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# Performance differences between verbally talented preschoolers and their regular counterparts in storytelling

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## Abstract

The primary purpose of this study was to compare language and narrative skills of both talented and regular young children in Taiwan. The participants were asked to tell a story based on images in children's picture books. Twelve children, who participated in a screening session designed to identify young talented children for the Enrichment Program for Cultivating Problem Solving Abilities and Multiple Intelligences for Talented Preschoolers (PSMIGP program), were divided into a verbally talented group (VT) and a regular group (RE). The stories told by the participants were tape-recorded, transcribed, and coded using the Child Language Data Exchange System (CHILDES). The results indicated that the verbally talented children demonstrated their linguistic talents at as young as four years of age. In telling a story, they used more clauses and more words that were different to complete the task. In addition, they used more modifiers (i.e. adjectives and adverbs) and employed more conjunctions that were more complex. However, there

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were no differences between the two groups in mean length of utterance (MLU) and type-token ratios (TTRs). This paper presents a discussion on the implications of this study and offers suggestions for future research.

## Keywords

Young talented children, storytelling, language development, narrative skills

## Introduction

Among the traits of talented children are their precocious language and cognitive skills (Davis and Rimm, 2004). Many research findings show that precocious verbal development is a crucial indicator for identifying young talented children (Abraham, Hartwell and Marston, 1985; Jackson, 2002; Piirto, 1999). Some talented children begin talking as early as 7 months of age, whereas other bright children do not start talking at an early age, but progress rapidly once they begin (Davis and Rimm, 2004; Jackson, 2002).

Bailey (1996), in describing two verbally talented children, five-year-old David and nine-year-old Cara, summarized the qualities they demonstrated, including “fluid, descriptive language,” “early mastery of the phonetic code,” “an advanced ability to use a linguistic symbol system,” “active engagement in reading or writing tasks for extended periods of time,” “playful doing of a skill coupled with seriousness of purpose,” “ability to express complex thoughts,” and “craving of challenge” (Bailey, 1996: 108). Tsai (1989) indicated four features of the language development of talented learners: (a) vocabulary: a large vocabulary, more sophisticated and precise diction; (b) linguistic fluency: being good at expressing themselves, using longer sentences, and showing higher abilities in learning foreign languages; (c) reading ability: starting to read at an exceptionally young age and enjoying reading both efficiently and extensively; and (d) writing ability: better penmanship and a higher ability to write sentences, letters, stories, prose, and poems. Regarding young verbally talented children, other studies have observed precious verbal comprehension ability and verbal productivity (Cline and Schwartz, 1999), production of longer sentences, an inclination to ask questions (Abraham et al., 1985; Fan, 2001), and a larger and more complex vocabulary (Jhan, 2000; Tucker and Hafenstein, 1997). Generally, these verbal developments are synchronous. Some preschoolers exhibit precocity in speech but not in other verbal domains (Jackson, 2002).

The current study was conducted to obtain a clearer understanding of the verbal characteristics of young verbally talented children and to provide more information for educators in selecting suitable criteria when attempting to identify students with linguistic and verbal talent. This research focused on how verbally talented and regular young children told a story in their first language, Mandarin Chinese, based on a wordless picture book.

The study was guided by the following research questions:

1. Do differences exist in language development between verbally talented and regular young children when engaging in storytelling activities as demonstrated by

- their performance in telling stories of different lengths, mean lengths of utterance, and vocabulary variations with limited sizes of lexicon in a limited time?
2. Do differences exist in narrative development between verbally talented and regular young children when engaging in storytelling activities as demonstrated by their use of adjectives and adverbs, as well as conjunctions?

## Literature review

### *Assessing children's verbal abilities*

Children's language capacity manifests itself in both perception (i.e. listening and reading) and production (i.e. speaking and writing). Most empirical studies on the linguistic skills of talented children have focused on perception but seldom on production (Hou, 2005). Because precise paper-and-pencil tests are not conducive to many factors involved in verbal talents, Brandwein and Passow (1988) proposed an operational approach to identification, "in which children are provided opportunities to manifest their potential by actually performing and producing" (Passow, 1996: 29). Feldman (1991) and Treffinger (1991) have suggested that identification practices should be characterized as developmental, process-oriented, and based on performance.

