

# Environmental Print: Research on Hong Kong Children's Understanding of Chinese Words

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## Abstract

This research explores the understanding of Chinese words (commonly used in normal surroundings) by Hong Kong children aged between 4 and 6 in their surrounding. Children were interviewed and were given thirteen objects which they come across in their daily lives. They were then invited to identify these objects, think of some related words and name their functions. Findings show that there is no significant difference in scores on Chinese words understanding of boys and girls. This indicates that children aged between 4 and 6 in Hong Kong can identify Chinese words in their daily lives and understand their meanings. Many of their parents (72%) and teachers (48%) have taught them these words before. However, not many children (42%) are really willing to guess the meanings and pronunciations of words they do not know. This shows that even children have the ability to read many words, though their awareness of language is not very strong. This may hinder development of their reading ability in the future. On the basis of the major results, this study makes some suggestions on the basis of conclusions of the study.

**Keywords :** environmental print, awareness of language, functions

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## Introduction

Infants begin exploring their environment as soon as they are born. They pay more attention to words, symbols and human languages used around them when they grow up. Children then gradually begin to understand the importance of language and words in their lives and spontaneously start exploring the meanings. Thus, in most cases, they have already understood briefly words used in daily life before they begin to read books. Such environmental prints can help most kindergarten children understand the alphabetic nature of words and how to handle books; “it is a bridge between emergent reading and alphabetic decoding” (Prior, 2009, p. 9). However, most research works have focused on acquisition of English words in the surrounding; the extent to which children in Hong Kong understand Chinese words and phrases around them has remained unexplored. The main aim of this research is to explore the understanding of Chinese words by children aged between 4 and 6 in Hong Kong. The other aim is to find scores for different Chinese words of boys and girls are different so that if there is indeed a gender difference, teachers may design the curriculum and learning materials according to children’s needs. This research also intends to give suggestions to schools, teachers and parents about ways to raise children’s awareness of language in their surroundings and help them in language learning. This research project is sponsored by research funding of the Hong Kong Institute of Education.

## Literature Review

### ***Environmental Print***

Environmental prints can be defined as words present in the environment and portrayed in illustrations such as labels, signs and logos (Justice et al., 2006). Children can easily recognize the brands of their favourite snacks and names of their favourite fast food restaurants. When children go out with their families, they pay more attention to environmental prints, such as road signs, shop names and bus route numbers which they come across in their everyday lives.

Many Western scholars (Masonheimer et al., 1984; Christie et al., 2003; Christie et al., 2007) have pointed out that most children between the ages of 2 and 5 years can read numerous product and restaurant logos. They often engage in reading the environmental print before they can read prints in books (Aldridge and Rust, 1987; Clay, 1991; Goodman and Goodman, 1979; Hall, 1985; Wepner, 1985; Wu and Huang, 1987). Reading and understanding the meaning of environmental prints implies that children understand what a print conveys and its meaning and function (Berry, 2000). The print is meaningful to them because they understand, and are familiar with, the functions associated with it (Morrow, 1993). When children read the environmental print, they respond to the graphics, context and function in which print is embedded. In other words, children are able to use symbolic clues to “read” the meaning associated with its functions, colours, pictures and graphics. Such contextualized clues can help children understand that the print is symbolic, functional and meaningful (Prior, 2009). Thus, reading environmental print is a psycholinguistic guessing game (Goodman, 1970). Children search for graphic clues in squiggles and lines of print (Prior and Gerard, 2004). Berry (2000) indicated that the ability to identify a familiar environmental print demonstrates a child’s awareness of the print. It was print awareness in situational contexts that Goodman (1986) proposed as the first root of literacy, which is important in reading.

### ***Related Researches***

In the early 1980s, Hiebert (1981) and Huba and Kontos (1985) found that children accumulate some knowledge of words, phrases and symbols from their daily lives before they begin to learn to read. Corinin, Farrell and Delaney (1999) pointed out that everyday words help children read. This shows that environmental print can increase children’s literacy to a certain extent.

Fingon (2005) found that children can learn and understand letters more effectively when they see their favourite signs. Horner (2005) also pointed out that children between the ages of 4 and 6, both boys and girls, already have a deep understanding of their surroundings, including words and symbols in their homes and

community. Children with different experiences have different sensitivities to and interest in the environmental print. For example, some are more interested in the logo of the company where their parents are working while some pay more attention to street names (Hernandez and Orellana, 1999). Therefore, children gradually acquire understanding of words, signs and symbols from their surroundings to an unspecified context (Kuby et al., 1994).

