difficult it is for someone who does not grow up in a culture to understand something with such a deep cultural foundation. Interviewee E-C, who lived in the southern United States until she came to Taiwan, can hardly be expected to understand Chinese examination culture and history, and her "Oh" moment, which multiple interviewees expressed when they finally understood a term by looking at images, did not occur until she saw pictures of test takers with their hair tied to poles. These experiences reflect that the native English-speaking interviewees often look up Taiwanese culture-based terms or Chinese language words that they are not familiar enough with, and by doing so they can visualize the imagery often already present in the minds of native Chinese speakers.

The native Chinese-speaking interviewees also deal with issues tied to culture. For example, Interviewee C-E, who grew up in Taiwan, struggles to understand English terms and phrases she was never exposed to during her childhood. She says English's colors can be particularly troublesome: "Because in English there are lots of names for different colors. In

Chinese, if it's a reddish color, then there'll be a 紅 at the end of it. 赭紅 (lit. "ocher red"), 玫瑰紅 (lit. "rose red")—if there's a 紅 in it, it has to do with red. But for English, there are many...just like scarlet. There are colors that are reddish, but their names don't have 'red' in them." English colors, like scarlet or turquoise, typically do not give a hint at what color they are, so non-native speakers might actually have no clue that what they are reading is a color. To be fair, looking up colors in Chinese can at times create more questions than answers; for example, the Chinese color 青 is blue in some images and green in others. However, for most two-character and three-character Chinese words about color, the final character indicates what kind of color it is, such as 螢光綠 (fluorescent green) and 草綠 (lit. "grass green"). In fact, this situation is prevalent in Chinese, which is a language that builds upon itself due to the recurring characteristic of radicals. For example, a non-native Chinese speaker might not know what a 鴕鳥 (ostrich) or 灰熊 (grizzly bear) is when they come across these animals in Chinese, but the second character in ostrich means "bird" and the first character has the radical for bird while the second character in grizzly bear is "bear". Essentially, a non-native Chinese speaker could come across a Chinese text full of wildlife and have a vague idea of what kinds of animals there are, whereas a non-native English speaker reading English would not stand a chance. English does not offer as many radical-like hints as Chinese, so native Chinese speakers will need to rely on context more when they decide what English words they should do an image search for.

Celebrities and popular things in the USA are another category Interviewee C-E focuses on. Interviewee C-F added that she looks up foreign celebrities in order to understand what they look like: "For example, let's say there's an article that describes a female celebrity. After looking her up, if the article writes about her specific features then I can translate better." In short, these interviewees' penchant for looking up things like colors, celebrities, and popular things show their dedication to grasping the culture of the source text, indicating

that for translators understanding the source text content is closely tied to understanding the source text's culture.

As shown a few paragraphs above, imagery can also help take translators back to non-modern cultures, like Victorian England. In an EC translation course at NTNU, Interviewee C-H had to translate *Wuthering Heights* (1847) for a class assignment, and he came across a piece of furniture that simply does not exist in Chinese culture:

In the book, I remember there was something—I've forgotten what it was called in English, but Professor Lai showed us pictures of what it was. It was a chair with a very tall backrest (high back chair). And, it was a very long chair… For that [kind of] thing if you use a [translation] dictionary to look it up it'll just say that it's a chair."

He explained that the problem with simply translating it as "椅子" (lit. "chair") is that the chair plays an important role in the setting of a scene. One of the characters is sitting in this chair with the specific name (as British people are rather particular about furniture), and the other people in the room do not notice the character because the high back rest blocks her upper body from view. If the Chinese only describes this piece of furniture as a "chair", then readers might wonder if the person in the chair is a dwarf, child, contortionist, or invisible, or maybe the other people in the room forgot to put on their extra-strength glasses. By using Google Images to look at pictures of this chair, the class was able to understand why the character in the chair could not be seen. Furthermore, the professor advised the students to make sure to add helpful description in their translations that would ensure the Chinese readers will be able to visualize that the chair has an incredibly high backrest.

Interviewee C-H provided another example with furniture, but for this situation he went to look up imagery after he realized that he had bought the wrong couch cover. In English, sofa or couch can refer to a piece of furniture that has places for at least *two* people, but more specifically it typically has enough space for *three* or more people. Of course,

English is a flexible language, so something like 1-seater sofa or 2-seater sofa works if you clearly indicate the number of seats. The major problem with the Chinese word 沙發 (sofa) is that it is a transliteration of sofa, but in Chinese a 沙發 can have as few as one seat—plus, it is not a requirement to indicate how many seats you have. With their small homes, it is easy to see how many Taiwanese people will make the same mistake Interviewee C-H did, which was accidentally getting a three-seat couch cover for his two-seat sofa:

> I went onto Amazon's website to buy a sofa cover. I ended up...I just didn't understand that sofas...sofas are longer. For Americans, what's it called? A love seat? A two-person [sofa]? My house's "chair" is a two-person [sofa]. So, I needed to select a love seat cover. So, I couldn't use the one I bought.

He went on to say that for some things, like furniture, imagery can be better to use than dictionaries: "It's only something you can learn by looking at pictures…If you only look [sofa] up in a dictionary, you won't be able to know the difference [between sofa and love seat]. For this, only by looking at images can you see the difference." Interviewee C-H has not had the luxury of living in the west, so his concept of what "sofa" is in English is going to be mostly shaped by the Chinese language and his living experiences in Taiwan. Fortunately, he was able to return the three-seat sofa cover without much of a hassle, but the moral of this story is that when buying something from a foreign culture, an imagery look-up can be the difference between getting what you wanted and trying to return something you cannot use. As for translators, they should be sure that they learn more about the culture of their second language, because they might not understand an equivalent in their second language as well as they think they do.

Interviewee E-C explained a kind of reverse example where her own United States background helped in producing a more proper translation for a CE group translation project with three Taiwanese students. The article was about losing weight, and the Chinese writer

used the term 馬甲 in a way that deviates from Mandarinspot.com's definition of "corset / sockpuppet (Internet slang) / vest (dialect)". The writer seemed to be talking about large bands people put around their waists, and the rationale of using 馬甲 is probably tied to the word 甲 (commonly found in armor-related terms) often being used to refer to the waist region, especially if one has well defined abs (a.k.a. a six pack). Her classmates wanted to translate 馬甲 as corset, but to her translating it as "Don't wear a corset every day" seemed strange because most women in today's world do not wear a corset every day. Furthermore, her memories of corsets clashed with her classmates' translation; when she saw corset she thought about "18th Century Europe" and "sexy time". After looking up images in English and Chinese of both corsets and waist bands (also called sweat bands, sweat belts, abdominal bands, and sauna belts), everyone realized that 馬甲 in this context was not corset. Overall, translators can consult imagery in their second language or first language, but the best combination is often looking up images of a word in both languages so appropriate equivalents can be chosen.

Compared to Taiwan, these bands may be used differently in the west. Interviewee E-C's statement that these bands are used for back pain in the west whereas people in Taiwan use them to look skinny may not be entirely true though, as an article called "Should You Wear an Abdominal Sweatband" (2015) shows that people in the west use these bands for slimming purposes, too (Bruso). Nonetheless, checking images for both languages is important for translators, regardless if they are translating into their mother tongue or second language. Interviewee E-C's example is fitting because 馬甲 and corset may be "equivalents" in most situations, but, at least according to one Chinese writer, 馬甲 seems to have a much larger range of meaning than corset. Therefore, the beauty of search engines like

Google Images is that they can show us how two seemingly equivalent words might have different ranges in terms of possible meanings.

Translators are not limited to searching for words in languages they understand. In fact, Interviewee C-E will look up images in other languages, such as French, which she does not speak. From time to time she will come across foreign words in the English source text, so she will plug those words into Google Images to get an idea of their imagery. Interviewee C-E pointed out that Google is being utilized by many language communities, and therefore translators can use it to look up resources in a variety of different languages, even if they do not understand these languages. One might ask, "How does a translator that doesn't speak French know that she is looking at images put up by native French speakers?" The answer to that question is Google's search settings allow users to adjust the country and language. As an example, let us say a translator wants to understand the way British people see the word "football", as Americans typically view European football as being soccer. Once the translator puts UK in the search box, the results will be specific to the United Kingdom. This can also be done in the French language; for example, a user can even put in Algeria (which has many French speakers) if he or she does not want to know what people from France think of a French word. The diverse amount of options for Google's search settings have many advantages, and one of those benefits is that they allow speakers unfamiliar with a country's culture and language to be relatively confident that what they are seeing is authentic.

Image results can be an effective warning that we misread the text. After a mini debate about Chinese's writing systems of traditional and simplified, Interviewee C-H and I came to a controversial agreement that traditional was better. This debate indirectly connects to the truth that imagery can help us clearly distinguish between two words that look similar but have completely different meanings. He asked me if foreigners think traditional characters are harder to read than simplified characters (they sure are harder to write) and then argued that

simplified characters have been simplified too much, which even some Communist Party officials have mentioned. I replied by stating that I had heard Wilt L. Idema, a professor of Chinese at Harvard University, explain that traditional characters have been proven to be easier to read because the eye can better differentiate between characters when there are more strokes—and thus differences between characters. Simplified characters, with their fewer strokes, often look very similar to one another due to the lack of variety. While simplified characters surely have made handwriting an easier endeavor (even though computers are erasing the need for handwriting anyways), in terms of literacy they do not seem to enjoy an advantage over traditional characters. Despite this, even Traditional Chinese has many characters that look almost identical to the foreign eye; my example of Google Images helping me would be searching for pictures of 連袂 (lit. "jointly", "together", or "as a group"). The images showed me that 袂 (lit. "sleeve of robe"), which Interviewee C-H states is a high register word, is not 快 (fast), so 連袂 would not mean something like "continuing to be fast". When you compare 袂/快 side-by-side though, the only difference is the left-side radical. Of course, a dictionary check might do the trick, but seeing different images than expected provides a good warning flag as well.

Interviewee C-H said he too confuses (English) words that look similar; his example was "scrap" and "scrape". If he were to do separate Google Images searches for these words, he would surely see that whether or not there is an "e" on the end plays a big role in meaning. Many may ask, "why not just look these words up in a dictionary—that would provide enough clues that these words are very different, right?" The counter argument here is that translation is a mentally exhausting task, and reading a one or two-sentence definition is arguably a lot more tiresome than just scanning a few images. So, in order to save energy, which is necessary as translation requires efficiency and precision, translators need to find

ways to ensure accuracy while minimizing mental exhaustion—imagery can be a good tool for achieving the above goal.

Like the interviewees, I also look up pictures of objects, especially in Chinese as I have only lived in Taiwan for seven or eight years and I often come across things in the Chinese source text that I either have not encountered before or have not seen it enough times to be confident of what it is. But, compared to most of the interviewees, I actually think viewing the imagery of abstract words, like communism and mental health, can also be helpful because I feel by doing so that you can get an idea of how the culture sees that word. For example, the image results one might get for communism in English may be very different from those if one were to search with Simplified Chinese. With Simplified Chinese, you might see pictures of how China's communism has brought wealth and order to the country, whereas in English you will probably see pictures of the evils of communism. A search with traditional characters can be interesting, too, because Hong Kong and Taiwan both use Traditional Chinese, and their relationship with China is often a contentious one. Overall, looking up images of abstract words will often lead to a better or more diverse cultural understanding, but that does not mean the process will give you a clear-cut answer though.

During my time in Taiwan, I have been both a university student and graduate student and have worked a variety of jobs as well. Many of the experiences I have had with the culture and language cannot be found in Chinese language textbooks nor in books about Chinese/Taiwanese culture and history, so I have an advantage that translators who have learned Chinese in their own countries and/or do not live in a Chinese-speaking country do not enjoy. These experiences have helped me countless times translate more accurately and effectively, and my cultural background has often helped me avoid pitfalls whenever a Chinese word means something different than what the character(s) directly means or might

suggest. All is not lost for the world's less privileged translators though, as imagery resources, like Google Images, give translators with less exposure or experiences the opportunity to see things that they have never viewed before and thus probably could not have imagined.

Essentially, perspective is important because it is tied to language, culture, living circumstances, and much, much more. The interviewees and I also understand the advantage of tools like Google Images, as they allow us to see the imagery that typically already exists in the minds of most native Chinese speakers. Therefore, the above situations show how despite non-native speakers being at a cultural disadvantage because they did not grow up speaking their second language, imagery still has a way of leveling the playing field.

4.2.12 Do Translators Use Visualization During Translation?

The concept of visualization did not play much of a role during these interviews, as the interviewees provided lots of examples of when and how they used imagery but they seldom mentioned how they incorporated visualization or their imaginations. This disparity may be due to me putting more emphasis on imagery rather than visualization or maybe it is because people remember when they used imagery but memories of utilizing their imagination or visualization tactics seem to be quite forgettable. Interviewee C-G says, "If we're talking about visualization (or imagination), I can't think of anything no matter how much I try [to think of an example]." Interviewee C-H went into more detail about visualization compared to imagery, but he, too, was not able to offer much of anything when it came to experiences: "So, what you mean by imagery is physical pictures and visualization is more like using your imagination? Oh…imagination? I don't think I use that as much [when I'm translating]." As strange as it may seem, the previous comment was not an outlier.