### *Assessment tools for language ability*

Based on the described performance-based identification paradigm, Maker (1996) developed an alternative assessment process, called the DISCOVER approach, which is composed of a set of diverse activities to assess spatial, linguistic, and logical-mathematical intelligences (Maker, 1996; Sarouphim, 1999). DISCOVER has five types of problems. Storytelling is classified under Type IV and is suitable for children from kindergarten to the fifth grade. Type IV problems are of a higher level and are more open-ended. Both the presenter and solver know the problems but they do not know the solutions to the problems (Maker, 1996; Sarouphim, 1999). During the DISCOVER identification process, students are asked to tell a story using some or all of the toys they play with. The evaluation criteria for storytelling include whether the stories have a beginning, middle, and end, as well as a plot, the quality of words used, dialogues, unique ideas, and an appropriate sequence of events (Sarouphim, 1999). Maker and colleagues suggested DISCOVER as a promising alternative assessment for identifying talented minority children (Maker, 1996; Sarouphim, 1999). However, Sarouphim (2000) examined the internal structure of the DISCOVER assessment further by analyzing data on 257 Navajo and Mexican-American participants from kindergarten and second, fourth, and fifth grades and found that the criteria for evaluating students' ability in storytelling not only overlapped with the story writing activity but also seemed more related to logical-mathematical intelligence than to linguistic intelligence. Sarouphim thus suggested that more emphasis be placed on the core capabilities of linguistic competence in evaluating students' ability in storytelling (i.e. sensitivity to the appreciation and use of language).

The type-token ratio (TTR) is another measure that researchers use in child language research as an index of lexical diversity (Richards, 1987). "Type" refers to the total

number of words that are different in a certain number of utterances, and “tokens” is the total number of words in those utterances. It is assumed that the more words that are sampled, the greater the probability of finding more words that are different; and the larger the resulting TTR, the less repetitive the vocabulary usage. As a measure of early child language, TTR has been used in studies on language development across age groups (Templin, 1957), individual differences (Lieven, 1978), longitudinal case studies (Fletcher, 1985), and as a predictor of foreign language learning aptitude and attainment (Skehan, 1986, 1989).

### *Language development in young children*

Generally, by the age of 5, most children have amassed a vocabulary of approximately 8000 words, learned almost all of the basic grammatical forms of their language, and have begun to learn to use relative clauses (Gleason, 2005; Tager-Flusberg, 2005). The size of a child’s lexicon not only indicates his or her stage of verbal development but is also a predictor of his or her later literacy skills. Of children’s early vocabulary, almost 40% comprises nouns, whereas verbs, adjectives, adverbs, and conjunctions are accumulated more slowly (Pan and Gleason, 2005). Thus, we infer that the more varied the classes of words the child employs, the more developed his or her language is. When children are asked to tell a story, educators are not only interested in what they say but also in how they say it. Studies on children’s narratives show that when children narrate text, a story, or an account from personal experience, they must employ their knowledge of language to accomplish the task. For example, children engaging in such an activity must use various tenses or conjunctions to express themselves (Hudson and Shapiro, 1991). This knowledge of language is crucial for maintaining coherence of the narrative. Relevant research has shown that, compared with older children who use conjunctions that are more temporal and causal, young children use more sequencers in their narratives. This does not mean that older children do not use sequencers. Instead, older children use not only sequencers but more types of conjunctions to produce narratives of various functions (Hudson and Shapiro, 1991). Therefore, by examining how well young children employ grammatical devices of language and what word classes they produce, we can infer the level of language development they have achieved.

Another useful index of language development is the child’s mean length of utterance (MLU) as proposed by Brown (1973), who suggested collecting a sample of 100 utterances from the child under observation and, for each utterance, calculating the number of morphemes it contains. The mean of these utterance lengths calculated according to the number of morphemes is adopted as the child’s MLU (Elliot, 1996). As their language skills develop, young children use more complex grammar in their utterances, such as plural inflections, past inflections, and articles. Employing more grammatical devices increases the length of their utterances. By analyzing the child’s MLU, researchers can measure his or her language development (Tager-Flusberg, 2005). Brown (1973) found that the measure of an MLU increases relatively smoothly over time for children and further proposed five stages of language development by using the MLU, with Stage I involving a maximal MLU value of 1.75, and Stages II–V corresponding to MLU values of 2.25, 2.75, 3.50, and 4.00. Brown also discovered an order of acquiring the

morphemes that effectively correlates among children, and that the rate of acquisition varies considerably among children (Elliot, 1996; Pan, 1994).

