

Position of the elderly in Singapore LL : literacy assessment of the Singaporean elderly

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Position of the elderly in Singapore LL: Literacy assessment of the Singaporean elderly.

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2012

Declaration of Authorship

I declare that this assignment is my own original work, unless otherwise referenced, as defined by the NTU policy on plagiarism. I have read the NTU Honour Code and Pledge.

No part of this Final Year Project has been or is being concurrently submitted for any other qualification at any other university.

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Signature

Date

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Abstract

Past researches show that the elderly face several problems living in urban areas, including problems with physical infrastructure and inaccessible information. In Singapore, elderly care policies involve the improvement of physical infrastructure, but the lack of information has caused underutilization of policies implemented and inconvenience to the elderly. A way to solve this problem is by improving information accessibility. This study aims to find out the problems illiterate Singaporean elderly face in understanding the written messages on signs around them. However, the paper takes the assumption that classification of literacy based only 'literate' or 'illiterate' is insufficient. Therefore, in conjunction with the study on understanding LL by the Singaporean elderly, a literacy test incorporating the understanding of signs is designed. An interview using the literacy test carried out on 25 illiterate elderly shows that most of them do not understand written words on signs and had to rely on familiarity with signs to help them understand the messages conveyed better.

1.0 Introduction

Elderly care is a key concern for countries with an ageing population. In particular, the elderly face several problems, including that of information inaccessibility. In Singapore, the government has implemented several policies addressing the healthcare, financial and social needs of senior citizens. However, in a previously conducted study, it has been noted that the illiterate elderly were unable to understand messages conveyed on street signs. Specifically, this represents a form of information inaccessibility faced by the elderly in Singapore. To better understand this problem, this paper addresses the question of whether the illiterate elderly in Singapore face problems understanding messages conveyed in the linguistic landscape, as well as the methods they adopt to decipher the meaning behind the signs which they do not understand.

However, it is difficult to classify literacy into two extremes (literate and illiterate), especially since literacy among the elderly is different from that of literacy among children or adults. The elderly, although not having received education all their lives, have been exposed to linguistic landscapes. As such, some of them might be able to achieve some form of reading from signs that they are familiar with, yet may be unable to deal with unfamiliar written information. Therefore, to answer our research questions and assess literacy among the elderly, the present study's methodology involves designing a literacy assessment with stimuli drawn from signs in Singapore that the elderly are familiar with.

This paper begins by examining the problems faced by the elderly living in urban areas, the solutions proposed by the government to resolve them, and by presenting a particular case study of Singapore's elderly care policies. Next, it will explore studies of linguistic landscapes and their inter-relation with information accessibility. Finally, it seeks to establish a working definition of literacy for the purposes of the present study.

1.1 Elderly Care

Many countries view their elderly as important assets of society. Correspondingly, governments take steps to ensure that their welfare needs are met. This is evidenced in studies revealing problems faced by the elderly concerning health, safety, infrastructure and information

access (Section 1.1.1), and with regards to the solutions undertaken to resolve these problems (Section 1.1.2).

1.1.1 Problems faced by the elderly

The elderly's ability to live independently in the community is reflected in their ability to perform mundane daily activities like dressing, bathing and getting around indoors (also known as activities of daily living, or ADL) (O'Donnell, 1989). There are a few problems that the elderly living in urban areas face which could affect their performance of ADL and healthy ageing (Fobker and Grotz, 2006). For instance, the elderly are increasingly dependent on physical infrastructure, face declining social integration and are fearful of crime and safety. Physical infrastructure in the environment can also provide the elderly with either a sense of safety or fear, depending on the quality of the physical infrastructure in terms of the elderly care provided. Both studies also mention problems faced by the elderly whilst learning to get around the urban areas in the neighborhood: specifically, these involve transport and security. On top of the difficulties faced in terms of physical infrastructure, the inaccessibility of information also represents a problem for the elderly. For example, vision-impaired individuals find signs too small and street crossings difficult to identify: although these exposed them to the hazards of traffic, no alternatives were provided. This paper examines both of these problems in the Singapore context (Section 1.2).

1.1.2 Solutions

Researchers have conducted studies on the problems faced by the elderly and have posited certain solutions. For instance, Venter, Savill, Rickett, Bogopane & Venkatesh (2002) found that several countries modified physical infrastructure to resolve mobility and access issues faced by the elderly, providing for an increased safety and convenience. Additionally, Venter *et. al.* (2002) emphasized the importance of providing accessible information to the elderly; accessible information provides the elderly and disabled with a sense of security, allowing them to travel safely and independently. Solutions proposed include improving written information and guides, providing other forms of communication and providing symbols in signs.

1.2 Elderly in Singapore

According to the Census of Population 2010 (Singapore Department of Statistics, 2010), 9% of the 4 million people are aged 65 and above (senior citizens). Additionally, the population born in the post-war baby boom will soon become part of this category. This suggests that Singapore is a country with a rapidly ageing population (Mehta, 2002, p. 150). Fobker and Grotz (2006) emphasized the importance for governments to place increasing attention on the elderly in countries facing ageing population, especially in the areas of politics and planning. By anticipating the challenges that the ageing population will face, the Singaporean government has developed several policies to take better care of the elderly.

1.2.1 Policies by Singapore Government

For the benefit of the ageing population in Singapore, the government implemented a range of policies to help the elderly maintain an independent and healthy lifestyle. These policies focus on healthcare and safety, financial independence and social interaction of the elderly. These policies entail healthcare and social benefits for the elderly as well as more elderly-friendly physical infrastructure.

1.2.1.1 Policies Targeting Healthcare and Safety

To begin with, the government emphasized children's responsibility to take care of their elderly parents by implementing the Maintenance of Parents Act in 1995 (Attorney General's Chambers, 2011). As such, it is a legal obligation for children to take care of their elderly parents, and the failure to do so empowers parents to carry out legal actions in reproach of their children's neglect. This not only ensures that the elderly are well taken care of by their children, but it also sustains the psychological and physical well-being of senior citizens.

Other than establishing legal procedures to safeguard the welfare of the elderly, the government attempts to ascertain that professional healthcare is available in times of need. In this regard, the Ministry of Health implemented two classifications of healthcare policies to ensure the health and safety of senior citizens living in Singapore (Ministry of Health, 2007). The first classification addresses residential services, which aims to provide healthcare within residential areas. It involves the building of community hospitals, hospitals for the chronically ill, nursing

homes, etc. The second classification covers community healthcare services, which seeks to provide both home-based and center-based care for the elderly. Home-based care involves providing healthcare at home and center-based care involves the utilization of day-care centers, day rehabilitation centers and dementia day care centers, whereby professionals are present to help the elderly at the centers in the day, before the elderly return home to their family at night.

Apart from this, a Five Year Masterplan of Elder Care (2001) was implemented. (Ministry of Community Development and Sports, 2001). This plan concentrated on improving infrastructure and policies for voluntary elder care services and on educating senior citizens and caregivers through a series of programs. Improvement in physical infrastructure is evident from the development of Senior Activity Centers (SAC). This joint act between MCDS and HDB seeks to improve living conditions of the elderly living in one-room HDB flats by means of refurbishing the physical environment of the blocks to become increasingly elderly-friendly.

Furthermore, in 2012, residents of Singapore will have noticed several changes in other facilities to help improve the accessibility of the elderly and the disabled. For example, ramps have been installed in buses to allow easy access onto buses by the wheelchair-bound or elderly who are unable to climb steps. Lifts have been installed in train stations and individuals are encouraged to use them if it is inconvenient for them to use the stairs or escalators. These improvements in physical infrastructure help to improve the safety and convenience required by the elderly to be effectively mobile around their neighborhoods.

1.2.1.2 Policies Providing Financial Independence for the Elderly

To empower the elderly with regards to achieving financial independence, which is beneficial for their financial and social well-being, the government attempts to encourage elderly employment in the workforce. In the 1980s, the government rose the official retirement age from 55 to 60 and adjusted wages based on seniority in order to boost the employability of the elderly (Mehta, 2002). Furthermore, public education on elderly and ageing were carried out. This was aimed at fostering appropriate attitudes towards the elderly, for instance, encouraging employers to recognise the value of experience that the elderly contribute to the workforce, and subsequently, keeping them in employment to make full use of their human resources. Alongside encouraging financial independence and providing healthcare, the Singaporean government also

implemented the ElderShield, setting aside money in an individual's Central Provident Fund (CPF) to help prepare him or her financially in the event of any health problems that one might face in the course of senior citizenship (Central Provident Fund, 2012).

On top of these initiatives, Singapore Prime Minister Lee Hsien Loong explained in the 2012 National Day Rally the government's commitment to the important issue of providing care for the less fortunate, as well as its decision to focus on housing, education and healthcare for the elderly and disabled (Channel News Asia, 2012). He discussed the Silver Housing Project which helps individuals unlock the amount of money kept in the CPF as well as receive a bonus upon giving up their larger flats for smaller studio apartments. This allows for the elderly to become more financially independent, with more money to care for themselves.

1.2.1.3 Policies Providing Social Interaction

To encourage senior citizens to remain socially active, the government implemented a series of programs for the elderly to interact with one another as well as their caregivers. This reduces instances of social isolation as well as the loneliness and possibility of depression among the elderly. Among these programs are PA's Senior Citizens' Club and Retirees' Club, which organizes a series of social, sports and recreational activities for the elderly, as well as the Befriender Service, in which volunteers are trained to communicate with and befriend the elderly (Ministry of Community Development and Sports, 2001).

In summary, Singapore has achieved a great deal in helping the elderly cope with urban living. Policies developed solved the healthcare and safety problems faced by senior citizens, as well as financial problems and the problem of social isolation. The infrastructure developed also increased accessibility within housing estates. However, the aforementioned policies addressing elderly care originate from official institutions in the government sector and have only resolved problems regarding the physical infrastructure. Referring to Fobker and Grotz's study (2006), a next step of improvement for the healthcare of the elderly involves specific changes to information accessibility. Since the elderly had no part in the policy development process, it is essential that steps be taken to assist them in terms of understanding these policies implemented for their benefit. With the infrastructure already in place, this is a suitable time to implement policies to improve information access for the elderly such that they can put these policies to use

and maximizing the employment of these resources specifically set aside for them. To begin with, information can be made more easily accessible through improvements in linguistic landscapes.

1.3 Linguistic Landscapes

In the last two decades, sociolinguists have developed a keen interest in linguistic landscapes (LL). There are many definitions surrounding the concept of LL, which will be presented in Section 1.3.1. LL mainly convey messages to the masses in public and are meticulously constructed by different actors to deliver messages to intended recipients. In Singapore, signs designed by the government have surrounded the elderly throughout their years of living in the country, with some signs constructed primarily to communicate certain messages to them. This paper attempts to evaluate the accessibility of the written information on signs for illiterate senior citizens in Singapore. It will first introduce the concept of LL, followed by a discussion of power structures behind the construction of LL in urban areas. Next, it will examine the contextual specificities of LL in Singapore as well as the relationship between LL and the elderly within the nation-state.

1.3.1 General Definition of Linguistic Landscapes

Linguistics landscapes refer to the study of signs found in public spaces. They can exist in many forms, such as road signs, commercials and notices etc. (Gorter, 2006; Ben-Rafael, Shohamy, Amara, & Trumper-Hecht, 2006) LL convey information to the public, but also unintentionally reveals the power and status of certain linguistic communities in a certain region (Landry & Bourhis, 1997; Spolsky & Cooper, 1991). Moreover, it is found that the absence or presence of a particular language on signs can reflect, affect or impose de-facto language policy and practice in the particular region (Shohamy, 2006). In the following sections, we will look at previous case studies done on LL as well as factors that shape the LL construction in different countries.

1.3.2 LL reflecting Power and Language – Case Studies

Using LL to study multilingualism is quite a new approach, especially in urban contexts and such research has been gaining popularity in recent years (Muth & Wolf, 2010; Gorter, 2006). For example, Edelman (2010) posited that LL are known for tools that reflect a society's manifestation of multilingualism and Backhaus (2007) claimed that research on LL is a sub-discipline of sociolinguistics. Indeed, many researches on this topic have been centered on the area. Edelman (2010) did a research on LL in Amsterdam and Friesland. She found that the LL in both areas reflect the languages spoken by the speech community. Turkish and Arabic are found to be used in Amsterdam mainly in the neighborhoods where immigrants are predominant. In a central shopping area Kalverstraat, more English was used compared to other less central neighborhoods. This is said to cater to the foreign visitors going to the central area of Amsterdam. Similarly, in Friesland, Frisian was used more in Burgum and Franeker on their LL compared to the more urban Leenwarden area as more native Frisian speakers reside in Burgum and Franeker.

Ben-Rafael et al. (2006) did a case study on Israel revealing how pragmatics and languages are intertwined to produce the signs there; Hebrew and English signs are used within the Jewish population and in areas populated by Israeli Palestinians, Hebrew while Arabic signs are used. In an area in East-Jerusalem where non-Israeli Palestinians live, Arabic and English signs are predominant. English signs are also used in areas where most tourists visit. This provides convenience in accessibility to the information for the audience.

Also, Landry and Bourhis (1997) discovered that LL have effects on the view of the members of the groups and their status and posited that LL are vital in language shift or maintenance in bilingual settings. All these studies mentioned above reflect on the presence of multiple languages in a region echoed upon their LL.

