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STUDENT LEARNING, CHILDHOOD & VOICES | RESEARCH ARTICLE

Investigating the development of Chinese oral explanation and justification in Singapore primary students

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Abstract: Explanation and justification require cognitive ability which selects and organises relevant information in a logical way, and linguistic ability which enables speakers to encode the information with linguistic knowledge. This study aims to investigate the development of Chinese oral explanation and justification in Singapore primary students. The study comprised 36 participants ranging from six-year-old to 11-year-old. They were learning Chinese as a second language. A series of questions were designed to elicit explanations and justifications based on a story. Explanation and justification were analysed on length of discourse, frequency of connectives, types of explanation and types of justification. The results showed that, from a linguistic perspective, as age increased, the frequency of connectives and length of discourse increased first then decreased. This suggests that linguistic measures are not sufficient in revealing the development. From a cognitive perspective, the older participants produced more effective explanations of event-related causal relationships than the younger participants in regard to explanation. With regard to justification, the older participants integrated and analysed the information in the story to justify opinions, while the younger participants relied mainly on familiar information, such as moral principles. The results demonstrate that the development of Chinese oral explanation and justification in primary students is reflected on cognitive dimensions.

Subjects: Communication Studies; Development Studies; Language & Literature

Keywords: explanation; justification; development; Chinese; second language

ABOUT THE AUTHOR

Teaching and learning Chinese as a second/foreign language has drawn increasing attention from researchers in second language education. Many studies in literature focused on learning of Chinese grammar while the researcher explored the development of Chinese conversational skills. Conversational skills include explanation, justification, topic-management and other discourse skills. The researcher's interest is on what are the developmental trends of conversational skills in Singapore bilingual children.

PUBLIC INTEREST STATEMENT

Oral explanation and justification require demanding cognitive activities. Speakers need to select and organise information and use appropriate language to express meanings with time pressure. How do children acquire the ability to explain and to justify in Chinese as a second language is the main concern of this study. For this purpose, the researcher compared children's explanation and justification across Primary One, Primary Three and Primary Five. The study found that the length of discourse and frequency of connectives increased first then decreased as age developed. This reflected that linguistic measures could only partially reflect the development. The study also found that the older participants had used different types of explanation and justification than the younger participants.

1. Introduction

Explanation and justification are integrative components of communicative competence (Bygate, 1987; Verhelst, Van Avermaet, & Takala, 2009). Explanation refers to explaining the causal relationship between two events or phenomena (Donaldson, 2006). Justification refers to the ability to provide evidence or examples to support one's opinion (Goetz & Shatz, 1999). Explanation and justification are used by language learners to communicate with native speakers in regard to a wide range of topics, which facilitate their integration into the target language community.

Explanation and justification require cognitive ability which selects and organises relevant and sufficient information in a logical way, and linguistic ability which enables speakers to encode the information with linguistic knowledge. Previous studies found that cognitive abilities which include memorial capacity, comprehension of causal relationships and switching perspective to understand other people's feelings and linguistic abilities which include the use of causal connectives, anaphors and other cohesive devices, contribute to the development of explanation and justification (Alamillo, Colletta, & Guidetti, 2013; Colletta & Pellenq, 2010; Goetz & Shatz, 1999; Kyrtatzis, Ross, & Koymen, 2010; Thomas, 1991; Veneziano & Sinclair, 1995).

However, previous research has adopted either a cognitive approach or a linguistic approach to explore the emergent development of explanation and justification in children's first language. Few studies have explored development from both perspectives in children's second language (L2). What factors may indicate such development calls for further empirical studies that provide a framework for teaching and assessing young L2 learners. This study designed questions to elicit children's explanations and justifications based on a series of wordless pictures, and compared explanation and justification across three age groups through a qualitative approach from both cognitive and linguistic perspectives, with the purpose of exploring the development of Chinese oral explanation and justification in Singapore primary students.

2. Literature review

2.1. *The linguistic dimension of explanation and justification*

Research from a linguistic perspective has found that linguistic measures, such as connectives, subordination markers, anaphors and length of discourse, could reflect the development of explanation and justification (Alamillo et al., 2013; Colletta & Pellenq, 2010). Alamillo et al. (2013) selected French native speaking children as their participants. Their results showed that the older participants produced longer discourse and used more anaphors than the younger participants. This indicated that the explanations of older children were more coherent than the younger children. Colletta and Pellenq (2010) investigated the complexity of explanation based on a corpus of explanations from 3-year-old to 11-year-old children. Complexity was measured by the number of clauses and connectives. A complex explanation refers to an explanation that includes more than one clause which is connected with connectives. The results indicated that the older participants provided longer and more complex explanations, with a larger variety of connectives than the younger participants.

However, linguistic indicators cannot guarantee that the produced discourse can achieve communicative purposes. The prepositions should have causal relationships and should be relevant to the topic. Therefore, other researchers have explored the development of explanation and justification from a cognitive perspective.