I am not an expert in psychology or neurology, but it is extremely hard to believe that people can go about their daily lives without using their imagination or visualization, let alone

complete the difficult task of translation. For example, if one were to translate *Wuthering Heights* into Chinese, then he or she needs to imagine or visualize the story in order to translate effectively, right? Interviewee C-H's comments are not stupid, yet they do possibly reveal just how little we consider the role of visualization and our imagination in translation. When it comes to imagery though, there is always a host of examples and experiences. Interviewee C-H says, "Right now, what I can think of when it comes to translation experiences mostly has to do with looking at pictures. I can't think of any good examples of my past experiences when I used imagination." The late interpreter Seleskovitch would probably be rolling around in her grave right now if she read comments like those found above, as she devoted sections of her books and research articles to the topic of visualization. Therefore, if visualization was such an important concept to a translation/interpretation great like Seleskovitch but is largely unknown to translation students today, we, the translation community, need to consider if we are not doing enough to teach and explore concepts that were addressed by our predecessors.

Translation often involves deadlines, so using visualization and our imagination is arguably better for when we are low on time and/or are confident that we understand the text, whereas consulting imagery is preferable if we have doubts as well as time on our hands. Interviewee C-F considers both her case's deadline and how familiar she is with the text's imagery when she determines whether or not she will consult pictures:

> If I really don't have enough time, then I'll only look up things I really don't understand and for other things that I kind of understand I'll just use my imagination. If the deadline is coming up fast, the things you don't understand [are what] you need to look up. But, if you kind of understand it, like sanheyuan (三合院) for example, I basically know what it is and so I won't make a point of looking it up. But, if there is a

lot of time then of course I think the best [option] is to both look up images and use my imagination together.

Interviewee C-F's strategy is both practical and professional—by also looking up imagery of things she could just visualize or imagine, she makes sure that she fully understands the text. But, translation is often a world where clients give quick deadlines, so saving time for looking up less understood words helps her do a better job while still working fast enough. Overall, her combination of consulting images and using her imagination together show that visualization and looking up imagery seem to share an important inter-connected relationship. Her own question provides the most fitting description of this relationship: "When you say imagination (or visualization), you're saying if you don't look up images and you're just relying on your imagination, or you're looking at images plus using your imagination?"

If we consult imagery in order to understand text, maybe we can use our imagination to visualize those same images in the future? Therefore, if we can already visualize something, then why waste time looking up images? Having lived in Taiwan for nearly a decade, Interviewee E-A, with his own eyes, has seen the spring "snow" on mountains in Taipei. This "snow" is actually the tiny flowers of Japanese Tung (oil) tree blossoms. According to him, these trees were brought in during the Japanese Colonization Era and cultivated by the Hakka people, and these blossoms are similar to cherry blossoms except that they bloom much later. Interviewee C-H added that these flowers are called 流蘇 (tassels) in Chinese. Apparently, when the flowers accumulate on the ground, the mountains look like they are covered with snow even though temperatures are far from freezing. Interviewee E-A would not need to look up images of this natural phenomenon because the imagery is already in his brain, but he pointed out how Google Images would be helpful for understanding this scene if he had never come to Taiwan:

But anybody in Taiwan has seen these and knows these trees, so when we're talking about this spring snow I had that bank of an image. I had that image in my own image reservoir, so I was able to call on that image in my own mind. But if I didn't have it in my own mind, it would've been helpful to see a picture of that from an Internet picture so that you can understand what they're trying to say with that.

The concept "image reservoir" is an interesting point. Compared to foreigners, native Chinese speakers likely have a bigger image reservoir of Chinese words that are tied to Taiwan because they have grown up here and they use the language every day. As for these images, native speakers will typically know terms and phrases connected to their daily lives whereas non-native speakers often will not. For example, Interviewee C-G provided the term 櫻花雨 (lit. "cherry blossom rain") as well as the idiom 櫻花吹雪 (which means cherry blossom "snow" being blown in the wind) to describe when cherry blossoms fall in the springtime. All is not lost for CE translators not based in Taiwan, as they can produce accurate translations by looking up imagery when they come across a word that is not in their image reservoir yet.

For translators like Interviewee C-E, who does not have a background in which she spent years abroad, tools like Google Images are the only way they will be able to see and then visualize imagery from the west. As for Interviewee C-G, she "look[s] up things in English I've never seen before". She did not explicitly say it, but it seems like she does not see the need to look up images of things she *has* seen before and thus can visualize. Essentially, we use these mental images of things we have viewed before to imagine or visualize the text that we are translating. This relationship between imagery and visualization explains why some translation scholars use the two terms interchangeably, so exploring this relationship will prove important in learning how translators comprehend the source text and produce the target text.

Just because we, the translators, can visualize the source text does not guarantee target text readers will also be able to visualize what they are reading. Although he is not genetically Chinese, Interviewee E-D, an American, first started learning Chinese as a child at his elementary school's Chinese course. He also studied Chinese during his university days in the United States. Taiwanese people are known for adding English words into their Chinese, even when it is completely unnecessary because Chinese has direct equivalents. A good example is using the word "support" when the Chinese equivalent "支持" is nearly a direct equivalent. That being said, Interviewee E-D offered a good example of the opposite phenomenon being true as well—many foreigners living in Taiwan add Chinese words into their English without even thinking about it. There are certain words in the Chinese language, such as 孝順 (filial piety) and 加油 (comparable to "go for it"), that are so tied to Taiwanese culture that they cannot be easily communicated in English. But, a great deal of Chinese words have relatively close English equivalents. For instance, Interviewee E-D used the Chinese terms 口譯 (interpretation) and 筆譯 (translation) when there are direct English equivalents. He also called his professor "Susan 老師" when he could have easily said "Professor Susan". His use of these Chinese words shows how immersed he is in the culture, and this immersion is sure to influence his thought processes. Overall, native English speakers who live in Taiwan typically work into English, and, despite Chinese being a challenge for even proficient non-native learners, they will be able to visualize much of the Chinese text because they have personally experienced it before. That being said, their audience will often be rather unfamiliar with Taiwanese culture, so finding a way to communicate the imagery of words to readers who do not know much about the Chinese language and Taiwan will require some thoughtful translation strategies.

Concerning the other side of the coin, because of English's status as the most important second language in Taiwan, its citizens often use English words and phrases when

they communicate with one another in Chinese. In Taiwan, English is learned in school; there are hordes of English cram schools and tutors who teach adults and children; and English learning books, radio shows, and TV series are very prevalent. As for the United States, Chinese seems light years away from replacing Spanish as the country's second language. Therefore, adding in Chinese words, except for a handful of terms like 風水 (fengshui), 功夫, (kung fu), and 陰陽 (yin-yang), will cause confusion for English readers. Many Taiwanese people do not understand English as well as they think they do, so EC translators will have to consider if readers will be able to visualize the Chinese target text if it has English words in it. In short, visualization is important for translators because it helps them understand the source text, but readers of the target text are also important, because if they cannot visualize the text they are reading then the translation is probably a failure.

I, too, recognize the advantage of living in the country of the source text (Chinese), as translators like me have accumulated a vast amount of images during our time here. Interviewee E-C's 豆皮 example is very fitting; literally meaning "bean skin", the word is translated as "dried beancurd (tofu)" on Mandarinspot.com, "yuba" on the National Academy for Education Research's Chinese-English dictionary database, and "tofu skin" and "bean curd skin" on Wikipedia. This food item can be easily found throughout Taiwan, but Interviewee E-C argues that westerners in places like the USA, Canada, and Europe will almost certainly be unable to understand basic things like this in Chinese culture because there just are not enough linguistic and cultural learning resources for non-native Chinese learners. In fact, Interviewee E-C only knows about dried beancurd because she lives in Taiwan, so it would likely be a different story if she had never come here and only studied Chinese in the USA, as cultural words like 豆皮 probably do not appear enough in American culture to warrant us to know them. This advantage of living location means that Taiwan's native English-speaking translators will often unintentionally learn Chinese words because

their daily lives involve this island's culture. Essentially, the convenience of visualizing foreign words from first-hand experience is a big benefit for translators who are living in the country of the source language.

This study places much more emphasis on consulting imagery, but visualization is still part of the discussion. To put it briefly, the interviewees' comments hint that the images we view on image-searching platforms or see in real life with our own eyes often end up becoming part of the mental images in our brains. Furthermore, you could also say that translators often turn to consulting imagery when they cannot visualize what they are reading. The native English-speaking interviewees all live in Taiwan, and, as a result, their backgrounds often allow them to use their imaginations to picture something in their minds that they have already seen before. As mentioned above, the late interpreter Seleskovitch claims visualization (or imagination) is critical for interpreters when they are working, so translators should consider this when they are building their image reservoir with visual tools like Google Images, personal experiences, or resources (such as videos) that allow them to see things as they are in real life. There is a lot more to learn about the roles of visualization and imagination in translation, but the lack of (quantitative) research progress since Seleskovitch is a problem. Intrusive methods, like using think-aloud protocols during the translation process or post-translation interviews, might be the only ways to learn about how translators visualize and utilize their imaginations, because this study has proven that they do not give much thought to how their brains work when they are translating.

4.2.13 Why Translators Cannot Remember When Imagery Led Them Astray

None of the eight interviewees could remember a specific occasion when Google Images caused them to mistranslate. Interviewee C-H stood out, as he was able to explain how Google Images would most likely cause him to mistranslate if he came across fruits and

vegetables. After thinking for a while about when imagery led him astray while translating, he said the following: "I think that for food, food-related stuff, that looking at pictures won't give you accurate results some times. What I thought of was food. Vegetables, fruits, things like that. I don't necessarily even know what they are in Chinese." He mentioned that one time he looked up "peach" in English—the results were a diversity of different peach varieties. In fact, there are over 2,000 types of peaches, such as the Halford, New Haven, Redskin, Snow Beauty, and Sun Haven (Albert). A look at Mandarinspot.com only provides "peach" (桃子) and "honey peach" (水蜜桃) though, so good luck translating those 2,000 peach names. Of course, there are academic-esque web sites with translations for less common plant varieties, but the look-up effort will likely be an exhausting quest.

Climate can heavily influence a country's language(s). It is worth noting that Taiwan's tropical climate is pretty much only similar to Hawaii and the very southern tip of Florida (the climates in England and the Commonwealth are not comparable to Taiwan's), so the plant life of the two countries will be very different. Furthermore, also playing a role is the physical distance between the countries and the USA and Chinese-speaking communities not having much contact with one another until around the 19th Century when Chinese started immigrating to North America. Of course, Taiwanese agriculture experts have translated many of the peach cultivars, but it is just not possible to have translations for each type of peach because of the sheer quantity worldwide and the reality that Taiwan only grows a limited variety of cultivars. Worse yet, peaches are native to non-tropical Northwest China, so the following situation could be prevalent—the same peach has a different name in each language but no resource links them, resulting in a gap in information. As a result, if the English source text writes about peaches in detail the translator is sure to "mistranslate" eventually because there are so many inconsistencies when it comes to official Chinese translations for peach cultivars. To him, "[the peaches] all looked very similar in the pictures"

and, as a result, "I wasn't able to take what I saw in the pictures and know what it was in Chinese". He never did say if he actually made an incorrect translation, but his response indicates that even if he did try his best he probably would have still been wrong in some parts. In this situation he was stuck, as searching for "peach" in Chinese or English probably leads to more questions than answers because there is so much information out there to choose from. So, his best bet would be to hope that he gets lucky or that his editor is knowledgeable about agriculture. Unfortunately, when it comes to accuracy when dealing with plant life, good fortune is all you can hope for when images are so complicated and text resources are all over the place.

Another problematic word for Interviewee C-H was "artichoke", which is native to the Mediterranean yet actually more abundantly produced in China than in the USA and other English-speaking countries. "But, even though I could see it in pictures, I still didn't really know what it was in Chinese," he explained before telling me that he has a college friend that now lives in the USA and sees artichoke everywhere; Interviewee C-H does not frequently see artichoke though. When something is not part of your life and/or culture, it can be difficult to understand what it is, and this is possibly why Interviewee C-H struggles to understand how to translate artichoke in Chinese. Worse yet, Wikipedia's Chinese translation for "artichoke" is 菜薊, whereas searching "artichoke" in Mandarinspot.com yields the following: 洋菜 (artichoke), 寶塔菜 and 草石蠶 (Chinese artichoke), and 菊芋 and 洋薑 (Jerusalem artichoke). Essentially, the translations on Wikipedia and Mandarinspot.com are different, meaning that there is a minimum of six different ways to write artichoke in Chinese. With so many translation options to choose from, it can be a daunting challenge to pick the correct one (if there is a standard translation at all). Some Chinese translations for English fruits and vegetables are straightforward (such as apple/蘋果 and rice/米/飯), but others do not have accepted equivalents yet and often, instead of equivalents, there is a bunch

of translation options that may or may not be correct depending on the reader's background. Because the Chinese and English language communities basically have different climates, the lack of similarity in plant life and not having enough work that translates plant life from one language to the other means that translators who turn to images for things like fruits and vegetables will likely end up mistranslating from time to time.

Just like the visualization/imagination topic, many of the interviewees drew a blank when it came to remembering specific examples of when they looked up images. Interviewee E-D could not think of a time when he used images to help him translate, so, not surprisingly, he was also unable to recall an instance when consulting imagery resulted in mistranslation. Interviewee E-B expressed that he is sure that consulting images has caused him to mistranslate before, but, like Interviewee E-A, he could not think of a specific instance when that happened. As mentioned previously, Interviewee E-D complained more than once about image results being full of celebrities or something famous when the search word is the same as that popular thing, yet he has his own method for dealing with situations where image results are either not helpful or potentially misleading: "I'll just do a dictionary search or find a different means of figuring out what it is. So, sometimes [looking for images] can lead you off-track. But, as long as you have a good head on your shoulders you won't, you know, fall into that trap." Despite having confidence in himself, Interviewee E-D believes that mistakes due to looking up images are entirely possible for him: "I don't remember any instance of finding that I incorrectly translated something, which makes me feel that it possibly has happened. But, I also don't look at images that frequently. I've never connected a mistake to images. You can put it like that. But, that doesn't mean I don't have mistakes. But, I don't know that they connect to the images [though]." His honesty about mistakes reveals just how many potential traps could cause a translator to err, but by being smart, and hopefully being paired with a good editor, translators should be able to produce accurate translations despite

Google Images' inconsistencies.