Research on the MLU in Mandarin has also indicated that the MLU is a useful index of Mandarin language development (Jhang, 1998). In studying the language development of 110 kindergarteners aged 4 to 6 years, Fan (2001) concluded that verbally talented preschoolers produced longer MLUs than did their regular counterparts, and that the preschoolers' MLUs could be divided into three groups of different lengths; that is, from 6 to 8, 8 to 10, and more than 10. Jhang (1998) and Pan (1994), by contrast, obtained different results regarding Mandarin MLUs, finding that when an MLU exceeds 3.50, whether in English or Mandarin, the rate of increase slows. Moreover, the utility of the MLU decreases markedly when exceeding 3.00, because using sophisticated grammatical devices, such as ellipses, results in shorter, rather than longer utterances (Jhang, 1998; Pan, 1994). Jhang (1998) focused on older children, aged 4 to 7 years, finding that MLUs in Mandarin increased with age, but the rate of increase is not stable. In addition, sometimes there are no differences among children of different ages. Jhang inferred that some developmental plateaus might exist in language development. The language skills of children aged 4 to 7 years are still developing; however, the corresponding MLUs do not manifest the development as much as they do for children of younger ages. Therefore, when examining the language development of children over the age of 4, other criteria must be included in conjunction with MLUs.

## Method

### *Participants*

Twelve young children, who participated in a screening session designed to identify young talented children for the Enrichment Program for Cultivating Problem Solving Abilities and Multiple Intelligences for Talented Preschoolers (PSMIGP program; Kuo, Maker, Su and Hu, 2010, 2011), also participated in this study, in which they told a story based on a wordless picture book. Six of the children were identified as verbally talented (VT) and the other six, who did not pass the identification exam, were in the regular (RE) group. All of the participants speak Mandarin as their first language. Three children in the verbally talented group were 4 years old and the others were 5 years old. Among them, Participant D in the VT group was identified as verbally talented despite her low scores on the Test of Nonverbal Intelligence (TONI-3) and the test of the Wechsler Primary and Preschool Scale of Intelligence-Revised (WPPSI-R), because she had an impressive portfolio and demonstrated high abilities during the observation process. Her being homeschooled and never having had any experience in a school setting might have influenced her scores on the standardized tests. Table 1 lists the children's performance levels on the standardized tests. The six verbally talented preschoolers' performance levels in the linguistic observation activities are shown in Table 2.

### *Procedure*

Before engaging in the storytelling activity, all of the participants underwent an identification process consisting of three sessions, as shown in Figure 1.

**Table 1.** Standardized test performance of the verbally talented and regular groups.

Group	Child	TONI-3	WPPSI-R			Age/gender
			PIQ	VIQ	FIQ	
Verbally talented group	A	150	111	131	125	4/M
	B	111	136	116	129	4/M
	C	122	121	132	131	4/F
	D	112	114	116	117	5/F
	E	136	117	128	127	5/F
	F	145	149	129	143	5/M
Regular group	T	106		None		5/M
	U	101		None		5/F
	V	115	104	118	112	5/F
	X	90		None		5/M
	Y	119	104	95	98	5/M
	Z	112		None		5/M

**Table 2.** Linguistic observation activities of the verbally talented group.

Child	Ranking	Qualitative comments on children
A	2	Acuity; clear oral expression; strong ability in reading, even in recognizing words that have no phonetics; ability in understanding complicated words and phonetics; logical and vivid storytelling ability; advanced literacy ability; recommended for courses for verbally talented children.
B	5	Ability in fluently expressing his opinions on whether the text was rich in content and words' usage; strong ability in comprehension; ability in reading independently; general ability in word recognition.
C	4	Abundant vocabulary; ability in using different words to express the same meaning; ability in vivid description and accurately expressing her feelings; can express fractions easily; used unusual words; loved reading; could guess the right meaning of pictures. Excellent in verbal ability; recommended for courses for verbally talented children.
D	4	Clear and fluent in oral expression; narrative; fast in giving response; good comprehension ability and word recognition ability; logical storytelling ability.
E	2	Fast in connecting a series of pictures reasonably; good imagination though with rather brief description; can read story independently; advanced in verbal ability; rich vocabulary; advanced in word recognition.
F	1	Clear and fluent oral expression with rich vocabulary; can retell stories he's read using his own words and in a logical way; imaginative; used body language to help with his storytelling; elaborated on the answers he's given.