2.2. *The cognitive dimension of explanation and justification*

With regard to explanation, researchers found that, as age increased, children's comprehension and production of various causal relationships developed (Colletta & Pellenq, 2010; Donaldson, 2006; Thomas, 1991). Donaldson (2006) tested children's comprehension and production of two types of causal relationships: causal relationships between two events and causal relationships between motivation and events. The results of this comprehension task showed that five-year-old children can accurately understand the direction of cause and effect. The results of the production task

demonstrated that, as age developed, the children's explanations were more complete and accurate. Meanwhile, the older participants had higher levels of ability to explain causal relationships between motivation and human behaviour. Thomas (1991) employed a causal thinking task to explore Primary One to Primary Six students' explanations. They found that most of the children's answers were descriptive. Only Primary Five and Six students could explain.

With regard to justification, previous research has focused on cognitive mechanisms which accounted for the development found. Researchers (Goetz & Shatz, 1999; Veneziano, 2001; Veneziano & Sinclair, 1995) found that memory, social interaction and external stimulus facilitated the development of justification. Veneziano and Sinclair (1995) proposed that the development of justification was due to the development of memory. They found that the occurrence of children's justification was related to the development of children's ability to describe past events. They explained that, as memorial capacity develops, children can retrieve past experiences and become less dependent on current information, so they can more easily imagine others' perspectives in order to justify their own opinions.

Veneziano's (2001) study also demonstrated that social interactions between parents and children contributed to the development of justification. They analysed a corpus consisting of authentic communication between parents and children. They found that, when the mother tried to persuade the child to do something, she would justify her opinion. When children justified their opinion with reasons, the parents were more likely to compromise. Therefore, they concluded that the mother-child interaction pattern provided models for children acquiring justification skills. Later, children would internalise the pattern. Meanwhile, they found that justification was initiated by the children themselves rather than elicited from the "why" question of the interlocutors.

Goetz and Shatz (1999) further investigated social interactional circumstances beyond the mother-child interaction, including other motivations for children to justify their opinions. They found that motivations behind providing justifications included: response to a question, response to an opposing opinion, confirmation of other people's opinions, self-explanation and extension of other people's opinions. Among these types, self-explanation and conflict of opinions were two main motivations. Goetz's (2010) study also explored the same issue by comparing children and adults. For two-year-old children, conflict stimulated justification, while questions were a stimulus for the justification of three-year-old children. Most of the four-year-old children initiated justification by themselves. Chambers (1995) also found that internal or external conflict influences opinion types and reasons in an intervention study.

However, very few studies have explored the developmental pathways of L2 learners' justifications. Only one such an example had been conducted by Brown, Anderson, Shillcock, and Yule (1985). They interviewed teachers' judgements of students' expressions of opinions. Three levels of opinion-expressing were generated from the teachers' interviews. The high proficiency level learners could express opinions with reasons and consider other alternatives. At median levels, learners could express opinions with reasons, but did not consider other alternatives, while, at low proficiency levels, learners could only express one's opinion without any reasons. This study to some extent provided framework for evaluating justifications. However, the levels were generated from teachers' perspectives rather than from learners' discourse.

Research regarding developmental pathways is important for second language educators for developing teaching methods and measuring rubrics. However, studies focusing on explanation and justification are marginal. Previous studies have either employed a linguistic approach or a cognitive approach to explore this issue. As justification and explanation require both sides of abilities, previous studies have therefore failed to reveal a complete picture of how children develop justification and explanation in L2. With this purpose, this study examined and compared linguistic features and cognitive features of children's explanations and justifications in Primary One, Primary Three and Primary Five students.

3. Research questions

With the above purpose, this study seeks to address the following research questions:

- (1) What are the types of explanation produced by the participants?
- (2) What are the differences among the three grades in regard to explanation, in terms of connectives, length of discourse and types of explanations?
- (3) What are the types of reasons produced by the participants in regard to justification?
- (4) What are the differences among the three grades in regard to justification, in terms of connectives, length of discourse and types of reasons?

4. Research methods

4.1. Participants

This study recruited 36 participants from Primary One (6- to 7-year-olds), Primary Three (8- to 9-year-olds) and Primary Five (10- to 11-year-olds), from four mainstream primary schools, with 12 participants from each grade. Mainstream schools are usually located in the heartland of public housing, constituting the majority of the primary schools in Singapore (Silver, Goh, & Alsagoff, 2011). Students from mainstream schools are more likely to come from bilingual language backgrounds, where English and Mandarin are both spoken to varying degrees (Goh, 2012). Research regarding participants from mainstream schools could give us a picture of the majority of the students. The participants are Chinese ethnic, taking Chinese as a mandatory subject. Within each grade, participants were from various classes and had mixed Chinese proficiency levels. There were 17 male participants and 19 female participants. As this study employed the convenient sampling method, the participants may not be representative of the whole population. In this case, the developmental trends found based on these participants may be biased.

Consent forms were given to guardians of the participants to gain consent before the research. If some participants' guardians refused to participate in the research, the researcher had given consent forms to other guardians till the researcher found enough participants.

4.2. Data collection

A series of six wordless pictures were used to elicit children's narration. The story began with two boys quarrelling with each other. After that, the two boys started to fight. An adult woman found out and stopped them. In the end, the two boys became friends.