A few of the interviewees were able to offer their imagery strategies despite being unable to share specific experiences. Interviewee E-D knows he looks up pictures for concrete words, especially if it will help him see an image more clearly, but, in the end, he was only able to explain his strategy and purpose for using imagery: "It's hard for me to say now when I'm not in the middle of translating but there are certain things that I can tell 'Oh, this is something that an image would quickly tell me what it is in a way that reading a definition wouldn't.'" His response is interesting not only because it explains how efficient imagery resources are, as it also implies that consulting imagery may be as natural or unconscious as looking up dictionary definitions. Many translators are constantly searching through dictionaries and other language resources for information concerning the target or source text, so his comment raises the question of *do translators look up images for words automatically or unconsciously?* If this is true, it seems that translators may be consulting images so frequently that they often do not even realize they are doing it.

Just like how a smart reader can realize when an unofficial dictionary has an incorrect definition, inaccurate image search results also do not necessarily lead to incorrect translations; but why weed out inaccurate images if Google can do it for you? For example, by using search settings and search operators, translators can limit what Interviewee C-E calls the "Internet area", as she prefers to look for results in a particular Internet area rather than see all the World Wide Web's results. Despite these advantageous tools, many of the interviewees seem to not be using what she says are Google's "powerful search abilities", which includes a type of "grammar" (search operators) that helps limit the search. As mentioned previously, Google's advanced search allows users to narrow results by categories, such as language, region, last update, safe search, file type, and usage rights in addition to pages with exact words/phrases, any of these words, none of these words, and number range.

On top of this, there are search operators that users can learn to help focus the results. For example, when a user puts quotation marks on both sides of a word or phrase then only web text with these words in the same order will appear. A minus sign (-) before a word tells Google to not include results with that, so searching "football -soccer -rugby" should not deliver anything related to soccer or rugby. As for location, typing in a colon (:) before a country's abbreviation limits the results to websites from that country; therefore, searching "statue:us" will only show statues on web sites from the USA. There is an endless amount of search operators, including many that Google does not attempt to teach users, so learning this "grammar" is a complicated task that requires a serious time investment. Interviewee C-E echoes this when she says that Google's search settings and search operators are a "burden" to learn and that they should be more user-friendly. Overall, Google needs to be more informative about how to use search operators, as this "search grammar" and the assortment of search settings are extremely useful for helping us get accurate/representative images.

Like how jewelry experts do not need fancy technology to decipher the quality of a diamond, a good eye can usually pick out what it needs without any tools. Even though he did not indicate that he uses search operators or adjusts search settings, Interviewee E-A does not worry much about inaccurate images leading to inaccurate translations: "I'm usually pretty careful. I don't know if I've mistranslated because of an image. I can't think of a specific reference. When I get to that point I'm pretty certain that this is the word it's referring to, because I'll go around and find other texts." Interviewee C-E acknowledged that she has discovered her own mistakes before but that she does not think she has mistranslated because of consulting images. Interviewee E-C, on the other hand, is confident that images have caused her to mistranslate, but, because most of her work is group-based, mistakes typically get found out by at least one pair of eyes before the assignment is turned in. Interviewee E-B believes it is not just Google Images that has problems; to him, anything on the Internet needs

to be taken with a grain of salt: "With anything on the Internet, you gotta be careful, unfortunately. [Google Images] is a great resource, but it can be misleading." Despite Google Images' flaws, I find it quite interesting that the interviewees could only remember instances where imagery helped them. But, even though many of the interviewees as well as me are confident that Google Images has caused us to mistranslate, for some reason we cannot remember a time when Google Images led us astray. That being said, working with other people and using good judgment is usually enough to avoid being duped by inaccurate images.

As for why translators cannot recall times where images caused them to mistranslate, the answer may be others see our own faults better than we do. Interviewee C-G argued that editors do not tell us when we have made mistakes, and the frequency translators look up pictures is so high that sometimes they do not even realize they have been looking at images. She also explained that she has not done group work for some time now, as she is finished with her classes, so her mistakes just are not being acknowledged anymore: "Maybe [I have mistranslated], but I can't really think of an example. Because sometimes when you translate something you won't necessarily have someone that'll edit it. So, you may've translated it incorrectly but you won't know it." She then expressed that we look at images and translate what we think is right, but that does not mean imagery will not lead us down the wrong path from time to time: "I think because we're probably doing this (looking up images) too often—looking up images, then translating...things like that. So, you can't remember if you translated it correctly or not." The frequency translators consult imagery and the lack of communication between editors and translators may at least partially explain why we do not remember when imagery led us astray. Yet, this conclusion still fails to answer why we often remember when imagery lent us a helping hand, meaning we still have much more to learn about this aspect.

Google Images is not the only flawed web-based resource, as the Internet is littered with low-quality dictionaries and language tools that often provide incorrect translations/definitions. However, when it comes to text-based resources that offer up inaccurate definitions, we can trace back the mistranslation to them because there is physical evidence (i.e. the word(s)) in the target text. Even good dictionaries can lead us down the wrong path though. For example, in an article about *zisha* (紫砂) pottery, I personally mistranslated 毛料 as "woolen cloth" when it should have been "unfinished ware". The character 毛 can mean "unfinished" in certain contexts, but I was unaware of that at the time. Furthermore, 毛料 had results on Mandarinspot.com and the Ministry of Education's Chinese dictionary, Google Images displayed mostly images of woolen cloth, and even a YouTube pottery video showed the potter rubbing the clay body with something that looked like wool. In situations like this, it is easy to point a finger at a dictionary or text-based resource for being wrong because we used the word(s) it provided us; however, it is harder to know where to put the blame when it comes to images.

When we talk about tools and resources, we usually focus on how they can help us produce better quality work or provide us with certain conveniences, such as being time-saving. However, we often forget that tools and resources are not only unhelpful in certain situations, as they can also create new problems we will have to compensate for. For example, Google Images provides us with great visual resources, which can teach us things that text-based resources will struggle to, but Google Images is also unreliable, meaning it may cause us to mistranslate if we fail to consider information in text-based tools. Even Kussmaul and researchers at the University of Granada are consumed by imagery's positive aspects. Therefore, both research on this topic and translators themselves must be more aware of imagery's potential pitfalls, as these interviews and previous research show that we may be

neglecting the negative aspects of visual resources like Google Images. In other words, an unawareness of our mistakes hints that there are underlying issues we are not seeing yet.

4.2.14 Does Google Images Reign Supreme?

Despite all the interviewees preferring Google Images, I still believe the Chinese-English translation community has people, especially Taiwanese, that break the mold. According to StatsMonkey.com, nearly 31% of people in Taiwan had Yahoo as their primary search engine in 2014. However, Interviewee C-E said that Taiwanese people really do not use Yahoo anymore and that Google is their primary search engine now (Google has 67% of the island's market). Her belief might be tied to factors like her own translation background, education, and age, yet this comment seems to reveal the trend that Taiwanese people are going towards Google and quitting Yahoo. Interviewee C-F serves as a perfect anecdote—for years Yahoo has not been her main search engine, as she now uses Google exclusively. Interviewee C-G offered up a similar response: "Yahoo? Pretty much nobody uses it anymore. Other than Yahoo Dictionary, we'll go and use [Google]…[but] Yahoo Dictionary is the most convenient [online dictionary]. But, it's been a long time since I last used Yahoo to search for something." With Google seemingly growing and Yahoo fading away here, we can assume that Taiwan and the United States (which Google has 72% of the market) will continue to share the commonality of Google being their most common search engine.

Despite Google Images' issues, such as having too many irrelevant images and not always being the most accurate, translators like Interviewee C-H accept its flaws and figure out ways to get around them. He said, "I think I should say that although sometimes the images are probably wrong, but Google has a lot of things so I think you can—let's say one or two images are wrong—if something appears a lot it's probably right. So, although the search results you get might not necessarily be correct, but I still think it's worth trying." Essentially,

when Google shows irrelevant images, all translators need to do is either consider the majority of relevant images or just give up on the image search this time. When asked whether he uses anything else other than Google Images, he replied that he prefers more "immediately available" resources, like the Internet and his Oxford Dictionary, and that he sees going to the library to look for books as being too time-consuming; books are also inconvenient to carry, limited in content, and information retrieval is typically slower than search engines. Except for looking at the pictures on his electronic Oxford Dictionary and the occasional perusal of the paper-based Longman Dictionary, Interviewee C-H exclusively uses Google Images. All the other Interviewees have Google Images as their primary imagery resource, with only Interviewee C-F using paper-based 圖鑑 (illustrated dictionaries) for certain situations. In short, the interviewees understand Google Images' flaws (which will probably be similar to other search engines' issues), but this has not caused them to try a different online resource or pick up a book like they would have to a couple decades ago.

Interviewee C-G exclusively uses Google for her imagery needs, as it has "more resources", but she realizes that across the Taiwan Strait things are very different in China, which uses Baidu as its primary search engine. She asked me "Is there anybody who looks up Chinese with Baidu? Because Baidu is for Simplified Chinese language users, so won't it have more pictures?" It seemed like she assumed I had previously come across other translators who use Baidu when they are looking for Chinese language images. But, I only know a few students from the mainland, and I assume Taiwanese people usually search with traditional characters. In fact, Interviewee C-G rarely uses Baidu because she types with traditional characters. Furthermore, she typically translates into Chinese, so she tends to look up the English source text, making Baidu essentially useless for her. Calling Baidu "mainland China's Google", she raises a good point that, compared to Google, Baidu might have more pictures for Chinese language users, considering the country's population of 1.4 billion people.

Therefore, native and non-native Chinese speakers in Taiwan could very well benefit from searching Baidu with Chinese (especially if they convert the characters into simplified). In short, Mao Zedong's decision to simplify Chinese characters has been a profound change, as even today it influences aspects such as the Chinese publishing market and the Internet's search engines.

Chinese is not the only language that has traditional characters though. Interviewee C-G admitted that she has gotten search results that were in Japanese because she used traditional characters. Their biggest advantage is that they can read classical Chinese and other pre-WWII texts, but Traditional Chinese users will also benefit from accidental Japanese search results if they understand Japan's language and/or culture. However, they suffer from Simplified Chinese having many more modern resources and texts, as Hong Kong, Macau, and Taiwan are the only Chinese-speaking nations that use traditional characters. Whereas Simplified Chinese might have close to a billion users (if not more), Traditional Chinese likely only has tens of millions, so it makes sense that, from books and journals to apps and online resources, simplified users are going to enjoy both quantity and quality. So, not only do traditional users get less image results than simplified users, they also have to deal with a reality that many of their results will be in Japanese, which has Kanji that are the same as Chinese characters. To be clear, Japanese words with traditional characters are called Kyūjita. While much more unlikely than with Japanese, it is possible that a search with traditional characters might bring up Korean results because of Hanja and the historical connection between the Chinese and Korean languages. A common linguistic topic is that romance languages borrow words from each other, but what we seldom discuss is that character languages like Chinese can appropriate, too. Therefore, if we consider the history of the Korean and Japanese languages we will find that Chinese has and continues to influence them in conspicuous and inconspicuous ways, and for this reason we should be prepared to

find that Google's Chinese searches will occasionally produce results in other languages.

But, despite simplified enjoying more resources, Traditional Chinese users who use Google will benefit in some ways due to having a smaller audience. For example, English is the most commonly spoken second language in the world, so image results in English could be from native speakers in all the world's English-speaking areas, including North America, Africa, United Kingdom and Ireland, and New Zealand and Australia, or the billions of non-native speakers from Central and South America to Europe and Asia. Search results done in Traditional Chinese, on the other hand, will probably almost always be from native speakers in Macau, Hong Kong, and Taiwan, which share relatively similar cultures and life styles. Essentially, Chinese is not a commonly spoken second language, so images found online will probably be closely connected to native speakers' culture and life experiences. As for how does this affect native and non-native Chinese translators when they do CE and EC (if they do not filter search settings)? Well, this could be debated at length, but basically those who search for Chinese will get more focused results, whereas English will offer greater diversity.

Smaller language communities that use Google may enjoy image results that are closer tied to their culture and life experiences, but a lack of variety or quantity in one language can make translation harder. Interviewee C-G explains, "[W]ith some Chinese words, they have a lot fewer images. There are more images for English—it's quite obvious." She made an example by comparing the most common religious building for each culture; basically, there will be fewer images of temples (Chinese) than there will be of churches (English). We came to an agreement that English will have more images than Chinese (at least Traditional Chinese), but while I felt that this makes CE more challenging, she had never thought about which language direction is more difficult due to fewer resources. If we exclude the role of consulting imagery, in Taiwan there is constant debate over whether CE or EC translation is

harder. Basically, people base their arguments on aspects such as language differences, the pay rate disparity (CE is usually better paying), volume (there are many more EC cases), and non-native English speakers often edit CE cases. The most important question for this study though is does the reality of fewer Chinese language resources (e.g. dictionaries, language education platforms and learning materials, and corpora) make it harder when you are translating into English and thus need to understand the Chinese source text or is it more difficult when translating into Chinese because you cannot find equivalents for the target text? For CE and EC translators that use Traditional Chinese on Google, they will have to consider the above situation.

