

## L1 Acquisition of Chinese Causal and Manner Questions: Data from *zenme hui* and *hui zenme*\*

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This study explores children's acquisition of manner and causal questions by examining *hui zenme* 'how' and *zenme hui* 'why' with a comprehension task (i.e. Picture Identification) and a production task (i.e. Question Asking) designed to investigate the acquisition of manner and causal questions, agency effects, genericity effects, and task effects. The 48 participants were preschoolers divided into three age groups: 4, 5, and 6 year olds. The major findings are, first, there was no significant difference in response to *hui zenme* and *zenme hui* ( $p > .05$ ), but performance was slightly better on the latter. Second, agency and genericity effects were significant in the participants' responses to *zenme* questions ( $p < .05$ ) with participants performing better on *those* with agent subjects and in the non-generic condition. Finally, more wrong responses were produced often in response to manner questions, indicating that questions with *hui zenme* were more difficult to acquire than questions with *zenme hui*.

Key words: agency, genericity, manner question, causal question, L1 acquisition

### 1. Introduction

The order in which children acquire *wh*-questions has been widely discussed in the past few decades (Ingram 1972, Cairns & Hsu 1978, Bloom, Merkin & Wooten 1982, Clancy 1989). The cognitive concepts that encode concreteness such as people, objects and places develop earlier than abstract concepts such as manner, causality, and time. Therefore, questions with *what*, *who*, and *where* are generally found to be easier to comprehend and respond to than those with *why*, *how*, and *when*. Moreover, it has been found that *wh*-questions are easy to understand and that they are generally produced at an early stage. As indicated by Slobin (1973), child language acquisition is intricate and essentially cognitive since the underlying semantic intentions of a child can contain more information than his surface utterance (1973:182). Additionally, many linguistic forms cannot be found in a child's speech until he fully grasps their meaning. To Slobin, a model of the order of acquisition of linguistic structure should consist of the development of semantic intentions, which stems from general cognitive development. In this way, a child, equipped with inherent structures

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and functions of language, “scans linguistic input to discover meaning, guided by certain ideas about language, by general cognitive-perceptual strategies, and by processing limitations imposed by the constraints of operative memory” (1973:208). Following Slobin’s logic, if cognitive development follows a universal sequence, then the order of acquisition of a given concept such as the locative expression or causality should be constant across all languages. If so, the acquisition of *wh*-questions in Chinese should follow the same pattern as well.

Of the *wh*-words in Chinese, *zenme* is the most interesting since its related question is often ambiguous as in (1), where it can be interpreted as a question asking ‘how’ (the manner reading) or a question asking ‘why’ (the causal reading).

- (1) Ni      zenme      wan      youxi?  
       you    how/why    play    games  
       ‘How do you play games?’  
       ‘Why do you play games?’

However, when *zenme* occurs sentence-initially as in (2), the manner reading (i.e. a ‘how’ question) does not occur. This is because the manner adverb *zenme* meaning ‘how’ can only occur before a verb, but the adverb *zenme* meaning ‘why’ can occur either pre-verbally or sentence-initially.

- (2) Zenme    ni      bu      qu      shang      ke?<sup>1</sup>  
       why      you    NEG    go      attend    class  
       ‘Why aren’t you attending your class?’

When the modal verb *hui* co-occurs with *zenme*, this ambiguity disappears. When *zenme* occurs before *hui*, only the causal reading can be made, as shown in (3). Likewise, when *zenme* occurs after *hui*, only the manner reading occurs, as in (4).

- (3) Lisi    zenme    hui      chuxian? (causal reading)  
       Lisi    why      MOD    show up  
       ‘Why did Lisi show up?’  
 (4) Lisi    hui      zenme    chuxian? (manner reading)  
       Lisi    MOD    how      show up  
       ‘How will Lisi show up?’

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<sup>1</sup> The following abbreviations are used in the paper: NEG: negative; MOD: modal; CL: classifier; PROG: progressive; QP: question particle.

Though there have been many studies on the acquisition of *wh*-questions (Ingram 1972, Cairns & Hsu 1978, Bloom, Merkin & Wootten 1982, Erreich 1984, Clancy 1989, Rowland & Pine 2000, Fahn 2003, Valian & Casey 2003), not much research has been done on the acquisition of *wh*-questions by Chinese-speaking children. Therefore, the purpose of the present study is to probe into developmental performance regarding *zenme* questions, particularly focusing on the ‘how’ and ‘why’ meanings of the Chinese *wh*-word *zenme* and its interaction with the modal *hui*.

## 2. Linguistic properties of *zenme* and *hui*

Every language uses its own devices to form questions, and in Chinese one device is to use *wh*-words. Chinese question words are semantically equivalent to English words such as *who*, *what*, *where*, *when*, *how*, and *why*. Interestingly, one of these *wh*-words in Chinese, *zenme*, denotes the meanings of *how* and *why* at the same time. What follows is a discussion of the meanings and uses of *zenme*, the modal verb *hui*, and the interpretations of *zenme* with *hui*.

### 2.1 Semantic classifications of *zenme*<sup>2</sup>

One of the most noticeable semantic properties of *zenme* in interrogative use is the alternation of *how-and-why*, which corresponds to the use of asking about manner<sup>3</sup> and cause.

#### Meaning 1: Manner

The manner adverb *zenme*, when it occurs right before a verb, can be used to ask in what way and style and by what means an action is carried out, as shown below.

- (5) A: Ni    *zenme*    zhu    zhe    dao    cai?  
          you    how     cook    this   CL    dish  
          ‘How will you cook this meal?’
- B: Yong    da    huo    zhu.  
          with   big   fire   cook  
          ‘I’ll cook it over a hot fire.’

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<sup>2</sup> The use of *wh*-words in Chinese can be interrogative or non-interrogative. Since the purpose of the present study is to investigate preschoolers’ acquisition of *zenme* questions, we will only discuss their interrogative use.

<sup>3</sup> According to Tsai (2000), the interpretation of *zenme* can be further divided into three types — the method reading, the mean reading, and the style reading. In this study, we will not further distinguish these interpretations, and we use the general term “manner” to cover all interpretations.

Meaning 2: Causal

When *zenme* is not directly followed by a verb, it usually carries a causal meaning. The causal *zenme* is found when it is followed not directly by verbs but by a negative like *bu* ‘not’ or *mei* ‘not’, or frequency adverbs like *changchang* ‘often’ or *zongshi* ‘always.’

(6) Ni    zenme        mei    zhu    zhe    dao   cai?  
       you   how.come   NEG    cook   this   CL   dish  
       ‘How come you didn’t make the dish?’

(7) Ni    zenme        changchang    zhu    zhe    dao   cai?  
       you   how.come   often            make   this   CL   dish  
       ‘How come you often make this dish?’

When a speaker utters a question that asks about a cause, some event has happened or is going to happen. Hence, the proposition of the sentence must be presupposed. In other words, the event being asked about in (8) and (9) must have happened or is going to happen before the question is asked. Based on this, we may infer that the aspect markers denoting events that have already happened, are in progress, or are about to happen can also be attributed to the causal *zenme*.

(8) Ta    zenme        zai        xizao?  
       he    how.come    PROG    take.a.bath  
       ‘How come he is taking a bath (now)?’

(9) Ta    zenme        chi    le    fan    cai    chuxian    ne?  
       he    how.come    eat    PF    rice    just    show.up    QP  
       ‘How come he did not show up until he had his meal?’

Accordingly, it seems natural to conclude that the causal *zenme* appears when the notion of reality is involved (cf. Tsai 2000).

**2.2 Semantic classification of *hui***

Lyons (1977) classifies modality into epistemic and deontic types, and these have been widely accepted as the two most semantically fundamental kinds of modality (Palmer 1990, van der Auwera & Plungian 1998). As defined by Lyons, epistemic modality refers to ‘the speaker’s opinion or attitude towards the proposition that the sentence expresses or the situation that proposition describes’ (1977:452) and deontic modality is ‘concerned with the necessity or possibility of acts performed by a morally

responsible agent’ (1977:823). In addition, Palmer (1990) adds a third kind of modality—dynamic, which is basically about the ability or volition of the subject of the sentence. As far as the modal *hui* is concerned, it can be epistemic or dynamic (Li 2004).

Meaning 1: Epistemic

The meaning of *hui* pointed out by Tang (1979) is the predictive *hui*, which can be used to make judgments or to show the speaker’s attitude toward an event in the future, in the past, or in the present, as shown below:

- (10) Ta zheyang hui shoushang.  
 he this.way MOD get.hurt  
 ‘He will get hurt if he does this.’