The content was based on a storybook (Olten, 2008). The story closely mirrors school life. Data collection was conducted via one-to-one semi-structured interviews in Chinese. Each interview lasted for about 10 min. The participants were given 2 min for preparation. Several questions were designed to elicit the participants' explanations and justifications. The main questions are shown below. The explanation questions concern the sequence of the pictures, with the purpose of eliciting the children's explanations of the relationship of the events shown. The justification questions concern comprehension and personal comments on the story, with the purpose of eliciting participants' opinions.

Explanation:

- (1) Ni ren wei di si zhang tu weishenme zai di san zhang tu de houmian? Di wu zhang zai di si zhang de hou mian ne?
Could you tell me why Picture Four comes after Picture Three, and Picture Five comes after Picture Four?
- (2) Ni keyi gaosu wo weishenme di liu zhang tu shi zuihou yizhang ma?
Could you tell me why Picture Six is the last picture?

Justification:

(3) Ni ren wei ta de xing wei dui ma? keyi gaosu wo liyou ma?

What do you think of his behaviour? Could you tell me the reasons for it?

(4) ni renwei zai zhege gushi zhong na yi zhang tu zui zhongyao? weishenme?

Which picture do you think is the most important picture in the story? Why?

In addition to this, the researcher asked spontaneous probing questions based on participants' answers, such as "Could you tell me more?" and "Could you elaborate?" These probing questions were designed to encourage participants to express their thoughts, in case they were silent, but not to affect their answers.

4.3. Data analysis

The oral production was first transcribed by the researcher. Meanings of remarks for transcription is in Appendix A. Then, the explanations and justifications given by the children were analysed from linguistic and cognitive perspectives. From a linguistic perspective, the explanations and justifications were measured by connectives and length of discourse. Connectives include conjunctions, adverbs and phrases which connect clauses. Length of discourse was measured by idea unit. From a cognitive perspective, different types of explanations and different types of reasons for justifications were analysed.

4.3.1. Connectives

Connectives include conjunctions, adverbs and phrases which connect clauses. Conjunctions include "suiran (though)", "yinwei (because)" and "bingqie (and)". Adverbs include "ganggang (just now)" and "mashang (immediately)". Phrases include "zai ... zhihou (after)" and "... de shihou (when)". Based on the relationship between clauses, there are three types of connectives: temporal, causal and adversative (Xing, 2001). Temporal connectives indicate a time sequence between two clauses, causal connectives imply a causal relationship between two clauses and adversative connectives indicate a paradoxical relationship between two clauses. The connectives in the data were coded. As this is a qualitative study and the number of participants was limited, median instead of mean is calculated and the number of participants who produced these connectives is also counted.

4.3.2. Length of discourse

Length of discourse was measured by idea units. An idea unit is basically a clause, including a subject and a predicate (Chafe, 1980; Keenan & Bennett, 1977). The researcher counted the median of the idea units in the explanations and justifications given.

4.3.3. Types of explanation

Content analysis was conducted, in order to explore the types of explanations in the participants' answers. The researcher first judged whether or not the participant's answer was explanatory. If the answer could not address the question appropriately, it was coded as pure description. If the answer could address the question appropriately, the researcher further judged which type of explanation the participant had produced. Donaldson (2006) categorised explanation into three categories (2006). The first type refers to a causal relationship between events. The second type refers to a causal relationship between events and motivation or intention. The third type is logical and includes explanations based on logic or arbitrary rules. In addition to this classification, the researcher generalised certain patterns from the data. The excerpts were translated and presented to demonstrate each category. The types of explanation were coded and the frequency, proportion and number of times participants produced these types were calculated.

4.3.4. Reasons of justifications

Content analysis was conducted, in order to explore the types of reasons in the participants' answers. The researcher first judged whether or not the reasons could support the participants' opinions. If the reasons could not support the participants' opinions, the answers were coded as pure description. If the reasons could support the participants' opinions, the researcher would further judge the reasons in terms of category. The framework for analysing the types of reasons was built on Goetz and Shatz's (1999) study. New categories were generated from the data. The excerpts were translated and presented to demonstrate each category. The types of reasons were coded and the frequency, the proportion and the number of times the participants produced these reasons were calculated.

5. Results

The results of the explanations and justifications are presented, respectively, in terms of the above measures.

5.1. The development of explanation

5.1.1. Connectives

Table 1 summarises the usage of three types of connectives across the three grades. In general, the Primary Three participants produced the most connectives, while the Primary One participants produced the least. In addition to this, the Primary Three students produced the most causal connectives as compared to the other two grades. This indicates that the Primary Three participants' explanations were the most complex among the three grades.

5.1.2. Length of discourse

Table 2 summarises the amount of information produced by the participants across the three grades. The Primary Three participants produced the most information, while the Primary One participants produced the least. This indicates that the Primary Three participants' explanations were more complete than participants' from the other two grades.

5.1.3. Types of explanations

Based on content analysis, four types of explanations emerged from the data. They are *event-related causal relationship*, *psychological causal relationship*, *reasoning* and *story schema*. Some of the participants were not able to explain at all. This situation is labelled as *description*. The definitions and excerpts illustrating each type are discussed below.

5.1.3.1. Event-related causal relationship. The first type includes explanations of the causal relationship between two events; one event causes another event to happen. This can be illustrated in Excerpt 1. Participant B5ET selected and described the main events of Pictures Three and Four: "the teacher asked them to stop" and "they stopped". These two events have a causal relationship; it is the teacher's behaviour that causes the two boys to stop. Therefore, the participant explained why Picture Four comes after Picture Three.