The above debate is further complicated when we add in imagery as a language resource. For example, if I am trying to do a CE translation about church architecture, will I struggle to find which of the many English church equivalents matches the source text? Or, would it be more difficult to do an EC translation of the same topic because finding a Chinese equivalent will be a needle-in-a-haystack search? A more common CE case would be translating content about temples into English; so, would the lack of English language resources, including images, make it harder to produce an appropriate equivalent than if it were an EC translation? Unfortunately, these kinds of questions need real quantitative experiments that do not exist at the moment, so the best thing we can do until we have numbers to calculate is to discuss our opinions in detail. My belief is that if we are trying to make the quantity of images similar for Chinese and English, we will have to consider using Google for English and Baidu for Chinese.

Interviewee C-G's comments about Baidu awakened me to the reality that just because Google seems to be the most popular choice worldwide does not mean it is always the most dominant search engine in every country. Compared to Google's 73.02%, Baidu only occupies 8.74% of the world's market share. The search engine Bing takes second place with

9.26% and Yahoo earns fourth with 7.07%—search engines that took fifth place or lower had less than 0.30% of the market ("Desktop Search Engine Market Share", 2016). It may seem like it is nothing compared to the mighty Google, but Baidu is a mainland Chinese search engine designed for Simplified Chinese and the People's Republic of China censorship. This explains why it still claims about 54% of the mainland's market share despite the rise of Qihoo 360, which was just launched in 2012 and now has around 30% ("Search Marketing in China: The Rise of so.com", 2016). Sogou is said to have above 10% of the market share, whereas Google China, once dominant until it left China and took its offices to Hong Kong due to its unwillingness to continue to cooperate with censorship, is barely hanging on. Google only plays a minor role in many other countries, including South Korea, as Naver controls 77%, Daum has 20%, and Google is nowhere to be found. As for Russia, Yandex enjoys 58% while Google manages a mere 34%. Even on its home soil in the United States, Google (72%) is getting slowly nibbled away by a rising Bing (21%) ("2015 Search Engine Market Share By Country", 2016). Essentially, we cannot assume that Google will get us numerous results in every country nor can we presume that it will always be king of the search engines, as newer search engines are rising in popularity.

Ethics certainly play a role, too. In 2016, Google was accused of fiddling with its search functions to ensure it provided only positive results for its preferred Democratic presidential candidate, Hillary Clinton. Accusations were made that this was done in order to help Clinton acquire the Democratic nomination as well as win the presidency. It seems much has changed in six years; as mentioned above, Google pulled out of China, which would cause it to lose essentially all available users in the world's largest market, because it wanted to be a moral-driven company. Baidu may have blood on its hands as well, as it works seamlessly with the Chinese government and all its censorship restrictions and regulations. The ethics of a search engine are important for translators that need to see representative

images. Ideally, users should be provided with unfiltered/uncensored material, although all search engines should block out images for things like child pornography and classified information. Therefore, if someone uses Baidu to search for pictures of Mao Zedong, he/she should probably get to see pictures of violence and suppression in addition to him standing like a hero in front of a Chinese flag or looking studious as he reads on his bed. When we search for images online, we usually are seeking to see how native speakers of that culture see that word—not how the government wants to portray its country and citizens.

Therefore, if in the future there are tools/resources that utilize search engine results or combine the results of different search engines, it would seem that whether a search engine is ethical or not should be taken into consideration. However, Baidu and other mainland search engines provide Simplified Chinese users with the most abundant and diverse images, so we need to recognize the reality that censorship will affect how Chinese citizens perceive the world. Furthermore, when we use Baidu the Chinese government's censorship is also shaping how we see China. Just like how a culture will heavily influence the kind of image results we will or will not find, a government that seeks to control search engines will also have a big impact on what images users will have access to. Unfortunately, there is little we can do to wrestle away government control over search engines, so all we can do is be aware of how a search engine is controlled by its government and/or company.

Their interviews were conducted before the Hillary Clinton Google Search scandal, so I could not ask the native English-speaking interviewees if this situation would cause them to stop using Google Images as their main search engine. As mentioned previously, the native English speakers were all web-based and set on Google Images. Interviewee E-B had actually never seen a picture/visual dictionary until I showed him two dictionaries I have used sporadically: *Everyday Chinese-English Picture Dictionary* (2014) and *Mandarin Chinese-English Bilingual Visual Dictionary* (2008), and Interviewee E-D did not even think

there was anything other than Google Images for consulting imagery: "I just look up Google Images. Are there any other resources?" After I explained some other tools to him, he announced his interest in Spinfold.com, which has an image for every definition, and he was especially intrigued by how Shahi-The Visual Dictionary provides definitions and online images side-by-side. Essentially, Shahi combines dictionaries with Google Images, making it highly convenient. The interviewees never really acknowledged trying out other search engines or visual resources before settling on Google, hinting that web sites like Spinfold.com and Shahi need to market themselves better if they are going to be become major tools, like Wikipedia. In short, the native English-speaking interviewees seemed interested in more powerful tools, yet they never expressed that they would occasionally search for something better.

Even in Taiwan, which has a healthier publishing market than the USA, paper-based tools struggle against the Internet's power. In today's world, paper-based resources seem to be only competitive in a niche market, so even if they are more accurate than resources like Google Images, they will still not be able to compete on factors like speed, quantity, and convenience. Compared to Google Images, even the best paper-based resources will be at a disadvantage when it comes to the smallest details. After flipping through the *Everyday Chinese-English Picture Dictionary*, Interviewee C-G responded by saying she used books like that as a child but now illustrated dictionaries and even 圖鑑 (illustrated encyclopedias) are not very useful for the complex texts she is translating: "When I look up things now, it is usually more [complicated] than what this book can give me. So, I've never given consideration to using a paper book before." She provided an example of how she usually needs to look up very specific things, like a part on a *qipao* (旗袍, sometimes called cheongsam). Unless it is an illustrated encyclopedia about *qipao* or Chinese dresses, you probably will not find anything that goes into enough detail, so platforms like Google Images

are the only available problem solver. Interviewee C-G was quite surprised when I told her one of her classmates uses 圖鑑 (illustrated encyclopedias), implying that she thought those kinds of books are targeted towards younger readers and non-native speakers. Overall, many of the interviewees' comments revealed the unfortunate state of books—there are excellent paper-based resources that have been carefully crafted by experts, yet the power and speed of search engines seems to be insurmountable.

Despite our exclusive use of Google Images, the irony of the situation is that we might not even understand the resource we often swear by. For instance, Interviewee E-D explained his belief about where pictures on Google Images come from:

> Also, I don't know if you knew this, but I'm pretty sure Google Images get their images by people that play this game where they shoot images at you. And the first thing that comes to mind—you type it in. So, it's gonna source from people from all over. You should look into that, actually. Just to double check the facts on that.
>
> So, I think there's like a game where you...you know, when you search something, why do those images come up? Because people like playing this game where it's fun—the image comes and you type in like "cat" or whatever the first thought is and then the system will store that information. So that the image will come up when anyone checks.

I did double check the facts and found his explanation to be slightly outdated. Unfortunately, the most official source on this issue was the article "Knowing Google Images Basics", which comes from a book entitled *Building Research Tools with Google For Dummies* (2005). It is hard to believe that, during this 11-year gap, Google Images has gone from "the context of an image determine[s] the image's relevance in your search results" to a fun game. But, a lot has changed since 2005—if we consider that the first iPhone came out in 2007. Many of the interviewees seemed unaware that Google Images cannot analyze images, photographs, or

pictures on web pages, so the words you search for determine what images you get. Essentially, the results for a single image are based on the image's caption, the text around the image, and the image's "alt HTML parameter". The file names of images are surprisingly not considered. The negative aspect of this search criteria is that images without any text will not get retrieved, and images with clear file names, such as greatwallofchina.jpg, will sometimes not come up either. It is unreasonable to expect Google Images' users to understand how an image search works, yet this knowledge will prove helpful for building translation tools and translators themselves can search in ways more suited to the criteria mentioned above.

Interviewee E-D seemed to be talking about Google Image Labeler, a video game created by Google that was available from 2006-2011. A user would get matched with a partner, and then there would be a time limit while both players would type in descriptive words for the images they saw. Essentially, if you saw a basketball, you should write "basketball" in the box. Scores were tallied and the game was well-liked, but, unfortunately, it is no longer available. The game seemed to be a good way to get around Google Images' limitation of only being able to search for pictures via text, as Google could use the game's statistics to make sure keywords matched with the correct images. The game had its issues though, including criticism about its programming and playability. Furthermore, there were many instances where users were intentionally responding with wrong answers and many felt it was unfair that players were not rewarded with much, whereas Google Images got a whole bunch of free data. It has been 5 years since the game was taken offline, and all signs in web-based articles, such as "Addictive Google Image Labeler Game Gone" (2012) by Barry Schwartz, point to the fact that Google Images used the information learned from the game but never relied on it exclusively for developing its image retrieval system. Translation tools could use the game as inspiration though, because, currently, technology cannot analyze imagery to the point where it knows that, for example, a picture of an airplane is an airplane.

So, instead of being forced to rely on text helping us find images, maybe we can develop tools that are accurate because they trust the human eye.

Despite its glaring flaws, it seems that *not* using Google Images, or other search engines, is quite strange. The most representative response concerning Google Images was when Interviewee E-D expressed his surprise after I mentioned that one translator I know refuses to look up imagery because she questions the accuracy of image results. He asks, "Do you think it's possible that she just didn't remember looking up images or was that person very strong [in her opinion]?" This comment hints that despite there being little research and instruction that focuses on using imagery or visualization while translating, translators are actually surprised if others in their field are limiting themselves to just text-based resources. While I cannot recall any specific moments of talking to other translators about using imagery before I started this thesis, I do remember there being discussion about what resources we should have in our "toolbox", such as should we use Google Translate, what dictionaries are better, and how to utilize corpora. In fact, I always assumed that some translators rarely looked up imagery, yet the eight interviewees all seemed to be consulting it quite frequently. These interviewees proved to me that translators know they are using imagery, but the fact that the translation community is not talking about this topic reveals there is a disconnect between teaching and the trade itself. So, having translators talk about their experiences, strategies, and resources they use that involve imagery is just the start, as there is a lot of work that needs to be done on education, research, and resources.

I am similar to the interviewees in that I, too, almost exclusively use Google Images, but I would gladly incorporate other resources if they were as convenient and could pull up an endless amount of images in seconds like Google can. Overall, based on my own experiences and the interviewees' responses, the convenience, quantity of images, and speed of search engines like Google Images make it seem clear that online-based imagery tools will continue

to reign supreme. Therefore, the emphasis should not be about promoting good paper-based imagery resources but figuring out ways to improve and invent Internet-based visual tools. Overall, Google getting replaced seems unlikely at the moment, yet it is entirely possible that in the future users will turn to something different. But, maybe instead of worrying about which search engine is best now or what search engine(s) is most suited for Chinese-English translators, we should be focused on improving search engines and combining resources so that we are able to find more accurate and helpful images.

4.2.15 Building a Perfect Imagery Tool/Resource

The main problem with Google Images and other search engines is that they do not have filters like dictionaries, databases, and corpora do; this deficiency was brought up by many of the interviewees. Both Interviewees E-A and E-B mentioned the issue of the lack of a "filter", and, not surprisingly, their upgrades for Google Images centered around making its imagery more reflective of the word searched for. Interviewee E-A does not have a specific invention in mind, yet he does have a few areas where he sees potential improvements:

> I don't think I've ever really thought of it because I just go to Google and then I hit images on Google. But, you always think "It would be nice if there were something that you put that phrase in there and this specific image, the proper image, would come up." Or, you'd have a high level of certainty that this is, in fact, related to what I typed into that [search box]. So, something that's not as time-consuming. Easy to use just like the online dictionaries. You just plug in the word and images pop up. And, it's nice to have…maybe different perspectives—maybe different options, because…in different contexts there might be a different image that would fit better.

Interviewee E-A's points on different perspectives and options would make the filter more difficult to design, yet it would also allow it to be more multi-dimensional, as being able to

select different options would certainly help translators find images that help them zero in on a word's meaning in a specific context. What those options would be is up for debate (e.g. country, region, dialect, era, etc.), but creating a filter with multiple options does seem ideal. However, this complexity explains why Interviewee E-C does not imagine a filter being possible because "There's just so much stuff out there" in the Information Age. After mentioning her satisfaction with what is currently available, she did express that she wished the website WordReference.com would have an images option (but mostly she just wants there to be more educational material that would teach Chinese and its culture to foreigners). Interviewee E-C's acceptance of the status quo may reveal that imagery tools will improve slowly because there is not much of a market for them, yet the other interviewees' improvement suggestions hint that ever-improving technology should eventually be able to get them what they want some day in the future.

Interviewee C-H's proposals for a better imagery resource of the future were also based on Google Image's weaknesses. After saying "Now, if you're talking about weaknesses [of Google Images]. I don't think there are any. I think most of its elements are strengths. When it comes to disadvantages, I think it's ok," he started to focus on how much time he spends trying to find representative pictures: "I think sometimes, like I just said, when we get a lot of image results, we need to determine which ones we want and don't want. When we're deciding which ones to consider we'll spend a good amount of time doing it." When a deadline is pressing, translators are often unable to spend the time necessary to thoroughly look at images and vet which ones are appropriate and which ones are not. Despite this issue, Interviewee C-H never really tried to imagine a completely new resource or tool, as he cares more about improving what we have now. He largely saw current resources as being satisfactory, so his suggestions for improvement involve better organization and combining resources: "So, I think the main point is how can we more effectively, using more efficient

ways, utilize these resources? I think right now we already have a great variety of resources."