Prior and Gerard (2004) further pointed out that environmental print is an important element to develop young children's reading ability and word identification power. Children who can understand the functions of environmental print have greater improvement in their reading in the future (Mason, 1981; Daniel et al., 2004). These researches prove that even before going to school most children have actually already understood many everyday words and acquired some knowledge of reading.

Some other researchers (Christie et al., 2003a, 2003b) found that children might not be able to recognize words in their early reading stages if no contexts or relevant clues (such as pictures and signs) are provided. However, if their parents read and recognize words with them, that helps children acquire word meanings even when no specific context is provided at a later stage.

However, all these research works were conducted in the West. Studies about the usage of everyday words by children in the Chinese society have been limited. Wu and Huang (1987) found that pre-school children could already recognize Mandarin phonetic symbols, identify symbol words and their sounds and even pronounce some of the Chinese characters. This research also discovered that children's ability to name the functions of some objects was highly related to their ability to comprehend individual characters; these findings were published some 20 years ago. With further social developments and information advancement, now there is a higher possibility of children understanding more and different words. To what extent do the children in Hong Kong understand the words in their surroundings? Can they identify these words without learning Mandarin phonetic symbols? Do they know the meanings of

these words? Researches conducted in Hong Kong and China about children's understanding of Chinese words have not yet been reported in published literature. Therefore, this research is intended to investigate this aspect.

## Method

### *Participants*

The participants of this research were selected from three different kindergartens. Details are as follows:

- Kindergarten A (Upper and Lower Class: one each)  
27 pupils in the Upper Class, 27 pupils in the Lower Class
- Kindergarten B (Upper and Lower Class: one each)  
25 pupils in the Upper Class, 25 pupils in the Lower Class
- Kindergarten C (Upper and Lower Class: one each)  
10 pupils in the Upper Class, 20 pupils in the Lower Class

The three kindergartens use thematic approach, i.e. the classrooms were decorated with to reflect specific themes such as “Lunar New Year”, “Spring” and “My family”. There were only some environmental prints, such as posters and notices, in Chinese language.

There were altogether 134 pupils participating in this research. Percentage of boys and girls was about the same. The average age of the interviewees in the Upper Class was 5.4 and in the Lower Class it was 4.0.

### *Research Methodology and Tools*

This research was based on two research methods suggested by Lomax and McGee (1984), and Wu and Huang (1987). In their researches, children were given thirteen objects, which could be found easily in their daily lives. These children were then invited to identify these objects, think of some related words and name their functions. Researchers of this study had prepared two sets of objects in advance.

There were thirteen objects in each set, and all these items could be found easily by children in their daily lives. These materials were then put in Bag A and Bag B. Objects in the bags were selected carefully by the study group members after detailed discussion; objects were different from, but of similar nature, compared to those used in Wu and Huang (1987) in Taiwan. These objects could also be found easily in Hong Kong. Objects in Bag A and Bag B were of similar nature but of different brands or names. Researchers were required to choose a bag randomly and invite the interviewees to look at the thirteen objects, including fruit juice, potato chips, egg rolls box, Chinese chess/leisure chess, drawing book, cotton swab, toothpaste, train station/pedestrian sign, “Pull”/“Push” door signs, “Exit”/“Kowloon Canton Railway (KCR)” direction signs, “Please Hold the Handrail”/“Wet Floor” and “Look Left”/“Taxi” notice signs and the signboards of “Welcome / PARKnSHOP” (the Hong Kong supermarkets’ names). The first seven items were material objects while the last six items were pictures. Bag A and Bag B were used by turns.

### ***Research Procedures***

This research was carried out between January and May 2007. The six interviewers were prospective teachers who had received training from the study group’s members and had conducted a trial test in a kindergarten. The interviewees were brought to a quiet classroom by the interviewers and were invited to look at the objects in one of the bags by sequence. Half of the interviewees were asked questions related to objects in the sequence from first to the thirteenth object while for the other half, the sequence was reversed. Whenever an interviewee had seen an object, the interviewer would ask them the following questions:

1. “What is this object?”
2. If the interviewee answered correctly, the interviewer would ask, “What can it be used for?” If the interviewee answered wrongly or did not answer the question, the interviewer could tell the respondent the name of the object and then ask “What can it be used for?”

3. If the interviewee could not name the functions of the object, the interviewer could give some guidance according to the characteristics of the object, such as “Do you have it at home?” and “Have you seen it before? Where did you see it? What is it used for?” This could prompt the respondent to think deeply about the functions of the object.
4. The question was “What would happen if there is no such thing?”