### Screening session I

*Completion of the observation checklist.* The parents and teachers completed The Talented Traits Checklist for Preschoolers observation checklist, which comprised 40 items. The parents and teachers rated each item on a three-point Likert-type scale based on their observation of their children, including length of attention span, mathematical

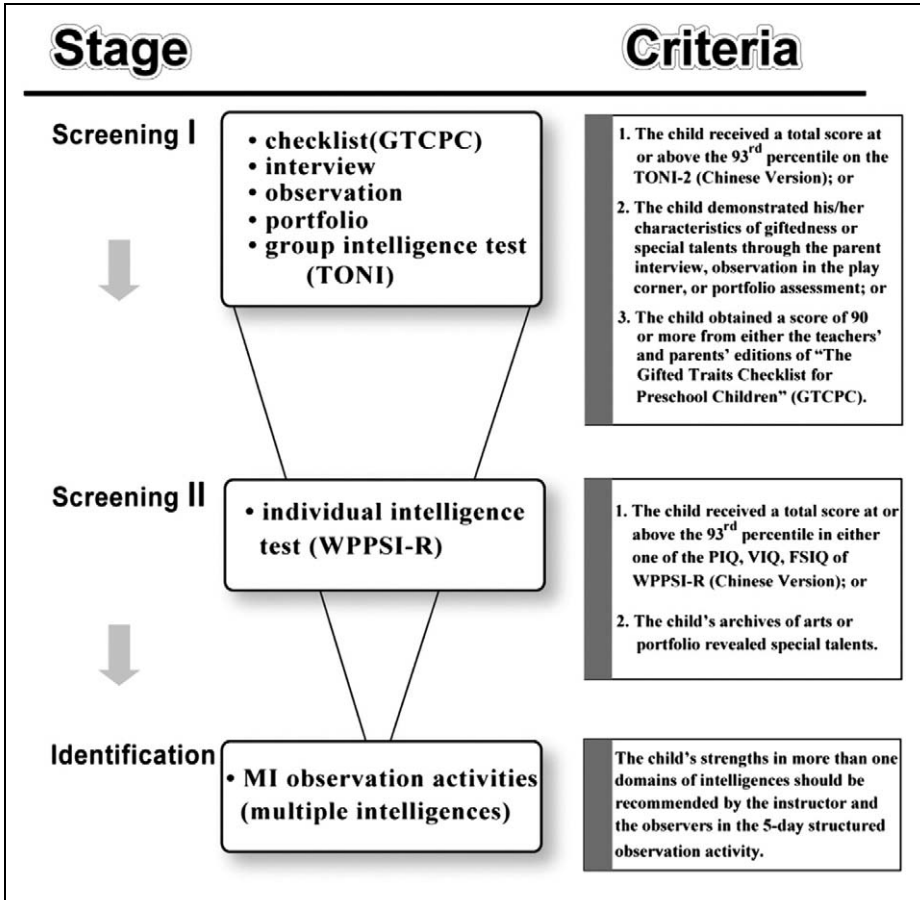


Figure 1. Identification model (from Kuo et al., 2010).

ability, verbal ability, and other operational abilities commonly associated with talented children. In addition, to ensure a more specific evaluation of the preschoolers' performance, the parents and teachers were asked to provide additional information for each item, such as the duration of each activity.

*Interview with parents, assessment of portfolio, and observation of children's behaviors.* The parents were interviewed by the researchers. Each interview lasted approximately 30 minutes, while assistants observed and recorded the children's on-site behavior in exploring materials. The parents were encouraged to bring their children's products (e.g. painting, short story writing), which were evaluated by experts in related areas (Kuo et al., 2010).

*Group intelligence test.* All of the preschoolers recommended for screening session I were tested using the Chinese version of the *Test of Nonverbal Intelligence*, 3rd ed

(TONI-3) (Wu, Tsai, Hu, Wang, Lin and Kuo, 1997). The children who scored above the 93rd percentile (122) on the TONI-3 were automatically advanced to screening session II. In addition, the children who scored below the 93rd percentile (122) but were previously recommended by the interviewer and the observer also joined screening session II. The previous recommendation was made based on the information gathered from the identification meeting, or when a child obtained a score of 90 or more on either the teachers' or the parents' versions of the observation checklist.

*Screening session II: Individual intelligence test.* The Chinese version of the *Wechsler Preschool and Primary Scale of Intelligence, Revised Edition* (WPPSI-R) (Chen and Chen, 1997) was administered to children in this session. The children who were above the 93rd percentile on the performances intelligence quotient (PIQ), verbal intelligence quotient (VIQ), or full intelligence quotient (FIQ) of WPPSI-R, or those who were previously recommended by the interviewer and the observer, were qualified to participate in the next session, identification.

*Identification session.* This session included a series of five-day structured observation activities, which were designed based on the theory of multiple intelligences for observing the children's abilities in six domains of intelligence: logical-mathematical, linguistic, naturalistic, musical, spatial, and bodily-kinesthetic. The two remaining intelligences, inter- and intra-personal, were incorporated into all of the domains. The courses involved two to six activities. Each observation course lasted 2 hours, within which the children could demonstrate their talents. Meanwhile, the children were provided with the opportunity to express their thoughts and describe their products if their thoughts or products were underestimated. One instructor and four observers were involved in each activity. The children's performance levels were recorded and rated based on the pre-planned observation criteria. Table 3 lists the observation activities and criteria for evaluating linguistic intelligence.