Table 1. A comparison of connectives across the three grades

	P1		P3		P5	
	M	N	M	N	M	N
Temporal	0.5	6	2.5	10	3	12
Causal	4	12	5.5	12	3.5	11
Adversative	0	0	0.5	6	0	5
Total	4.5	12	8.5	12	6.5	12

Notes: M is the median of frequency of connectives; N is the number of participants.

Table 2. A comparison of the length of discourse across the three grades

	M
P1	0
P3	9.5
P5	5.5

Note: M is the median of frequency of idea units.

Excerpt 1

B5ET: Because, when they quarrelled, the teacher asked them to stop, then they stopped.

5.1.3.2. *Psychological causal relationship.* This type is different from the previous category in that the causal relationship exists between motivation and an event. Motivation includes one's feelings, thoughts and intentions. When explaining a psychological causal relationship, participants need to infer feelings, thoughts and intentions from characters' perspectives, which is more cognitively demanding than the previous type of explanation. In Excerpt 2, participant F5BE described the differences in the girl in the pink skirt's behaviour between Picture Three and Picture Four: "don't know what to do" and "left". He then explained that this change was caused by her feelings: "she seemed not so worried, because the teacher would help".

Excerpt 2

F5BE: Behind that dressed (1.4)@e pink colour skirt (1) was very scared, don't know [//]er after what to do? But in Picture Four that dressed (1)@e pink colour skirt left. I think she [/] she seemed not so worried what to do later, because the teacher would help.

5.1.3.3. *Reasoning.* This type does not involve explanations of causal relationships. Instead, the participants hypothesised what would happen if the sequence of pictures was changed and the depicted events did not happen in a logical way. This logic is used to explain the sequence of the pictures. This was demonstrated in Excerpt 3.

Excerpt 3

X5CY: Because originally this girl was here, then she turned around and left like this, it is impossible that she turned around, left, then turned to be here all in a sudden.

Participant X5CY first described the change in the girl in the pink skirt's behaviour. In Picture Three, the girl was present, while, in Picture Four, she left. After that, the participant hypothesised that, if Picture Four came before Picture Three, the girl could not be in the picture because she had already left. Therefore, the sequence cannot be changed.

5.1.3.4. *Story schema.* This type, again, does not involve any explanations of causal relationships. The participant explained that the sequence of the pictures should follow the story schema. Participant B3CL summarised the story schema in Excerpt 4: "first it is good, then something bad happened. At last, problem be solved and became good again". He implied that Pictures Three, Four and Five follow this structure and therefore explained the sequence of the three pictures.

Excerpt 4

B3CL: <Because:>[/]erm (5.5) because every story has this, like<first chapter>[/]er first chapter seems<beautiful>[/]er beautiful things, er later you[///] then in the second picture you turned into quarrelling things, then in the third picture slowly finished quarrelling, from quarrelling to then like this, slowly like seemed "ah, stop", no more talking.

5.1.3.5. *Description*. Descriptions refer to the answers that did not achieve explanatory purposes. This type includes three situations: (1) pure description of characters' behaviour; (2) description of the numbers of the pictures; (3) description of the differences among three pictures, without explaining how these differences determine the sequence. In the final situation, the participants had an inclination of explaining. In Excerpt 5, participant X3EB was able to spot the differences in two boys' behaviour, from fighting to quarrelling. Nevertheless, he still needed to further explain why there were differences among the pictures for his answer to be explanatory. Therefore, his explanation was not sufficient and was deemed a description instead.

Excerpt 5

X3EB: Because (1.8) that teacher stopped those two boys fi [/] fighting, {erm} (1.1) then the fifth picture described that they admitted their mistakes {erm} (2.1), then the fourth picture described that they [/] still [/] still were quarrelling.

This study found that the participants employed four types of explanation. Reasoning and story schema have not been explored in previous research. These two types are specific to the tasks employed in this study. This reflects the way in which explanations can be dynamic in an authentic learning environment. Table 3 compared the usage of various types of explanations by the participants. An event-related causal relationship was most frequently used by the participants, while reasoning was the second most frequent. Only a few participants employed psychological causal relationships and story schema. This is consistent with the literature, in that the production of a psychological causal relationship is more difficult than the event-related causal relationship. Table 4 compares explanation types across the three grades, The Primary One participants were unable to explain most of the time; their answers were mainly descriptive. Some of them were able to spot the differences between the pictures, but could not explain these differences. One participant indicated that the sequence of the pictures cannot be changed but could not give reasons explaining why this is the case. Some of the Primary Three and Primary Five participants were able to explain and produced different types of explanation. The Primary Three participants mainly explained event-related causal relationships and reasoning, while the Primary Five participants mainly explained event-related causal relationships. The frequency of the use of event-related causal relationships increased with age (Figure 1).