Answers to the above questions were evaluated with the set criteria (described in the next section). Interviews were recorded live and marks were assigned by two interviewers. When there was some difference of opinion about marks to be given, the interviewers listened to the recording again. Organizing and transcribing the information, they would discuss and decide how many marks should be given to the interviewee.

There were two follow-up questions:

1. “Has anyone told you about the names of the objects?”
2. “If you don’t know the names of the objects, do you want to guess?”

### ***Evaluation Criteria***

The evaluation criteria were as follows:

1. 2 points: when the interviewee can name the functions of the word
2. 1 point: if the interviewee can name usage of the words related to the object
3. 0 point: wrong answer or no answer
4. Maximum marks were 26 (13 objects).

The above criteria are based on the research conducted by Wu and Huang in 1987. Since environmental print is symbolic, functional and meaningful, if the child cannot name the word, he/she can describe its usage or function; he/she still gets 1 point.

The scores and typical answers of the interviewees are shown in Table 1.

Table 1. *Scores and Typical Answers of the Word Function Test*

| Items                               | Typical answers                                                                                                                                                                                |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fruit juice                         | 2 points: Guess from the picture of oranges that the words “orange juice” are printed on the box.<br>1 point: Know the words mean orange juice, but do not know which words carry the meaning. |
| Potato chip                         | 2 points: Know from the words Calbee that these are potato chips.<br>1 point: Potato chips. This is something edible. Have tried it before, but do not understand what the words mean.         |
| Egg rolls box<br>(Chinese biscuit)  | 2 points: Egg rolls.<br>1 point: Guess from the appearance that this is a kind of biscuit.                                                                                                     |
| Chinese chess/<br>Leisure chess     | 2 points: Chess. The pictures and words show that this is chess.<br>1 point: Have seen it at home and know this is Chinese chess.                                                              |
| Drawing book                        | 2 points: Micky. To colour. (Pointing at the words and saying that this is a colouring book)<br>1 point: Can get a sticker if we colour it beautifully.                                        |
| Cotton swab                         | 2 points: Cotton swab. To pick ears. (Pointing at the words cotton swab)<br>1 point: To pick ears. Do not understand the words on it.                                                          |
| Toothpaste                          | 2 points: Toothpaste. Have used it before. (Pointing at the word toothpaste)<br>1 point: Know the words on the box which mean toothpaste, but not able to tell which words carry the meaning.  |
| Train station/<br>Pedestrian sign   | 2 points: Know the word “train” and understand some people would take a train.<br>1 point: Roadwork. Forbidding cars to pass through. (Thinking that this is for the drivers)                  |
| “Pull”/ “Push”                      | 2 points: Ask people to push the door.<br>1point: Can not distinguish “Pull” and “Push”, but understand the function of the word.                                                              |
| “Exit”/ “Kowloon Canton<br>Railway” | 2 points: “Exit” informs us where the exit is.<br>1 point: “Exit” informs people where to go.                                                                                                  |

Table 1. continued

|                                                                      |                                                                                             |
|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| “Hold the Handrail”/<br>“Wet Floor”                                  | 2 points: “Hold the Handrail” reminds people to be careful on the escalator.                |
|                                                                      | 1 point: Able to explain the meaning of “Wet Floor”: Don’t tumble.                          |
| “Look Left”/“Taxi”                                                   | 2 points: Have seen it on the road before and know that this is a “taxi”.                   |
|                                                                      | 1 point: Do not know the word “taxi”, but able to explain that this is to carry passengers. |
| “Welcome/ PARKnSHOP”<br>(The famous Hong Kong<br>supermarket’s name) | 2 points: Know from the sign that this is “PARKnSHOP” supermarket.                          |
|                                                                      | 1 mark: Only know that this is a supermarket.                                               |

## Results and Discussion

In order to enhance the credibility of marks given, the two interviewers evaluated the interview according to the above criteria. The interviewers would then decide whether they could reach a consensus on marks given to an interviewee. As shown in Table 2, coefficients of agreement for twelve items had reached over 90. Therefore, the marking criteria of the two interviewers were highly consistent. The remaining items’ score was over 85.