One of his specific proposals was finding a way to organize fruits and vegetables by themes:

"Maybe there could be a theme, like fruits for example. There would be all different types of

fruits and vegetables with their English name and a picture. They would all be put together

[on the same page]. That would make it more convenient for us when we're looking up [fruits

and vegetables]." Creating categories of things and then putting them on the "same web page"

would surely make the imagery look-up process more effective and efficient. Overall, the

Internet is full of different resources, but rarely are these resources merged together in a

helpful manner. Tools like Shahi, which combines dictionary definitions and Internet pictures,

prove how useful resources are when they are put together. Unfortunately, these interviews

proved that currently available tools like Shahi do not have much exposure, so their

capabilities are not getting taken advantage of.

A major issue of filters is that they can limit the results too much. During her

university days, Interviewee C-F had a linguistics professor that suggested to his students that

they use Google Images or Merriam-Webster's Visual Dictionary Online to look up things

they did not understand rather than always just using a dictionary. This lesson ended up

becoming a habit for her, as she now regularly consults images. Furthermore, one of her

current translation goals is to use Merriam-Webster's Visual Dictionary Online more

frequently. As mentioned above and below, the main problem that visual dictionaries have is

that they typically only show one image per word. Unfortunately, on top of only being able to

provide words already in the dictionary's database (Google Images, on the other hand, almost

always produces a heap of pictures for any word), Interviewee C-F stated that the visual

dictionary's images are often not all that useful as well: "But, when you look at [the images],

they don't really do much for you." One personal example I have is looking at an image on

Merriam-Webster's Visual Dictionary Online of a shin guard for soccer players; the image's

angle and overall quality made it very hard to see that there was a shin guard underneath the long sock. Furthermore, there are many different types of shin guards, ranging from small to large and ones with a connected ankle pad and those without. In the online visual dictionaries I tried out, users have to click the sports tab and then the soccer tab just to see a shin guard, which is a lot slower than doing a quick Google Images search. Furthermore, Google will produce a horde of images at the click of the mouse, and these image results will show the user a great variety of shin guards. So, if I could only use images to teach someone who does not know much about soccer what a shin guard is, I would still choose Google Images over online visual dictionaries because, despite Google Images pulling up some irrelevant pictures, a variety of images will teach this person more than a single unclear image on a filtered dictionary. In short, an ideal filter should not be a limitation but an enhancement.

Some imagery research focuses on whether imagery moves (i.e. videos) or is still (i.e. pictures), however I never considered the 2D vs. 3D debate until Interviewee C-H brought it up. He explains, "This [Oxford Dictionary] only has 2D, and I think that 2D is still very useful, but if it had 3D it'd be even better." He went on to talk about 3D images and motion imagery in detail:

> I think it's not that I dislike them, but let's just say I wish that in today's world dictionaries had 3D capabilities. Just like you said with "squeeze"—that movement. I think that would make it even better. It's not that I dislike [current resources], I just wish that maybe they could have even more [capabilities/options].

Being able to view the depth of an object would certainly help in certain aspects, such as understanding a vehicle's motor or the body shape of a bear. Seeing motion is also beneficial, as, compared to static images, having the capability to distinguish between movements for similar words (particularly verbs) like "squeeze" and "crush" would aid users in grasping minor yet important differences. That being said, the interviewees and I tend to use static

imagery, which explains why the topic of movement did not come up much in the interviews. As for 3D, despite the recent rise of technology like virtual reality headsets, 3D imagery is still hard to find, so tools like Google Images and visual dictionaries need to figure out how to employ 3D images. A lot of research has proven that motion imagery is extremely helpful for learning (and even more beneficial than static imagery in many cases), yet the role of 3D seems less explored, so it is about time that the translation world starts looking into it.

While the printing press made books accessible for the commoners many centuries ago, technology, unfortunately, is steadily causing it to become an invention of the past. Considering this bleak outlook, it is easy to understand why the interviewees did not offer much for paper-based possibilities. Even the following response by Interviewee C-H was probably more due to me showing him my illustrated dictionary than something he imagined: "[O]r, maybe a dictionary publisher could have certain illustrated dictionaries [that organize similar categories]. You just mentioned illustrated dictionaries...maybe they could [make the situation better]." He did express that he liked the illustrated dictionary I use, although he and Interviewee C-G criticized the quality of the drawings, which, in all honesty, are not very realistic and probably less helpful than real life pictures. Interviewee C-H pretty much exclusively uses Google Images and the electronic Oxford Dictionary, so it is very possible that he would not even purchase his own paper-based invention. Interviewee C-F expressed that she likes utilizing paper-based resources, but all the other translators seem to only be using online resources. In short, if one out of eight people buy paper-based tools, then they still have an enormous market, yet with all eight translators using online resources it seems like the biggest profits and potential awaits on the World Wide Web.

On top of making many suggestions, Interviewee E-B also has a grand invention in mind: "I know this is going to sound bad, but if we could have a Wikipedia of Images…I feel like we could trust Wikipedia at this point." During the interview, he reminded me of how

years ago Wikipedia was more susceptible to users intentionally or unintentionally inserting incorrect information, but fast forward to today and the enormous platform, through different mechanisms and methods, is highly adept at preventing inaccurate content from appearing on pages. My fiancée actually suggested a Wikipedia of Images during a practice interview for this thesis and Interviewee E-C frequently uses Wikipedia for its imagery, so a Wikipedia of Images does seem like it could have large-scale interest in the translation community. But, the problem is that this resource would probably need more than just translators if it is going to survive. Interviewee E-B understands how translation is connected to fields like foreign language education, expressing that imagery is helpful for language learning in general and that his girlfriend, a Chinese teacher, uses imagery during instruction. Therefore, a Wikipedia of Images would likely have more than enough users if it is capable of providing useful visual information for a variety of aspects, such as languages, cultures, concepts, and physical objects.

Many translators use corpora, so it is hardly surprising that a couple of the interviewees thought about incorporating imagery into a corpus. Interviewee E-D gave a broad outline of his brain child: "…making a corpus of imagery would be really cool; with the intention of being used for translation. So, Chinese words that just have all images that go with it. And, the same thing for English." He admitted that, despite its usefulness, this would be a huge project. Interviewee C-E had not heard of a visual corpus before, yet she likes this resource too, as she wants to see imagery and text together. She also realizes how big of an effort it would take to make a visual corpus though, so she will not be building one any time soon: "I'm not as proactive as you—I don't want to develop a corpus. I'm just waiting for someone else to make it for me." Her point may explain why no one has made a visual corpus yet—it is a big project that does not seem to offer enough of a reward to whoever produces it. Essentially, Wikipedia relies on effective donation campaigns and corpora are often

connected to universities so they have access to considerable funding. Therefore, a resource that provides imagery or text and imagery together will need to get money from somewhere in order to remain viable.

Many people will not be optimistic about user figures for a Wikipedia of Images or a visual corpus though. Interviewee C-G had never thought about improving Google Images until I asked her, but once she had some time to reflect on it she came up with some creative ideas as well as an honest assessment that a superior Chinese-English imagery tool would simply not have enough users to make it viable:

> I think if there was something like a dictionary where you could also get accurate image results—I think that'd be great. But, because it'd require too much, so you wouldn't be able to make it, as there is too much [quantity] and there won't be many users. Because, maybe only translators will need to look up images like that. Maybe, when students are doing a class presentation they'll use it to look for pictures, too. If there were people to supervise it, that'd be better [though].

There are tools out there right now that feature some of the qualities mentioned above, yet nothing currently is very close to meeting every one of her requirements. This thesis often mentions the visual dictionary Shahi, which provides dictionary definitions as well as images from Yahoo!, Flickr, and Google. However, there is no image filter nor is it able to produce Chinese definitions. Shahi was copyrighted in 2006, and a decade later there is nothing that currently provides Chinese and English together. While Shahi is a great tool that shows the power of resources that combine both text and imagery, it is clear that Chinese-English translators are far away from being able to enjoy a single resource that meets all their text and imagery needs. Furthermore, even if a Chinese-English imagery-text resource is created, there still is the issue of a filter, which is typically quite costly. For example, Wikipedia is mostly

user-run, but there is a salaried team that serves as a filter when users cannot create an accurate page. In short, the current outlook for the perfect imagery-text tool is pretty bleak.

The theme of tools combining text and imagery was prevalent during these interviews. Interviewee C-F at first could not think of anything that would improve current tools and resources, as she felt it would be a very difficult challenge and she questioned if people would know how to use a (self-run) filter for image searches. Despite this pessimism, she said, "The perfect dictionary of my dreams would have text and images," and she also wants *multiple* images per word, not just one picture per term like you see in current visual dictionaries. She went on to describe a more useful version of *Google*—the book that replaces each word in the English language with one picture: "I once thought up something—every time I look something up in a dictionary, almost always there's no picture. I feel it's kind of meaningless because there's no picture. So, can there be a dictionary that shows a big bunch of pictures?" Most dictionaries for adults only have text, whereas children's dictionaries tend to include pictures for some words (but at most they have one picture per word). So, it seems that what she is looking for would have useful text definitions/descriptions alongside a host of images that help you see a single word from different perspectives and angles.

According to Interviewee C-F, businesspeople may have already figured out her ideal tool. She explained that online clothing catalogues are a convenient way to look up clothes, as they often show multiple images per item so users can see the product from different angles (please see Sample Images section). Therefore, rather than looking up clothes on Google Images, she will often go to clothing web sites in English and Chinese to see the shapes of clothes (e.g. the shape of jackets with shoulder pads) as well as their materials. These sites' images and textual descriptions are apparently clearer than Google Images, explaining why these platforms help her both translate and get rid of her savings: "They're very descriptive about their products, and they'll introduce the product's material, [like] what kind of seams it

has. I think that sometimes this can make it very convenient [to translate]. But, sometimes it's also just an excuse to look at a web site with sales." Essentially, Interviewee C-F's ideal tool is a mixture of many things—it could further improve a good resource we already have (dictionaries) and it involves the cash-savvy business world. A visual dictionary built by academics may be good, but it could also struggle financially and be disconnected from what the real world needs. Therefore, maybe the best way to form a perfect tool that combines imagery and text is to incorporate concepts and strategies that are more practical in nature.

Overall, current imagery tools are not lacking or inadequate, yet there still are many improvements that can be made. The most obvious flaw of search engines, like Google Images, is the lack of a filter, slowing down translators because they have to scan a large quantity of pictures to ensure that they are not being misled by unrepresentative images. On the other side of this spectrum is visual dictionaries, which have filters that limit each term to one picture but this is often not enough to get a full understanding of a word. As said before, a dictionary provides multiple definitions, example sentences, and other helpful information that allow readers to understand a term's full range of meaning, so why should users be limited to one picture per word? Other adjustments include having motion imagery and 3D imagery as well as providing pictures and text together for overall comprehension purposes. Most of the interviewees focused on improving current tools, yet there were two original inventions: a Wikipedia of Images and visual corpora. Currently, there are audio-visual corpora that typically focus on speech perception (i.e. how the mouth and other facial parts move when speaking), but the above two imagery tool ideas are still relatively revolutionary. This newness means they will require a lot of time to develop and once they are launched funding will be needed to sustain them. Essentially, the reason these tools do not exist yet probably has nothing to do with the world lacking creativity—it likely all comes down to money. Therefore, if tools like visual corpora are going to be created, then they need to rely

on donations, funding from a university, or be profitable so that the business world will see a reason to run them. In summary, these interviews showed that the world has ideas for building new language tools, but there is a big difference between thinking up tools and actually creating them.

4.3   Overview of Interview Results

The translation studies community enjoys a great amount of text-focused research, including articles that compare regular texts with translated texts, translation error(s), translation speed, and translation strategies. However, after conducting these interviews I was pleasantly surprised to find that the scarcity of research and educational materials that involve imagery and/or visualization is not reflective of how frequently translators utilize imagery and visualization. Therefore, the question is no longer *are translators consulting imagery and using visualization tactics?* Instead, we must ask how can we improve translation research, education, and tools so that translators will be able to more effectively employ tactics that involve imagery and/or visualization? An even more important question though is *how can we improve current tools or create new tools so that looking up imagery is a quicker, more consistent, and more accurate endeavor?* The interview results show we still have a long way to go.

Of course, there is an abundant amount of research that explains various strategies and methods for reproducing imagery in the target text, yet the meaning of "imagery" in these articles is typically the visual content a reader imagines when he/she sees a word. Furthermore, imagery often refers to words that involve the senses (i.e. sight, hearing, touch, smell, and taste); "Accompanied by *chirping* blue jays, the sky was decorated with *white clouds* that looked like *fluffy pillows* and a *crisp breeze* that *tickled* the nostrils" is thus a highly imagistic sentence. A good example of the type of research mentioned above is

Kazakova's appropriately titled "Imagery in Translation" (2003), which mostly focuses on translating canonized works of English literature (poetry, prose, drama, and folklore) into Russian. While this article features a great variety of informative content, it unfortunately never mentions looking up imagery or using visualization as translation strategies. This begs the question of *how can we reproduce imagery in the target text if we do not first consult imagery or imagine the visual content in the source text?* Of course, translators are using their imaginations or employing visualization techniques, but the problem is we are only discussing imagery at the textual level; for example, we are deliberating about how to translate "teal" into another language instead of first determining the actual color and tint of teal in both languages. Essentially, we are not talking about imagery all by itself.