Table 3. A comparison of different types of explanation

Types	Freq.	%	N
Event	23	21.70	13
Psychology	5	4.72	5
Reasoning	17	16.04	14
Schema	2	1.89	1
Description	59	55.66	23
Total	106	100	36

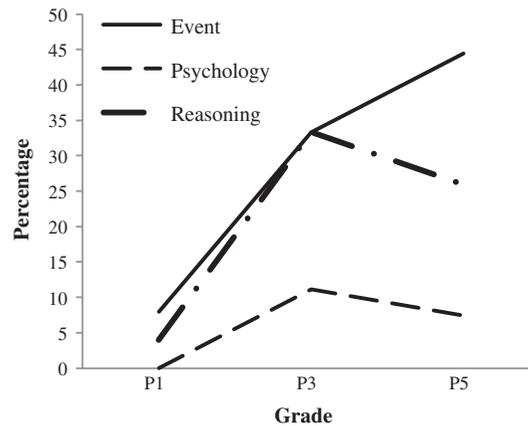
Note: N is the number of participants.

Table 4. A comparison of different types of explanations across the three grades

Types	P1			P3			P5		
	Freq.	%	N	Freq.	%	N	Freq.	%	N
Event	2	8	1	9	33.33	6	12	44.44	6
Psychology	0	0	0	3	11.11	3	2	7.4	2
Reasoning	1	4	1	9	33.33	7	7	25.93	6
Schema	0	0	0	2	7.4	1	0	0	0
Description	22	88	11	4	14.81	3	6	22.22	5
Total	25	100	12	27	100	12	27	100	12

Note: N is the number of participants.

Figure 1. A comparison of different types of explanations across the three grades.



5.2. Summary of the development of explanation

(1) What are the types of explanation produced by the participants?

Based on content analysis, this study found that the participants employed four types of explanation: event-related causal relationship, psychological causal relationship, reasoning and story schema. An event-related causal relationship was most frequently used by the participants, while reasoning was the second most frequent. Only a few participants employed psychological causal relationships and story schema.

(2) What are the differences among the three grades in regard to explanation, in terms of connectives, length of discourse and types of explanations?

The Primary Three participants produced the most connectives and the longest length of discourse, while the Primary One participants produced the least connectives and the shortest length of discourse. This indicates that the Primary Three participants produced the most complex and complete explanations while the Primary One participants produced the simplest explanations. Based on cognitive measures, the Primary Three and Primary Five participants were able to produce sufficient explanations but employed different explaining strategies. The Primary One participants were unable to provide sufficient explanations. The frequency of event-related causal relationships increased with age.

5.3. The development of justification

5.3.1. Connectives

Table 5 summarises the usage of the three types of connectives in regard to justification across the three grades. The Primary Three participants produced the most connectives as compared to the other two grades, while the Primary One participants produced the least. This indicates that the justifications of the Primary Three participants were the most complex.

Table 5. A comparison of connectives across the three grades in regard to justification

	P1		P3		P5	
	M	N	M	N	M	N
Temporal	0	4	0	5	1	8
Causal	5	11	6	12	4.5	11
Adversative	0	0	0	5	0	4
Total	5	11	6	12	5.5	12

Notes: M is the median of frequency of connectives; N is the number of participants.

5.3.2. Length of discourse

Table 6 summarises the amount of information produced by the three grades. The Primary Three and Primary Five participants produced similar amounts of information, while the Primary One participants produced the least. This indicates that the justifications of the Primary Three and Primary Five participants are more complete than those of the Primary One participants.

5.3.3. Reasons of justifications

Based on the content, the participants' answers were divided into different types of reasons: *evaluation*, *story information*, *prediction*, *moral principles* and *description*.

5.3.3.1. *Evaluation*. This type includes judgments of behaviour or people. In Excerpt 6, one participant stated that “fighting would not solve the problem”, which is evaluating the property of fighting.

Excerpt 6

F5EB: Not good, because fighting<would not>[/] (5.1)would not solve the problem.

5.3.3.2. *Prediction*. This type of reason refers to predictions of what will happen in the future. The participants stated the consequences of the behaviour in order to justify opinions. In Excerpt 7, “get hurt”, “need to go to hospital”, “pay hospitalisation bills” and “scolded by parents/teachers” are the possible consequences of fighting. The participants justified their opinions that fighting was not good by stating these negative consequences.

Excerpt 7

G1BK: Because fighting (1.4) would [/](1.6) would go to police station.

F5CE: Because they would [/]may hurt each other.

5.3.3.3. *Story information*. Some of the participants elaborated on and analysed information in the pictures to justify their opinions. Some of the participants analysed the cause of the conflict, so as to justify the notion that fighting behaviour is not appropriate. Other participants justified their opinions from the perspective of problem-solving. In Excerpt 8, the participant F3CC first elaborated on the way in which the two boys fought because one of them had made a mistake about the other boy stealing something. From a problem-solving perspective, the participant stated that, first, they did not find out who the thief was. Second, she suggested that they needed to find evidence to confirm whether or not the other boy was the thief. Without these premises, the fighting behaviour was not appropriate.

Excerpt 8

F3CC:Because, first, if at the first time you haven't er (1.7) you <have not>[/]have not heard that person said it was not him, then after that you have not checked out who stole it, you just fought straightforward, so I thought you should check in details, let the police catch the real thieves. He had to find the evidence to prove that this thief was the one who stole that thing.

Table 6. A comparison of the length of discourse across the three grades in regard to justification

	M
P1	6.5
P3	14
P5	13.5

Note: M is the median of idea units.