Meaning 2: Dynamic

Sentences (11)-(12) are examples for the *hui* which relates to capacity taken from Tang (1979), where the modal *hui* shows the knowledge and skills of the subject.

- (11) Ta hui shuo san zhong yuyan.  
 he MOD speak three CL language  
 ‘He can speak three languages.’  
 (12) Ta hui kan xiang.  
 he MOD read face  
 ‘He can tell your future from your face.’

The capacity *hui* can be defined as the ‘ability and knowledge to do something’ and ‘being good at doing something.’ Examples for ability-knowledge *hui* are shown in (13), where modifiers such as *hen* ‘very,’ *zhen* ‘really,’ and *zui* ‘the most’ are usually added:

- (13) Ta hen hui kanxiang.  
 he very MOD read.face  
 ‘He is very good at telling the future from your face.’

Meaning 3: Generic

In addition to the above-mentioned meanings, *hui* can be generic<sup>4</sup>, which is not

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<sup>4</sup> The dynamic ‘capacity’ and generic uses of *hui* can be distinguished by context, as shown in (i):

(1) Ta hen hui mai yifu, mai de yifu dou hen panyi.  
 she very MOD buy clothes, buy DE clothes all very cheap  
 ‘She is good at buying clothes. All the clothes she buys are cheap.’

included in Palmer’s classification of modalities. The generic *hui* involves the natural laws, habits or traits and characteristics of a place, person or animal, as in (14), which states a natural phenomenon, the fact that wood can float on water:

- (14) Mutou hui fu zai shuimian shang.  
 Wood MOD float on water.surface top  
 ‘Wood can float on the water surface.’

To sum up, there are three meanings of *hui*: epistemic—judging the possibility of an event; dynamic ‘capacity’—describing ability; and generic—involving the natural laws, habits or traits and characteristics of a place.

### 2.3 Interpretations of *zenme* with the modal *hui*

As discussed above, the *wh*-word *zenme* can have causal and manner meanings. When it occurs with any type of *hui* (i.e. epistemic, dynamic, or generic), these two meanings still hold.<sup>5</sup> However, altered word orders of *zenme* with *hui* lead to different interpretations. For example, a sentence like (15) with *zenme* preceding *hui* attracts the causal interpretation.

- (15) A: Zhangsan baba jintian zenme hui lai?  
 Zhangsan father today how MOD come  
 ‘How come Zhangsan’s father came today?’  
 B: Keneng gen ta shoushang youguan.  
 Maybe with he hurt related  
 ‘Maybe because he (Zhangsan) got hurt.’

In (15), Speaker A was surprised to see *Zhangsan’s* father and asked about his presence. Speaker B then tried to provide a possible explanation.

When *hui* occurs before *zenme*, the manner interpretation is obtained, as in (16):

- (16) a. Ta hui zenme tiaowu?  
 he MOD how dance  
 ‘How will he dance?’

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<sup>5</sup> Special thanks go to one of the reviewers for pointing this out. We mainly focused on the sentences with *zenme* and *hui* in two orders to see if our participants knew how to distinguish the causal reading (*zenme hui*) from the manner reading (i.e. *hui zenme*). The former one is related to causal-*why* and the latter is about manner-*how* in the child L1 acquisition literature. The other functions of *why* or *how* were not investigated in this study.

- b. Ta hen hui zenme chui kouqin?  
 he very MOD how blow harmonica  
 ‘How is it that he is so good at playing the harmonica?’
- c. Mutou hui zenme piao zai shuimian shang?  
 wood MOD how float on water.surface top  
 ‘How will the wood float on the water?’

In (16), the manner interpretation arises, and three types of *hui* can also be found. The first type of *hui* is epistemic, which indicates the possible ways of dancing, as in (16a). Another other type of *hui* is dynamic capacity as in (16b). This not only confirms the speaker’s ability to play the harmonica but further asks about the way in which the subject is good at playing the instrument. For example, the subject may be good at playing the harmonica without air passing in and out of his/her nose. When asking (16c), the speaker does not question the quality of wood that allows it to float; instead, he is asking about the way the wood floats. Sentence (16c) may sound unnatural without a proper context; however, it is acceptable in (17), where the speaker is asking about the way in which the wood will float on the creek.

- (17) A: Zai na tiao xiaoxi li, mutou hui zenme piao?  
 in that CL creek in, wood MOD how float  
 ‘How will the wood float in the creek?’
- B: Manmandi piao.  
 slowly float  
 ‘(The wood will) float slowly.’

Comparing (16a) and (16b) with (16c), we can see that the genericity of the questions can be a factor affecting the acceptability of the *zenme* questions in (17). In addition, the agency of the subject seems to be another factor, as in (18), where the question sounds weird without the answer provided:

- (18) A: Lisi hui zenme xihuan Zhangsan?  
 Lisi MOD how like Zhangsan  
 ‘How will Lisi like Zhangsan?’
- B: Toutoudi xihuan.  
 secretly like  
 ‘(Lisi) will like (Zhangsan) secretly.’

Therefore, we can conclude that the combination of the *wh*-word *zenme* with *hui* can lead to two interpretations, causal and manner. Moreover, some previous L1 studies

have shown that children are more likely to associate the subject with an agent role (cf. Bever 1970, Angiolillo & Golden-Meadow 1982) rather than with other thematic roles. This implies that agency can also be a factor affecting children's comprehension or production of questions containing an agent versus questions containing a non-agent subject. Cimpian & Markman (2011) also found that their child participants tended to provide more essentialized explanations in the generic condition than in the non-generic condition, indicating that children's generic/non-generic beliefs indeed affected their understanding of the world. Since agency or genericity have affected children's acquisition of other constructions, yet since there is no study directly showing that these two factors can affect the causal/manner reading of questions, it is worth incorporating these them into the present study to see if they affect Chinese children's distinction of causal/manner questions.

### 3. Previous studies on the acquisition of casual and manner questions

To our knowledge, no research has been done on the acquisition of causal and manner questions in Chinese. However, several studies on the sequence of the acquisition of causal and manner questions in English have been conducted, and they will be reviewed here (i.e. Cairns & Hsu 1978, Bloom, Merkin & Wootten 1982, Erreich 1984, Miao 1985, Clancy 1989).

Cairns & Hsu (1978) conducted an experimental study on children's responses to six types of *wh*-question: (1) *who*-subject, (2) *who*-object using the progressive aspect, (3) *who*-subject using *do*-support, (4) *why*, (5) *when*, and (6) *how*. Fifty monolingual subjects from a white middle-class background participated in their study. The results showed that, across all ages, the subjects gained the highest scores when answering *who*-object (*do*) and *who* (subject) questions, followed by *who*-object (progressive) and *why* questions, and gained the lowest scores in response to *when* questions and *how* questions. *Why*-questions were found to be the easiest after *who*-questions, showing that causality relations developed fairly early. With regard to the subjects' responses to the *when*-questions, 27% of them were 'temporal-causal.' These answers assumed causal events as the temporal locus for the events asked about. *How*-questions were the most difficult question-type according to the study. It seemed that mastery of *how*-sentences was essential, as the difficulty of answering *how*-questions lay in the lack of sentence production skills and variability<sup>6</sup> in answering such questions.

<sup>6</sup> There are at least three major types of answers to a *how*-question: (1) locative or instrumental responses such as *in a dish* or *with a knife*, (2) statements of the syntactic form *by + V-ing* such as *by jumping on her*, and (3) statements describing a series of events such as *He put on the peanut butter, then he put on the jelly*.

Bloom, Merkin & Wootten (1982) observed seven subjects longitudinally; they ranged in age from 1 year 10 months to 3 years. During the observation sessions, the data were audio-recorded and transcribed with a non-linguistic context provided. Altogether, 7,877 *wh*-questions were produced. The questions acquired earlier in the sequence differed syntactically from those acquired later. Those which first emerged using verbs were *wh*-pronominals such as *where*, *what*, and *who*, and those acquired later were *how*, *why*, and *when* questions; the latter were considered *wh*-sententials whose semantic scope includes the whole proposition expressed in the sentence. In addition, it was found that *what*, *where*, and *who* questions marked an increase in the pattern of verb ellipsis with non-obligatory verbs; however, *how* and *why* questions presented a pattern of increasing utterance length with verbs that were optional in the discourse. Moreover, *why* questions showed the highest proportion of linguistic contingency while *how* questions showed the lowest. Regarding discourse function, *why* and *how* were used differently, *why* questions responding to topics initiated by someone else, and *how* questions introducing new topics.