1.3.3 Theories on LL Construction

When multiple languages co-exist within a society, linguistic landscaping becomes a complicated business. Several researchers have offered views and theories regarding this matter. There are 5 approaches found to have been used to construct signs in urban landscapes.

1.3.3.1 Spolsky & Cooper's Three Conditions

Spolsky & Cooper (1991) gave theories on how languages are chosen for the signs, namely: signs are written in a language

- (1) which the writers know (*'sign-writer's skill'* condition),
- (2) which the readers know (*'presumed-reader'* condition) and
- (3) which is the writer's own language or in an identity which they wished to be identified with (*'symbolic value'* condition)

Other than these 3 theories by Spolsky and Cooper (1991), there are other theories put forth by other researchers, which looks at signs construction at a more detailed level (as seen below).

1.3.3.2 Edelman & Gorter's Five Categories

In another study, Edelman & Gorter (2010) categorized actors of construction and perception of LL into five categories. The first category is businesses, which involves people putting up signs with linguistic items to attract their pool of audience for benefit of their business. The second category involves quite a few people, namely the designers, producers and salesmen of these signs. People in this category are responsible for how the signs turn out aesthetically in order to please the customers into buying them for their own usage. The third category consists of private persons. These people put up signs to announce their own events or personal causes through LL like posters or even graffiti. The fourth category belongs to the authorities, who construct signs to provide accessibility to information like directions (e.g. directing people to the subway or public libraries etc.) The authorities are also responsible for deciding whether the signs are appropriate for use or not. The last category is the passers-by, people who pass by, read and observe these signs consciously or subconsciously. These people could affect the designs and placement of the signs if actors construct the signs with them in mind. They are also responsible for decoding the linguistic items on the signs and perceiving the information meant to share with them.

1.3.3.3 Top-down and Bottom-up Approach

Another theory proposed to be used in linguistic landscaping: the 'top-down' and 'bottom up' approach (Backhaus, 2007; Gorter, 2006, p. 84ff). LL constructed using the top-down

approach meant that LL items are issued by the government or state. These can be affected, sometimes indirectly, by official language policies (Huebner, 2006). An example can be seen in a study of Wales done by Coupland (2010), as written below.

Wales has been actively pushing their ideology of ‘true bilingualism’ or to be ‘a truly bilingual Wales’. In the past, English was the high-variety language and Welsh was the low-variety language. The government’s aim is to push for equivalence of both languages. This is stated clearly in the official documents of the Welsh Assembly Government, that ‘the presence of the two languages’ will be ‘a visible and audible source of pride and strength to us all’. This indicates very clearly the intention and commitment of the Welsh government in linguistic landscaping. From here, parallel-text bilingualism is seen, advocating the idea of equality of both languages, which means that both Welsh and English are to be given equal weightage and prominence in order to provide the same accessibility according to readers’ choice. This is a clear example of linguistic landscaping using the ‘top-down’ approach.

LL constructed using the bottom-up approach are simply LL items issued by autonomous social actors selected by individuals, for example, names of shops and private announcements (Shohamy, 2006). However, Coupland (2010) finds the idea of the ‘bottom-up’ approach ambiguous, as within each commercial initiative, they have their own ‘top-down’ approaches when it comes to constructing LL for their own benefit. It is however not impossible to find LL that work outside the remit of the government and are less controlled and more creative. So, arguably, in Coupland’s point of view, all LL follow a ‘top-down’ approach that ranges from within the company or within the state.

1.3.3.4 Ben-Rafael’s Four Principles of LL Construction

Ben-Rafael (2009) also proposed her theory of structuration of LL. She believes that there for four main driving principles of the construction of these landscapes: presentation of self, good reasons, power relations and collective identity. The people responsible for construction of the LL according to the above principles are known as actors. Self presentation entails constructing signs while expressing their identities, especially through linguistic choices. These signs are usually aimed to capture the attention of the audience and are unique compared to one another. It is also hypothesized that more often than not, the languages on the signs are languages of

prestige. Good reason involves the structuration of LL with both the aim of the actor to influence the public as well as adhering to the values of the audience in mind. It is aimed to benefit both the actor as well as the audience, thus their choices of how the signs look like converges. The extent of which the actor can impose a certain pattern of behavior on others is referred to as 'power relations'. For example, dominant groups can impose their language on the subordinate groups but not the other way round. It is hypothesized that usually, signs constructed according to this carry the language of the dominant group instead of those used by the subordinate groups. Lastly, the principle of collective identity entails actors asserting a particular identity and exhibiting their aim to attract a certain group of people. For example, placing the word 'halal' on food stores attract customers of the religion or fellowship.

1.3.3.5 Malinowsky's Social Conventions vs Individual Intentions

Malinowsky (2009) suggests that construction of signs is constituted by both social conventions and individual intentions. This is somewhat similar to the 'good reason' principle denoted by Ben-Rafael (2009). In his study of Korean-American business owners in Oakland, California, he found that business owners did not in fact have much say in the construction of signs. Some of them had continued the use of the signs when they purchased the business from the previous owner. Others had their signs designed by their local sign companies (an example of the second category of actors of construction of LL proposed by Eldeman and Gorter (2010), as mentioned above) and therefore had no control over how their signs look. More than half of the business owners who could design their own signs claimed that they included English in their signs because of the fact that they were in America. This shows that signs designed by these business owners adhere to the languages of the majority and therefore merged their aim of attracting businesses ('individual intention') via the use of the dominant language in the area ('social convention').

Upon reviewing the many theories uncovered by researchers, it seems that there are three generic ways in which signs can be structured in a state. They can all fit into the 'top-down' and 'bottom-up' framework. The three generic ways are:

- (1) solely 'top-down' approach, which signs are designed solely with the aims of the actors in mind.

- (2) convergence of ‘top-down’ and ‘bottom-up’ approach, which signs are designed to meet both needs of actors and audience. The principle of ‘good reasons’ proposed by Ben-Rafael (2009) and the idea of ‘individual intention’ and ‘social convention’ proposed by Malinowski (2009) fit into this approach.
- (3) solely ‘bottom-up’ approach, which signs are designed only for the benefit of the audience to represent different domains. This is rare in Coupland’s point of view, as signs that simply serve to inform the audience of an existing domain can be designed to attract the attention for private business gains (e.g. catchy shop names on signs with striking designs etc.)

1.3.4 LL of Singapore

Similar to Wales, Singapore is a multilingual country that has policies emphasizing on bilingualism; citizens must know both English and their mother tongues (Silver, 2004). The government’s emphasis on English has always been to build up national cohesion through inter-ethnic communication. It is also a useful language for trade as it is the lingua franca between the country and other regions. The government’s emphasis on the citizens learning their mother tongues have always been to preserve their cultural and personal identities and sense of heritage.

However, bilingualism is not only emphasized in education but also through language planning and this is reflected on construction of signs in the country, revealing the ‘top-down’ nature of LL construction and the main actor being the government. It is found in a study that bi-bilingual split in signs are observed in a heartland area of Singapore (Tan, 2011). He found that in a same poster that carries the same message has been split into 2 posters, one carrying English and Mandarin Chinese languages, the other Malay and Tamil languages. This is upholding the nation’s language policy of being bilingual and keeping emphasis on all four official languages of Singapore. This is also a clear top-down approach of the government in constructing the signs in conjunction with the nation’s language policies.

It is also likely that top-down approach can be used by government authorities, keeping the needs and values of the citizens in mind. In the same study by Tan (2011), he found that in the bi-bilingual split of the languages on the poster reflects the ‘realistic prestige’ of all four languages i.e. the two languages spoken by the majority are grouped together, while the other two are languages spoken by the minority of the population. Tan (2011) hypothesized this after a

comparison with the statistics of Singapore (Singapore Department of Statistics, 2010), where it is found that ethnic Chinese holds the largest population in the country, followed by Malay then by Indians. However, this point can be contended. With the government promoting for inter-ethnic harmony, splitting the languages according to statistics would not be upholding their policy. It is as if the linguistic items on these signs are to serve as a constant reminder of the dominant race in Singapore. Therefore, another reason of the split of the languages can be proposed. It could also be due to the convenience of the audience, as grouping the English and Malay languages together, which are languages containing similar scripts, confuses the audience visually. Hence, this arrangement could be due to the audience's viewing pleasure and convenience, which is an example of a top-down approach of LL construction while keeping the audience's needs and values in mind.

1.4 Linguistic landscapes and Elderly Care

As we have seen earlier in Section 1.2.1, the Singaporean government has implemented numerous policies to help the elderly. Policies are normally communicated to the masses through the news – on television, radios or in print media like newspapers. Instructions on how to use these facilities were provided on print signs. These signs, as pointed above in Section 1.3.4, are constructed by the government with the country's language policies in mind. Signs can appear in all four languages, emphasizing the country's promotion of bilingualism and Singapore's multicultural roots.

Soh (2011) carried out a small-scale study involving a variety of signs obtained from a particular neighbourhood. She found that most signs were printed in English and the elderly had problems understanding these signs. The illiterate elderly preferred verbal explanations and did not like the use of pictures because they could not understand them. These elderly will not be able to access the services and policies implemented by the government which are developed to solve the aforementioned problems, resulting in a problem of inaccessible information.

1.5 Literacy

In Singapore, 45% of the elderly population in Singapore is illiterate (Singapore Department of Statistics, 2010). These senior citizens did not receive any form of education and have problems understanding written information, regardless of language, which creates a problem of

inaccessible information for the elderly mentioned earlier in Section 1.1.1. However, to classify these elderly to be either literate or illiterate seems to be over-simplifying matters of literacy. Unlike young children, the elderly have been surrounded by signs for a long time, some designed just for them. Does this long-term exposure to written information on the signs help the elderly to recognize some linguistic items? If it does help, their ability to read off certain signs does not classify them as entirely illiterate, nor does it make them literate either. To help you understand the definition of literacy in this thesis, we will first introduce you to the different definitions and types of literacy recorded in studies, and our own definition of literacy which we have crafted for this paper.

1.5.1 Definition of Literacy

There are many different levels to the definitions of literacy. To put it simply, literacy means one's ability to read and write (Norris & Phillips, 2003). There are also four different types and perspectives of literacy (Knoblauch, 1990). Firstly, the functionalist perspective involves skills of understanding required for daily living and even technology literacy. This can include understanding of announcements, basic signs for direction or use of handphones and computers. Secondly, cultural literacy perspective includes higher order thinking skills to understand and assimilate into a culture. The ability to converse pragmatically with another person and understanding of the culture can be an example for this perspective. The third perspective is the personal-growth perspective, which includes the understanding of material which is personally enjoyed by the individual. For example, an individual's understanding of his favorite magazine. The last perspective is the critical literacy perspective, which sees literacy as a way to "seek political meaning for the individual or the group." Downing (2005) defines literacy as activities involving reviewing, utilizing and communicating about anything, be it print material or online digital format, regardless whether the material is seen or heard. In a definition by UNESCO, literacy means possessing skills related to interpreting or using written language and symbols (Schaffner, 2005).

These definitions constitute the meaning of understanding. However, there are many levels to understanding. Since literacy levels of the elderly in Singapore have never been studied upon, a test is designed for this research to assess the elderly's literacy at the functionalist perspective level proposed by Knoblauch (1990). For the purpose of the study, the definition of literacy in

this paper is established to encompass a certain level of understanding: literacy is the ability to read and fully understand a language from a given sign independent of context, not just at a single word level, but also at a sentential level.

1.5.2 Methodology to Measure

Since this thesis concerns information accessibility of the elderly, test instruments will include pictures of signs from different categories. The design of the literacy test in this study is largely based on the method of measuring literacy developed by UNESCO (Schaffner, 2005). This paper is chosen as a guideline as it raises the issues, evidences and pointers in creating literacy tests in developing countries. For the focus on designing a literacy test for this study, this section will talk about the literacy concepts examined and the skill levels used to assess the participant's level of literacy by UNESCO.

The literacy concepts that can be tested mentioned in the paper consists of reading, writing, oral, written mathematical calculations or interpreting any type of visual information not limited to words. Other skills tested include relation to tasks common in different domains, for example, formal schooling contexts and everyday life.

Since skills within a domain can be mastered at varying degrees at different individuals, the paper suggests that survey designers to measure literacy level within a single domain. Designers of the literacy test can label the levels accordingly. For example, if an individual is able to read aloud a simple sentence, the level is labeled as "basic literacy", and if an individual can read a letter with understanding, he or she has achieved the level of "functional literacy". For individuals who cannot identify words or letters, they have then attained the level of "illiterate".

For this study, we are more interested in the level of understanding of signs. Therefore, the domain which this study is focusing on is functional literacy. To test functional literacy of the elderly, a methodology incorporating both signs and literacy measurement is developed.

In a literacy assessment held in Bangladesh, we see the method of testing for different levels of literacy used. The test started off with the lowest level of reading (by identifying letters) and each child had to identify 7 out of 8 letters to progress to the next level, which is word recognition and pictorial identification. The criterion to pass was to get 6 out of 16 items right. In

the third level, a passage is given and the children had to read and answer some questions regarding the passage. Therefore, as each level progress, the difficulty of the test is increased. The literacy assessment in this paper will be set based on the idea of levels of difficulty in terms of word and pictorial recognition as used in the study in Bangladesh. More information regarding the test is given in Section 2.0.