5.3.3.4. *Moral principles*: This type of reason includes stating moral principles as reasons with which to justify what is appropriate and what is not. Participant B5ET stated that ‘fighting in school is wrong’ to justify the way in which fighting is bad.

Excerpt 9

B5ET: Because fighting in school is wrong.

5.3.3.5. *Description*. This type refers to the answers given that could not achieve justifying purposes. In Excerpt 10, when the interviewer asked which picture was most important in this story and why, the participant only described the content of the pictures and did not make judgements on the importance of the pictures or explained why this picture was important.

Excerpt 10

G1BK: (3) One was hurt, one was happy, one made smiling faces, one was scared (1.7), one was angry.

G3EJ: We er (2.3) were very angry.

This study found that the participants employed different types of reasons from various perspectives to justify their opinions. Table 7 compares the usage of various types of reasons by the participants. Prediction was most frequently used by the participants, while moral principles comprised the second largest category. Different types of reasons require different cognitive efforts. For prediction, moral principles and evaluation, the participants are familiar with the information, while for story information, the participants need to employ more cognitive efforts to elaborate on and analyse information. Therefore, the participants employed prediction and moral principles more than the other types of reasons.

Table 8 compares types of reasons across the three grades. Almost all the participants were able to justify their opinions. The proportion of using story information increases, while the proportion of prediction and moral principles decreases as age increases. This indicates that the older participants used reasons requiring more cognitive efforts than the younger participants (Figure 2).

5.4. Summary of the development of justification

(1) What are the types of reasons produced by the participants in regard to justification?

Based on the content analysis, this study found that the participants employed four types of reasons: evaluation, story information, prediction, and moral principles. Prediction was most frequently used by the participants, while moral principles comprised the second largest category.

(2) What are the differences among the three grades in regard to justification, in terms of connectives, length of discourse and types of reasons?

Table 7. A comparison of different types of reasons

	Freq.	%	N
Evaluation	12	6.56	9
Story information	13	7.1	20
Prediction	95	51.91	30
Moral principles	54	29.51	28
Description	9	4.92	7
Total	183	100	36

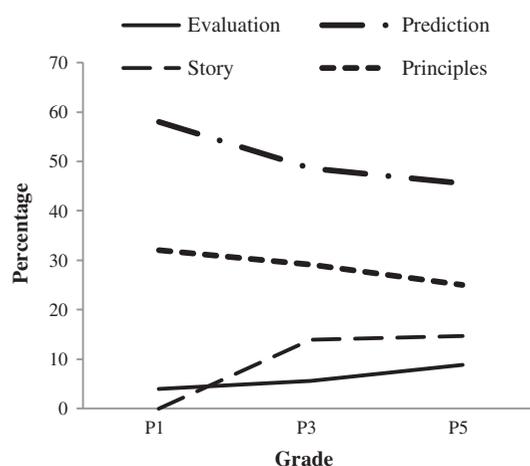
Note: N is the number of participants.

Table 8. A comparison of different types of reasons across the three grades

	P1			P3			P5		
	Freq.	%	N	Freq.	%	N	Freq.	%	N
Evaluation	2	4	1	4	5.56	4	6	8.82	4
Story information	0	0	0	10	13.89	7	10	14.71	6
Prediction	29	58	9	35	48.61	11	31	45.59	10
Moral principles	16	32	11	21	29.17	10	17	25	7
Description	3	6	3	2	2.78	2	4	5.88	2
Total	50	100	12	72	100	12	68	100	12

Note: N is the number of participants.

Figure 2. A comparison of different types of reasons across the three grades.



The Primary Three participants produced the most connectives as compared to the other two grades, while the Primary One participants produced the least. The Primary Three and Primary Five participants produced similar amounts of information, while the Primary One participants produced the least. This indicates that the Primary Three participants produced the most complex and complete justifications, while the Primary One participants produced simple justifications. Based on cognitive measures, the Primary One participants usually used prediction and moral principles to support their opinions. The Primary Three and Primary Five participants were able to elaborate on and analyse story information to justify their opinions.

6. Discussion

By exploring the development of explanations and justifications of six-to 11-year-old Chinese children, this research found that explanation and justification are multi-faceted. This development is reflected on both linguistic and cognitive dimensions. With regard to explanation, this research found that linguistic measures could only partly indicate development. This is reflected by the way in which the length of discourse and frequency of connectives usage increased from Primary One to Primary Three, but decreased from Primary Three to Primary Five. The Primary Three participants produced the most complete and complex explanations among the three age groups, based on linguistic measures. This is different from previous findings, which suggest that, as age increases, children use more connectives and longer discourse (Alamillo et al., 2013; Colletta & Pellenq, 2010).

One reason for this difference could be the way in which the age range of the participants in this study is wider than those in previous studies. Studies in narration (Chang & McCabe, 2013; Chen & Yan, 2010) found that, after a certain age, the usage of causal connectives decreased. Linguistic measures may reflect the accumulation of language but may not necessarily reflect the

development of explanation in children aged nine years and above. The second reason for this difference could be the way in which the performance of language is strongly associated with content. The Primary Three and Primary Five participants employed different types of explanations. Primary Three participants employed reasoning as the main type of explanation, while Primary Five participants mainly employed event-related causal relationships. In order to reason, participants needed to describe the information in each picture first, then hypothesise the impossible consequences if the sequence of pictures was changed. Therefore, reasoning requires more expression of information than explaining causal relationship among events. This may lead to the increase in connectives and length of discourse.