Erreich (1984) designed an elicitation task to collect yes-no questions and *wh*-questions in English from 18 children (aged from 2 years 5 months to 3 years) in order to see if subject-auxiliary inversion occurs in yes-no questions before *wh*-questions. It was found that a significant number of children applied an optional inversion rule in both types of questions. It was also found that the subjects produced 66 tokens of *why* questions out of 563 *wh*-questions and only 18 tokens of *how* questions. Therefore, causal questions accounted for 11% while manner questions made up only 3%, indicating that causal questions are easier for children to produce than manner questions.

Miao (1985) examined the acquisition order of *zenme* and *weishenme* questions in Chinese with a comprehension task. It was found that *weishenme* questions were acquired later than *zenme* questions. The 4-year-old subjects had significantly better ability in responding to *weishenme* questions than did the 3-year-old subjects. There was a statistical difference between the four year olds and five year olds ( $p < .01$ ). In addition, 42% of correct responses to the *zenme* questions were found in the group of 3 year olds, with the percentage of correct responses reaching 77% in the group of 4 year olds and 80% in the group of 5 year olds. These results show that *zenme* questions are actually acquired quite early.

Clancy (1989) analyzed the order in which *wh*-questions were comprehended and produced in Korean, focusing on the meanings of *wh*-questions and their functions. Two girls, W (aged 1 year 8 months) and H (aged 1 year 10 months) were longitudinally observed, and were audio-recorded for one hour in spontaneous interaction with their caregivers, once every two weeks for a year. Throughout all the

observation sessions, W, whose mean length of utterance (MLU) ranged from 1.5 to 3.9, produced 418 questions, and H, whose MLU ranged from 1.3 to 3.4, produced 367 *wh*-questions. The comprehension and production order of *wh*-question acquisition for both children was similar overall to those of previous findings. However, it was obvious that the two girls had a grasp of certain *wh*-questions that were actually first uttered only a few months later. Besides, the appearance of *wh*-forms confirmed the findings of Bloom, Merkin & Wootten (1982) in their observation that certain *wh*-forms occurred with certain verbs, followed by a gradual expansion to a broader range of linguistic contexts. The later emergence of questions with *how*, *why*, and *when* was interpreted as a reflection of the relative difficulty, abstractness, and heterogeneity of the notions of manner/means, causality, and temporality.

To sum up, though these studies investigated the acquisition order of *wh*-words, there are some flaws in the experiments. Take Cairns & Hu's study for example. There was a mismatch between the questions asked and the content of the video presented to the children in their experiment. The answers to both the *how* and *why* questions could not be found in the video. In some episodes, the answers to the questions were obvious, but in others such information was missing. Bloom, Merkin & Wootten, Erreich, and Miao provide another analysis of the acquisition sequence of *wh*-words; however, in Bloom, Merkin & Wootten's and in Erreich's research, only the production data were examined and in Miao's study only comprehension data were collected. Clancy's study offers an interesting discussion on the acquisition sequence of *wh*-questions, but there is no strong evidence for the influence of input frequency. Aside from these flaws, the difficulty level and acquisition order of *how* and *why* questions have not been discussed much in these studies, and of course none of them were conducted in Chinese. Since previous studies on the acquisition of causal-*why* and manner-*how* questions have not discussed how Chinese-speaking children distinguish *zenme hui* from *hui zenme*, the present study would like to fill this gap by addressing the following research questions:

- 1) Which interpretation of *zenme* with *hui* is easier, manner or causal?
- 2) Do the agency of a subject and the genericity of a *wh*-question influence the Chinese preschoolers' acquisition of *zenme* questions?
- 3) Do Chinese preschoolers perform equally well on comprehension and production tasks in acquiring *zenme* questions?
- 4) Do Chinese children show any general production patterns of *zenme* questions, and which patterns do they frequently use when forming manner and causal questions?

## 4. Research design

### 4.1 Subjects

The participants were 48 Chinese children from a monolingual kindergarten in Tainan County, aged from four to six years old; they were further divided into three age groups, each of which consisted of sixteen subjects.

**Table 1. Background of the participants**

Group	Age	Male	Female
G1 (4 year olds)	4;0~4;11	8	8
G2 (5 year olds)	5;0~5;11	8	8
G3 (6 year olds)	6;0~6;11	8	8
G4 (native controls)	19;0~23;0	8	8

In addition, a group of college students whose native language is Chinese participated in the experiment.

### 4.2 Materials and methods

#### 4.2.1 An analytical framework

As suggested by Karmiloff-Smith (1979:61), both comprehension and production tasks should be conducted in research on language acquisition to avoid “extrapolations which are only narrowly valid.” Therefore, in the present study we designed two tasks — a Picture Identification task (PI task) for comprehension and a Question Asking task (QA task) for production.

As we have discussed in the previous section, the *wh*-word *zenme* used with *hui* can have both manner and causal meanings, and the genericity of the questions and agency of the subject are factors in determining whether a *zenme* question is considered acceptable. This will lead to the following eight types of *zenme* questions: four sub-types for the manner interpretation and four sub-types for the causal interpretation, each of which will be discussed below.

#### Type 1-1 An agent subject in the non-generic condition

This type is the most prototypical, as in (19), where, with an agent subject *ta*, *hui* can be epistemic or have dynamic ‘capacity’. The epistemic *hui* states the speaker’s possible ways of writing, as in (19a), and the dynamic ‘capacity’ *hui* indicates the speaker’s ability to write and in which way he writes best, as in (19b):

- (19) A. Ta hui zenme xie zi?  
 he MOD how write word  
 ‘How will he write?’
- B. Ta hen hui zenme xie zi?  
 he very MOD how write word  
 ‘In what way is X very good at writing?’

Type 1-2 An agent subject in the generic condition

An example of this type of *zenme* question can be seen in (20). Like the subject in the previous type, *yu* ‘rain’ is an agent or a causer that starts the action of raining and affects another entity *beibu* ‘the north.’

- (20) A: Ruguo taifeng mingtian lai le, beibu yu hui zenme xia?  
 if typhoon tomorrow come PART north rain MOD how down  
 ‘If the typhoon comes tomorrow, in what way will it rain in the north?’
- B: Cong shanqu kaishi xia.  
 from mountains begin down  
 ‘It will start raining in the mountains.’

Type 1-3 A non-agent subject in the non-generic condition

This type of question does not exhibit the dynamic ‘capacity’ or generic use of *hui*. As shown in (21), the subject *Lisi* is like an experiencer in essence here since he cannot actively start the action. Besides, the condition cannot be generic since *Lisi*’s liking of *Zhangsan* is neither subject to a natural law nor to *Lisi*’s personality traits:

- (21) A: Lisi hui zenme xihuan Zhangsan?  
 Lisi MOD how like Zhangsan  
 ‘In what way will Lisi like Zhangsan?’
- B: Toutoudi xihuan.  
 Secretly like  
 ‘Lisi will like Zhangsan secretly.’

Type 1-4 A non-agent subject in the generic condition

The last type of manner-*zenme* is used with a non-agent subject in a generic condition as in (22). The subject *mutou* is neither an agent nor an affected argument because it neither starts to act on other entities nor gets affected by them.

- (22) A: Zai na tiao xiaoxi li, mutou hui zenme piao?  
in that CL creek in wood MOD how float  
‘How will the wood float down the creek?’
- B: Manmandi piao.  
slowly float  
‘(The wood will) float slowly.’

Type 2-1 An agent in the non-generic condition

In causal-*zenme* questions asking about the causes of events as in (23), *hui* can have an epistemic and also a dynamic ‘capacity’ meaning. Both of these can be seen in the translations: (a) *hui* shows the speaker’s attitude regarding the proposed cooking event; (b) *hui* shows the subject’s cooking ability. These interpretations indicate the possible reasons why the subject is cooking and about his ability to cook.

- (23) Ta zenme hui zhufan?  
he how MOD cook.rice  
(a) ‘How come he cooked (today)?’  
(b) ‘How is it possible that he knows how to cook?’

Type 2-2 An agent subject in the generic condition

Sentence (24) is an example of Type 2-2. It asks about the natural law according to which fire can burn things down. Like Type 1-2, the dynamic ‘capacity’ use of *hui* cannot occur since no intention on the part of the subject is involved.

- (24) Huo zenme hui shaokua fangzi?  
fire how MOD burn.collapse house  
‘How come fire can burn down a house?’

Type 2-3 A non-agent subject in a non-generic condition

Unlike Type 1-3, (25) has a causal reading even without a context. In (25), *hui* is epistemic, suggesting the possibility of *Lisi*’s liking *Zhangsan*.

- (25) Lisi zenme hui xihuan Zhangsan?  
Lisi how MOD like Zhangsan  
‘How come Lisi will like Zhangsan?’