2.0 Methodology

The methodology of the paper is designed to answer, in summary, these two questions:

- (1) Do the illiterate elderly in Singapore have problems understanding the LL in Singapore?
- (2) What are some of the methods used by the elderly to help them decipher the meaning behind LL which they do not understand?

As mentioned earlier in Section 1.5, the long-term exposure to signs designed for the elderly might have helped the senior citizens gain some reading ability throughout the course of their life, despite receiving no education. Yet, no literacy tests have been carried out on the elderly in Singapore. Hence, to further understand the nature of literacy the elderly in Singapore has while answering the research questions at the same time, the methodology incorporates a literacy assessment together with testing their understanding of Singaporean signs into the questionnaire. First, let us look at the literacy test and the stimuli used.

2.1 Literacy Test

The methodology of creating the literacy test will be based on these 2 guidelines. Firstly, to ensure an all-rounded selection of LL, signs of all domains which the elderly interact with in their daily lives will be obtained. Secondly, test instruments will be divided into 6 levels (Section 2.1.2).

2.1.1 Test Instruments – Pictures of Signs

As mentioned earlier, LL is used as a tool for this literacy test. Hence, test stimuli are extracted from different signs. These signs are chosen based on the author's discretion of the level of familiarity the elderly have with them by observing her grandmother's living habits. The signs used for the test are divided into nine categories, as such:

<u>Categories</u>	<u>Type of LL</u>
A. Basic necessities (e.g. food, detergent)	Commercial
B. Road signs (e.g. road names)	Official/‘Top-down’
C. Temple (e.g. labels)	‘Bottom-up’
D. Wet market (e.g. pricing boards)	‘Bottom-up’
E. Warning signs (e.g. high voltage)	Official/‘Top-down’
F. Healthcare (e.g. X-Ray)	Official/‘Top-down’
G. Chinese tradition (e.g. traditional food)	‘Bottom-up’/Partly ‘top-down’
H. Common medicines (e.g. common ointment)	‘Bottom-up’/Partly ‘top-down’
I. Surnames (common Chinese surnames)	Random/Tradition

2.1.2 Manipulation of the Signs

In the assessment, a sign from each category is presented to the participant in the order from A to I. For the pictures in categories A to H, pictures of the signs among each category are split into six levels. Table 1 below explains what each level constitutes.

Level	Contents
Level 1	Typed words (font: Helvetica), Black and White
Level 2	Typed words (font: Helvetica), Colour
Level 3	Font in signs, Black and White
Level 4	Font in signs, Picture, Black and White
Level 5	Font in signs, Picture, Colour
Level 6	Font in signs, Picture, Colour, Context

Table 1. Levels in Literacy Test

The font Helvetica is used because it is recognized as the simplest fonts by typographers (Bringhurst, 2004). To give you a better idea of how the test instruments look like, pictures of the Tiger Balm signs (mentioned above) split into the different levels are given below (Figures 1 to 6). All of the pictures generated and used for the literacy test are provided in Appendix A.

TIGER BALM

虎標萬金油

Figure 1. Tiger Balm Level 1



Figure 2. Tiger Balm Level 2

Signs in levels 1 and 2 are mostly kept at least bilingual in English and Mandarin Chinese (if there is a known Chinese name). The colours chosen for pictures in Level 2 matches the colour of the exact sign itself, as will be revealed in Level 5. This is to test the elderly's literacy in both languages and to test whether they are able to use colours as visual cues to decipher the exact meaning and context of the signs. If they are able to recognize the meaning of the words at Levels 1 or 2, they will be concluded as literate in that language.



Figure 3. Tiger Balm Level 3

Level 3 is used to see whether the font extracted from the original sign is recognized by the elderly. It is hypothesized in this study that proper fonts that appear in the sign itself might be remembered by the elderly as pictorial images, thereby cueing their recognition for the sign. If they are able to recognize the sign and its meaning at Level 3, it means that only pictorial cues of the fonts are needed.



Figure 4. Tiger Balm Level 4

Level 4 provides the elderly with the original sign (as it is collected in the LL) that they are most commonly exposed to in their daily lives. The absence of colour in this level will shed light on whether the picture on the sign itself is sufficient to cue the elderly of the sign. If the elderly is able to recognize the sign at Level 4, then it is concluded that picture, but not colour, is needed for recognition of this sign among the elderly.



Figure 5. Tiger Balm Level 5

In the event that the elderly fails to decipher the meaning of the sign at Level 4, the test goes on to Level 5; the picture in Level 5 is a coloured version of Level 4. At this juncture, if the elderly recognizes the sign, it is safe to say that colour is the main trigger for sign recognition in this picture for the elderly.



Figure 6. Tiger Balm Level 6

Figure 6 shows the test instrument at Level 6, which is the exact item from where the sign is taken from. In this case, the entire context of which the sign appears is presented to the elderly. Therefore we know that no visual cues on the sign helps in its recognition by the elderly.

All the pictures are developed on size 4R matte photographs to minimize any visual problems posed by the test instruments, such as unclear pictures due to pixilation or light reflection off the photographs. At the same time, pictures are also loaded into a computer screen or an iPad in case which an elderly requires a larger, zoomed in version of the signs.

As for Category I, no levels of contextual clues are given to the participants. Instead, a list of common surnames is presented to the elderly, as presented in Figure 7 below.

陳 CHEN	陈 CHEN	黃 HUANG	王 WANG
葉 YE / IP	叶 YE / IP	蔡 CAI	曾 ZENG
吳 WU	吴 WU	許 XU	许 XU
林 LIN	李 LI	張 ZHANG	张 ZHANG

Figure 7. List of Common Surnames

Similarly, these surnames are presented on 4R matte photographs. Each photograph consists of four surnames. There are a total of four photographs used for this category. Again, these instruments are loaded from the computer or iPad.

2.1.3 Test Instruments – Interview

For categories A to H, the interview questions focused mainly on the recognition of the signs. The interview, together with the language profile questionnaire, is provided in Appendix C. For each level, each participant is asked firstly, whether they understand the signs and secondly, what is the exact meaning of the sign and thirdly, what did they use to recognize the sign. The second step is to ensure that their interpretation of the picture is correct and the third step is to find out what cue is used by the elderly to decipher the sign, in case the cue is not what is interpreted from the levels of the signs. For example, if the elderly recognizes a sign at Level 4, he or she might not have used the pictorial cue but the shape of the entire sign. In this case, field notes are taken and written down on the questionnaire to be used in results analysis.

Also, the nature of the interview questions is kept as precise as possible. Instead of leaving open-ended questions, options are presented to the elderly. For example, instead of asking directly “what did you use to interpret the meaning of the sign?”, questions are phrased like this

“did you use the colours to interpret the meaning of the sign?” or “did you use the picture?”. All vocabulary is kept as simple as possible, with no linguistic jargons used and all sentences used are simple sentences to ensure that participants can answer. On a case by case basis, in the event which the elderly does not understand the question, examples are given to help him or her understand the question better.

2.1.3.1 Category I – Surnames

For category I, the participants are first asked to see if they know how to write their own surnames. If they claim that they do, they are requested to write it down on the questionnaire. If they feel uncomfortable with it, the question is skipped. After which the interviewer brings out the list of the surnames (as seen in Figure 7) and points to a few random surnames and see if the participant can read out the surname correctly. Lastly, the elderly is then asked where or how did they learn all the surnames. Again, the participants are prompted with options such as reading from books or newspapers, friend’s names etc.

2.1.3.2 Language of Conduct

The language used during the interview is Mandarin Chinese, the native language of the interviewer. If the elderly did not know how to speak Mandarin Chinese, the questions are being translated by a translator or the caregiver of the elderly. Before the translator starts translating for the interview, the interviewer confirms that Mandarin Chinese is the native language of the translator and is fluent in the dialect or the language which the interview has to be translated in to.

2.2 Interview Procedure

Prior to the interview, the caregivers and participants are briefed verbally about the interview. Because the participants are illiterate, verbal consent is used instead of signing a document to give consent. The script briefing the caregivers and participants are provided in Appendix B. After the consent is given, the interview begins with the language profile questionnaire, followed by the interview on the signs.

The signs are presented in ascending order of the categories i.e. from Category A to H. Within each category, the pictures are presented according to ascending levels of the pictures i.e.

Levels 1 to 6. The moment a participant recognizes the sign of the category and gives a correct interpretation of it, the rest of the levels of that sign will not be presented to the participant. The interview then moves on to the sign in the next category. Each level is presented until the participant recognizes the sign completely. If a participant guesses a sign wrongly, the next level is presented. After all categories are presented, the interviewer goes on to ask about the surnames and then presents the list of surnames in Category I for the surname recognition test. This concludes the interview and literacy test.

2.3 Scoring Procedure

After the interview, scores of each category is then collated by recording the level at which the participant correctly deciphers the sign. For example, if a participant recognizes a sign for Category A at Level 4, the score for that category is recorded as 4. In other words, the illiteracy level of the participant in that category is 4. No scores for the surname recognition test are recorded. Scores collated are analyzed in two ways: by categories and by levels.

To analyze the scores by category, the interviewer totals up the scores obtained by the participants for each category and averaging it out by the total number of participants (twenty-five). The category with the highest score is the category which the elderly is most unfamiliar with in terms of sign recognition and the reverse is true for the category with the lowest score.

To analyze the scores by level, the interviewer collects the total number of times each level appears throughout the interview among all participants. The level which appears most throughout the entire interview shows the contextual clue which is most useful for sign recognition among the elderly and the level which appears least, or not at all, shows the contextual clue which is the least useful for the sign recognition. The next section reveals the results collected in the interview.

2.4 Participants

A total of 25 Chinese elderly are interviewed for this study. All of them are aged 65 and above. These elderly came from two branches of elderly day care center under Fei Yue Community Services in Choa Chu Kang. The location is specifically chosen to ensure that the elderly are familiar with the signs taken from the neighborhood. All of the elderly are first declared as illiterate in both English and Mandarin Chinese and without any health problems, especially visual, hearing or mental problems, by their caregivers.

There are two parts to this interview. The first part consists of a questionnaire on language profile, checking on the literacy levels of the elderly, health problems, especially with regard to visual and hearing problems and the languages spoken. This time, literacy levels and health problems are self-declared by the elderly. Some of the elderly declared themselves to be literate in Mandarin Chinese. However, these elderly are still required to carry on with the second part of the interview, which is the Literacy Test.

3.0 Results and Discussion

The results of the interview are collated and charted in line graphs for better comparison. The results will be presented in two ways. First, it will be analyzed according to the categories and then by the levels of literacy.

3.1 By Categories

In the analysis according to categories, we will first look at the overall trend before breaking them down into individual categories. Each participant's response for each category is recorded on the line graph and notes taken during the interview will also be presented explaining each phenomenon.

3.1.1 Overall Trend

From Figure 8, we see that most of the categories fared around the score of 5 and the category with the lowest average score is category H, the category of common medicine, with a score of 2.04. This means that most of the participants can recognize the sign even at its lower levels and very little contextual clues are needed. In fact, Level 2 consists of only font and colour. Category A, basic necessities, comes in second lowest with an overall average score of 3.72, which is also low compared to the other categories. Among all categories, the highest overall average score belongs to Category F, healthcare, closely followed by Category E, warning signs. This shows that signs in these 2 categories are among the hardest to be recognized by the elderly, requiring more contextual clues than the others. Having seen the overall trend, let us now break down the results and examine them according to the individual categories.

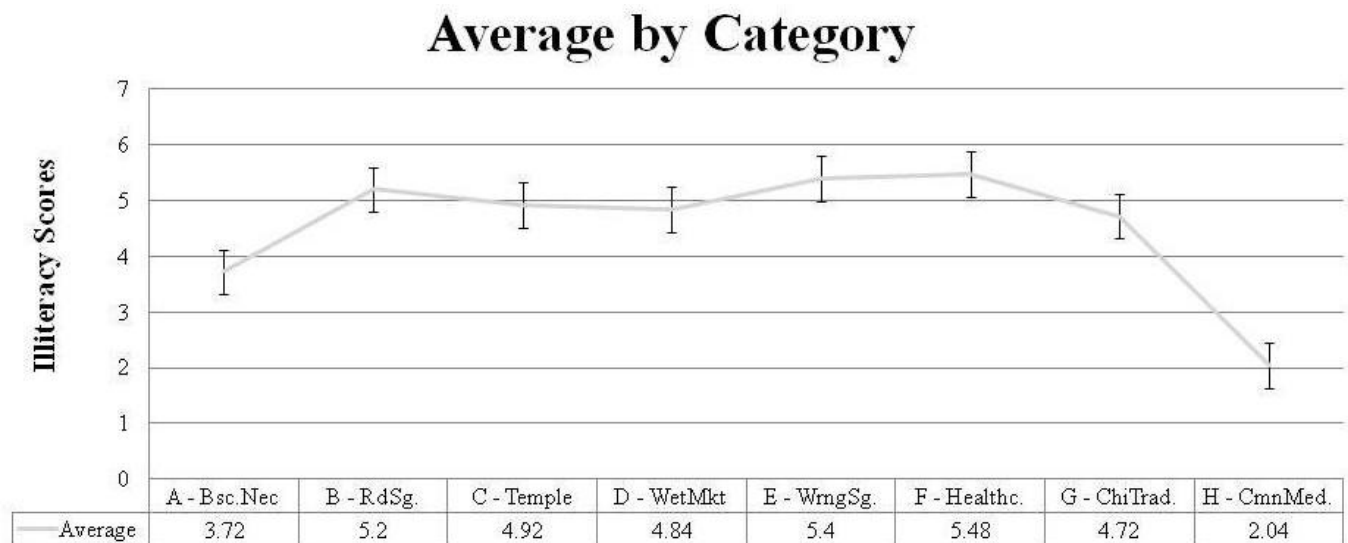


Figure 8. Overall Average Scores of Participants by Category

3.1.2 Category A – Basic Necessities

Figure 9 shows the scores each individual participant scored in Category A. The participants in the category were presented with signs A1 or A2. Curiously enough, a number of people scored at Level 1 despite their caregivers declaring that these participants were illiterate. It also has the highest number of participants scoring at that level for this category.