From a cognitive perspective, this research found that the development of explanation is also reflected by the types and frequency of effective explanations. The frequency of event-related causal explanations increased from Primary Three to Primary Five. This study also found that participants employed various types of explanations, such as reasoning, in addition to Donaldson's (2006) classifications. This may be due to the tasks employed in this study. In traditional cognitive research, the tasks and content are strictly controlled in a laboratory environment. However, in daily life, explanation tasks can be dynamic and approaches to explaining can be diverse.

With regard to justification, again, linguistic measures can only partly indicate development. From a cognitive perspective, this study found that the participants employed various types of reasons which involve varying cognitive efforts. The results demonstrated that, as age developed, participants were able to produce longer length of discourse and justify opinions using different perspectives, which is consistent with Brown and Yule's study (1983). Additionally, the development is reflected by the complexity of the reasons given, which involve cognitive efforts regarding analysing and organising information. The older participants could elaborate on and analyse the given information in order to justify their opinions, while the younger participants relied on familiar information, such as moral principles which are repeatedly emphasised and taught to them at home and in school.

Based on all the measures, the development from Primary One to Primary Three is steep, while the development from Primary Three to Primary Five is rather flat. This can be explained by cognitive development. According to Piaget's description of children's developmental stages (1959), four- to seven-year-old children are at a preoperational stage, whereas nine-year-old children are at a concrete operational stage. Nine-year-old children can think from other people's perspectives and understand causal relationships and classification. Indicators that can distinguish the performance of Primary Three children from that of Primary Five children need to be explored in further empirical studies.

One dimension that has not been previously captured but was revealed by qualitative analysis is communicative efficiency. It refers to the ease with which a listener can understand a speaker's meaning. The following excerpts demonstrate this point. In Excerpt 11, the Primary Three participant employed different types of explanation. First, he described the causal relationship between events, then hypothesised that, if the sequence of the pictures was changed, the events would happen in an illogical way. Although the participant produced connectives and information, the listener needed to make an effort to infer his logic. In comparison to this, the Primary Five participant's explanation was clear and logical. The participant summarised the main content of each picture and explained the causal relationship among the three pictures. The listener did not need to make an effort to infer the participant's meaning. Excerpt 12 demonstrates justifications made by Primary Three and Primary Five children. The Primary Five participant's language is simpler and clearer than Primary Three's justification, with a shorter length of discourse and less disfluency. Therefore, communicative efficiency can be a potential factor for measuring the development of explanation and justification in children aged nine and above.

Excerpt 11

Primary Three

X3BJ: (8.2) Erm **because** they were angry, they were angry two {en}, at here<again>[/]/<also>[/]/ still angry{en}. **Then the last one** described sadness<because >[/]/**because** this little boy {en}seemed angry with them, {en}left{en}that meant they were sad{en}because qi[/]/ **after** when they quarrelled again, he told them<them not to do>[/]/ he did not want to be their friends, then sad.<It is not possible>[/]/ not possible their friend said didn't want to be your friend, **but**<they still continue>[/]/ they still continued quarrelling, it is not possible.

Primary Five

X5CY: (1.1) **Because** the teacher should stop them fighting first. **Then** they would become reconciled, **at last** they would feel ashamed.

Excerpt 12

Primary Three

B3CL: Because if you fought, you[/]you had not known that, seemed it was wrong to quarrel if you have not yet solved the problem, if<you want>[/]/ you knew that problem, you knew who was it<then you can>[/]/ then you can.

Primary Five

X5BT: Maybe he was er innocent, then was misunderstood, but he also fought. He [/]er was wrong too.

Though they may reflect an accumulation of linguistic knowledge, linguistic measures have limited indicative power of abilities of explanation and justification as children grow up. The development of explanation and justification are reflected on both cognitive measures (methods of explanation and types of reasons) and linguistic measures (length of discourse, frequency of connectives and communicative efficiency). As age increases, children can express different types of explanations and justify opinions from multiple perspectives, involving increasing cognitive efforts via necessary linguistic devices. Development is steep from Primary One to Primary Three, but rather flat from Primary Three to Primary Five. Communicative efficiency may be a potential indicator with which to measure development as children grow up.

7. Conclusion

The research findings provide some references for both teaching and assessment. Explanation and justification as learning objectives of speaking are specified in 2015 Primary Chinese Syllabus (Curriculum Planning & Development Division, 2015). However, what are the requirements of explanation and justification and how can teachers foster these two abilities are not clearly stated in the syllabus. This study found that the development of oral explanation and justification was reflected on both cognitive and linguistic dimensions, which informs us that speaking is also cognitively demanding for primary students. Teachers should provide both cognitive and linguistic scaffolding for students. For cognitive scaffolding, teachers can analyse the requirements of explanation and justification, then employ brainstorming activities, questioning strategies or cooperative learning activities to help students generate and organise information. Students should be told which information is needed for achieving the purposes of explanation and justification. Based on what students intend to express, linguistic scaffolding can then be provided to help students encode information with necessary linguistic knowledge.