Type 2-4 A non-agent subject in the generic condition

Sentence (26) represents a causal *zenme* question in the generic condition. Unlike

the case with its manner counterpart, a context is required to make the question acceptable.

- (26) Mutou zenme hui piao zai shuimian?  
 wood how MOD float on water.surface  
 ‘How come the wood can float on the water?’

Based on the above classification, test materials for these types of sentences were designed. Table 2 provides details of each type and their corresponding examples. In total, there were twenty questions including four fillers:

**Table 2. Tests items examined in the present study**

Condition	Agency	Meaning	Example	Item
Generic	Agent	Manner	Naozhong hui zenme chaoxing ren? alarm.clock MOD how awaken people ‘In what way will the alarm clock awaken people?’	2
		Causal	Naozhong zenme hui chaoxing ren? alarm.clock how MOD awaken people ‘How come the alarm clock will awaken people?’	2
	Non-agent	Manner	Youqi hui zenme diao? paint MOD how fall.off ‘In what way will the paint fall off?’	2
		Causal	Youqi zenme hui diao? paint how MOD fall.off ‘Why would the paint fall off?’	2
Non-generic	Agent	Manner	Xiaojing hui zenme da A-ming? Xiaojing MOD how hit A-ming ‘How did Xiaojing hit A-ming?’	2
		Causal	Xiaojing zenme hui da A-ming? Xiaojing how MOD hit A-ming ‘How come Xiaojing hit A-ming?’	2
	Non-agent	Manner	Xiaojing hui zenme xihuan A-ming? Xiaojing MOD how like A-ming ‘In what way will Xiaojing like A-ming?’	2
		Causal	Xiaojing zenme hui xihuan A-ming? Xiaojing how MOD like A-ming ‘How come Xiaojing likes A-ming?’	2
Fillers				4
Total				20

In the PI task, the participants were asked either a manner question containing *hui+zenme* or a causal question with *zenme+hui*. After the question, they were shown two pictures at the same time as in Figure 1: one for the manner reading and the other for the causal reading. If the children understood the question that was designed to elicit the manner reading, then they were expected to choose the picture in which *Xiaojing* is hitting *A-ming* with a hammer. For more information about the PI task, please refer to Appendix A.<sup>7</sup>

Participants saw:	
<p>Picture 1</p> 	<p>Picture 2</p> 
<p>Participants heard:</p> <p><i>Xiaojing hui zenme da A-ming?</i>          ‘How will Xiaojing hit A-ming?’</p> <p><i>Zheli you liang zhang tupian. Na-yi-zhang tupian shi da-an?</i>          ‘Here are two pictures. Which one is the answer?’</p>	

**Figure 1. A sample for the PI task**

In the QA task, the participants listened to sixteen scenarios to elicit the production of questions (also see Appendix B). In this task, a picture of a rabbit with a blank bubble and many question marks over its head was shown throughout. The participants were asked to ask the questions that the rabbit wanted to ask, as shown in Figure 2:

<p>Participants saw:</p> 
<p>Participants heard:</p> <p><i>Xiaotu zai lushang yudao laohu. Laohu shuo ta yao qu da Xiaoxiong. Xiaotu hen xiang zhidao Laohu da Xiaoxiong de fangfa. Keshi Xiaotu buhui shuohua.</i>  <i>Ni neng-bu-neng bang Xiaotu wen Laohu da Xiaoxiong de fangfa ne?</i>          ‘Rabbit met Tiger on the road. Tiger said he wanted to hit Bear. Rabbit couldn’t speak, but he still wanted to know the way Tiger would hit Bear. Can you help Rabbit ask the question?’</p>

**Figure 2. A sample for the QA task**

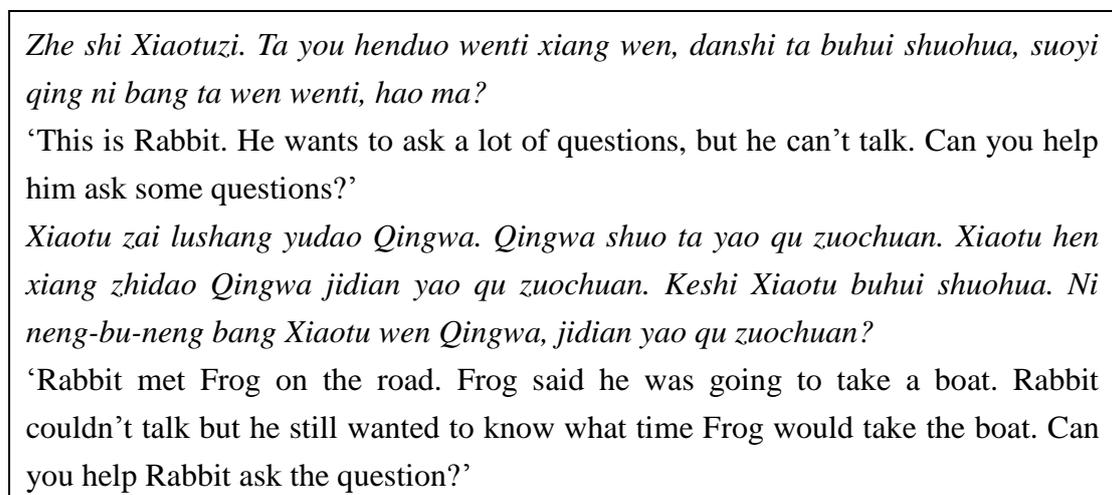
<sup>7</sup> Appendix A presents the trial sentences and the fillers before they were randomized.

Puppets or pictures of the characters mentioned in each scenario were put in front of the participants to remind them of the main characters. While the participants were listening to the description of the experiment, they were shown a tiger puppet and a bear puppet.

### 4.3 Procedure

In the study, two tasks were conducted: a picture identification (PI task) and a question-asking (QA task). All of the child participants received same trial sentences<sup>8</sup> in both tasks; however, the trial sentences had been tested during a different visit to ensure there was no practice effect. To reduce the burden for our child participants, they were first asked to listen to 16 scenarios in the QA task with no fillers. Any participants who failed to respond were considered invalid and were not asked to conduct the PI task. To prevent our participants from randomly selecting an answer to each question in the PI task, we designed four fillers. Those who failed to respond to the fillers correctly were removed. In both tasks, an MP3 recorder was used to record what the participants said in completing the tasks.

For the QA task, two scenarios were provided in the training session:



**Figure 3. A training session conducted in the QA task**

<sup>8</sup> Special thanks go to one of the reviewers for this clarification. In this case-control study, we manipulated complex, multifaceted variables (such as the participants’ language aptitude and the environmental factors, etc.) by conducting the experiment with a smaller number of cases. We chose to avoid potential confounding factors like age and gender by matching the comparison groups, which is time-consuming but straightforward. Therefore, our sample size was limited to ensure that our study groups did not differ with respect to possible confounders. In other words, the groups we compared were artificially made similar with respect to these factors so they would not confound the relationship.

There were two training scenarios in the QA task, which elicited neither manner nor causal questions. In order to make sure that the participants understood the whole process, the task did not begin until each participant asked the question on his/her own. In this task, the pictures mentioned in the scenarios were shown to the participants. The time for completing the QA task was about twenty minutes.

After all of the participants had finished the QA task, the PI task was conducted on different days. Before the formal task started, two training questions were provided, as shown in Figure 4:

<p><i>Zhe shi Gougou. Ta yao gen ni wan youxi. Ta hui wen ni. Ranhou hui gei ni kan tu. Ni keyi gaosu Gougou na-yi-zhang tu shi duide ma?</i>  ‘This is Doggie. He wants to play a game with you. He will ask you a question with two pictures. Can you tell Doggie which picture is correct?’  <i>A-ming wancan chi sheme?</i>  A-ming dinner eat what  (Two pictures were shown to the subject.)</p>	
<p>Picture 1</p> 	<p>Picture 2</p> 

**Figure 4. A training session conducted in the PI task**

At the beginning of the training questions, the characters in the pictures, *Xiaojing* and *A-ming*, were introduced. After the experimenter had ensured that the participants could identify both characters, related questions were asked. Neither of the related questions were manner or causal questions. Once the participants finished answering the questions, the task formally began. The overall time for the PI task, including the training session, was approximately seven minutes.

In the PI task, each correct response to the questions listed in the experiment was given one point. For example, when asked a target question like *Xiaojing zenme hui da A-ming?* ‘How come Xiaojing hit A-ming?’, the participant was expected to choose the picture in which A-ming is eating Xiaojing’s cake. If the correct picture was chosen, then one point was given. If not, no points were given. In the QA task, as long as the participant produced the expected questions, one point was given. For example, one point was given for a question like *Ren zenme hui bei meigui cishang?* ‘How come people get pricked by a rose?’ although the expected question is *meiguihua*

*zenme hui ci shang ren?* ‘How come the rose can prick people?’ Then, the frequency of correct patterns was calculated. The data for each task was processed by SPSS.