The following statement by the Russian academic may reveal the translation community's lack of attention towards consulting imagery and visualizing textual content:

> Here we come across a difference in the ways and principles of manifesting a piece of the world in words. A literary picture of the world may reside hidden but quite well known quotations from famous theatrical, literary, political or religious sources that, even if familiar and recognizable to the translator, the child of two attires, will require commentary or other guidance to be perused by the foreign reader. (Kazakova, p. 18)

Kazakova's points about adding commentary or "guidance" to help the foreign reader are important and connect indirectly to this study's argument that imagery and visualization aid in source text and target text comprehension. But, Kazakova's "literary picture of the world" still seems too text-focused and not like the real world we see with our eyes every day. Academic papers like this are undoubtedly important to the field, but by being too text-centric we are probably neglecting just how much of a role imagery, visualization, and many other non-textual elements play in translation. Producing equivalent imagery with words in the target text is important, but so is understanding how imagery and visualization can aid us in

source text comprehension and target text production. Because by consulting imagery when we are translating, we can both better understand the imagery of the source text and then have a better grasp of the imagery behind the words we write in the target text.

Therefore, based on this thesis's interview content, it seems like we, as a translation community, need to be focusing on image-based tools and resources as well as teaching methods that instruct students when and how to consult imagery and employ visualization tactics. Although the interviewees did not express that they need or even want to be taught how to use images or visualization tactics, they did mention that they are using tools and resources to look up imagery, even though these tools have significant flaws. Therefore, it seems like the priority for imagery and visualization in translation should be improving available resources and inventing new tools, but maybe we can also find ways to teach translators how to use current tools more effectively.

This is the digital age and seven of the eight interviewees did not go against this trend, as they only utilize Google Images. While not surprising, this exclusive use of an Internet-based image search engine reveals that even highly effective paper-based imagery resources probably do not stand much of a chance. I believe that the two visual dictionaries I use are of great quality, because they provide helpful images for a diverse variety of words, but the drawbacks of print-based visual dictionaries like these are that they cannot compete with the speed, quantity, and convenience of online tools like Google Images. Google Images does not need to be carried around like physical dictionaries do and at the click of a mouse an unlimited amount of images pop up. Furthermore, print-based visual dictionaries almost always only have one image per word and it takes time to find the word the user is looking for anyways. Therefore, it seems like if we are going to improve imagery resources, we should set our sights on online-based tools.

The most notable point from the interviewees was about issues concerning image searches pulling up unrepresentative or inaccurate images. A major problem with misleading image results is that they can lead to mistranslation, but most of this study's translators were pretty confident that mistakes were very infrequent, as they are willing to take the time necessary to zero in on representative imagery. The other problematic aspect is that unrepresentative/inaccurate imagery can make looking for imagery a time-consuming endeavor. Essentially, needing to comb through so many images in order to find the representative one(s) also reflects the lack of trust translators have in image searches. So, if tools like Google Images were to be more accurate so that they only pull up representative images, this would ensure that translators would not have to waste time scrolling up and down for accurate images. Consulting imagery could be just as fast or even faster than looking up a word in an online dictionary. In short, time-wasting and a lack of trust seem to be why looking up imagery was considered a secondary resource by many of the interviewees, meaning that search engines need to find a way to fix their filters so that only representative images pop up.

Creating a filter that ensures only relevant images appear is easier to talk about but much harder to bring to fruition. Visual corpora could have an effective filter, yet there are drawbacks as well. In order to weed out irrelevant images, a qualified team of well-funded language experts and Internet engineers could come up with some type of method(s) that combines human labor with artificial intelligence. Furthermore, costs can be driven down by making it mostly user-run like Wikipedia, which relies on users to write and edit content. But, the obvious drawback is the amount of money that would be needed to make the engine run. If it is not supported by funding or donations, like Wikipedia, membership costs could result in the majority of translators being uninterested in it; essentially, only translators who are able and willing to spend their own money and translators at institutions that subscribe to the

visual corpus would be able to utilize it. The second big drawback is who is qualified to be on the visual corpus team and who gets to pick this team? Overall, Interviewee E-B's insecurity of his idea for a "Wikipedia of Images" seems to hint that he knows just how big of an effort it would take to get a visual corpus off the ground.

While Google Images and other image search engines do not carry the prestige that monolingual and multilingual databases and corpora enjoy, the Lee and Liao 2011 study "A Comparative Study of Human Translation and Machine Translation with Post-editing" uses machine translations by Google Translate, which according to the authors is an award-winning machine translation tool. In a fashion somewhat similar to corpora, Google Translate's system instantly scans an incredible amount of text in both languages in order to find equivalent translations. So, what if Google Images could implement a similar system to find relevant images for words that are put into the search box? Like Wikipedia, Google Translate is also free. These two tools have shown their incredible value, and their availability is something any future imagery resource should consider.

Imagery and visualization is starting to finally get the attention it deserves, as translation scholars like Kussmaul and the team at the University of Granada are pushing out important research. But, there are still many questions that must be answered and tools that need to be developed, so this thesis is only a start to understanding how translators are using imagery and visualization. What we do know is that the interviewees mostly look up imagery to better understand physical/concrete objects, they all use Google Images and consider it to be a secondary resource, and overall imagery has been very helpful to them—in fact, they cannot remember when it ever led them astray. Most importantly, the interview results show that translators are using imagery in a much more complex fashion than just to check what something looks like in their non-native language, as they consult imagery for both the source text and target text, regardless of whether they are translating into their first or second

language. They also have their own opinions for how and when to use imagery as well as which situations they will not turn to visual information for help. Although it does not look like these translators are being taught much, if at all, about consulting imagery, it seems that they have used imagery so frequently that they have, perhaps unconsciously, developed strategies for how to use it.

A master's thesis, however, cannot provide enough experiences and opinions to speak for the entire global translation community, let alone all Chinese-English translators. Therefore, research from different countries and language communities is exactly what this area of research needs. There is no specific direction the translation community has to go towards in the area of imagery and visualization though, because there is so much work to do that can be either qualitative or quantitative in nature. The key word here is more: more research, more voices, more experiences, more tools, and more images.
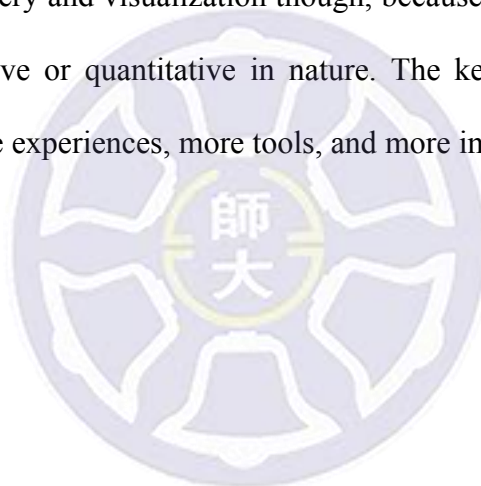
Chapter 5   Conclusion

5.1   Summary of Findings and Implications

This study's strength surely is the quantity of, relatively unbiased, qualitative information that it offers. Furthermore, I have yet to find a study that interviews translators about how they use imagery and visualization. Research by Kussmaul and the team at the University of Granada has been mostly qualitative in addition to describing potential quantitative experiments. Yet, what they do not have is qualitative information that comes directly from the mouths of translators, as their research tends to be the author sharing his/her own experiences. Furthermore, in their articles, experiences tied to group work are talked about, but this study differs, because it interviews how translators see imagery and visualization rather than speaking for them through the biased perspective of the author. Essentially, imagery and visualization translation researchers, for the most part, may be focused on how translators use imagery/visualization, but never do they ask a group of translators to discuss their opinions, strategies, and experiences in detail. Therefore, this study may only have eight interviewees, yet the amount of space given to quoting the interviewees and interpreting their responses provides a solid foundation for this topic's future research.

Many academic experts believe that quantitative research is superior to qualitative research, but quantitative research arguably cannot begin until there are qualitative results that point to certain trends or phenomena. Kussmaul has mentioned the need for quantitative research for the role of visualization/imagery in translation, and this thesis surely gives future quantitative researchers more information to ponder before they finalize their research plans. In short, this thesis needed to be qualitative in nature because there was not enough available literature to base a quantitative study on.

One of this study's major advantages is that it focuses on imagery and visualization in a more holistic fashion, as it explores aspects such as why imagery is put into text, the purposes behind images, and how translators use imagery and visualization. This allows us to see how translators have to be more aware when they consult imagery. For example, a photograph that shows abandoned houses in Detroit, Michigan should not be seen as simply a representative photo of the city, because this picture may have been taken by a news channel to attract interest or maybe it is a photo of a group frustrated with Detroit's plight. However, a walk around the downtown area can provide visitors with many positive images: a bustling day market, sports stadiums, fancy hotels, and intriguing tourism spots. A couple years ago, a western news company showed the negative side of Detroit, and Taiwanese people, who had never visited this city, ended up seeing it in a negative light. But, a report about Detroit's positive aspects and post-transformation potential would cause Taiwanese society to react in a completely different way. This is why translators should consider the sources and purposes of images they look up, because most things are biased and bias can skew their perspectives. Literary translation often deals with interpreting what the author meant when he/she wrote a certain part of the work, and the same situation is true for images/pictures. Therefore, if translators look up images of the source text and/or target text, then they should, just like they do with textual content, consider the source's viewpoint and motivation.

The most original aspect of this study is quite simply the interviews. Learning the opinions, strategies, and experiences of young translators who are still trying out new (Internet-based) tools is arguably quite useful. Because of these interviews, I have learned that these translators use imagery to familiarize themselves with concrete objects yet they tend to see abstract images as not being advantageous, although research has shown that abstract imagery may still be somewhat helpful (see David (1998)). I expected that these translators would look up imagery in order to familiarize themselves with foreign cultures, but I never

considered that they would frequently use imagery to learn more about their own culture as well. Furthermore, I did not anticipate that imagery would be utilized more as a "language checker", as imagery is seen as a secondary tool compared to text-based resources. Overall, I originally thought translators, just like me, would mostly look up imagery of their second language in order to get a better understanding of the source text, but after the interviews I came to realize that, in addition to the above information, they even have established rules or strategies for when and how they use imagery. In short, the ways the interviewees view and utilize imagery is much more complicated than I previously imagined. All of this information will prove very helpful for future imagery tools and research as well as education that involves imagery and visualization techniques.

5.2   Research Limitations

Unfortunately, this study's major limitation is its lack of quantitative data. Imagery is typically seen as something that is not objective, so this issue lingers throughout the entire thesis. For example, even choosing an image to represent the word "cell phone" can verge on being subjective—particularly if it is an individual or a small group that chose the image. Words in dictionaries have explanations that have been created by humans because someone had to write the definitions and example sentences, so dictionaries to some extent are subjective or biased. But, imagery does not enjoy the same amount of research or prestige as dictionaries do, which means that anything I say or write in this thesis will arguably be subjective/biased in nature. Unfortunately, the research I cite and carry out is mostly qualitative, so readers will have to accept the reality of this paper's subjective feel.

The interviewees are master's students from the United States of America (4 native English speakers) and Taiwan (4 native Chinese speakers). I am a native English speaker and I spent most of my life in Michigan (a state in the USA), so linguistic and cultural differences

definitely played a role with the Taiwanese interviewees. To be fair, the interviewees from the USA are west coast, northeast, south, and a military brat, yet despite our geographical differences we share English and the experience of being a foreigner in Taiwan. I conducted the interviews in English with the Americans and in Chinese with the Taiwanese, but I know my Mandarin ability and seven years living in Taiwan is not enough to allow me to fully understand the experiences and mindsets of the Taiwanese interviewees. Furthermore, I translated the interview questions verbally, but I never wrote them in Chinese, so this may have hindered the interviewees' understanding of the questions. Overall, my perspective and biases are going to be American and foreigner-in-Taiwan-centric, so I realize that the results, and my interpretations of the interviewees' responses, would be very different if a Taiwanese person were to be the interviewer.

Imagery is a topic that is not explored enough, meaning that anyone, including Kussmaul and the University of Granada, who does research in this field is often using "outdated" or older research that dates back to the 20th Century. This thesis cites some sources that were published as long as forty to fifty years ago, so while this information is rarely false now, it lacks credibility because it might not stand up to modern scientific standards. Therefore, the current standard of using resources that were published within the last 10 years is essentially impossible in this field, and even if the ten-year standard was followed, this thesis would not have enough research to make any significant claims or explanations. So, I decided to join the club with other imagery researchers, who are all quoting sources that come from the 20th Century because they have to.

Much of the work on imagery and visualization in translation has been carried out in Germany by Paul Kussmaul and in Spain by the researchers at the University of Granada. This study is written in English by an American who has been influenced by his time in Taiwan, so my background in addition to the study being carried out in Taiwan makes this

thesis much different than the researchers mentioned above. I, unfortunately, cannot read German or Spanish, and as a result much of the above researchers' work is not part of this thesis. Thankfully, a good amount of Kussmaul's and the University of Granada's work has been translated into English, and it serves as the foundation of this thesis.

I am fluent in Mandarin, but it is very possible that I missed online and print-based tools for Chinese (particularly Chinese tools for native Chinese speakers). I also only read traditional characters and I live in Taiwan, so I am not very aware of the situation in China, which may have caused me to not find resources in Simplified Chinese. That being said, I found very few resources and tools in Chinese, and the majority of relevant articles were from mainland China and their content was not applicable to this thesis anyways. For example, "跨文化图像翻译的补偿" (2009) ("Compensating for Cross-cultural Image Translation") had interesting aspects, such as how to translate three cypress trees named "the Great General, Second General, and Third General", but, like much of Chinese translation research, it is too focused on Classical Chinese and not enough on modern texts. "视觉文化与翻译" (2003) ("Visual Culture and Translation") is an interesting title, but this short article does not give much in convincing examples and it only puts forth preliminary ideas. Overall, English enjoys much more research than Chinese, and my topic of imagery and visualization is already a small research field, so Chinese cannot be expected to have many scholarly articles. This thesis, however, does cite a helpful master's thesis on education written by a Taiwanese student, and it had great quantitative figures for an experiment involving a large group of sixth grade students that compared picture clues with translation clues and context clues. But, it is the outlier, as most Chinese research is not focused on the modern and, even if it is, it tends to be talking about general situations instead of more helpful specific examples.