By employing pedagogical tasks as eliciting tasks, this research has demonstrated that the content and discourse of explanation and justification can be very dynamic. More research is needed in the future in regard to designing a variety of explanation and justification tasks that learners may encounter authentically in the world, and in regard to exploring the linguistic and cognitive abilities required to do so.

However, the development was found based on descriptive data in this study. The results should be validated by large-scale quantitative research. Future research can develop rating rubrics for assessing explanation and justification, based on the findings of this study, and apply it to a large sample of participants.

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References

- Alamillo, A. R., Colletta, J. M., & Guidetti, M. (2013). Gesture and language in narratives and explanations: The effects of age and communicative activity on late multimodal discourse development. *Journal of Child Language*, 40, 511–538. <http://dx.doi.org/10.1017/S0305000912000062>
- Brown, G., Anderson, A., Shillcock, R., & Yule, G. (1985). *Teaching talk: Strategies for production and assessment*. Cambridge: Cambridge University Press.
- Brown, G., & Yule, G. (1983). *Teaching the spoken language*. Cambridge: Cambridge University Press.
- Bygate, M. (1987). *Speaking*. Oxford: Oxford University Press.
- Chafe, W. L. (1980). *The pear stories: Cognitive, cultural and linguistic aspects of narrative production*. Norwood: Ablex.
- Chambers, S. M. (1995). Age, prior opinions, and peer interactions in opinion restructuring. *Child Development*, 66, 178–192.
- Chang, C., & McCabe, A. (2013). Evaluation in Mandarin Chinese children's personal narratives. In A. McCabe & C. Chang (Eds.), *Chinese language narration: Culture, cognition, and emotion* (Vol. 19 pp. 33–56). Amsterdam: John Benjamins Publishing. <http://dx.doi.org/10.1075/sin>
- Chen, L., & Yan, R. (2010). Development and use of English evaluative expressions in narratives of Chinese–English bilinguals. *Bilingualism: Language and Cognition*, 14, 570–578.
- Colletta, J.-M., & Pellenq, C. (2010). The development of multimodal explanations in French children. In M. A. Nippold & C. M. Scott (Eds.), *Expository discourse in children, adolescents, and adults: Development and disorders* (pp. 63–97). New York, NY: Psychology Press.
- Curriculum Planning & Development Division. (2015). *2015 syllabus Chinese language primary*. Singapore: Ministry of Education.
- Donaldson, M. L. (2006). *Children's explanations: A psycholinguistic study*. New York, NY: Cambridge University Press.
- Goetz, P. J. (2010). The development of verbal justifications in the conversations of preschool children and adults. *First Language*, 30, 403–420.
- Goetz, P. J., & Shatz, M. (1999). When and how peers give reasons: Justifications in the talk of middle school children. *Journal of Child Language*, 26, 721–748. <http://dx.doi.org/10.1017/S0305000999003980>
- Goh, H. H. (2012). *A study of lexical diversity, syntactic complexity and code-switching in spoken Mandarin of Chinese preschoolers in Singapore: A corpus-based analysis*. Singapore: National Institute of Education, Nanyang Technology University.
- Keenan, E. O., & Bennett, T. L. (1977). *Discourse across time and space*. Los Angeles, CA: University of Southern California.
- Kyrtziz, A., Ross, T. S., & Koymen, S. B. (2010). Validating justifications in preschool girls' and boys' friendship group talk: Implications for linguistic and socio-cognitive development. *Journal of Child Language*, 37, 115–144. <http://dx.doi.org/10.1017/S0305000908009069>
- Olten, M. (2008). *Wahre Freunde* [True friends]. Zürich: Banzazzo-Verl.
- Piaget, J. (1959). *The language and thought of the child* (Vol. 5). London and New York: Routledge.
- Silver, R. E., Goh, C. C. M., & Alsagoff, L. (2011). *Language learning in new English contexts: Studies of acquisition and development*. Singapore: Bloomsbury Publishing.
- Thomas, E. (1991). Cognitive tasks and Singaporean children's explanations: Expectations, realities and prospects. In A. Kwan-Terry (Ed.), *Child language development in Singapore and Malaysia* (pp. 77–97). Singapore: NUS Press.
- Veneziano, E. (2001). Interactional processes in the origins of the explaining capacity. In K. Nelson & A. Aksu-Koc (Eds.), *Children's language: Developing narrative and discourse competence* (Vol. 10, pp. 113–114). Mahwah, NJ: Lawrence Erlbaum.
- Veneziano, E., & Sinclair, H. (1995). Functional changes in early child language: The appearance of references to the past and of explanations. *Journal of Child Language*, 22, 557–581.
- Verhelst, N., Van Avermaet, P., & Takala, S. (2009). *Common European framework of reference for languages: Learning, teaching, assessment*. Cambridge: Cambridge University Press.
- Xing, F. (2001). *Hanyu fuju yanjiu* [On Chinese complex sentences]. Beijing: The Commercial Press.

Appendix A

Remarks for transcription

Remark	Meaning
@e	Code-switching to English
[/]	repetition
[//]	Partial correction
[///]	Re-start
(2)	(pausing time)
{XXX}	Interviewer's utterances



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