After every observation period (for every domain), the instructor and the observers discussed the performance of the children before they made final recommendations. The children who underwent the entire identification procedure and were identified as talented preschoolers were further divided into different talent groups, depending on the domain in which the children demonstrated strengths. There were approximately six children (or one-quarter of the number of children assessed) from every domain who were recommended for the program. They were encouraged to join activities one day each week for 36 weeks to develop multiple intelligences and problem-solving skills.

*Storytelling activity.* The children who were identified as verbally talented and six other children who did not pass the identification procedure participated in the storytelling activity. Each child was given a picture book with no words printed in it and was asked to tell a story based on the pictures. The child was allowed to explore the book first, and could begin telling a story when ready. The first researcher gave instructions to the children and recorded what they said. The activity was conducted in an observation room with a one-sided mirror, thus allowing the parents to observe and hear what the researcher and the children were doing and saying in the room. After the children

**Table 3.** Observation activities and criteria of evaluation of linguistic intelligence.

Observation activities	Evaluation criteria
Big problems in a small story	<ol style="list-style-type: none"> <li>1. Listening:               <ol style="list-style-type: none"> <li>(a) To pay complete attention;</li> <li>(b) To respond to the story appropriately;</li> <li>(c) To answer a Type I problem exactly.</li> </ol> </li> <li>2. Linguistic expression:               <ol style="list-style-type: none"> <li>(a) To speak clearly;</li> <li>(b) To express ideas clearly;</li> <li>(c) To express concepts with abundant content and vocabulary terms.</li> </ol> </li> <li>3. Problem solving abilities:               <ol style="list-style-type: none"> <li>(a) To raise a solution for problem;</li> <li>(b) To answer a Type II problem reasonably;</li> <li>(c) To answer a Type III problem;</li> <li>(d) To answer a Type IV problem.</li> </ol> </li> </ol>
What did the pictures show?	<ol style="list-style-type: none"> <li>1. Imagination:               <ol style="list-style-type: none"> <li>(a) To interpret the content reasonably;</li> <li>(b) To interpret the content creatively.</li> </ol> </li> <li>2. Organization:               <ol style="list-style-type: none"> <li>(a) To arrange a connected series of pictures reasonably;</li> <li>(b) To tell a story logically.</li> </ol> </li> <li>3. Linguistic expression:               <ol style="list-style-type: none"> <li>(a) To speak clearly;</li> <li>(b) To express ideas clearly;</li> <li>(c) To express concepts with abundant content and vocabulary terms;</li> <li>(d) To vary the tone of voice to dramatize the plot.</li> </ol> </li> </ol>

finished telling their stories, they were prompted to offer comments, which the first researcher documented.

**Materials.** For the storytelling activity, we used the book, *Frog, Where Are You?* (Mayer, 1969), which is a wordless book with one picture on each of 29 pages, not including the index or copyright pages. This book has been used in many cross-cultural designs for studying children's language development. The book contains pictures that involve narrative elements and entails a universal theme that transcends cultural and language barriers. It tells a typical children's story with a hero (a little boy), a problem (the boy's pet frog is missing), a series of actions to solve the problem (the boy looks for his frog with his dog), and a happy ending (the boy retrieves his frog and he finds another frog (Berman and Slobin, 1994)). The participants viewed the book and all of the pictures independently and were asked to tell a story about what they believed the pictures depicted.

**Data collection and analysis.** All of the children's stories were recorded and transcribed verbatim by the first author. The language samples were analyzed by using the Child Language Data Exchange System (CHILDES). The researcher calculated the total

**Table 4.** Types of conjunctions.

Types of conjunctions	Grade	Examples
Sequencer	Lower	Ran-hou (then), hai-you (and)
Temporal marker	Higher	Jie-guo (as a result), suo-yi (so), hou-lai (and then), yuan-lai (actually), di-er-tian-zao-shang (the next morning), tong-shi (meanwhile), ... de-shi-hou (when ...)
Causal marker	Higher	Ke-shi (but), dan-shi (however), yin-wei (because), suo-yi (so)