## 5. Results and discussion

### 5.1 Acquisition order of *hui zenme* and *zenme hui*

In the present study, *hui* preceding *zenme* denotes ‘how’ questions and *zenme* preceding *hui* denotes ‘why’ questions. Two tasks were designed (i.e. PI and QA Tasks) to avoid the bias caused by a single experiment. The first task enabled us to test the children’s competence of some language aspects they do not show in their production while the second task helped us see a better picture of the children’s linguistic representations (McDaniel, Robinson-Riegler & Einstein 1998). Table 3 illustrates the overall results of the participants’ performances with the two *zenme* patterns.

**Table 3. Subjects’ correct responses to the two tasks**

Type	<i>zenme hui</i>						<i>hui zenme</i>					
	PI		QA		Overall		PI		QA		Overall	
Experimental group	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
	0.56	0.19	0.04	0.14	0.30	0.11	0.59	0.15	0.01	0.04	0.30	0.80
Adult group	0.97	0.05	0.13	0.22	0.55	0.10	0.96	0.05	0.11	0.26	0.54	0.13

As we can see in Table 3, the mean scores for both *zenme hui* ‘why’ and *hui zenme* ‘how’ for the experimental group were quite similar (PI: 0.56 vs. 0.59; QA: 0.04 vs. 0.01; overall: 0.30 vs. 0.30). In other words, at an early stage of language acquisition, our preschoolers did not show a significant difference in their use of these two patterns with *zenme* and *hui* ( $p > .05$ ). Likewise, there was also no significant difference for the Adult Group (PI: 0.97 vs. 0.96; QA: 0.13 vs. 0.11; overall: 0.54 vs. 0.55).

As shown in Figure 5, in the PI task G1 responded in the same ways to the two patterns, but G2 had a higher score on manner questions (i.e. *hui zenme*). On the other hand, G3 and the Adult Group did better on causal questions (i.e. *zenme hui*). In the QA task, G1, G2 and the Adult Group scored slightly higher on *zenme hui*, while G3 showed a higher production rate for *hui zenme*. However, none of these discrepancies reached a statistically significant level ( $p > .05$ ).

Some results are worth noting in Figure 5.

First, there was no significant difference between our participants’ performance on *zenme hui* (i.e. *why* questions) and *hui zenme* (i.e. *how* questions) ( $p > .05$ ), nor was any significant difference found among age groups. It was not easy for us to tell

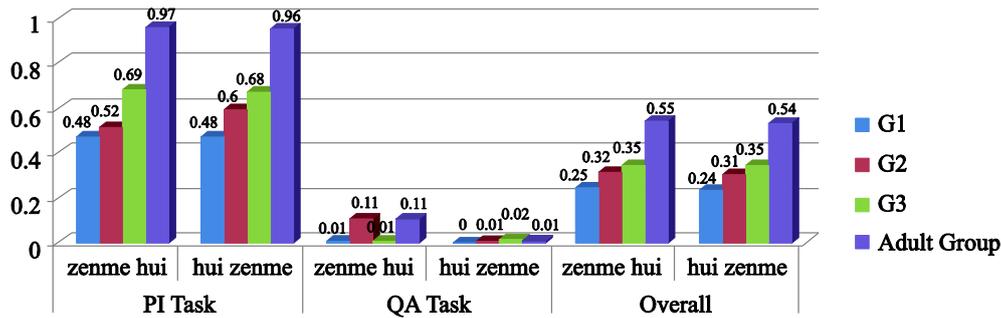


Figure 5. Group scores on the two question types in the QA and PI tasks

which question-type was acquired earlier. However, if we take a closer look at the overall performance of each age group, we can see that except for the oldest group most participants gained higher scores for *zenme hui* questions than for *hui zenme* questions (G1: 0.25 > 0.24; G2: 0.32 > 0.31; G3: 0.35 = 0.35), indicating that causal questions are generally easier than manner questions. Another piece of evidence lies in the differences between the three age groups regarding performance on *zenme hui* questions and *hui zenme* questions. Our children all performed similarly (G1&G2:  $p > .05$ ; G1&G3:  $p > .05$ ; G2&G3:  $p > .05$ ) on *zenme hui* questions, but the four-year-olds and the six-year-olds performed significantly differently on *hui zenme* questions ( $p = .011$ ). In other words, *zenme hui* questions were easier and less challenging than *hui zenme* questions for our participants. Some previous studies have shown different results for the acquisition of *how* and *why* questions. According to Okubo (1967), Wode (1971), Savić (1975), Bloom, Merkin & Wootten (1982), and Miao (1985), *how* questions are learned earlier than *why* questions. However, the present findings are more consistent with Ingram (1972) and Clancy (1989) in that that *why* questions are acquired earlier than *how* questions. As pointed out by Cairns and Hsu, ‘children’s ability to deal with the concept of causality develops fairly early’ and ‘*how* seems like a mixed bag conceptually’ (1978:486). The difficulty of forming *how* questions may lie in the variety of possible answers to them. Likewise, in Chinese there are at least three interpretations of the manner *zenme*, i.e. in what way, with what method, and in what style, and thus at least three answers are possible. Thus, it is reasonable that children would have less ability to deal with *hui zenme* questions. The present results contradict Miao’s (1985) study on Chinese children’s comprehension of *wh*-questions in that *weishenme* questions were acquired later than *zenme* questions. One possible explanation, as provided by Miao, for this difference is that the contents of causal questions in her study was more complicated than those of the manner questions.

Second, Figure 5 shows a developmental trend in the subjects’ use of these two questions. The older groups, as far as their overall performance was concerned,

outperformed the younger groups. With regard to *zenme hui* causal questions, a rising curve (Adult Group > G3 > G2 > G1) was found. As for *hui zenme* manner questions, the average score of correct responses for the Adult Group (0.54) was higher than that for G3 (0.35), that for G3 was higher than that for G2 (0.32), and that for G2 was higher than that for G1 (0.25). The percentage of correct responses to both question-types increased as the subjects got older, indicating that there is a developmental progression in manner questions and causal questions alike that extends beyond age 6. Moreover, since there was no significant difference among the three age groups in response to *zenme hui*, we can infer that children may acquire causal questions before they reach the age of four. Regarding manner questions with *hui zenme*, a significant difference was found only between the 4 year olds and 6 year olds ( $p = .011$ ), suggesting that age five is when the preschoolers develop an ability to use manner questions. Our 6 year olds also showed a significant difference from the Adult Group in their responses to manner questions, indicating that the development of manner questions continues after the age of six.

Third, as shown in Figure 5, our participants scored considerably higher on the PI task than on the QA task ( $p = .000$ ). In Table 3, regarding *hui zenme*, the participants' mean score on the PI task was 0.59 and that on the QA task was 0.01 ( $p = .000$ ). For *zenme hui*, the mean score on the PI task was 0.56, and that on the QA task 0.04 ( $p = .000$ ), demonstrating a significant task effect. This result supports the generally accepted model that comprehension precedes production (Gerken & Shady 1996), and corresponds to previous studies on different language aspects. In line with Tyack & Ingram (1977), our study found that even though the scores of our production task were extremely low for each age group, the participants could still differentiate *hui zenme* from *zenme hui*. In other words, the comprehension task was valid in testing their sensitivity to an aspect of language that they did not yet produce in their speech, and thus lends support to the assumption that comprehension is prior to production in language development. In addition, our participants' better performance on the PI task can be attributed to the fact that there are other ways to ask manner questions and causal questions in Chinese besides *hui zenme* and *zenme hui*. For the former, our subjects adapted other *wh*-words such as *shenme* as in *Laohu ni yao yong shenme fangfa da Xiaoxiung* (Tiger, in what way will you hit Bear?) or use other words such as *yao* 'want' and *xiang* 'think instead of *hui*.' For the latter, the *wh*-word for causal questions *weishenme* was most frequently used. This might be due to the pragmatic factor that lies in the use of *zenme hui*. As pointed out by Tang (1979), *zenme* with causal meanings involves the speakers' emotions, like surprise. In our QA task, the participants were required to ask questions for Rabbit, and the questions were not relevant to our child participants themselves. It was perplexing for them to express

their emotions with *zenme hui*; consequently, most of them chose *weishenme* over *zenme hui* even though the scenario was appropriate.