To shed light on this phenomenon, we asked their caregivers on the elderly's familiarity with the sign shown. Their caregivers claimed that the elderly either take care of grandchildren and prepare food with the item in A1 or consume A1 on their own. Some of them use the brand of detergent presented in A2 so they could identify the words. Participant P20 is a cook and therefore recognizes sign A1, a food ingredient, at Level 1. None of the participants scored at levels 2 and 3.

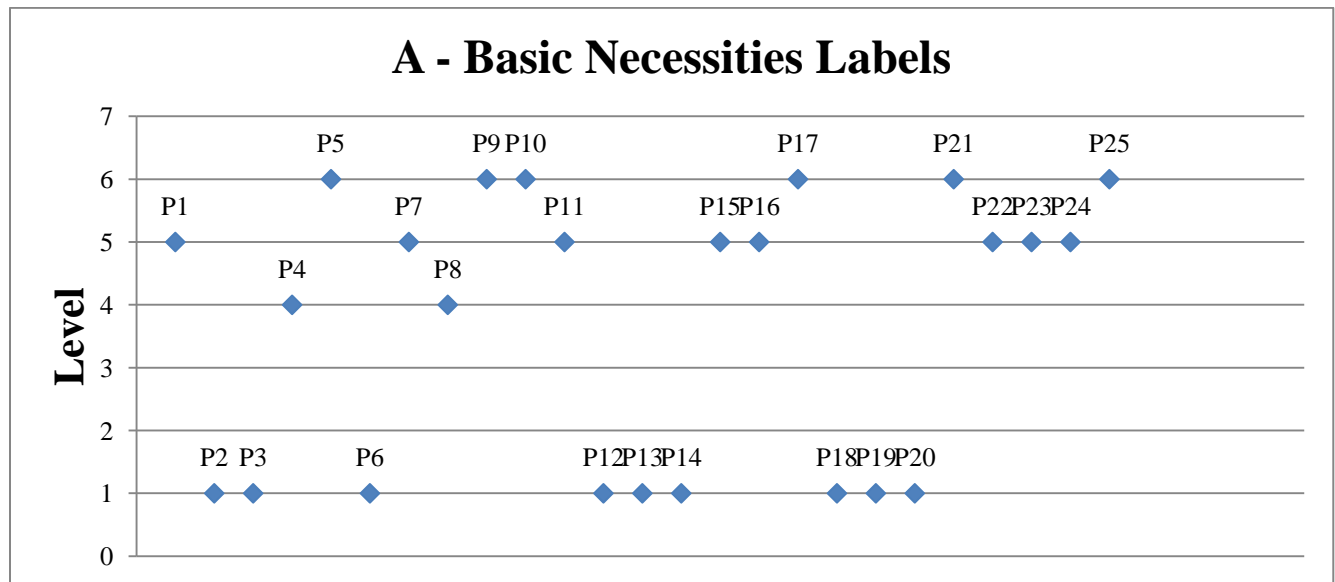


Figure 9. Participant scores in Basic Necessities Labels

3.1.3 Category B – Road Signs

Figure 10 shows the scores each individual participant scored in Category B. The participants in the category were presented with signs B1 or B2. The level score with the highest number of participants is Level 6, with a total of 16 participants relying on the context to recognize the sign. Similar to Category A, no one scored at Levels 2 and 3.

Comparing to Category A, there were participants who recognized the sign at Level 1. What is different, though, is that not only is it a lot significantly lesser than that in Category A, it also has the lowest number of participants scoring at Level 1. Also, the participants who recognized the sign at Level 1 in Category A had disappeared from the list, with the exception of P13. This shows that they can only recognize certain lexical words and these participants are not literate by our definition and we continued observing P13's performance in the test.

At the same time, P7 is a new addition to the Level 1 score in Category B. Upon asking his caregiver, she said this participant is very well-read in some areas. He likes to walk around the neighbourhood and also look at pictures in newspapers and magazines at leisure despite not being able to read and understand the prose. He follows the news on television regularly as well. He is therefore rather familiar with things around the neighbourhood and this could possibly have allowed him to recognize certain words. P7 is also a driver and hence, it is unsurprising that he can read road names.

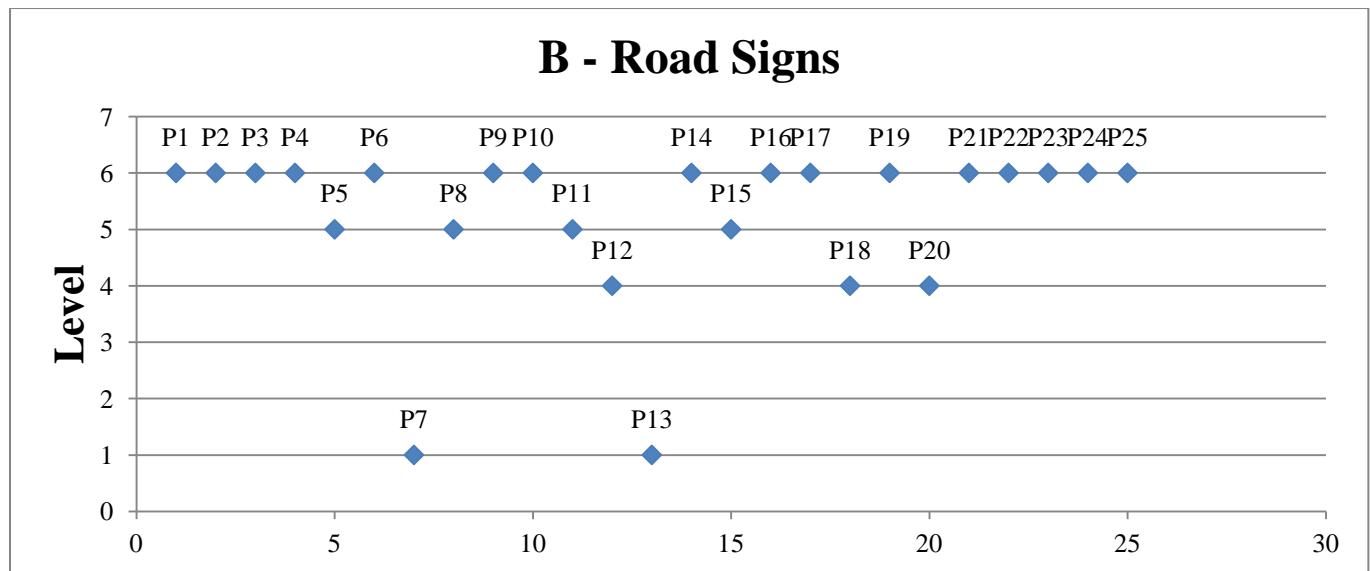


Figure 10. Participant Scores in Road Signs

3.1.4 Category C – Temple

Figure 11 shows the scores each individual participant scored in Category C. The participants in the category were presented with sign C1. Similar to Category B, most participants scored at Level 6 for this category and again, no participants scored at Levels 2 and 3. When asked why they had to rely on the context (Level 6) to decipher the sign, some participants claimed that there is no need to look at the sign on the item since it is evident what it does; hence they never bothered looking at the words.

However, 5 people scored at Level 1 in this category, P13 among them. At this juncture, P13 was presented with a sign in Category F, which consists of a phrase in Level 1 to test her level of

understanding (see Section 3.1.7 below). This is to test her level of literacy, to ensure that it is not contained within identifying simple lexical items.

Unpredictably, a few of the participants who dropped out of the Level 1 score in Category B reappeared (P2, P18 and P19). These participants claimed to know how to read the words because they visit the temple regularly. Furthermore, there was only 1 participant who recognized the sign at Level 4 and none at Level 5. P12 claimed to have seen it when she had gone to the temple before, although she was not sure what it read.

Bearing this comment in mind, we should recall about inaccessibility of information posing as a problem for the mobility of the elderly as mentioned earlier. Apparently, not knowing the sign in the temple did not bother or hinder the elderly at all. It seems like in a context like ‘temple’, literacy is not needed for them to navigate around. Rather, they relied a lot on routines or culture to figure out how to navigate around the place. This is perhaps only true in places where it is safe to walk around or in contexts which they are familiar in. To further understand this situation, let us look on further to see if similar situations arise in other domains.

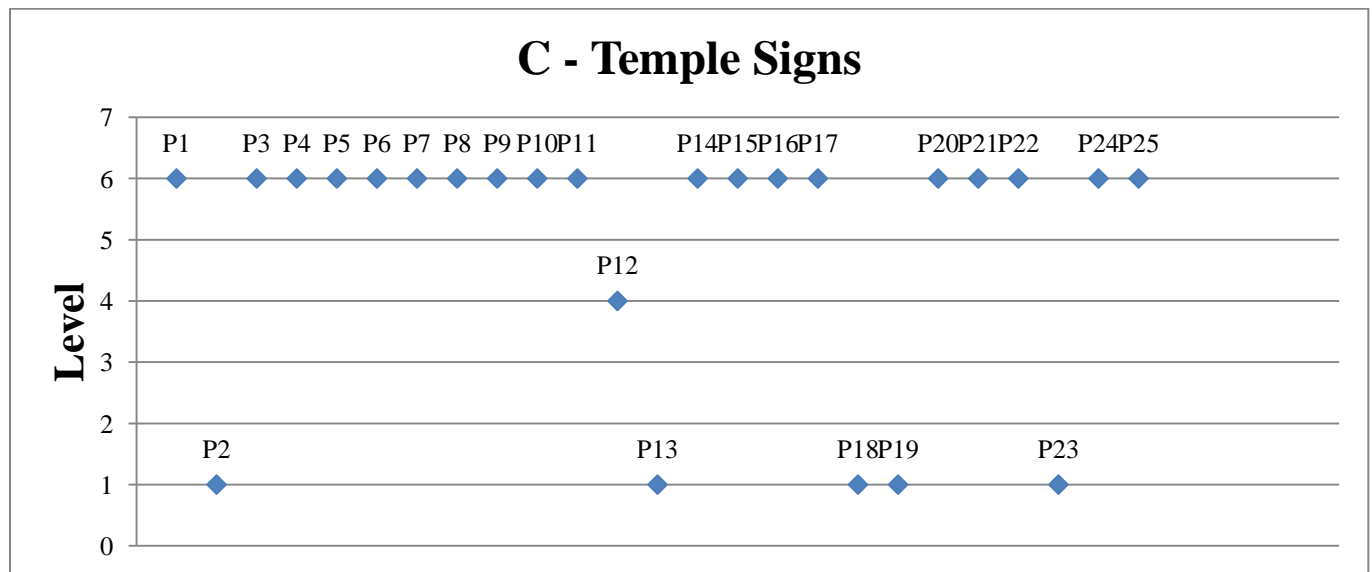


Figure 11. Participant Scores in Temple Signs

3.1.5 Category D – Wet Market

Figure 12 shows the scores each individual participant scored in Category D. The participants in the category were presented with sign D1. Level 1 remains to have the lowest number of

participants and Level 6 has the highest. As with all other categories seen thus far, Levels 2 and 3 has scored no participants.

In this category, P13 has fallen off the score of Level 1. The participant was not sure of the sign even when presented at Level 6 and despite his caregiver having declared that he had been around the area and should be familiar with the sign. This shows that P13 is not literate as he had claimed to be.

P2 and P23 remained at Level 1 since Category C and could decipher that the words in the font belonged to either a pricing board or in identification of a certain, specific type of mangoes. These two participants go to the wet market regularly and P23 is familiar with the stall holder, therefore knows the terminologies of the wet market very well. Again, familiarity seems to have helped the participants in deciphering the written information in signs.