**Table 5.** Verbally talented group performance in the storytelling activity.

Child	Clauses	MLU	TTR	Corrected TTR	Total number of different words
A	60	7.30	0.38	4.68	117
B	30	6.12	0.45	4.06	73
C	26	8.50	0.46	4.09	73
D	99	8.42	0.30	5.03	164
E	26	6.30	0.52	4.19	67
F	63	8.70	0.37	4.89	128
Mean	50.67	7.56	0.41	4.49	103.67
SD	29.04	1.15	0.08	0.43	39.08

number of clauses, MLUs, TTRs, different words used, and modifiers (i.e. adjectives and adverbs) used. The number of clauses was used as the unit of measure for the length of the story; the MLU is derived by counting the number of morphemes for every clause; TTR was calculated by dividing the number of different words by the total number of words the child produced in the speech sample (Pan, 1994). Table 4 lists the types of conjunctions the children employed. The same conjunctions in Chinese can perform different linguistic functions. For example, *suo-yi* can be used as a temporal marker or a causal marker, depending on the context.

## Results and discussion

### *Story length, MLU, TTR, and total number of different words*

The verbally talented group outperformed the regular group based on the measurements of the total number of clauses, the total number of words, and the number of modifiers used, as shown in Tables 5 and 6. The mean number of clauses produced by the VT group ( $M_v = 50.67$ ) was nearly twice as high as that of the regular group ( $M_r = 28.67$ ). Participant D in the VT group told the longest story with 99 clauses, whereas the shortest story with 21 clauses was told by Participant T in the regular group. The number of clauses in the longest story was more than four times that of the shortest story.

**Table 6.** Regular group performance in the storytelling activity.

Child	Clauses	MLU	TTR	Corrected TTR	Total number of different words
T	21	7.89	0.46	3.88	66
U	28	7.47	0.50	4.32	74
V	22	8.34	0.56	4.31	66
X	49	8.79	0.27	3.29	80
Y	25	5.70	0.48	3.58	54
Z	27	7.74	0.42	3.67	64
Mean	28.67	7.66	0.45	3.84	67.33
SD	10.32	1.07	0.10	0.41	8.91

Obviously, the verbally talented children were more communicative than their regular counterparts in telling a story.

However, there were no differences in MLU between the two groups. As Tables 5 and 6 show, the MLUs of the two groups were quite close ( $M_v = 7.56$ ,  $M_r = 7.66$ ). Furthermore, the shortest MLU in the two groups ( $MLU = 5.70$ ) was higher than the MLU of Brown's Stage V ( $MLU = 4.00$ ), which corresponds to the age of 4 (Brown, 1973). Our results also contrasted with Fan's (2001) results in two respects. First, Fan (2001) concluded that the gifted preschoolers used longer sentences than the regular preschoolers did. Second, the MLUs that Fan derived are longer than those obtained in the current study. Fan further divided the MLUs of the participants into three range groups: the mean length of utterance were from 6 to 8, 8 to 10, and more than 10. One possible explanation for the differences between Fan (2001) and the present study is that Fan, instead of measuring participant MLUs in the manner that was executed in our study, derived the MLUs based on the general impressions expressed by the teachers and parents of the participants.

Another study on children's MLUs in Mandarin, however, supports the results of the current study. Jhang (1998) investigated Mandarin-speaking children's language development and found that when children reach the age of 4, the MLU does not increase in proportion to their language development. Jhang thus assumed that there are developmental plateaus between the ages of 4 and 7. Such developmental plateaus might explain why the two groups in this study showed no differences in MLUs. Moreover, although the MLU is an index of grammatical growth, and the development of MLU reflects an increase in morphological sophistication or semantic elaboration, some sophisticated devices, such as ellipses, may result in shorter utterances (Pan, 1994). Hence, that there were no MLU differences between the two groups does not necessarily indicate that no difference exists between the two groups' levels of grammatical ability. Rather, some of the verbally talented children may have used more sophisticated language devices that led to shorter but higher-level utterances.

There were also no obvious differences in the TTRs between the two groups ( $M_v = 0.41$ ,  $M_r = 0.45$ ). At first, it might be concluded that TTR was not a good index of lexical complexity in distinguishing verbally talented children and regular children. However, re-examining how TTR was derived in this study and how TTR was calculated