Table 2. *The Coefficient, Average Scores and F value for Each Item*

| Item                          | Coefficient | Average scores | F value |
|-------------------------------|-------------|----------------|---------|
| Fruit juice                   | 97.6        | 1.75           | 0.92    |
| Potato chip                   | 93.5        | 1.45           | 0.85    |
| Egg rolls box                 | 98.8        | 1.25           | 0.73    |
| Chinese chess/Leisure chess   | 92.1        | 1.15           | 0.62    |
| Drawing book                  | 95.3        | 1.16           | 0.71    |
| Cotton swab                   | 90.4        | 1.28           | 0.52    |
| Toothpaste                    | 85.7        | 1.57           | 0.63    |
| Train station/Pedestrian sign | 97.1        | 1.57           | 0.85    |
| Pull/Push                     | 98.9        | 1.24           | 0.67    |

Table 2. continued

|                              |      |      |      |
|------------------------------|------|------|------|
| Exit/ Kowloon Canton Railway | 96.6 | 1.31 | 0.57 |
| Hold the Handrail/Wet Floor  | 93.5 | 1.53 | 0.96 |
| Look Left/Taxi               | 94.7 | 1.45 | 0.62 |
| Welcome/ PARKnSHOP           | 98.7 | 1.60 | 0.88 |

Remarks:

“Coefficient” indicates the coefficient of agreement between marks given by the two interviewers for each item.

“Average scores”: indicate the average scores of the interviewees for each item.

“*F* value” indicates the variance of the *F* value with gender for each item.

Table 2 also shows average scores of 134 interviewees for each item (the average score of each interviewee for each item is calculated by averaging marks given by the two interviewers). Average scores of all the thirteen material objects were over 1.10, indicating that children had understood the messages conveyed by these objects. Many children could name the functions of the objects or even identify the words on the objects clearly. Among the thirteen real objects, fruit juice and supermarket signboards were the most familiar to the children because they drink fruit juice or go to supermarket very often in their daily lives; scores on these objects were very high, 1.75 and 1.60, respectively. As for signs in the surroundings, such as Hold the Handrail/Wet Floor and train station/pedestrian signs, average scores were over 1.50. Scores of Chinese chess and leisure chess were lower (1.15), showing that children do not see these objects very often or they may not like playing chess.

The score of each child is the dependent variable for each question while the gender of the interviewee is the independent variable for all questions. The variation of scores with gender for each of the thirteen questions is shown in Table 2. There is no statistical difference between scores of the two genders. This indicates that boys and girls have similar understanding of words in specific contexts.

This research shows that children between the ages of 4 and 6 in Hong Kong have good understanding of words used in everyday life, which is similar to findings of some foreign researchers (Masonheimer et al., 1984; Christie et al., 2003; Christie et

al., 2007). In the pre-school stage, children have already acquired a large number of words. They also pay much attention to words they encounter in their surroundings and understand the messages conveyed by these words. The findings of this research are different from the study conducted by Wu and Huang (1987) in Taiwan. Most of the children in Taiwan could only recognize Mandarin phonetic symbols, identify symbol words and their sounds or pronounce some of the Chinese words, but they in general did not comprehend the functions of the words around them. However, most children in Hong Kong can tell the messages conveyed by the signs or words on the object and then read out these words in Cantonese without any phonetic symbols.

In other words, Hong Kong children are able to understand Chinese words in daily use and the associated functions. There are two reasons for this. Firstly, it is the effect of family education on children. Children in the interviews indicated that 72% of parents and 48% of teachers had taught them what they knew. Most parents in Hong Kong value children's learning. They like their children to know more new words because they think that the more words their children understand, the higher learning ability their kids will have. Parents in Hong Kong are also very willing to spend money on learning materials such as flash cards for their children, to explain the meaning of words in the environment and thus children learn to recognize many words when they are in kindergarten. Secondly, Hong Kong children have many occasions to interact with the environment. Children in Hong Kong like watching television. Television program and advertisements can subconsciously enhance children's understanding of their surroundings. They have experience of travelling in different kinds of transportation and they always have experience of shopping with their family or domestic helpers. All these experiences help children understand better the words in daily use and the messages conveyed.

This research finds that children in Hong Kong have some understanding of words used in everyday life but it does not mean that they have a very strong awareness of language. In fact this research has a rather worrying implication. During the experiment, many children could read and understand many words. The interviewed

children indicated that their parents and teachers had directly told and taught them these words before and so they could pronounce the words they knew naturally and spontaneously. However, when the children encounter a new word that they are not familiar with, many of them do not really want to try to pronounce the word or explore its meaning. Only 42% of children interviewed said that they would guess the meanings and functions of words from the clues provided, such as pictures and real objects.

## Suggestions and Conclusion

Schools, parents and teachers have helped their children understand many words, but have these three parties made further use of these words to help learning of children and to raise their awareness of language? If children can recognize some of these words only by their resemblance with what they are familiar with, and do not have any significant self-awareness of language, then the future development of their reading abilities will be hindered. Below are some suggestions for school curriculum, teaching methods and parental education.