I realize my own preferences in terms of tools have in many ways limited this study's potential. For example, I only use Google Images, and so other search engines have been

neglected in this thesis. Just because the interviewees and I all use Google Images does not mean it is the superior search engine though, so it would have been nice to meet translators that prefer something else. Furthermore, I also have used visual dictionaries, which inspired and influenced some of the interviewees to offer up a host of comments linked to the two dictionaries I use. But, if I were to regularly utilize corpora, dictionaries, and other types of tools/resources, I could have garnered a broader range of interviewee comments. In short, so much of this thesis is about visual-based tools and resources translators are utilizing, so my minimal toolbox surely has played a role in limiting variety.

5.3   Suggestions for Future Research

Translation research on imagery and visualization is a more recent trend, yet the post-2000 work hints that it is about time to start obtaining quantitative data. I say this because there seems to be enough convincing qualitative research that shows that imagery and visualization play an important role in translation. Of course, more interview-related research could explore different aspects and translators of other backgrounds (rather than just graduate students), thus adding more to this topic's knowledge base. Furthermore, more qualitative-style discussion, similar to the work done by Kussmaul and the University of Granada, could be very helpful if it adds to, critiques, or explores articles written by researchers in the past. Also, a far-reaching review on literature concerning imagery and visualization in translation has not been done yet, and it would be very helpful if it found newer sources because there seems to be little research that has been carried out in the last 10 years. Despite Seleskovitch mentioning visualization decades ago, imagery and visualization is, quite simply, still such a minority topic that any kind of research would prove very helpful and most likely quite original. But, although I may be a hypocrite for saying it, I still believe

it is time that this topic's researchers start answering questions with quantitative research instead of posing new questions or writing about established beliefs via qualitative research.

However, if a future researcher prefers qualitative research and wanted to do a similar study to this one that involves interviewing, he/she could consider some of the following suggestions: interview a bigger group of interviewees, focus on professional translators rather than graduate students, consider particular fields or subject matter, or explore different language combinations. In fact, a similar study that interviews established translators would arguably prove more authoritative or practical than this thesis. Overall, a study similar to this one may be even more helpful than this thesis because the results of this thesis can be a solid foundation for creating better interview questions that are more specific, developing theories for the role(s) of imagery/visualization in translation, and exploring why translators use imagery/visualization the way they do.

My biggest regret is that my original research will not answer questions like: *how or when does imagery lead to successful translations or mistranslating*?, *does imagery help with abstract text translation?*, *can imagery lead to more creative translations?*, *how much does consulting imagery slow down our translation speed?*, and *what kind of translators (age, gender, background, language, genre, etc.) use imagery more frequently?* As for the backgrounds of translators in terms of how frequently and in what ways they use imagery, these questions could be answered by questionnaires. The other questions written above could be answered with a grand experiment that is quantitative in nature.

I already had decided to do interviewing, which meant a full-blown experiment would make this already-long-winded thesis too lengthy, but, originally, I also wanted to carry out a mini experiment with 4 participants (2 in the control group and 2 in the experiment group). The experiment would compare the translators that had access to images with the control group, which would not be able to look at imagery. It should be noted that Paul Kussmaul

actually proposed that someone do a similar research experiment.

> In this context, we may want to know if translators who have had some training in visualization techniques are better than translators without such training. We would have to compare two groups then, but this would involve statistical considerations, since the groups as a variable should be kept stable. And this would only be possible if the groups were fairly large. (2005b, p. 350)

Kussmaul's recommendation of large groups will be difficult to set up yet it will prove important for getting us reliable quantitative results. On the other hand, carrying out visualization training might not be necessary (we all know how to visualize, right?). I, therefore, propose that the focus instead should be on how looking up images helps translators be more accurate (and creative). Overall, Kussmaul's proposal is a solid suggestion that anyone interested in creating an experiment for the role(s) of imagery/visualization in translation should consider or use as a reference.

Using Kussmaul's proposal as inspiration, what I recommend is that an equal number of translators be divided into two groups, and both groups will be given the same time limit, same text(s) (the source text(s) ideally would have lots of image-laden words), and be allowed to use their own computer, which they can use to look up anything. The control group would still be allowed to use a computer, but there would need to be a method that prevents the group's translators from looking up images (such as having a person monitor them or implementing computer programming techniques that block them from seeing images). The translations of the two groups will be given scores by translation experts who will be unaware what group a test taker is from, and these judges will use Pym's binary error/non-binary error standards, which are covered in the Literature Review section. After scores are tallied, the researcher will then analyze the translations to see if there are differences in style and translation techniques. The results, therefore, could be analyzed both qualitatively and

quantitatively.

We are living and working in the Internet Era, so I believe for the sake of being realistic that we should allow the first group to look up imagery on the Internet and the control group would still be able to go online instead of limiting the translators to an unrealistic non-Internet paper-based test where images are provided on sheets of paper for the experiment group. An experiment like the one I propose could properly answer questions about how much consulting imagery affects speed, and using Pym's translation error analysis could tell us about imagery's role in accuracy. Furthermore, by analyzing mistakes tied to where translators did or did not look up imagery, we can try to deduce how these errors occurred in addition to asking the translators in retrospective interviews why they translated in a certain way(s). Overall, this experiment could provide both quantitative and qualitative information that will let us know the influence of consulting imagery and using visualization techniques.

The experiment I originally wanted to carry out would have been a great start to getting quantitative numbers, but its size or scope would have been problematic. The quantitative information garnered from the experiment would struggle to hold up to scientific scrutiny for quantitative data, and so inspecting and comparing the translations would pretty much only provide a heap of qualitative results. Yet, looking at the two groups and comparing their translations would likely prove useful because future researchers might see trends or patterns that will inspire their own experiments. On the other hand, results of this mini experiment may be extreme in two ways: 1) the small sample size might show a trend that will not be found in a bigger sample size, or 2) the mini experiment will fail to show a trend that is discovered in a bigger sample size. Overall, regardless of whether there are many subjects like in Kussmaul's experiment or only a handful like in mine, a quantitative experiment of any kind concerning the role of imagery/visualization in translation would be

an incredibly helpful start and a welcome addition to this research area.

As for Kussmaul's focus on creativity, the role(s) of imagery in creative translation may be an interesting question, but finding the answer is surely a highly difficult and controversial task. Determining what is creative is very subjective, and writing up a definition for creative translation could bring objectivity to the study but it would be a daunting challenge as well. If we allow evaluation of creativity to be more subjective, then the researchers could utilize the translations of the study I proposed above by evaluating them in a qualitative research manner. Essentially, in addition to translation error, they could compare the experiment group's translations with the control group's. Maybe the control group would have less variety between their translations, or the researchers can try to see if the experiment group translated in a way that is less literal. Overall, the results from this kind of research would be highly debatable, but the discussion of findings would be important because it could help translators better understand the importance of imagery when they are seeking to create translations that are more than just textually accurate.

Research in many types of fields, like medical studies and technology development, is typically done in order to find new methods, improve older techniques, and create innovative tools. Translation research, particularly that which focuses on imagery and visualization, seems content with the status quo though, as it attempts to diagnose issues while seldom giving tangible solutions. Therefore, it would be nice if translation experts on this thesis's topic could invent any type of tool that provides imagery—it does not matter how small in scale it is, because anything would be a helpful start. Overall, this thesis puts forth a lot of information that shows using image-based tools like Google Images can be beneficial and it offers up potential strategies for how to use visual content to improve one's translation ability. So, in a sense, it is improving older methods and encouraging translators that never really used imagery in the past to try new strategies. But, something is missing—this study's

interviewees talked about fixing current tools and inventing new ones. They, however, did not mention the desire to be taught how to use imagery tools and visualization techniques, so the next step should be giving translators what they want—better tools.

REFERENCES

Albert, S. (2016). Peach varieties. Retrieved from

http://www.harvesttotable.com/2007/06/peach_varieties_there_are_more/

Alesandrini, K. (1984). Pictures and adult learning. *Instructional Science, 13,* 63-77.

Berinstein, P. (1997). Moving multimedia: the information value in images. *Searcher*,

5(8), 40-49.

Bodmer, G.R. (1992). Approaching the illustrated text. In G.E. Sadler (Ed.),

Teaching children's literature: Issues, pedagogy, resources (pp. 72-79). New York:

Modern Language Association of America.

Bruso, J. (2015, November 28). *Should you wear an abdominal sweatband?* Retrieved

from http://www.livestrong.com/article/556582-the-proper-way-to-wear-an-

abdominal-sweatband/

Bryman, A. (Ed.). (2007). *Qualitative research 2* (Vol. 4: Qualitative Data Analysis).

Los Angeles: Sage.

Carney, R.N. & Levin, J.R. (2002). Pictorial illustrations still improve students'

learning from text. *Educational Psychology Review*, *14*(1), 5-26.

Catechetical Guild Educational Society (1947). Anti-communism drawing. Retrieved from

http://www.marefa.org/

Chase, W.J. (Ed.). (1973). *Visual information processing*. New York: Academic Press.

Chen, J. (Ed.). (2014). *Everyday chinese-english picture dictionary* (2nd ed.). Taipei,

Taiwan: Hebron Soft.

David, P. (1998). News concreteness and visual-verbal association: Do news pictures

narrow the recall gap between concrete and abstract news? *Human Communication

Research*, *25*(2), 180-201.

Davis, H. (2016). *Knowing google images basics*. Retrieved from

http://www.dummies.com/how-to/content/knowing-google-images-basics.html

Desktop search engine market share. (2016). *Net Market Share*. Retrieved from

https://www.netmarketshare.com/search-engine-market-share.aspx?qprid=4&qpcusto

md=0

Duchastel, P., & Waller, R. (1979). Pictorial illustrations in instructional

texts. *Educational Technology*, *19*(11), 20-25.

Faber, P., & Márquez Linares, C. (2004). The role of imagery in specialized

communication. In B. Lewandowska-Tomaszczyk & A. Kwiatkowska (Eds.), *Imagery*

in language (pp. 585-602). Frankfurt: Peter Lang.

Fang, Z. (1996). Illustrations, text, and the child reader: What are pictures in

children's storybooks for? *Reading Horizons*, *37*(2), 130-142.

Findlay, S. (2012, May 29*). Google dictionary: Artists illustrate every*

word in the oxford dictionary through google search images. Retrieved from

http://www.thestar.com/business/2012/05/29/google_dictionary_artists_illustrate_ever

y_word_in_the_oxford_dictionary_through_google_search_images.html

Flanagan, P. (2014, April 20). *RIP for oed as world's finest dictionary goes out of*

print. Retrieved from

http://www.telegraph.co.uk/culture/culturenews/10777079/RIP-for-OED-as-worlds-fi

nest-dictionary-goes-out-of-print.html

Fontova, H. (2016). *Burning shirt of che guevara* [photograph]. Retrieved from

http://www.babalublog.com/2016/05/12/che-guevara-t-shirts-burned-by-protesters-yes

-you-read-right/

Fox, R. (2013). Taiwanese opera in english: Translating liao chiung-chih's chen

san wu niang. *Monumenta Taiwanica*, *8*, 1-27. DOI: 10.6242/twnica.8.1

Ilson, R. (1987). Illustrations in dictionaries. In A.P. Cowie (Ed.), *The Dictionary and*

the language learner (pp. 120-125), Teubingen: M. Niemeyer.

Imagery. (2016). In *Dictionary.com*. Retrieved from

http://www.dictionary.com/browse/imagery?s=t

Kussmaul, P. (2005a, June 8). *Observing visualisations*. Retrieved from

http://www.est-translationstudies.org

Kussmaul, P. (2005b). Translation through visualization. *Meta, 50*(2), 378-391.

Lakoff, G. (1987). *Women, fire, and dangerous things: What categories reveal*

about the mind (1st ed.). Chicago, Illinois: University of Chicago Press.

Langacker, R. (1991). *Concept, image and symbol: The cognitive basis of*

grammar. Berlin: Mouton. (on Google)

Lee, J., & Liao, P. (2011). A comparative study of human translation and machine

translation with post-editing. *Compilation and Translation Review*, *4*(2), 105-

149.

Levie, H., & Lentz, R. (1982). Effects of text illustrations: a review of research.

Educational Communication and Technology: A Journal of Theory, Research and

Development, *30*(4), 195-232.

Levin, J. (1981). On functions of pictures in prose. In F. Pirozzolo & M.

Wittrock (Eds.), *Neuropsychological and cognitive processes in reading* (pp. 203-228).

New York: Academic Press.

Liao, C.P. (2006). *The influence of translation, picture clues and written contexts on*

taiwanese sixth graders' word recognition in english learning. Retrieved from

National Digital Library of Theses and Dissertations in Taiwan.

Major Food And Agricultural Commodities And Producers – Countries By

Commodity (2015). Retrieved from Fao.org.

Marsh, E., & White, M. (2003). A taxonomy of relationships between images and

text. *Journal of Documentation*, *59*(6), 647-672.

Munday, J. (2012) *Introducing translation studies: Theories and applications* (3rd ed.).
New York: Routledge.