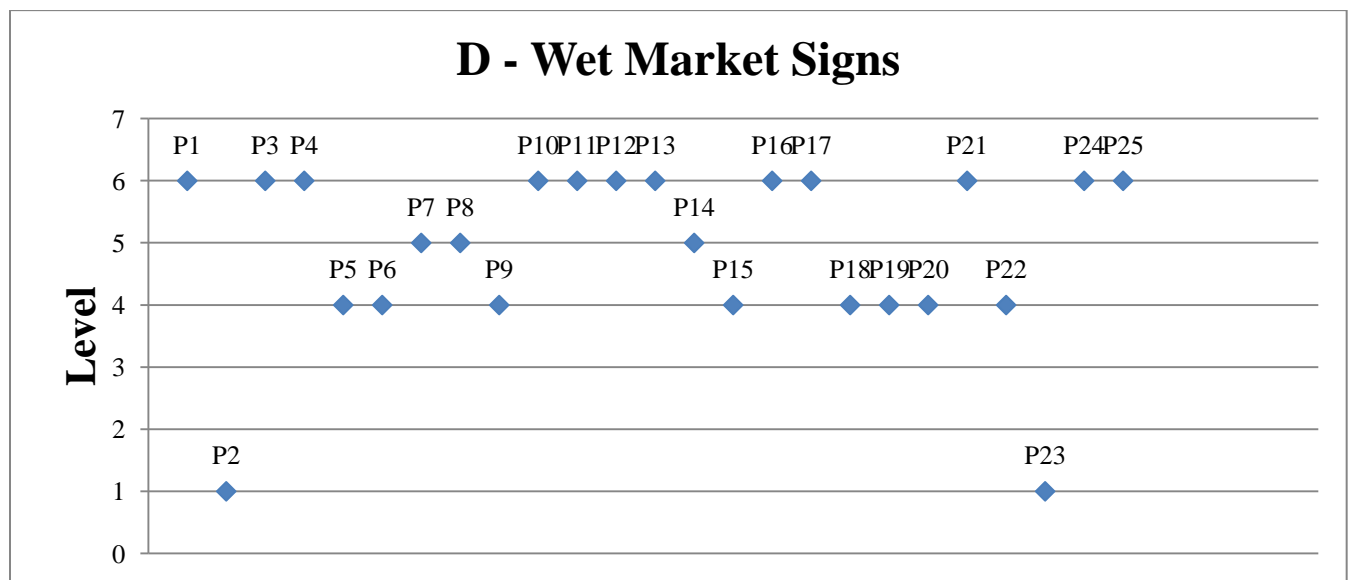


Figure 12. Participant scores in Wet Market Signs

3.1.6 Category E – Warning Signs

Figure 13 shows the scores each individual participant scored in Category E. The participants in the category were presented with signs E1 and E3. Most participants scored at Level 6 again but this time, no one scored at Levels 2, 3 and even 5. This shows that colour is of little significance to the participants when it comes to deciphering warning signs. In fact, taking a look at the results, most participants did not know what the warning signs represented even when presented with the context. Some claimed to have ignored the signs all their lives since they did not know what they meant anyway and some claimed to have believed it to be of a different meaning and no one had corrected them.

Unpredictably, given the unfamiliarity and the poor results of literacy yielded in this category of the test, Participant P21 was sure about the warning sign presented to him in the interview, even at Level 1 (sign E3). The sign said ‘Beware of Traffic’ in both English and Chinese. He managed to recognize the first English word ‘Beware’ in the picture in Level 1. When asked, he said that he knew this because someone had told him the meaning.

We can see from the above, as with the situation in Category C, that the elderly’s mobility around the area did not seem to be hindered by the lack of accessibility to information. However, participant P25 said with regard to sign E3, the place is a road crossing without traffic light nor zebra crossing, but a sign which they are unable to understand. Upon neglect, some of his friends crossed the road without thinking, assuming that no traffic light or zebra crossing means that it is a no-traffic area. Only people familiar with the area would know to stop and look out for traffic. When asked if such a worry will hinder him from roaming around the area, he said it is not much of a problem once he is familiarized with the area, but it takes some time getting used to it and the process can be a little risky at times. This proves that inaccessibility to information can create a problem of insecurity among the elderly, but however for P25, it does not affect his level of independence.

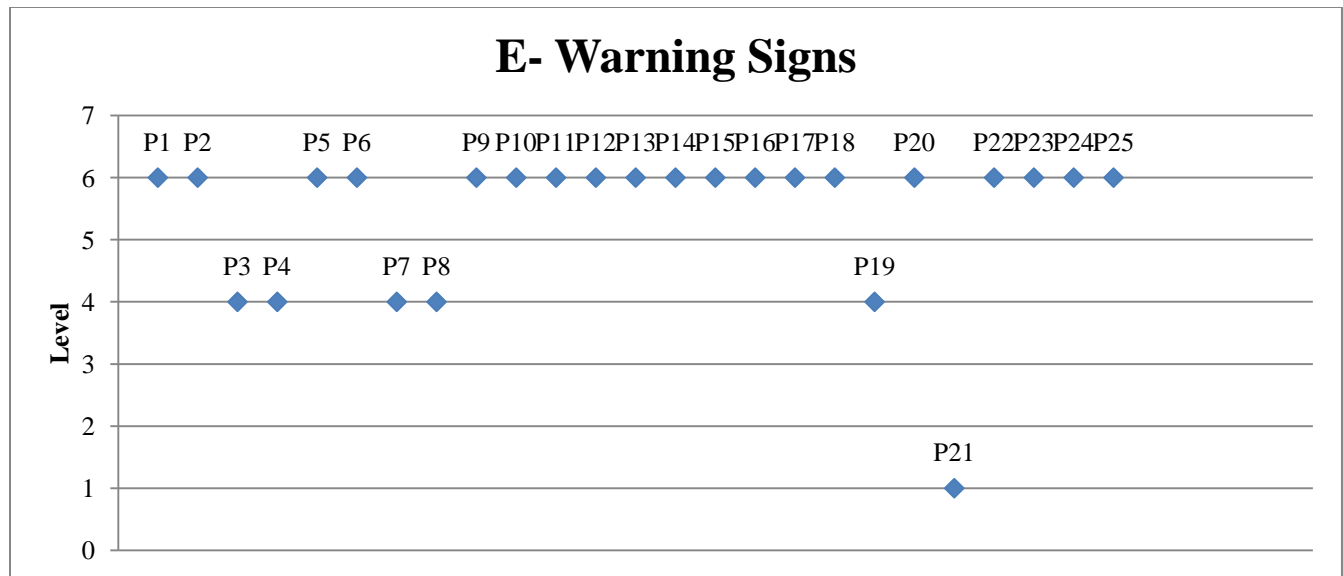


Figure 13. Participant scores in Warning Signs

3.1.7 Category F – Healthcare

Figure 14 shows the scores each individual participant scored in Category F. The participants in the category were presented with signs F1 and F2. Like other categories, most people scored at Level 6. Some of the participants could not even understand what the signs meant when presented in the context. Once again, some participants claimed to have been ignoring the signs, using verbal means to get around in polyclinics, where one of the signs was taken from.

It is also interesting to note that P13, having claimed to have been literate and having recognized signs at Level 1 in the first three categories failed to recognize the sign presented to her in this category. P13 was given sign F2, a sign which consisted of words presented at the sentential level in Level 1. P13 failed to understand its meaning and could not decipher what the sign meant even at Level 6, when the sign was presented with context. This shows that P13 is actually illiterate by our definition and could have claimed to be literate just because she could recognize a few lexical items which she was familiar with.

P7 reappeared at the score of Level 1 in this category and was the only one who knows the healthcare signs presented to the participants. However, in some categories, this participant seemed to be highly illiterate, scoring a 6 at Category C and 5 at Category D. When asked, P7

mentioned that someone had told him what the word was when he saw it in the newspapers once (P7 is presented with sign F1).

Let us take a look at the results obtained for sign F2. The sign gives instructions to the elderly to tap their senior citizen Ez-Link cards to increase the ‘green man’ timing so they could have a longer time to cross the road. However, most who received the sign in their test did not know what it meant, even with context presented. When asked to guess, most of them said it was for paying money to cross the road, drawing a connection to Singapore’s Electronic Road Pricing (ERP) gantry, which collects road taxes automatically from a car passing by the gantry, and Singapore’s Ez-Link card service, which pays for transport fares per time you take a public transport. When asked if they would tap the card at the card reader as shown in the sign, all of them said no and when the exact function of the card reader is revealed to them, some expressed surprise or even disbelief at such a service because they have never heard about it before.

From this, it is clear that inaccessibility of information has hindered the elderly in understanding and using the infrastructure designed to provide them with convenience and safety when navigating around the neighbourhood. Although the scheme has not been implemented in Choa Chu Kang, most of them had not even heard about this healthcare service provided for them because they do not read the newspapers nor have they heard it on the local news. As such, usage of this scheme is hindered due to the inaccessible information provided.

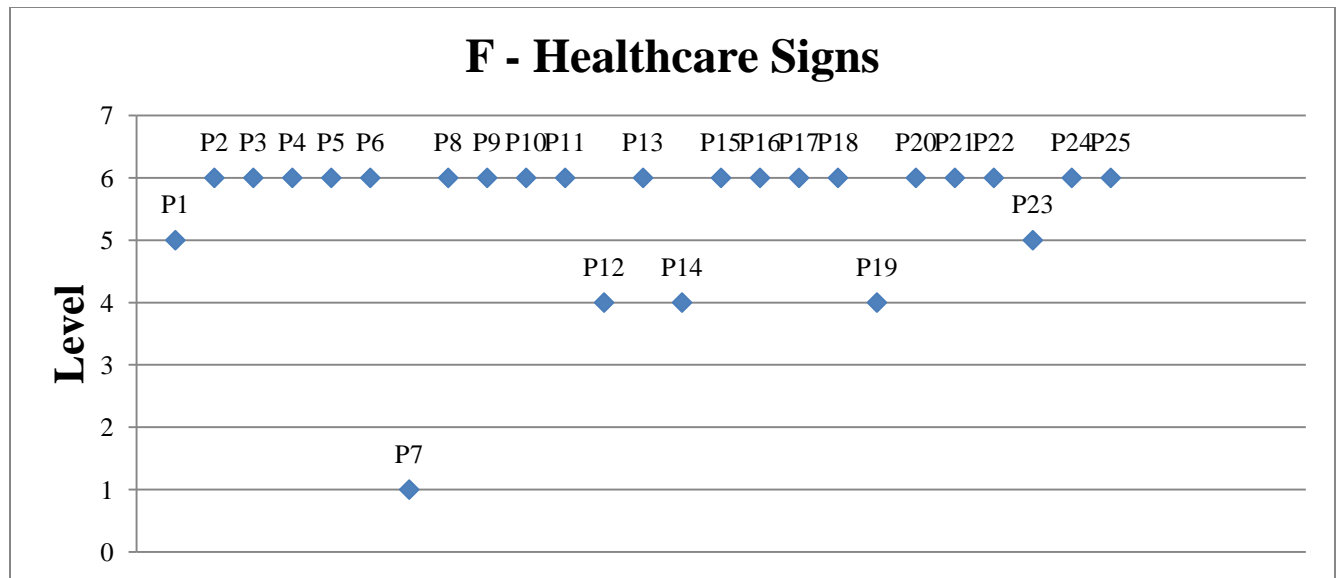


Figure 14. Participant scores in Healthcare Signs

3.1.8 Category G – Chinese Tradition

Figure 15 shows the scores each individual participant scored in Category G. When presented with the sign (sign G2 in Appendix A), all of the participants were told that it represents a brand. Most participants had no clue until Level 6. The elderly claimed that since it was a brand of sweet, some of them did not like it and others could not take them because of chronic ailments like diabetes, hence unfamiliar with its name or logo until they saw the unique packaging of the sweets and therefore having to rely on contexts to know what it is.

However, five of the participants could immediately recognize the words and identified that it was a brand of sweet and could name the brand correctly at Level 1. The caregivers identified these participants to either eat the sweets themselves or had to take care of grandchildren who liked eating the sweets.

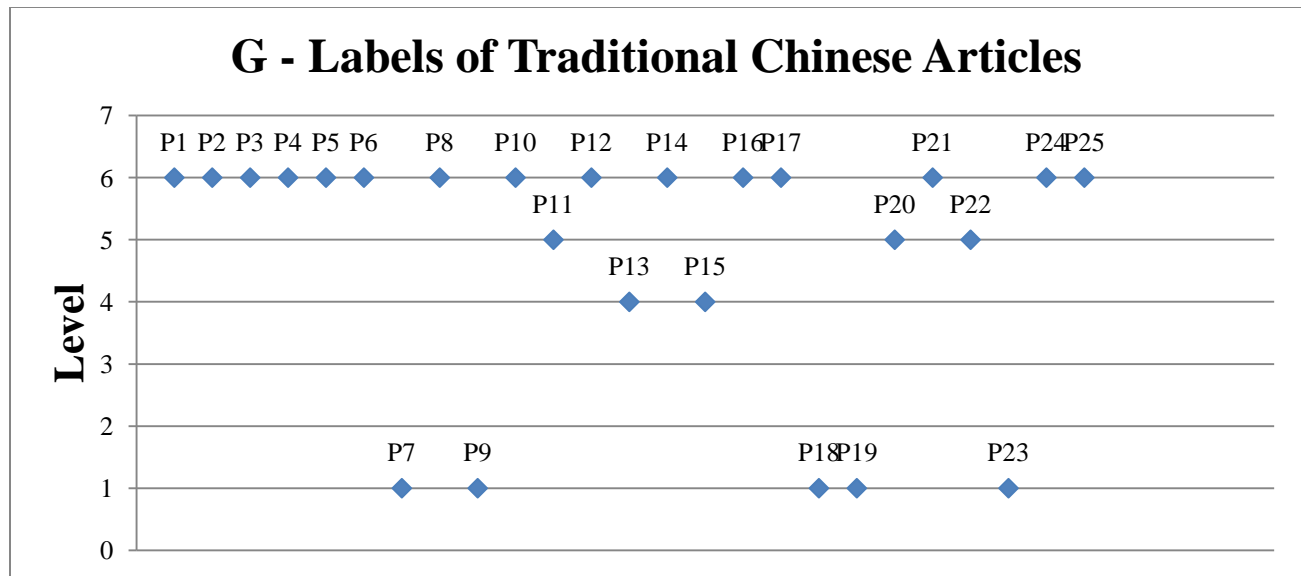


Figure 15. Participant scores for Labels of Traditional Chinese Articles

3.1.9 Category H – Common Medicine

Figure 16 shows the scores each individual participant scored in Category H. The participants in the category were presented with sign H1. Surprisingly, at this category, the reverse trend seemed to have occurred. Most participants identified the sign at Level 1, even participants like P1 or P11 who had been scoring at Levels 5 or 6 for each category throughout the interview. When questioned, these elderly said that the brand had been around even before they were born and they grew up with it, hence familiar with the brand and its words. Most of them, however, identified it with its Chinese name rather than its English name.