To sum up, our results show that *zenme hui* (*why* questions) are acquired earlier than *hui zenme* (*how* questions). However, because the difference between these two question-types within each group did not reach a significant level, further research is necessary.

## 5.2 Agency and genericity effect

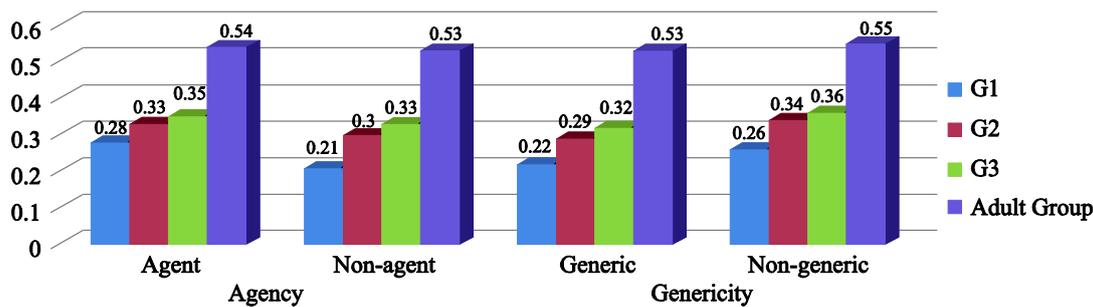
Table 4 presents our participants' performance on *zenme* questions regarding agency and genericity. From the mean scores shown in Table 4, it can be seen that the preschoolers gained a higher score for *zenme* questions with an agent subject than for those with a non-agent subject and that there was a statistically significant difference ( $p = .001$ ). That is to say, the young children showed a preference for *zenme* questions with an agent subject. This preference also showed up in the Adult Group, but with no significant difference ( $p > 0.05$ ). In addition, we can see that the child participants gained higher scores on questions in the non-generic condition than on those in the generic condition, and a significant difference was found ( $p = .006$ ). Likewise, the Adult Group also gained higher scores for the *zenme* questions in the non-generic condition than for those in the generic condition, but no significant difference was found ( $p > .05$ ).

**Table 4. Participants' performances on *zenme* questions regarding agency and genericity**

Group	Agency				Genericity			
	Agent subject		Non-agent subject		Generic condition		Non-generic condition	
	M	SD	M	SD	M	SD	M	SD
Experimental	0.32	0.08	0.28	0.09	0.28	0.07	0.32	0.10
Adult group	0.54	0.12	0.53	0.12	0.53	0.12	0.55	0.12

As shown in Figure 6, the mean scores for *zenme* questions with an agent subject and *zenme* questions in the non-generic conditions were consistently higher than those for their counterparts.

Additionally, a developmental trend was found regarding agency and genericity. As for agency, the older children earned higher scores than the younger ones. It was found that when the participants responded to questions with an agent subject, there was no significant difference among the three age groups. However, when responding



**Figure 6. The performance of each group on questions concerning agency and genericity**

to questions with a non-agent subject, G1 and G3 reached a significant level of difference ( $p = .007$ ), indicating that the non-agent feature of the subject was more challenging to acquire. With respect to genericity, the participants also performed consistently better as their age increased. They performed better on *zenme* questions in the non-generic condition and no significant difference was found among the three age groups. However, the between-group comparison showed that G1 and G3 performed significantly differently ( $p = .010$ ) on questions in the generic condition, implying that the younger children were not as sensitive to the genericity feature of the condition as were the other two experimental groups.

All in all, Table 4 and Figure 6 show that the preschoolers performed better on questions with an agent subject and questions in the non-generic condition. Why were these two types of *zenme* questions less challenging for them?

First, as noticed by Givón (1984), there is a semantic hierarchy for the subject position: agent > recipient/benefactor > theme/patient > instrument > location. In the present study, a significant difference was found between the questions with agent and non-agent subjects ( $p = .001$ ). Take G1 for example. The subjects showed a significant preference ( $p = .048$ ) for questions with an agent subject over those with a non-agent subject. Evidently, questions with an agent subject are easier to acquire and less challenging, supporting Givón’s hierarchy. This agency effect can also be found in Tyack and Ingram’s (1977) study, where the overall percentage of correct responses to questions using a transitive verb with an agent subject was slightly higher than that of correct responses to questions using an intransitive verb with a non-agent subject. The present findings also support agency preference. All age groups encountered less difficulty in acquiring questions with an agent subject than those with a non-agent subject. As Robertson & Suci (1980) pointed out, agents are more attention-catching for children and are better ‘pegs’ for learning words than non-agents. According to Slobin (1982), the ideas first marked grammatically by young children are more salient; that is, sentences with an agent subject are easier for

young children to acquire.

Second, based on the results, it can be seen that our preschool children preferred *zenme* questions in the non-generic condition to those in the generic condition, indicating that there exists a generic/nongeneric distinction in L1 acquisition (Markman 2011, Cimpian & Erickson 2012). This is probably because non-generic events usually happen at the actual time of speaking, and thus are easier for children to capture. On the contrary, generic events usually concern natural laws or habits, which are more abstract and thus more challenging. In the study, the preschoolers responded differently to the generic/nongeneric condition. The youngest group (i.e. G1) might not have even experienced the designed generic scenarios such as the wood floating on the river, and the paint falling off. However, they would have often experienced the non-generic scenarios such as hitting a person, and moving things in their daily life. Therefore, it is not surprising to see that the 4-year-olds performed significantly differently on *zenme* questions in generic and non-generic conditions ( $p = .006$ ). In addition, the between-group comparison showed that the 4-year-olds performed significantly worse than the 6-year-old subjects ( $p = .010$ ), implying that the non-generic condition is favored before age six. As pointed out by Piaget (cited in Papalia & Olds 1992), children from around 2 to 5 years of age are at the pre-operation stage, that is, their learning is closely related to their experience. That is why generic events were more difficult for our young children to grasp. After a few years of learning and life experience, children may have learned about natural laws and become more familiar with them.

All in all, the results of the present study show that it is plausible to consider agency as a universal factor affecting first language acquisition. Moreover, children's familiarity with the world improves their ability to deal with *zenme* questions in the generic condition, as suggested by some studies showing that familiarity influences L1 acquisition and L2 learning (Nippold & Taylor 2002, Garman & Newman 2004, Marinellie & Chan 2006, Lee 2007).

### 5.3 Other patterns found in the QA task

As discussed in Section 5.1, the production rate of *zenme hui* and *hui zenme* questions obtained from the QA task was fairly low. A further examination of the data shows that a total of 768 responses were collected from the experimental group, in which 210 tokens (27.3%) were for causal questions, 60 tokens (7.8%) for manner questions, and 498 tokens (64.9%) for other patterns. As for the adult group, of the 256 responses, 128 tokens (50%) were for causal questions, another 128 were for manner, and no other patterns were produced, as shown in Table 5.

**Table 5. Patterns produced by the participants in the QA task**

Group	Causal questions			Manner questions			Other patterns	Total
	<i>Zenme hui</i>	Related questions	Total	<i>Hui zenme</i>	Related questions	Total		
Experimental group	18	192	210 (27.3%)	7	53	60 (7.8%)	498 (64.9%)	768
Adult group	16	112	128 (50%)	14	114	128 (50%)	0 (0%)	256

*Zenme hui* questions seemed less favored by both the experimental group (18 tokens) and the adult group (16 tokens) in forming causal questions, as were *hui zenme* questions in forming manner questions by the participants (Experimental group: 7 tokens; Adult group: 14 tokens). Instead, more related questions or other patterns were produced, as shown in Table 6 where Types A, B, C, and D are related to causal questions, and Types E, F, and G concern manner questions.

**Table 6. Related questions and other patterns found in the QA task**

Question type		Example	
Causal-related question	A	<i>weishenme</i> + modal + verb	Xiaoxiong, ni <u><i>weishenme yao qu kan</i></u> Laohu? (G2S2) 'Little Bear, why did you want to visit Tiger?'
	B	<i>weishenme</i> + verb	Laohu <u><i>weishenme da</i></u> Xiongxiang? (G2S9) 'Why did Tiger hit Little Bear?'
	C	<i>shi yinwei shenme yuanyin</i>	Laohu bang yi jien <u><i>shi yinwei shenme yuanyin</i></u> ne? (G2S15) 'Tiger helped with one thing due to what reason?'
	D	<i>zenme</i> + V	Meigui, ni <u><i>zenme ci</i></u> ren? (G2S3) 'Rose, how do you hurt people?'
Manner-related question	E	<i>zenme</i> + V	Naozhong <u><i>zenme chaoxing</i></u> ren? (G1S11) 'How does the alarm clock wake people up?'
	F	modal + <i>zenme</i> + V	Xiaoxiong ni <u><i>yao zenme</i></u> xihuan Laohu? (G4S4) 'Little Bear, in what way do you like Tiger?'
	G	modal + verb + <i>shenme</i> + noun	Laohu, ni <u><i>hui yong shenme fangfa</i></u> da Xiaoxiong? (G3S15) 'Tiger, how would you hit Little Bear?'
Other patterns	H	no elicitation	--
	I	repetition	<u><i>Naozhong chaoxingren de fangfa?</i></u> (G1S11) 'The method by which the alarm clock wakes up people?'
	J	keywords	Shitou zai he li zenme hui piao? → <u><i>Shui!</i></u> (G1S13) 'How come the stone can float on the river?' 'Water!'
	K	wrong responses	Xiaoxiong, ni xihuan Laohu <u><i>ma</i></u> ? (G1S8) 'Little Bear, do you like Tiger?'