**Table 7.** Modifiers used by the verbally talented group.

Child	Adjectives and adverbs	Total number of conjunctions	Sequencers	Temporal markers	Causal markers
A	3	9	3	5	1
B	4	8	1	7	0
C	4	12	11	0	1
D	9	65	32	7	26
E	3	12	8	2	2
F	6	27	21	6	0
Mean	4.83	22.17	12.67	4.50	5.00
SD	2.32	22.08	11.80	2.88	10.31

in previous studies reveals why the two groups' TTR measurements were so similar. In previous studies on various age groups (Templin, 1957), longitudinal case studies (Fletcher, 1985), and individual differences (Lieven, 1978), TTRs were comparable when the number of tokens (i.e. the denominator) was held constant. As Richards (1987) stated, "If... sample size varies extensively, it is possible to produce TTRs which appear to demonstrate that the speech of the two-year-old shows greater lexical diversity than the prose of the Professor of Linguistics" (Richards, 1987: 205). The TTRs in this study were calculated by dividing the number of different words by the total number of words the child produced in the speech sample. The numbers of clauses varied greatly among these children, particularly in the VT group. This means that the total number of words produced by each child also varies, which in turn yields TTRs with different numbers as the denominators of the ratios. When the number of tokens is not held constant, comparing TTRs fails to indicate lexical complexity. To ensure that TTRs are more representative of the distinct stages of children's language development, Carroll (1964) proposed using corrected TTR as an index. A comparison of the corrected TTRs of the two groups, as shown in Tables 5 and 6, indicates that the VT group outperformed the regular group ( $M_v = 4.49$ ,  $M_r = 3.84$ ). Therefore, we infer that verbally talented children produce larger TTRs than do regular children.

Another indicator of child language development is the total number of different words used by children. In the current study, the VT group used considerably more words that are different than did the regular group ( $M_v = 103.67$ ,  $M_r = 67.33$ ). Participant D in the group, in particular, used as many as 164 different words, which is three times more than what Participant Y in the regular group used (i.e. 54 different words). These results indicate that the verbally talented young children exhibited a larger lexicon than those in the regular group.

### *Use of adjectives, adverbs and conjunctions*

The VT group outperformed the regular group in the use of adjectives, adverbs, and conjunctions. As Tables 7 and 8 show, the total number of adjectives and adverbs used by the verbally talented group ( $M_v = 4.83$ ) was almost twice as large as that of the regular group ( $M_r = 2.50$ ). Participant D in the VT group used as many as nine modifiers

**Table 8.** Modifiers used by the regular group.

P	Adjectives and adverbs	Total number of conjunctions	Sequencers	Temporal markers	Causal markers
T	2	4	2	2	0
U	5	18	17	1	0
V	3	7	2	3	2
X	3	10	5	5	0
Y	1	3	1	2	0
Z	1	18	13	5	0
Mean	2.50	10.00	6.67	3.00	0.33
SD	1.52	6.66	6.71	1.67	0.82

(i.e. adjectives and adverbs). The lowest score in the VT group is higher than the mean of the regular group. Two participants in the regular group used only one modifier in the individual speech sample. Research on children's language development has found that children acquire adjectives and adverbs later than they do nouns or verbs (Pan and Gleason, 2005). Therefore, the use of adjectives and adverbs suggests a more advanced language development. The results correspond with those of Abraham et al. (1985), Fan (2001), and Jhan (2000), thus indicating that verbally talented children use words that are more complex.

The mean of the total number of conjunctions used by the VT group ( $M_v = 22.17$ ) was more than twice that of the regular group ( $M_r = 10.00$ ). Participant D in the VT group used as many as 65 conjunctions, whereas Participants T and Y in the regular group used only four and three conjunctions, respectively. Among the three types of conjunctions, sequencers were the type that the participants used with the highest frequency. Both groups used more sequencers than the other two types of conjunctions in combination, with 116 sequencers, 45 temporal markers, and 32 causal markers produced, thus corresponding to the fact that sequencers are of a lower degree of complexity compared with temporal and causal markers. In using sequencers, the VT group produced almost twice as many sequencers as did the regular group ( $M_v = 12.67$ ,  $M_r = 6.67$ ). The use of temporal markers was not as frequent compared with the use of sequencers, suggesting the complexity of temporal markers. One of the VT participants did not use any sequencers in telling the story. The VT group used a total of 27 temporal markers with a mean of 4.50, which is much higher than the regular group's total number of 18 and mean of 3.00. Causal markers are a more complex grammatical device, and this complexity was shown in the way the participants used them. A total of 32 causal markers were used by five of the participants: four VT children and one regular child. Of the 32 causal markers used, 26 were from one VT child, Participant D. These findings indicate that verbally talented children use not only more conjunctions but also higher-level ones when telling a story. The use of conjunctions reflects the ability to tell a coherent story (Shapiro and Hudson, 1991). Thus, we infer that verbally talented young children tell stories that are more coherent than the stories told by regular children.