Interestingly though, while a few needed pictorial and colour cues to prompt the recognition of the sign, P13 did not score at Level 1. Given that most elderly are most familiar with this sign, P13, who could recognize signs at Level 1 in Categories A to C failed to do so in Category H. Upon questioning, P13 simply could not read the words presented in the first few levels and had to rely on the picture of the tiger to recognize the sign. There seemed to be no other reasons other than she had largely ignored the words on the sign and solely identified the item by the picture itself.

It is possible though that the results for this category is largely skewed due to the familiarity of the particular brand of medicine, Tiger Balm, which has been a household name ever since

they were born. Although this elicits the importance of familiarity in functional literacy of the sign, it might not be conclusive to all common medicines available in the market. Therefore, an additional sign could be used in a follow-up to offset this difference for a more accurate result.

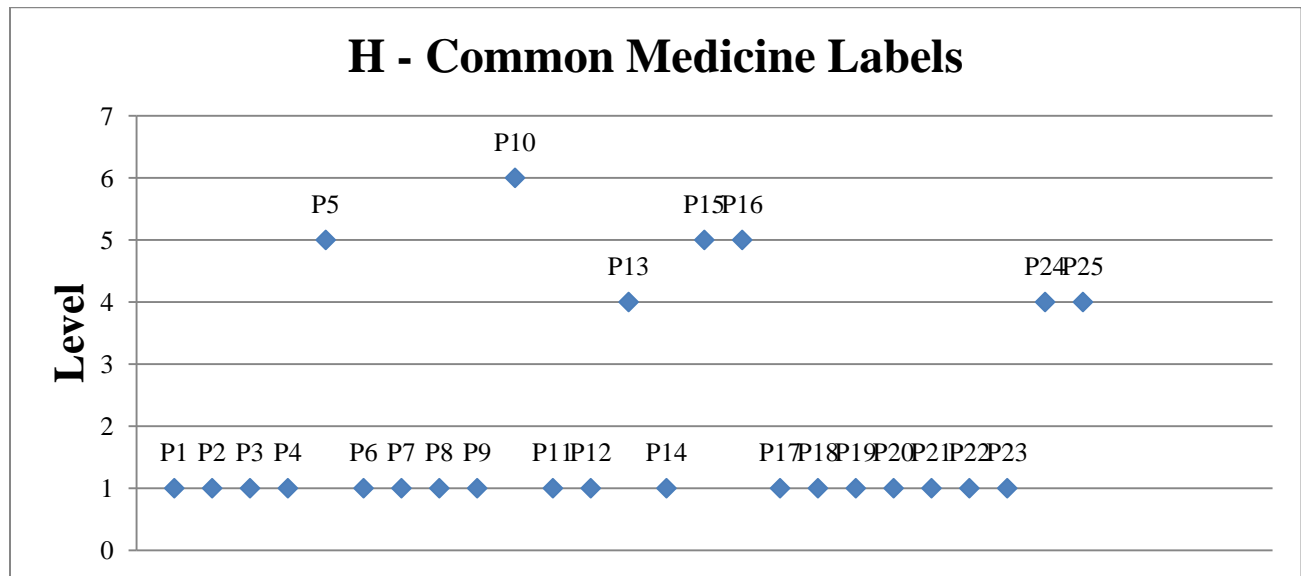


Figure 16. Participant scores in Common Medicine Labels

3.1.10 Category I – Surname Recognition Test

For this section, the total number of people is recorded for each sub-category, hence a bar graph is used instead of a line graph; Figure 17 reflects the number of participants who could write their own surnames or recognize common surnames. Surprisingly, most of the participants could write and recognize surnames, with the exception of 2 who could not write and 1 who could not recognize common surnames. There are two different participants who fall into this category.

P5 cannot write nor recognize common surnames, not even her own. When asked to write her surname, she gave a pictorial like imitation of the Chinese character. She could not recognize any of the surnames presented in the list. The other participant, P25, could not write his own surname, but could recognize common surnames. He specially pointed out the surname Wu, relating it to Singapore's Emeritus Senior Minister Goh Chok Tong and the surname Chen to his friend's name. The association with surnames to famous, public figures like our ministers or celebrities, or even friends whom the elderly are familiar with could be the reason why they can

recognize surnames even if they are illiterate. It is therefore evident that familiarity also plays a part in surname recognition among the elderly.

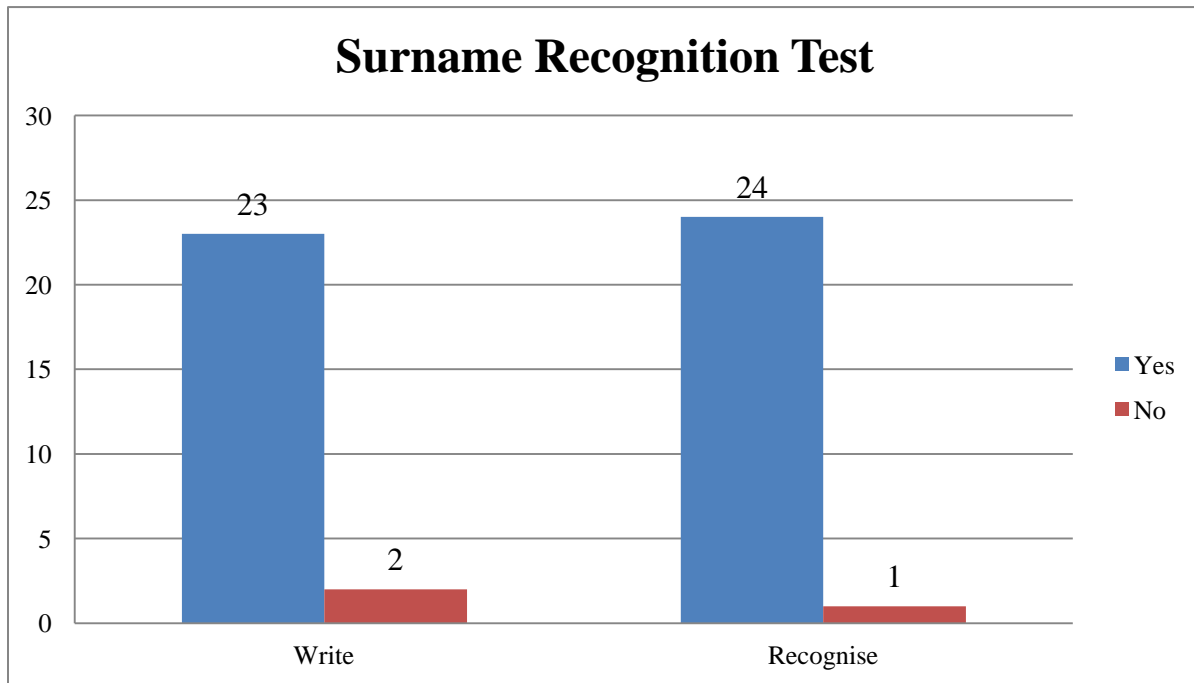


Figure 17. Results for Surname Recognition Test

3.2 By Levels

Similar to the analysis of the surnames category, a bar graph (Figure 18) is used to reflect the total number of people scored in each level of literacy throughout the entire interview. Levels 2 and 3 were not used for sign-recognition at all and Level 6 was scored the most times. This shows that for most signs, elderly largely relied on context or more (like people explaining it to them etc.) In the cases which signs were not recognized even at Level 6 despite the caregivers declaring that they should be familiar with the signs, reasons given by the elderly were that either they had never bothered looking at the signs at all since they did not understand it anyway, or that they had a misconception about what the signs meant. This case is largely significant in Categories E and F.

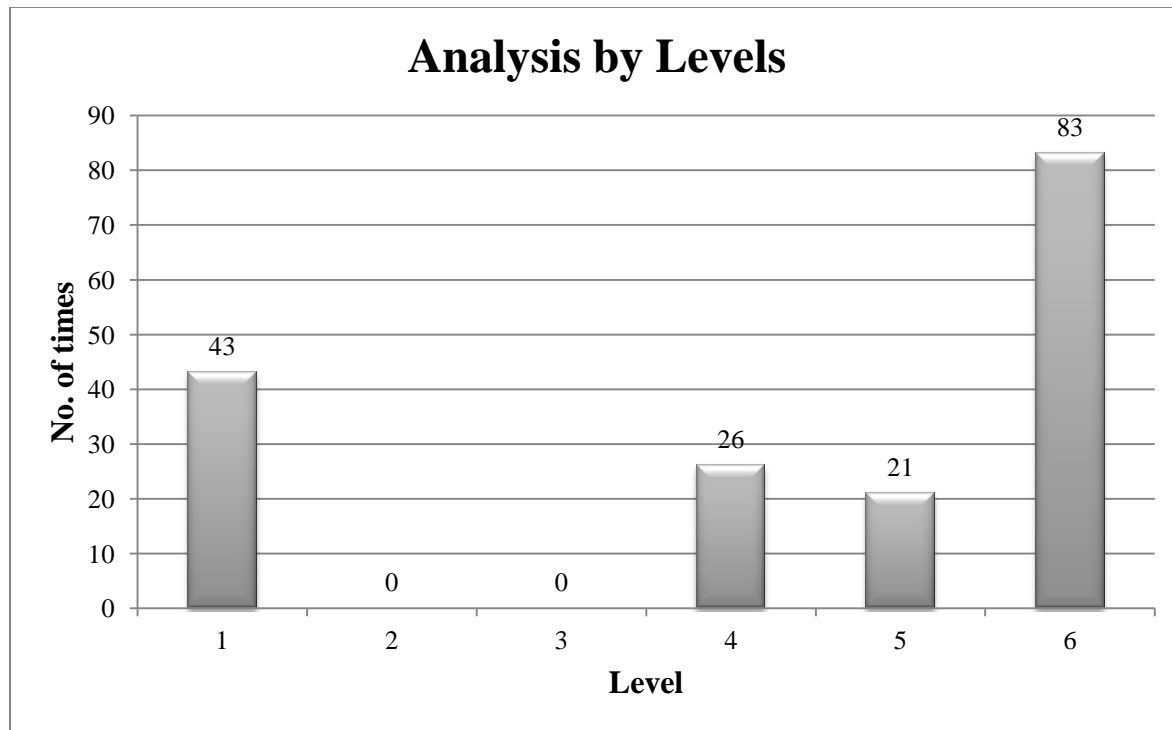


Figure 18. Analysis by Levels

4.0 Conclusion

The elderly face a couple of problems while staying in the urban areas, namely, problems with physical infrastructure and information access. Studies reported that these problems influence the elderly's perception of safety and security of navigating around their neighbourhood. Policies implemented in Singapore helped the elderly safeguard their financial, healthcare and safety and social needs. With problems of infrastructure resolved, Singapore can take up the next step to help the elderly better. This can come in the form of improving the accessibility of information for the elderly.

Statistics reveal that a large portion of the elderly is illiterate and a previous study is conducted discovered that a portion of the elderly in Singapore faced difficulties in understanding street signs in their neighbourhood. This problem of illiteracy complicates the situation of inaccessible information for the elderly as information access requires basic understanding of 'written' language. Hence, this research attempts to analyze the problem of illiteracy among the elderly in conjunction with their understanding of the written messages in LL in their neighbourhood. Seeing that, unlike children, the elderly have been surrounded by

signs all their life, it seems possible that they may have picked up reading or understanding from these signs. Therefore, it seems insufficient to simply classify literacy of the elderly into just two categories, literate or illiterate. Therefore, to start off the study, an instrument was designed to test the elderly's literacy level. It includes the use of different categories of signs which the elderly are familiar with and analysis is broken down into different levels to help us understand the level of illiteracy the elderly are at. In this paper, the ability to read is defined as the elderly's ability to decipher the meaning of the written messages in the signs without the use of context, in a default font, colour and size. Also, recognition of simple lexical items is not regarded as literacy; to be considered as completely literate, the elderly must be able to understand written information at a sentential level.