If we further examine the causal and manner questions the children produced, we can see that each age group preferred to use other *wh*-words rather than *hui zenme* ('how') and *zenme hui* ('why'). As shown in Table 7, there were a total of 743 responses given by the child participants other than *zenme hui* and *hui zenme* questions.

**Table 7. Frequency and percentage of causal/manner-related patterns and other patterns produced by each age group**

Question type		G1		G2		G3		Total	
Causal-related questions	A	20 (7.9%)	31 (12.3%)	25 (10.5%)	51 (21.3%)	68 (27%)	110 (43.7%)	113 (15.2%)	192 (25.8%)
	B	9 (3.6%)		13 (5.4%)		31 (12.3%)		53 (7.1%)	
	C	0 (0%)		2 (0.8%)		8 (3.2%)		10 (1.3%)	
	D	2 (0.8%)		11 (4.6%)		3 (1.2%)		16 (2.2%)	
Manner-related questions	E	5 (2.0%)	8 (3.2%)	2 (0.8%)	16 (6.7%)	2 (0.8%)	29 (11.5%)	9 (1.2%)	53 (7.1%)
	F	1 (0.4%)		4 (1.7%)		7 (2.8%)		12 (1.6%)	
	G	2 (0.8%)		10 (4.2%)		20 (7.9%)		32 (4.3%)	
Other patterns	H	87 (34.5%)	213 (84.5%)	24 (10.1%)	172 (72.0%)	3 (1.2%)	113 (44.8%)	114 (15.3%)	498 (67.1%)
	I	43 (17.1%)		29 (12.1%)		18 (7.1%)		90 (12.1%)	
	J	41 (16.3%)		46 (19.3%)		9 (3.6%)		96 (13%)	
	K	42 (16.6%)		73 (30.5%)		83 (32.9%)		198 (26.7%)	
Total		252 (100%)		239 (100%)		252 (100%)		743 (100%)	

In general, the causal-related questions (Types A~D) were more frequently produced than the manner-related questions (Types E~G): (G1: 12.3% causal vs. 3.2% manner; G2: 21.3% causal vs. 6.7% manner; G3: 43.7% causal vs. 11.5% manner; Total: 25.8% causal vs. 7.1% manner). Among the types of causal questions, Type A (i.e. *weishenme* + modal + verb) was more frequently adopted; as for the manner questions, Type G (i.e. modal + verb + *shenme* + noun) was used more than Types E and F. The finding that causal questions are more easily formed, was also obtained by Erreich (1984), whose results lend support to the claim that causal questions are easier for children than manner questions, which is in line with our findings here. Evidently, our child participants had difficulty forming questions about causality and manner.

Taken together, approximately 166 tokens of causal questions with *weishenme* ‘why’ (i.e. Types A and B) were produced by the three age groups (see Table 7), but only 18 tokens of *zenme hui* questions were found (see Table 5). That is to say, *weishenme* questions accounted for a large proportion of the question forms produced by the three age groups, indicating that *weishenme* questions appear earlier than the other two types (i.e. *shi yinwei shenme yuanyin* and *zenme + verb*). This finding also shows that *weishenme* is the unmarked form for causal questions compared with *zenme hui*, since forms acquired earlier are usually unmarked (Jakobson 1968). As for the manner questions, *yong shenme + NP* (i.e. Type G) was favored, occurring 32 times (see Table 7), while *hui zenme* only occurred 7 times (see Table 5). The children seemed to consider the *shenme + NP* pattern easier because the meaning of this pattern is more transparent than that using the *wh*-word *zenme*.

Table 7 also shows that other patterns were actually used much more frequently than our target questions with *hui zenme* and *zenme hui*. The child participants used Types H~K mostly to respond to the QA Task (G1: 84.5%; G2: 72.0%; G3: 44.8%; Total: 67.1%). In other words, even if they did not fail to form a question (i.e. Type H), their responses were frequently wrong (i.e. Type K) or they used strategies like repetition (i.e. Type I) or keywords (i.e. Type J) to reply. We can also see that as the subjects’ age increased, the rate of non-question types (i.e. Types I and J) decreased, while that of question types (Types A~G) increased. This may be attributed to the development of linguistic capacity (Brown 1973). As children grow older, they gain better ability in forming questions concerning ‘how,’ ‘why’ and ‘when’.

If we further examine the participants’ responses to manner and causal scenarios separately within each group, we can see that Types H, I and J occurred in the manner scenarios as much as they did in the causal scenarios, and that they appeared less frequently as the participants’ age increased, as shown in Table 8.

**Table 8. Participants’ responses to manner and causal scenarios in the QA task**

Type	G1		G2		G3		Total	
	Manner	Causal	Manner	Causal	Manner	Causal	Manner	Causal
H	47 (39.8%)	40 (42.1%)	10 (9.1%)	14 (22.6%)	2 (2.1%)	1 (5.88%)	59 (18.2%)	55 (31.6%)
I	18 (15.3%)	25 (26.3%)	11 (10.0%)	18 (29.0%)	8 (8.3%)	10 (58.82%)	37 (11.4%)	53 (30.5%)
J	22 (18.6%)	19 (20.0%)	21 (19.1%)	25 (40.3%)	5 (5.2%)	4 (23.52%)	48 (14.8%)	48 (27.6%)
K	31 (26.3%)	11 (11.6%)	68 (61.8%)	5 (8.1%)	81 (84.4%)	2 (11.76%)	180 (55.6%)	18 (10.3%)
Total	118 (100%)	95 (100%)	110 (100%)	62 (100%)	96 (100%)	17 (100%)	324 (100%)	174 (100%)

However, Type K mostly occurred in response to the manner rather than causal scenarios. For example, our participants mistook a manner question for one about causality and gave a wrong response. In a scenario designed to elicit the manner question *Meiguìhua hui zenme ci-shang ren* 'How would the rose hurt a person?', the participants produced a casual question like *Meiguìhua weishenme hui ci-shang ren?* 'Why would the rose hurt a person?' instead of a manner question. Obviously, causal questions with *weishenme* were easier for the preschoolers to form.

In the literature, it has been found that children interpret 'how' questions as 'why' questions and give reasons for their manner questions (Cairns & Hsu 1978). Miao (1985) also found that children tended to treat difficult *wh*-questions as easier *wh*-questions. As for the proper response to manner scenarios in the study, we can see that our participants employed the similar strategy of replacing *hui zenme* with *yong shenme fangfa* 'method' /*dongxi* 'thing' (Type G), or simply used the *wh*-word. Hence, it is plausible for us to generalize that the children interpreted manner questions as a type of *wh*-question, and that they produced easier *wh*-questions to replace the more difficult ones (i.e. *hui zenme*).

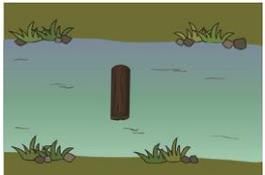
## 6. Concluding remarks

In the present study, it was found that *zenme hui* (*why* questions) was easier for the young participants than *hui zenme* (*how* questions) though no statistically significant difference was found between the participants' overall performance regarding the two questions. In addition, agency effects were obvious in that the experimental group had better ability in dealing with *zenme* questions with an agent subject than those with a non-agent subject. Moreover, the children preferred *zenme* questions in the non-generic condition and they had difficulty responding to manner questions in generic conditions. As for patterns other than the targeted ones, it was found that causal questions were easier than manner questions for all of the subjects to produce.