### *Overall evaluation*

We found that the verbally talented young children were considerably more adept at telling a story. They told a longer story, and the content of their stories was more coherent. Moreover, the verbally talented group exhibited a larger vocabulary and expressed more variety in word choice. These findings correspond with those of previous studies on talented young children who speak English as their first language (Abraham et al., 1985; Clark, 1992; Jackson, 2002; Tucker and Hafenstein, 1997). The findings also supported Fan (2001), suggesting that verbal ability is an effective criterion in identifying talented preschoolers in Taiwan. However, when we evaluated the basic criteria of language ability, there were no differences in MLU or TTR between the two groups. These results differed from those of previous studies (Abraham et al., 1985; Fan, 2001). Considering the characteristics of MLU and comparing the different designs of those studies, the results of this study indicate that when participants are young preschoolers, the MLU can be an effective criterion. However, when young children reach the age of 4 or 5, the MLU may not be as effective, especially for distinguishing between talented and regular preschoolers.

Another compelling finding of this study was the preferences of the young children. Although a few of the young children needed encouragement to finish the storytelling activity, only one verbally talented child (Participant E) explicitly told the first author that she did not like books without words. She said she was no longer a baby who needed only picture books and that she could read independently. When telling the story, she spoke quickly and even skipped some pages. This also reflects an essential characteristic of talented children, as described by Clark (1992), who suggested that talented children are a heterogeneous group and that, despite having similar standardized test scores, may not have similar characteristics or abilities. If teachers are unaware of the characteristics and advanced development of verbally talented preschoolers, they might label a child who claims not to like participating in reading tasks with peers as rude and disobedient (Gross, 1999). Such labeling might negatively influence the later social or emotional development of talented young children.

The findings of this study also provide possible criteria for the storytelling activity. The ability of word choice in this study is defined as the ability to choose appropriate modifiers. To identify talented young children, the educator can count the number of clauses and modifiers they use. These criteria are easy to manage and also correspond to Sarouphim (2000) in that the core capabilities of linguistic ability should be emphasized more when identifying verbally talented children.

### *Limitation of the study*

It must be mentioned that the 12 young children in this study constituted a convenient sample. They were all recommended for the enrichment program by their parents and teachers because of their apparent talent. Lee et al. (2008) suggested that talent-search participants usually come from higher-income backgrounds. It should also be noted that the parents who used the checklist were relatively well-educated and probably knew more about talentedness (Robinson, 2008). In fact, most of the young children in the

current study came from middle-class backgrounds. The findings of this study are limited by the small homogeneous sample and, therefore, are not generalizable to a wider population. Additionally, the performance levels of the children in the storytelling activity might not be appropriately used as criteria for identifying verbally talented young children, despite the results showing some differences between talented and non-talented young children in this study. The information gathered in the storytelling activity still require further analysis. Nevertheless, it provided some evidence to support that these two groups exhibit marked differences.

## Conclusion

In this study, stories told by 12 preschoolers based on the picture book *Frog, Where Are You?* (Mayer, 1969) were collected and analyzed. The results of this study indicated that verbally talented children demonstrate their linguistic talents at an age as young as 4 years. In telling a story, they used more clauses and more words that are different to complete the task. In addition, they used more modifiers (i.e. adjectives and adverbs) and employed more conjunctions that are more complex. Therefore, verbally talented children possess a larger vocabulary and more advanced grammatical competence. Such linguistic precocity is likely to be overlooked if standardized tests alone are used as the identification tools. Some scholars (Gross, 1999; Henderson, Jackson and Mukamal, 1993; Maker, 1996; Robinson and Robinson, 1992) have suggested that many standardized tests require a long time to finish, and preschool children might become tired before the tests are complete. Thus, their potentials might be underestimated. Therefore, to identify verbally talented young children more objectively, employing multiple measures along with traditional standardized tests is advisable. A research-based storytelling activity, such as that used in the current study, facilitates identifying verbally talented young children. In completing a storytelling activity, children are required to exhibit their linguistic competence, which includes vocabulary and grammatical knowledge. This study proved that verbally talented children demonstrate a larger vocabulary and more complex use of grammar. Hence, educators can design various types of storytelling activities to explore young children's linguistic competence, which can facilitate identifying verbally talented young children and designing the curricula that are appropriate for them.

Future research could conduct a follow-up study on the six verbally talented young children who joined the PSMIGP program to examine how accurately verbal ability at the preschool age predicts literacy performance after enrolment in elementary school. Such an inquiry could address the lack of literature concerning how accurately high verbal ability predicts literacy performance in using the Mandarin language. In addition, a follow-up study could be designed for young children to investigate whether the language precocity of preschoolers persists as they progress through school.

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