We found that, generally, most elderly are unable to recognize healthcare and warning signs. Given the government's attempts at improving healthcare and infrastructure for the elderly as mentioned in Section 1.2.1, the inability for the elderly to recognize these signs have resulted in the under-utilization of the facilities and policies implemented by the government.

This study also yielded a number of surprising findings. Firstly, the elderly seem to be able to recognize signs even in typed out fonts when they are extremely familiar with the lexical item. For example, in the case of Category H, most illiterate elderly recognized Tiger Balm at Level 1. Similarly, P2 and P23 could recognize the pricing boards in the wet market because they frequent the place. Secondly, the elderly seemed to ignore signs when they saw that they were unable to understand them. For example, participants claimed to ignore the warning signs all their lives since they did not know what they meant. They gained knowledge by relying on word spread by people, through the news on TV or by through their friends and loved ones. Thirdly, in relation to the previous point, when they elderly go to places which they were familiar with, in terms of culture and tradition, there was an unspoken rule to help them navigate their area safely without the use of signs. For instance, participants did not rely on the sign for donation box (Category C) to know what it was for since they already knew the routine in the temple. Finally, we also found that even though the elderly are illiterate, most of them could recognize and write surnames. This seems to suggest that surnames is another category altogether in the lexicon of the uneducated elderly.

From the results above, we can tell that the elderly recognize signs best when told verbally or when they are most familiar with them. Thereafter, further research and policy making can look into creating or identifying adequate information channels to overcome the problem of inaccessible information faced by the illiterate elderly in Singapore based on this direction. For example, more information on policies and benefits for the elderly can be released through news on television and radio, perhaps most effectively run by the elderly themselves. A similar research can also be done on with the Malay or Indian elderly population in Singapore.

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Appendix A

MARMITE

妈蜜菜汁

A1.1



A1.2

MARMITE

A1.3



A1.4



A1.5



A1.6

TOP

A2.1

TOP

A2.2

TOP

A2.3



A2.4



A2.5



A2.6

Choa Chu Kang Loop

B1.1

Choa Chu Kang Loop

B1.2

C h o a C h u K a n g L o o p

B1.3



B1.4



B1.5



B1.6

Brickland Rd

B2.1



B2.2

Brickland Rd

B2.3



B2.4



B2.5



B2.6

DONATION BOX
福田箱

C1.1

DONATION BOX
福田箱

C1.2

福田箱

C1.3



C1.4



C1.5



C1.6

蜜蜂芒果

MANGOES

D1.1

蜜蜂芒果

MANGOES

D1.2

蜜蜂芒果

D1.3

蜜蜂芒果
3.米串 7.00
E17.14 串 2.50

D1.4/D1.5



D1.6

皇白菜

HUANG BAI CAI

D2.1

皇白菜

HUANG BAI CAI

D2.2



D2.3



D2.4



D2.5



D2.6

DANGER

危險勿進

BAHAYA

E1.1

DANGER

危險勿進

BAHAYA

E1.2

DANGER

**危險
勿近 BAHAYA**

E1.3



E1.4



E1.5



E1.6

PROTECTED AREA

保护区 闲人免进

DI LARANG MASOK
JIKA TIADA
KEBENARAN

E2.1

PROTECTED AREA

保护区 闲人免进

DI LARANG MASOK
JIKA TIADA
KEBENARAN

E2.2

PROTECTED AREA

DI LARANG MASOK
JIKI TIADA
KEBENARAN

保护区
闲人免进

E2.3



E2.4



E2.5



E2.6

BEWARE OF TRAFFIC
注意交通

E3.1

BEWARE OF TRAFFIC
注意交通

E3.2

**BEWARE OF
TRAFFIC**

E3.3



E3.4



E3.5



E3.6

X-Ray

F1.1



F1.2

X-ray

F1.3



F1.4



F1.5



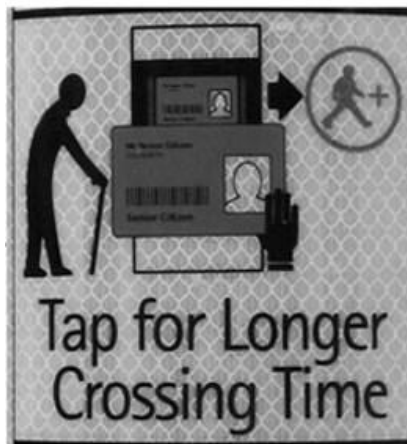
F1.6

Tap for Longer
Crossing Time
请打卡以增加绿人时间

F2.1/2.2

Tap for Longer Crossing Time

F2.3



F2.4



F2.5



F2.6

宣都銀行

THE HELL BANK

G1.1

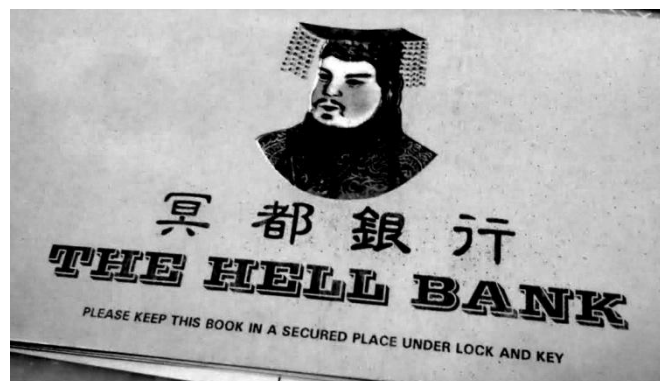
宣都銀行

THE HELL BANK

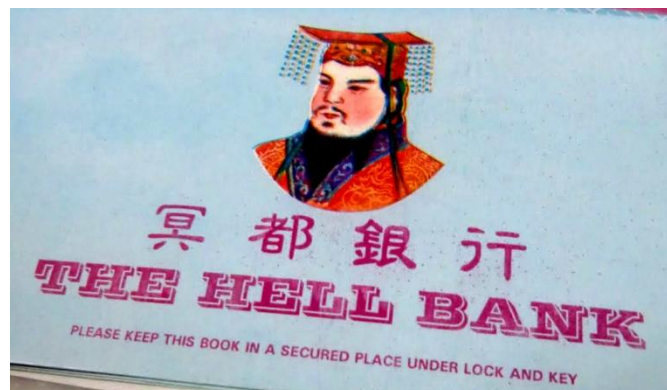
G1.2

冥都銀行
THE HELL BANK

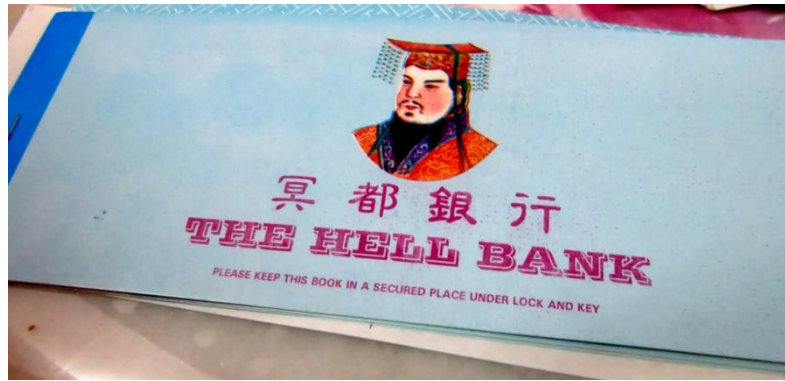
G1.3



G1.4



G1.5



G1.6

大白兔

WHITE RABBIT

G2.1

大白兔

WHITE RABBIT

G2.2

大白兔
WHITE RABBIT

G2.3



G2.4



G2.5



G2.6

TIGER BALM

虎標萬金油

H1.1

TIGER BALM

虎標萬金油

H1.2

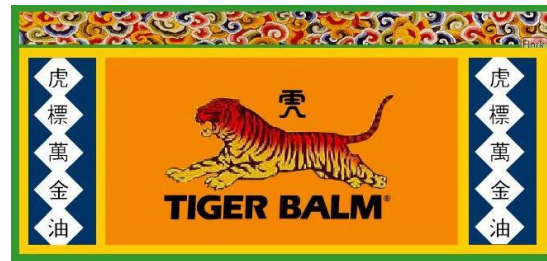
TIGER BALM

虎
標
萬
金
油

H1.3



H1.4



H1.5



H1.6

Zam-Buk

H2.1

Zam-Buk

H2.2

Zam-Buk

H2.3



H2.4



H2.5



H2.6

Fever Relief

银翘散

H3.1

Fever Relief

银翘散

H3.2

Fever Relief 银翘散

H3.3



H3.4



H3.5



H3.6

陳	陈
CHEN	CHEN

葉	叶
YE / IP	YE / IP

II.1

吳	吴
WU	WU

林	李
LIN	LI

II.2

黃	王
HUANG	WANG

蔡	曾
CAI	ZENG

II.3

許	许
XU	XU

張	张
ZHANG	ZHANG

II.4

Appendix B

Verbal Consent Script

Hi. My name is Soh Yu Bin, an NTU undergraduate from the Division of Linguistics and Multilingual Studies.

NTU is conducting research to find out more about whether and how the non-verbal linguistic landscapes in Singapore, focusing on warning signs, cater to the needs of the illiterate elderly and you fulfil the criteria required for the participants in this study.

There will be approximately 25 participants in the study. The study involves an interview, which will be recorded using a sound recorder. It will only take about an hour. Participation in this study does not involve any foreseeable risks and your identity will be kept confidential. Your name will not be mentioned in the report.

We hope that we can help improve the healthcare system and benefits for the elderly through this study and your participation will be of great help.

Parts of your interview may be played in linguistics classes or conference presentations, or transcribed in written reports, for demonstration purposes connected with linguistic analysis.

Should you have any questions about the participation or the study, you can reach me at 9762 3657.

Participation in this research is entirely voluntary. You may refuse to participate or withdraw at any time without penalty.

Research records will be kept completely confidential to the extent allowed by law.

Do you understand everything that I've just explained to you?

If you have no further questions, do you agree to participate in the interview?

Appendix C**Language Profile**

Participant code: _____

Age: _____ Birth year: _____

Declaration of education: Y/N

Can you read? Y/N

Any eyesight, hearing or mental disabilities (declared by caregiver):

- ☐ Yes. What is it? _____
- ☐ No.

Q1. What are the languages that you speak? How often?

- ☐ English; Daily/Frequently/Occasionally
- ☐ Mandarin Chinese; Daily/Frequently/Occasionally
- ☐ Malay; Daily/Frequently/Occasionally
- ☐ Japanese; Daily/Frequently/Occasionally
- ☐ Hokkien; Daily/Frequently/Occasionally
- ☐ Teochew; Daily/Frequently/Occasionally
- ☐ Hakka; Daily/Frequently/Occasionally
- ☐ Cantonese; Daily/Frequently/Occasionally
- ☐ Others: _____

Q2. To whom do you speak these languages with?

- ☐ Family and relatives
- ☐ Friends
- ☐ Sales people (at market, at shopping centers etc).
- ☐ Others: _____

Q3. What media do you engage in to learn about news, policies, benefits and improved elderly friendly infrastructure for the elderly?

- ☐ Newspaper
- ☐ Magazines
- ☐ Radio. Which station? _____ What language? _____
- ☐ News on TV
- ☐ Internet
- ☐ Word of mouth (from families or friends)

☐ Others: _____

Q4. Do you have problems navigating around the neighborhood?

- ☐ Yes
- ☐ No

Q5. If yes, what are some of the problems that you face?

- ☐ Don't know the way.
 - Could you read the direction signs provided? Y/N
 - If no, why? _____
- ☐ Feel that the neighborhood is not safe.
 - Do you know where to seek help if you meet with problems? Y/N
 - Do you understand the warning signs that have been pasted around, warning people to avoid dangerous surroundings? Y/N
 - If no, why? _____
 - Does this deter you in going out and walking around your neighborhood? Y/N
- ☐ I can't walk very much. No space to rest.
- ☐ It's inconvenient for me to walk around.
 - Reason:
 - Sickness, need someone to be around
 - Disability
 - Physical pain

I am going to show you some pictures and ask you some questions. You can stop me at any point if you are tired and take a rest. We can then continue when you are ready, is that okay?

Category A – Picture Code: _____

Level 1: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I can read written English.
 b. I can read written Chinese/Malay.
 c. Others: _____
☐ No.

Level 2: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I can read written English.
 b. I can read written Chinese/Malay.
 c. I know it means _____ when the colour is _____.
 d. Others: _____
☐ No.
 Make a guess.
 Answer: _____
 What did you use to guess the meaning?
 a. I use the colour.
 I. What do you think this colour means?
 II. Colour: _____ Meaning: _____
 III. Why did you guess this colour to mean this?

 b. Others: _____

Level 3: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I know the font looks like this for this thing.
 b. I know it means _____ when the colour is _____.
 c. Other people have told me what this is before.
 I. Before they told you, did you know what was it? Y/N
 II. What did you think it was previously? _____ (Correct/Wrong)
☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. Others: _____

Level 4: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- d. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. Others: _____

Level 5: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. I know it means _____ when the colour is _____.
- d. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- e. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. I use the colour.