However, some issues could be further investigated. For example, we employed a picture selection task to demonstrate comprehension and an elicitation task for production. Some researchers have tested children's comprehension of *wh*-questions by asking the participants to respond to questions based on a few pictures or video clips. Thus, children's performance of manner and causal questions could be further examined using different tasks (i.e. picture identification, answering questions, and elicitation) to see if a more complete picture of the development of manner and causal questions would be obtained. Furthermore, genericity includes natural laws and personal habits. However, in this context we only examined natural laws, which involve inanimate entities as the subject of events. The influence of genericity with regard to personal habits on *zenme* questions could be explored in the future as well.

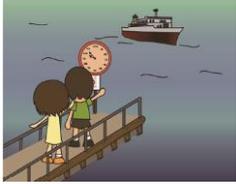
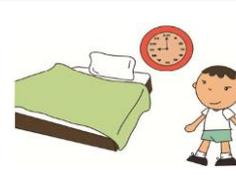
**Appendix A: Test Items Used in the PI Task**

Type 1: The manner reading with an agent subject in the generic condition			
Q1.鬧鐘會怎麼吵醒人?		Q2.玫瑰花會怎麼刺傷人?	
Type 2: The causal reading with an agent subject in the generic condition			
Q3.鬧鐘怎麼會吵醒人?		Q4.玫瑰花怎麼會刺傷人?	
			

Type 3: The manner reading with a non-agent subject in the generic condition			
Q1.木頭會怎麼漂?		Q2.顏色會怎麼掉?	
Type 4: The causal reading with a non-agent subject in the generic condition			
Q3.木頭怎麼會漂?		Q4.顏色怎麼會掉?	
			

Type 5: The manner reading with an agent subject in the non-generic condition			
Q1.小靜會怎麼打阿明?		Q2.阿明會怎麼搬書?	
Type 6: The causal reading with an agent subject in the non-generic condition			
Q3.小靜怎麼會打阿明?		Q4.阿明怎麼會搬書?	
			

Type 7: The manner reading with a non-agent subject in the non-generic condition			
Q1.小靜會怎麼喜歡阿明?		Q2.小靜會怎麼看阿明?	
Type 8: The causal reading with a non-agent subject in the non-generic condition			
Q3.小靜怎麼會喜歡阿明?		Q4.小靜怎麼會看阿明?	
			

Fillers			
Q1. 小靜跟誰去搭船?		Q2. 小靜要去誰家?	
			
Q3. 阿明午餐吃什麼?		Q4. 誰最愛唱歌?	
			

### Appendix B: Scenarios Used in the QA Task

#### Type 1: Manner reading with an agent subject in the generic condition

##### Scenario 1

小兔聽說鬧鐘可以把愛睡覺的人都吵醒。他很想知道鬧鐘吵醒人的方法，可是他不會說話。你能不能幫小兔問，鬧鐘吵醒人的方法呢？

Target Sentence: 鬧鐘會怎麼吵醒人？

##### Scenario 2

小兔聽說玫瑰花會刺傷人。他很想知道玫瑰花刺傷人的方法，可是他不會說話。能不能請你幫小兔問，玫瑰花刺傷人的方法呢？

Target Sentence: 玫瑰花會怎麼刺傷人？

#### Type 2: Causal reading with an agent subject in generic condition

##### Scenario 3

老虎很會睡覺。不過，有個鬧鐘很厲害，每天都可以把老虎吵醒。小兔很想知道鬧鐘吵醒老虎的原因，可是他不會說話能不能請你幫小兔問，鬧鐘每天吵醒老虎的原因呢？

Target Sentence: 鬧鐘怎麼會吵醒老虎？

##### Scenario 4

小兔很喜歡玫瑰花。有一天他聽說玫瑰花會刺傷動物，他很想知道玫瑰花刺傷動物的原因，可是他不會說話。能不能請你幫小兔問，玫瑰花刺傷小動物的原因呢？

Target Sentence: 玫瑰花怎麼會刺傷動物？

### **Type 3: Manner reading with a non-agent subject in the generic condition**

#### Scenario 5

小兔在回家的路上看到一根大木頭在河裡漂，他很想知道木頭會用什麼方法漂在河裡，可是他不會說話。能不能請你幫小兔問，木頭會在河裡漂的方法呢？

Target Sentence: 木頭在河裡會怎麼漂？

#### Scenario 6

每到下雨天，小兔家裡的顏色就會掉，他沒有看過顏色掉下來，所以很想知道顏色掉的方法，可是他不會說話能不能請你幫小兔問，顏色會掉下來的方法呢？

Target Sentence: 顏色會怎麼掉？

### **Type 4: Causal reading with a non-agent subject in the generic condition**

#### Scenario 7

石頭很重，會掉到河裡。可是有一天，小兔看到石頭漂在河裡子，很想知道石頭漂在河裡的原因子，可是他不會說話。能不能請你幫小兔問，大石頭漂在河裡的原因呢？

Target Sentence: 石頭在河裡怎麼會漂？

#### Scenario 8

小兔買了彩色筆來給房子上顏色不過有一天顏色就開始掉下來。他想知道顏色掉下來的原因，可是他不會說話。能不能請你幫小兔問，顏色掉下來的原因呢？

Target Sentence: 顏色怎麼會掉？

### **Type 5: Manner reading with an agent subject in the non-generic condition**

#### Scenario 9

小兔在路上遇到老虎，老虎說他要去打小熊。小兔很想知道老虎打小熊的方法，可是他不會說話。能不能幫小兔，問老虎打小熊的方法呢？

Target Sentence: 老虎會怎麼打小熊？

#### Scenario 10

小兔在路上看到小熊，小熊說他要去搬大石頭。小兔很想知道小熊搬大石頭的方法，可是小兔不會說話。你能不能請你幫小兔問，小熊搬大石頭的方法呢？

Target Sentence: 小熊會怎麼搬石頭？

### **Type 6: Causal reading with an agent subject in the non-generic condition**

#### Scenario 11

小兔看到老虎在打小熊，他很害怕。小兔很想知道老虎打小熊的原因，可是小兔不會說話。你能不能請你幫小兔問，老虎打小熊的原因呢？

Target Sentence: 老虎怎麼會打小熊？

Scenario 12

老虎很懶惰，什麼事都不做。今天老虎在搬桌子，小兔看了，很高興。小兔很想知道老虎搬桌子的原因，可是他不會說話。能不能請你幫小兔問，老虎搬桌子的原因呢？

Target Sentence: 老虎怎麼會搬桌子？

**Type 7: Manner reading with a non-agent subject in the non-generic condition**

Scenario 13

小熊很喜歡老虎，小兔很想知道小熊喜歡老虎的方法，可是他不能說話。能不能請你幫小兔問，小熊喜歡老虎的方法呢？

Target Sentence: 小熊會怎麼喜歡老虎？

Scenario 14

小熊很喜歡看其他的動物。小兔很想知道，小熊看其他動物的方法，可是他不能說話。能不能請你幫小兔問，小熊看其他動物的方法呢？

Target Sentence: 小熊會怎麼看其他動物？

**Type 8: Causal reading with a non-agent subject in the non-generic condition**

Scenario 15

老虎很喜歡小熊，小兔很知道老虎喜歡小熊的原因，可是他不會說話。能不能請你幫小兔問，老虎喜歡小熊的原因呢？

Target Sentence: 老虎怎麼會喜歡小熊？

Scenario 16

小熊很怕老虎，不過今天小熊居然要去看老虎耶！小兔很想知道小熊要去看老虎的原因，可是他不會說話。能不能請你幫小兔問，小熊要去看老虎的原因呢？

Target Sentence: 小熊怎麼會看老虎？

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## 華語因果問句與方法問句之第一語言習得：

### 以「怎麼會」和「會怎麼」為例

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本研究藉由中文疑問詞「怎麼」來探討以中文為母語的學齡前兒童對於方法問句與因果問句的習得。主要的議題包括方法問句與因果問句的習得順序、主事效應、泛指效應、題型效應及其他相關問法的句型。本研究共設計兩個測驗：圖片選擇測驗與問句形成測驗。研究對象為 48 位以中文為母語的學齡前兒童，根據其年齡分為三組（第一組為四歲零個月至四歲十一個月、第二組為五歲零個月至五歲十一個月、及第三組為六歲零個月至六歲十一個月）。研究發現，學齡前兒童對於方法問句與因果問句的分辨，並未達到統計上的差異，但其在因果問句的表現仍較其在方法問句來得佳。其次，主事效應和泛指效應對孩童在「怎麼」問句的影響達到顯著性。孩童在含主事者之「怎麼」問句與非泛指之「怎麼」問句表現皆較佳。最後，相較於因果問句，學齡前兒童對方法問句掌握較差，因此錯誤回應較多，再次顯示「會怎麼」的問句比「怎麼會」難習得。

關鍵詞：主事效應、泛指效應、方法問句、因果問句、母語習得