Park, O.C., & Hopkins, R. (1993). Instructional conditions for using dynamic displays:
A review. *Instructional Science*, *21*, 427-449.

Party Politics. (2016). In *Dictionary.com*. Retrieved from
http://www.dictionary.com/browse/party-politics

Prieto Velasco, J.A., Tercedor Sánchez, M.I., & López Rodríguez, C. I. (2007).
Using multimedia materials in the teaching of scientific and technical translation.
Linguistica Antverpiensia, *6*, 115-135.

Pym, A. (1992). Translation error analysis and the interface with language teaching.
In C. Dollerup & A. Loddegaard (Eds.), *The teaching of translation* (pp. 279-288).
Amsterdam: John Benjamins, 1992.

Rehling, J. (n.d.). *Native american languages*. Retrieved from
http://www.cogsci.indiana.edu/farg/rehling/nativeAm/ling.html

Robson, D. (2012, December 18). "Are there really 50 eskimo words for snow?". *New Scientist.*

Rosch, E. (1978). Principles of categorization. In Rosch, E. & B. B. Lloyd (Eds.),
Cognition and categorization (pp. 27-48). Hillsdale, NJ: Lawrence Erlbaum.

Rundell, M. (2012, November 5). *Stop the presses: The end of the printed dictionary*.
Retrieved from http://www.macmillandictionaryblog.com/bye-print-dictionary

Sanheyuan (三合院) drawing (2017). Retrieved from
http://library.taiwanschoolnet.org/cyberfair2005/psjh204208/building/b2.htm

Scholz, A. (2012, May 28). *Google–The first google image for every word in the dictionary*. Retrieved from

http://www.creativeapplications.net/scripts/google-the-first-google-image-for-every-word-in-the-dictionary/

Schwartz, B. (2012, February 1). *Addictive google image labeler game gone*. Retrieved from https://www.seroundtable.com/google-image-labeler-dead-14663.html

Seleskovitch, D. (1978). *Interpreting for international conferences*. Washington: Pen and Booth.

Skirt. (2016). In *Dictionary.com*. Retrieved from http://dictionary.reference.com/browse/trousers?s=t

Snappy Words (2015). Retrieved from http://www.snappywords.com

Standaert, N. (2000). *Handbook of Christianity in China: 635-1800* (Vol. 1). Boston, Massachusetts: Brill.

Taiwan search engine market share. (2016). *StatsMonkey.com*. Retrieved from https://www.statsmonkey.com/sunburst/18513-taiwan-search-engine-market-share-usage-statistics-2014.php

Tercedor-Sanchez, M.I., & Abadía-Molina, F. (2005). The role of images in the translation of technical and scientific texts. *Meta*, *50*(4).

Tercedor-Sanchez, M.I., Alarcón-Navío, E., Prieto-Velasco, J.A., & López-Rodríguez, C.I. (2009). Images as part of technical translation courses: Implications and applications. *JoSTrans*, *11*, 143-168.

Tercedor-Sanchez, M.I., Lopez-Rodriguez, C. I., & Robinson, B. (2005). Textual and visual aids for e-learning translation courses. *Meta*, *50*(4), 1-13.

The Visual Dictionary (2014). Retrieved from http://www.infovisual.info

Thinkmap Visual Thesaurus (2015). Retrieved from https://www.visualthesaurus.com

Tucker, P. (2007). *Che guevara* [digitally edited photograph]. Retrieved from http://theinspirationroom.com/daily/2007/we-live-in-financial-times/

Visual Dictionary Online (2015). Retrieved from https://visualdictionaryonline.com

Vost, C. (1995). *The Tribes of Taiwan*. Retrieved from

>   https://www.sinica.edu.tw/tit/culture/0795_TribesOfTaiwan.html

Wilkes, A. (Ed.). (2008). *Mandarin chinese english bilingual visual dictionary*. New

>   York: DK Publishing.

Wolchover, N. (2011, January 24). *How accurate is wikipedia?* Retrieved from

>   http://www.livescience.com/32950-how-accurate-is-wikipedia.html

Yeh, T.M. (Ed.). (2008). *Far east pinyin chinese-english dictionary*. Taipei: The Far

>   East Book Company.

Yu, J. (2016, May 9). Search marketing in China: the rise of so.com. *Search Engine

>   Watch*. Retrieved from https://searchenginewatch.com/2016/05/09/search-

>   marketing-in-china-the-rise-of-so-com/

2015 Search Engine Market Share By Country (2016). *Return On Now*. Retrieved

>   from

>   http://returnonnow.com/internet-marketing-resources/2015-search-engine-market-shar

>   e-by-country/

彩霞. (2015). In *MandarinSpot*. Retrieved from http://mandarinspot.com/dict?word=

>   彩霞晚霞&phs=pinyin&sort=rel

馬甲. (2016).　In *MandarinSpot*. Retrieved from http://mandarinspot.com/dict?word=

>   馬甲&phs=pinyin&sort=rel

台灣閩南語常用詞辭典. (2011). Retrieved from

>   http://twblg.dict.edu.tw/holodict_new/index.html

La universidad de granada, la mejor de españa por los estudiantes internacionales.

(2014, October 1). Retrieved from

http://www.europapress.es/andalucia/noticia-universidad-granada-elegida-mejor-espan

a-estudiantes-internacionales-20140110122931.html

Казакова Т. А. (2003). *Imagery in translation*. Практикум по художествен-ному

переводу. / Учебное пособие. На английском язы-ке. - СПб.: Издательство

«Союз», - 320 с. (Изуча-ем иностранные языки)

Sample Images

Comparison of Che Guevara Magazine Advertisement, Anti-Che Protest,

and Trendy Western Fashion with Che Images

Tucker, P. (2007). Che Guevara digitally edited photograph. Retrieved from http://theinspirationroom.com

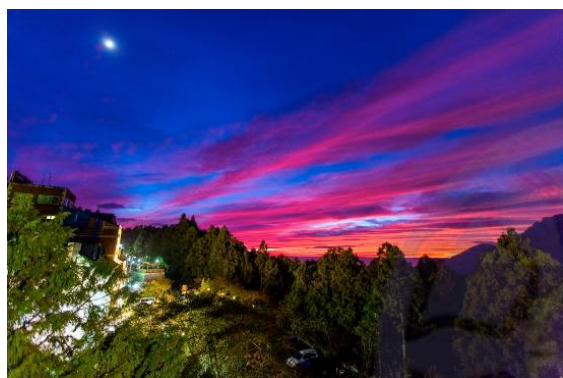Fontova, H. (2016). Burning Shirt of Che Guevara photograph. Retrieved from http://www.babalublog.com

Che Guevara Shirt photograph (2017). Retrieved from amazon.com

Concrete Images (*Sanheyuan* and Sunset Clouds)

vs Abstract Images (Communism and Love)

Sanheyuan (三合院) drawing (2017). Retrieved from http://library.taiwanschoolnet.org

Sunset Clouds (晚霞) photograph (2017). Retrieved from tripadvisor.com

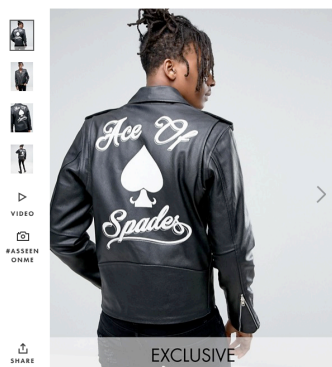Catechetical Guild Educational Society (1947). Anti-Communism drawing. Retrieved from

http://www.marefa.org/

Love photograph (2017). Retrieved from http://www.santabanta.com

Starving African Children (mentioned in Seleskovitch)

Starving African Children photograph (2017). Retrieved from http://www.it-helps.org

Multiple Images for One Word

Leather Jacket photographs (2017). Retrieved from asos.com
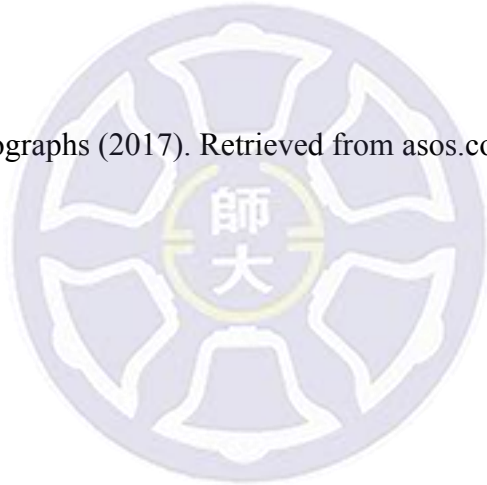
Consent to Participate in Research

The Role of Looking Up Imagery in Translation

Introduction and Purpose of Study

My name is Luke Deming and I am studying my master's degree in translation and interpretation at National Taiwan Normal University's Graduate Institute of Translation and Interpretation (GITI). I am carrying out my master's thesis under the guidance of Professor Daniel Hu, who is a full-time assistant professor at GITI. I would like to invite you to take part in my research study, which involves acquiring qualitative and quantitative data on how translators use imagery and visualization when they translate. By gathering information on imagery and visualization in translation, the world's translation community will become more knowledgeable about the opinions translators have towards imagery and visualization as well as be aware of how translators use imagery and visualization when they translate. This knowledge can then be used to improve current tools or create new tools that provide imagery that translators can refer to.

Procedures

If you agree to take part in my research study, I will conduct an interview with you at a time of your choice. I will do my best to find a location that is convenient for you. The interview will involve questions about whether and how you use imagery when you translate, what tools you use for imagery, and what opinions you have towards using imagery while you translate. I also will ask you to offer some examples of when you have used imagery or visualization during translation tasks. The interview should take about one hour to complete. With your permission, I will record the audio of our interview as well as take notes. The reason for recording is for transcription purposes as I want to ensure that I have correctly heard information, and I also want to be able to write down finer details that I did not have in my original notes. If you choose not to be recorded, I will not conduct the interview. If you

originally agreed to be recorded but then feel uncomfortable at any time during the interview, I will immediately turn off the recording machine at your request and destroy the file. You will not be forced to complete the interview, so you can end the interview at any time.

Benefits

As translators, the interview content you provide will possibly lead to future education methods and translation tools that can both improve the field of translation and help translators. Furthermore, by taking part in this study you may discover new things about yourself, the techniques and methods you use when you translate, how you can improve your translation work, and how you can translate in different ways that will likely lead to better quality work.

Risks and Discomforts

While the research questions are not intended to make interviewees feel uncomfortable emotionally, some of the questions that will be posed could possibly invoke unpleasant memories in the mind of the interviewee. Therefore, I will not push you to answer questions you are uncomfortable with nor encourage you to keep speaking about something that makes you feel uncomfortable. You can choose to not answer a question(s), and you can also stop the interview at any time.

As in any type of research, there is the potential that confidentiality can be compromised. That being said, I will do my absolute best to ensure that confidentiality is maintained. Please see the following section on confidentiality.

Confidentiality

The information I gather will be treated and used in ways that best ensure confidentiality is maintained. If the results of this study are published or presented, your name and other personal information that could compromise confidentiality will not be used. Anonymity will be maintained by using aliases (fake names). Content garnered from the

interviews will be kept on my personal computer, and the information will not be put on online resources, such as email, Dropbox, and other types of cloud computing resources.

When the thesis is completed, which is expected to be between December 2016 and June 2017, I will destroy all files that contain interview information.

Compensation

You will not be paid for participating in this research study. However, I will provide you with a small gift as a way of thanking you for your participation.

Rights

Participation in this research study is completely voluntary. You are free to decline to take part in this interview. You are also free to not answer any question I pose, and you can stop taking part in the interview at any time. You will not be penalized if you choose to stop taking part in the interview. You will still be given the gift regardless of whether you do or do not finish the interview.

Questions

If you have any questions about this research study, feel free to contact me at any time at 0930537372 or lademing13@gmail.com

If you have any questions about your rights as a research participant in this research study, please contact National Taiwan Normal University's Graduate Institute of Translation and Interpretation at 886-2-7734-3989 or giti@deps.ntnu.edu.tw

Consent

You will be given a copy of this consent form to keep for your own records.

If you are willing to participate in this research study, please sign your name below and write the date.

Participant's Name (please print): _____

Participant's Signature: _____ Date: _____

Interview Guide

(1 hour interview, one-on-one)

1. Have you ever looked up images of a word while translating so you could better understand the word?

2. If yes, why did you look up images for a word or words?

3. If no, why don't you look up images for words?

4. Do you think looking up images for words is good, bad, or both? Please explain.

5. Can you share a couple or a few experiences you've had when you used imagery or visualization during translation?

6. What are some advantages of looking up images?

7. What are some disadvantages of looking up images?

8. How has using imagery or visualization resulted in you translating better?

9. How has using imagery or visualization caused you to translate incorrectly?

10. Can you talk a little about when you use imagery compared to when you use more traditional text-based resources like a dictionary or Wikipedia to look something up?

11. What resources do you use to look up images?

12. What do you like about the imagery resource(s) you use?

13. What do you dislike about the imagery resource(s) you use?

14. How should current imagery resources be changed to make them better?

15. What resources do you wish there were for looking up images?

NOTE

This researcher is a Chinese-English translator, so this study will focus on English and Mandarin Chinese (and use traditional characters). Furthermore, he is an American from Michigan who is currently living in Taipei, Taiwan, where he has lived for over seven years. It should be noted that the example images of this thesis are typically proposed by him and there is no selection process based on scientific theories. In short, the issues of translation, language, and culture covered in this article will be influenced heavily by his time spent in Michigan (where he has lived for over 20 years) and Taiwan.