- I. What do you think this colour means?
- II. Colour: _____ Meaning: _____
- III. Why did you guess this colour to mean this?

d. Others: _____

Level 6: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. I know it means _____ when the colour is _____.
- d. I am familiar with this place.
- e. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- f. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. I use the colour.
 - I. What do you think this colour means?
 - II. Colour: _____ Meaning: _____
 - III. Why did you guess this colour to mean this?

d. I have to use the context.

e. Others: _____

Category B – Picture Code: _____

Level 1: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I can read written English.
 b. I can read written Chinese/Malay.
 c. Others: _____
☐ No.

Level 2: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I can read written English.
 b. I can read written Chinese/Malay.
 c. I know it means _____ when the colour is _____.
 d. Others: _____
☐ No.
 Make a guess.
 Answer: _____
 What did you use to guess the meaning?
 a. I use the colour.
 I. What do you think this colour means?
 II. Colour: _____ Meaning: _____
 III. Why did you guess this colour to mean this?

 b. Others: _____

Level 3: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I know the font looks like this for this thing.
 b. I know it means _____ when the colour is _____.
 c. Other people have told me what this is before.
 I. Before they told you, did you know what was it? Y/N
 II. What did you think it was previously? _____ (Correct/Wrong)
☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. Others: _____

Level 4: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- d. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. Others: _____

Level 5: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. I know it means _____ when the colour is _____.
- d. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- e. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. I use the colour.

- I. What do you think this colour means?
- II. Colour: _____ Meaning: _____
- III. Why did you guess this colour to mean this?

d. Others: _____

Level 6: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. I know it means _____ when the colour is _____.
- d. I am familiar with this place.
- e. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- f. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. I use the colour.
 - I. What do you think this colour means?
 - II. Colour: _____ Meaning: _____
 - III. Why did you guess this colour to mean this?

d. I have to use the context.

e. Others: _____

Category C – Picture Code: _____

Level 1: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I can read written English.
 b. I can read written Chinese/Malay.
 c. Others: _____
☐ No.

Level 2: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I can read written English.
 b. I can read written Chinese/Malay.
 c. I know it means _____ when the colour is _____.
 d. Others: _____
☐ No.
 Make a guess.
 Answer: _____
 What did you use to guess the meaning?
 a. I use the colour.
 I. What do you think this colour means?
 II. Colour: _____ Meaning: _____
 III. Why did you guess this colour to mean this?

 b. Others: _____

Level 3: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I know the font looks like this for this thing.
 b. I know it means _____ when the colour is _____.
 c. Other people have told me what this is before.
 I. Before they told you, did you know what was it? Y/N
 II. What did you think it was previously? _____ (Correct/Wrong)
☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. Others: _____

Level 4: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- d. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. Others: _____

Level 5: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. I know it means _____ when the colour is _____.
- d. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- e. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. I use the colour.

- I. What do you think this colour means?
- II. Colour: _____ Meaning: _____
- III. Why did you guess this colour to mean this?

d. Others: _____

Level 6: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. I know it means _____ when the colour is _____.
- d. I am familiar with this place.
- e. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- f. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. I use the colour.
 - I. What do you think this colour means?
 - II. Colour: _____ Meaning: _____
 - III. Why did you guess this colour to mean this?

d. I have to use the context.

e. Others: _____

Category D – Picture Code: _____

Level 1: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I can read written English.
 b. I can read written Chinese/Malay.
 c. Others: _____
☐ No.

Level 2: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I can read written English.
 b. I can read written Chinese/Malay.
 c. I know it means _____ when the colour is _____.
 d. Others: _____
☐ No.
 Make a guess.
 Answer: _____
 What did you use to guess the meaning?
 a. I use the colour.
 I. What do you think this colour means?
 II. Colour: _____ Meaning: _____
 III. Why did you guess this colour to mean this?

 b. Others: _____

Level 3: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I know the font looks like this for this thing.
 b. I know it means _____ when the colour is _____.
 c. Other people have told me what this is before.
 I. Before they told you, did you know what was it? Y/N
 II. What did you think it was previously? _____ (Correct/Wrong)
☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- c. I think it means _____ when the word looks like _____.
- d. Others: _____

Level 4: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- d. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. Others: _____

Level 5: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. I know it means _____ when the colour is _____.
- d. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- e. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- e. I think it means _____ when the word looks like _____.
- f. I use the picture on the sign.
- g. I use the colour.

- I. What do you think this colour means?
- II. Colour: _____ Meaning: _____
- III. Why did you guess this colour to mean this?

h. Others: _____

Level 6: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. I know it means _____ when the colour is _____.
- d. I am familiar with this place.
- e. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- f. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. I use the colour.
 - I. What do you think this colour means?
 - II. Colour: _____ Meaning: _____
 - III. Why did you guess this colour to mean this?

d. I have to use the context.

e. Others: _____

Category E – Picture Code: _____

Level 1: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I can read written English.
 b. I can read written Chinese/Malay.
 c. Others: _____
☐ No.

Level 2: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I can read written English.
 b. I can read written Chinese/Malay.
 c. I know it means _____ when the colour is _____.
 d. Others: _____
☐ No.
 Make a guess.
 Answer: _____
 What did you use to guess the meaning?
 a. I use the colour.
 I. What do you think this colour means?
 II. Colour: _____ Meaning: _____
 III. Why did you guess this colour to mean this?

 b. Others: _____

Level 3: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I know the font looks like this for this thing.
 b. I know it means _____ when the colour is _____.
 c. Other people have told me what this is before.
 I. Before they told you, did you know what was it? Y/N
 II. What did you think it was previously? _____ (Correct/Wrong)
☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. Others: _____

Level 4: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- d. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. Others: _____

Level 5: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. I know it means _____ when the colour is _____.
- d. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- e. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. I use the colour.

- I. What do you think this colour means?
- II. Colour: _____ Meaning: _____
- III. Why did you guess this colour to mean this?

d. Others: _____

Level 6: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. I know it means _____ when the colour is _____.
- d. I am familiar with this place.
- e. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- f. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. I use the colour.
 - I. What do you think this colour means?
 - II. Colour: _____ Meaning: _____
 - III. Why did you guess this colour to mean this?

d. I have to use the context.

e. Others: _____

Category F – Picture Code: _____

Level 1: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I can read written English.
 b. I can read written Chinese/Malay.
 c. Others: _____
☐ No.

Level 2: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I can read written English.
 b. I can read written Chinese/Malay.
 c. I know it means _____ when the colour is _____.
 d. Others: _____
☐ No.
 Make a guess.
 Answer: _____
 What did you use to guess the meaning?
 a. I use the colour.
 I. What do you think this colour means?
 II. Colour: _____ Meaning: _____
 III. Why did you guess this colour to mean this?

 b. Others: _____

Level 3: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I know the font looks like this for this thing.
 b. I know it means _____ when the colour is _____.
 c. Other people have told me what this is before.
 I. Before they told you, did you know what was it? Y/N
 II. What did you think it was previously? _____ (Correct/Wrong)
☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. Others: _____

Level 4: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- d. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. Others: _____

Level 5: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. I know it means _____ when the colour is _____.
- d. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- e. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. I use the colour.

- I. What do you think this colour means?
- II. Colour: _____ Meaning: _____
- III. Why did you guess this colour to mean this?

d. Others: _____

Level 6: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. I know it means _____ when the colour is _____.
- d. I am familiar with this place.
- e. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- f. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. I use the colour.
 - I. What do you think this colour means?
 - II. Colour: _____ Meaning: _____
 - III. Why did you guess this colour to mean this?

d. I have to use the context.

e. Others: _____

Category G – Picture Code: _____

Level 1: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I can read written English.
 b. I can read written Chinese/Malay.
 c. Others: _____
☐ No.

Level 2: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I can read written English.
 b. I can read written Chinese/Malay.
 c. I know it means _____ when the colour is _____.
 d. Others: _____
☐ No.
 Make a guess.
 Answer: _____
 What did you use to guess the meaning?
 a. I use the colour.
 I. What do you think this colour means?
 II. Colour: _____ Meaning: _____
 III. Why did you guess this colour to mean this?

 b. Others: _____

Level 3: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I know the font looks like this for this thing.
 b. I know it means _____ when the colour is _____.
 c. Other people have told me what this is before.
 I. Before they told you, did you know what was it? Y/N
 II. What did you think it was previously? _____ (Correct/Wrong)
☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. Others: _____

Level 4: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- d. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. Others: _____

Level 5: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. I know it means _____ when the colour is _____.
- d. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- e. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. I use the colour.

- I. What do you think this colour means?
- II. Colour: _____ Meaning: _____
- III. Why did you guess this colour to mean this?

d. Others: _____

Level 6: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. I know it means _____ when the colour is _____.
- d. I am familiar with this place.
- e. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- f. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. I use the colour.
 - I. What do you think this colour means?
 - II. Colour: _____ Meaning: _____
 - III. Why did you guess this colour to mean this?

d. I have to use the context.

e. Others: _____

Category H – Picture Code: _____

Level 1: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I can read written English.
 b. I can read written Chinese/Malay.
 c. Others: _____
☐ No.

Level 2: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I can read written English.
 b. I can read written Chinese/Malay.
 c. I know it means _____ when the colour is _____.
 d. Others: _____
☐ No.
 Make a guess.
 Answer: _____
 What did you use to guess the meaning?
 a. I use the colour.
 I. What do you think this colour means?
 II. Colour: _____ Meaning: _____
 III. Why did you guess this colour to mean this?

 b. Others: _____

Level 3: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I know the font looks like this for this thing.
 b. I know it means _____ when the colour is _____.
 c. Other people have told me what this is before.
 I. Before they told you, did you know what was it? Y/N
 II. What did you think it was previously? _____ (Correct/Wrong)
☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. Others: _____

Level 4: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- d. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. Others: _____

Level 5: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. I know it means _____ when the colour is _____.
- d. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- e. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. I use the colour.

- I. What do you think this colour means?
- II. Colour: _____ Meaning: _____
- III. Why did you guess this colour to mean this?

d. Others: _____

Level 6: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. I know it means _____ when the colour is _____.
- d. I am familiar with this place.
- e. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- f. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. I use the colour.
 - I. What do you think this colour means?
 - II. Colour: _____ Meaning: _____
 - III. Why did you guess this colour to mean this?

d. I have to use the context.

e. Others: _____

Category I – Picture Code: _____

Level 1: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I can read written English.
 b. I can read written Chinese/Malay.
 c. Others: _____
☐ No.

Level 2: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I can read written English.
 b. I can read written Chinese/Malay.
 c. I know it means _____ when the colour is _____.
 d. Others: _____
☐ No.
 Make a guess.
 Answer: _____
 What did you use to guess the meaning?
 a. I use the colour.
 I. What do you think this colour means?
 II. Colour: _____ Meaning: _____
 III. Why did you guess this colour to mean this?

 b. Others: _____

Level 3: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)
 How did you know?
 a. I know the font looks like this for this thing.
 b. I know it means _____ when the colour is _____.
 c. Other people have told me what this is before.
 I. Before they told you, did you know what was it? Y/N
 II. What did you think it was previously? _____ (Correct/Wrong)
☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. Others: _____

Level 4: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- d. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. Others: _____

Level 5: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. I know it means _____ when the colour is _____.
- d. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- e. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. I use the colour.

- I. What do you think this colour means?
- II. Colour: _____ Meaning: _____
- III. Why did you guess this colour to mean this?

d. Others: _____

Level 6: Do you understand this?

- ☐ Yes. What is it? _____ (Correct/Wrong)

How did you know?

- a. I know the font looks like this for this thing.
- b. I can recognize the picture on the sign.
- c. I know it means _____ when the colour is _____.
- d. I am familiar with this place.
- e. Other people have told me what this is before.
 - I. Before they told you, did you know what was it? Y/N
 - II. What did you think it was previously? _____ (Correct/Wrong)
- f. Others: _____

- ☐ No.

Make a guess.

Answer: _____

What did you use to guess the meaning?

- a. I think it means _____ when the word looks like _____.
- b. I use the picture on the sign.
- c. I use the colour.
 - I. What do you think this colour means?
 - II. Colour: _____ Meaning: _____
 - III. Why did you guess this colour to mean this?

d. I have to use the context.

e. Others: _____

This is the end of the interview. Are there any feedback or questions that I can help you with?

Other comments:

Thank you for your time! ☺

Participant	Field Notes
P1	G2: Does not eat sweets
P2	Takes A1 (familiar with A1), visits temple and market regularly
P3	
P4	
P5	G2: diabetes, does not eat sweets
P6	
P7	Driver, likes to walk around neighbourhood, knows F2 from newspapers, G2: eats the sweet (G2)
P8	
P9	
P10	G2: Does not eat sweets
P11	
P12	Unsure of sign C1, goes to temple
P13	
P14	Takes care of grandchildren, F2: collect money
P15	F2: collect money
P16	F2: collect money
P17	F2: no such thing
P18	Uses A2, visits temple regularly, F2: collect money
P19	Visits temple regularly, F2: collect money
P20	Cook (familiar with cooking materials), F2: collect money
P21	Someone taught him the word 'beware' in E3, F2: collect money
P22	F2: collect money
P23	Familiar with stallholder in market, F2: collect money
P24	F2: no such thing
P25	Ignores sign E3 (says most elderly do), F2: collect money