### ***The environmental print module***

The use of themes is the dominant approach used in kindergartens. Teachers can select themes that are relevant and interesting to children (Pawilen et al., 2010). Teachers may use the thematic approach to design modules with the concept of environmental print. They can provide a print-rich environment in the classroom (Hammer et al., 2002). Children actually have the ability to learn naturally from their environment; the environmental print module just helps those who are not so aware of environmental print and enhances understanding of those who have shown interest in environmental print.

Since there is no statistical difference between genders in these findings, it is not necessary for teachers to consider gender differences in designing learning materials in environmental modules.

It is suggested that there are two ways to promote environmental print curriculum in kindergartens. Firstly, it is necessary to set the theme of one of the modules to “Environmental Print”. This module is composed of words and symbols which students are familiar with. Words and symbols in daily lives are used to decorate the classroom, together with some relevant games and activities, in order to make students more aware of everyday words. For example, teachers can discuss with the students meanings of some environmental prints and interpret words and symbols with the help of the clues (such as pictures) in their surroundings. This course is more suitable for students who are newly admitted to the Lower Class of the kindergarten because they can learn from words and symbols they are more familiar with; they will be more motivated to learn these words and symbols and their meanings. Secondly, teachers can combine environmental print with existing modules in schools. The present curriculum is not changed, but the application of words used daily is intensified. For example, in the “Food” module, teachers can encourage students to read the menus and guess the names of food items from the pictures provided. This can help students recognize more new words.

### ***The teaching strategy***

Environmental print activities used in kindergarten classrooms should use the constructivist approach, giving children instruction about materials, but allowing them to construct their knowledge as they interact with the environment (Kamii, 1993). Kuby and Aldrige (2004) found that indirect instruction using environment print appeared to have a positive influence on the ability of kindergarten children to read logos from environment as compared to those who received direct instruction in environment print.

Teachers can design some teaching activities based on daily life settings to help young children combine symbols and sounds of words. This can also help children develop their reading abilities in the early stages, to a certain extent. However, teachers should not over-pressurize their students to read and remember words

because when students are used to recite words without understanding them, they become less aware of words in daily use. Teachers should design class activities such as matching games with words and Pictionary. They should also pay more attention to their interaction with students. For example, teachers can draw pictures and design slogans together with their students in order to remind the students of regulations that they have to follow before they can eat any snacks. These pictures and slogans can be stuck on the tea table in order to make students understand the functions of the words in daily use and to increase their awareness of language.

### ***Parental education***

Many parents force their children to learn new words and phrases or frequently buy flash cards for their kids. However, this is not the only channel to help children learn. Parents can make use of the environmental print intentionally or unintentionally to create a learning environment, encourage children to be more aware of words in their surroundings and make them more willing to explore the functions of these words. They can also purposefully encourage their children to pay attention to things around them, such as signboards, street names, road signs or even electronic display boards (showing the name of the next stop) on public transport, when they are commuting to and from home. Parents can even play games with children, such as guessing the meanings of road signs, counting the number of signboards, reading menus and guessing names of food items. All of these activities can cultivate children's awareness of language. Parents can also unintentionally carry out some context-based reading activities, such as reading estate notices or labels on canned food with children. This exposes children to new words, encouraging them to explore the meanings of words with contextualized clues, to recognize more new words and to understand the functions of these prints or words.

To conclude, this research shows that children aged between 4 and 6 in Hong Kong can identify Chinese words in their daily lives and understand the meanings carried by these words. In the mean time, there is no significant difference between

scores of boys and girls. Many children indicated that their parents or teachers had already taught them the words used in the interviews. However, the respondents were not really willing to guess meanings and pronunciations of words they did not know. This shows that though children have the ability to read many words, their awareness of language may not be very strong. This may hinder development of their reading ability in the future. Therefore, schools, teachers and parents should enhance children's awareness of language rather than merely the ability to recognize and read words.

This research has its limitations. There were only thirteen questions used in this study, relating to food, articles of daily use, road signs, indication signs and signboards. This was only a trial test in which printed matter such as newspaper; calendars and maps were not included. Therefore, these objects too can be included in future research in order to gain a deeper understanding of children's awareness of language. In the meantime, this research has also shown that children have a fairly good understanding of Chinese words and phrases they encounter in their surroundings. It is suggested that research in the future can investigate whether children's understanding of environmental print can help them develop their Chinese language reading ability when they are promoted to Primary one.

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