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## ASPERGER SYNDROME SECOND LANGUAGE LEARNERS' COMPREHENSION AND ORAL PRODUCTION IN STORYTELLING CLASSES: A CASE STUDY

**Abstract:** Individuals with Asperger Syndrome (AS) often face difficulties in social communication and language skills, encompassing comprehension and production in both their first and second languages. English as a second language has been one of the most common communication tools and a school subject for decades in Asia; therefore, mastering English becomes crucial including individuals with AS. Prior studies on AS focused on first language development in adolescence. However, few explored second language learning especially the comprehension and oral production in preschoolers in a storytelling class— This study aimed to investigate the comprehension and oral production of a Taiwanese learner with AS in a storytelling setting. Data collection included a questionnaire, close-ended and open-ended questions related to storybooks, classroom observations, self-reports from the participant's mother, and clinical consultation documents. The study found that the participant with AS exhibited a higher level of interest in learning a second language, English, in storytelling classes. Moreover, he could comprehend the stories and answer related questions with a moderate to high degree of accuracy. These findings provide valuable insights for educators to guide and teach the second language within storytelling contexts to young learners with AS to not only motivate them but also support the young learners' development of comprehension and oral production in a second language.

**Keywords:** Asperger Syndrome, storybooks, storytelling, comprehension, oral production

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## INTRODUCTION

Communication in verbal forms can present challenges for individuals with Asperger Syndrome (AS), particularly in pragmatic language and vocabulary production (Polirstok & Houghteling, 2006; Saalasti, Lepistö, Toppila, Kujala, Laakso, Nieminen-von Wendt, & Jansson-Verkasalo, 2008). For instance, tasks involving figurative thinking and sarcasm can be challenging (Craig & Baron-Cohen, 2000). Despite the typical development of many linguistic skills, children with AS demonstrated significantly lower scores on tests assessing comprehension of instructions, indicating that their understanding of language may still be impaired (Saalasti et al., 2008). Children with AS often experience frustration in comprehending their first language, raising concerns about whether similar challenges exist in comprehending a second language.

Being able to understand and comprehend a second language is essential in today's globalized world. English, in particular, is widely recognized as a dominant language and a crucial skill must be mastered particularly speaking (Rao, 2019). Learning English through storybooks exceptionally social stories has been considered beneficial and popular for learners with AS (Hanley-Hochdorfer, Bray, Kehle, & Elinoff, 2010).

The present study aims to explore the comprehension and oral communication production of a second language young learner with AS in a storytelling class within an English as a Foreign Language (EFL) setting. The research question was listed as follows:

How does participation in a storytelling class affect the comprehension of a second language learner with AS?

How does participation in a storytelling class affect the oral production of a second language learner with AS?

### **Literature Review**

To explore the comprehension and oral production of a second language in a young learner with AS in a storytelling class, the following literature review sections are included: literature related to children with AS, second language learning for learners with AS, and the use of storybooks for second language learners with AS in a storytelling class.

## **Children with Asperger Syndrome**

AS is a neurobiological disorder within the autistic spectrum (Murphy, 2001), often referred to as high-functioning autism. Individuals with AS typically possess intellectual capabilities but frequently encounter challenges in communication, social skills, interpersonal interactions, daily routines, social and emotional development, as well as imagination and abstract thinking (Hanley-Hochdorfer et al., 2010; Kuncé & Mesiboy, 1998). To be more specific, individuals with AS often exhibit tendencies towards obsession with specific topics, and adherence to strict routines, and encounter difficulties with pragmatic language, placing these children at educational risk (Polirstok & Houghteling, 2006). Children with AS may face severe challenges in first language acquisition, yet there is limited research examining their communication abilities and production in EFL settings. The following section will introduce "second language learning for individuals with AS."

## **Second Language Learning for Learners with Asperger Syndrome**

Griswold (2016) argued for the adoption of monolingualism for individuals with AS, so pediatricians, educators, and speech therapists have long advised multilingual families to speak one dominant language to eliminate developmental delays and struggles. However, Griswold (2016) also suggested that individuals with AS could successfully learn two languages, with one of them flourishing in multilingual environments. In today's globalized world, bilingualism is considered fundamental, and multilingualism is seen as advantageous. Acquiring language proficiency provides opportunities to expand one's professional reach globally and enhances competitiveness in an ever-evolving society. The primary objective of this study is to promote and investigate second language learning among individuals with AS. To achieve this goal, it is essential to recognize the challenges they encounter and identify the support and facilitation we can offer to overcome these challenges.

Several difficulties in communication and production have been proposed by several researchers; Saalasti et al. (2008) highlighted impairment in communication skills within social contexts, such as significant challenges in producing and comprehending speech prosody (Koning & McGill-Evans, 2001; Saalasti et al., 2008) even though they can produce adult-like vocabulary (Attwood, 1997). Moreover, individuals with AS often struggle with social language vulnerabilities (Murphy, 2001) and pragmatic use of language, which include communication, social language use, interpreting utterances (Rapin &

Dunn, 2003), anxiety, and self-image challenges (Murphy, 2001). They may comprehend the literal meanings of expressions without grasping their underlying implications, such as idioms (Kerbel & Grunwell, 1998), humor (Ozonoff & Miller, 1996), and metaphors, and irony (Happe, 1995). In essence, with communication breakdown, obstacles in interactive language use affect both production and comprehension. For example, they may irritate peers or teachers by engaging in conversations about irrelevant topics, offering pedantic explanations, making frequent interruptions, or voicing complaints (Wire, 2005). Even among individuals with AS who exhibit fluency in speech or verbal expression, pragmatic impairments persist, along with difficulties in understanding semantics, including multiple-word meanings (Kerbell & Grunwell, 1998; Koning & McGill-Evans, 2001; Shriberg, Paul, McSweeny, Klin, Cohen, & Volkmar, 2001).

Previous studies have highlighted the challenges faced by individuals with AS. However, of particular concern is the insufficient training and resources available to educators to effectively assist AS learners in language acquisition (Bradley, 2019). Additionally, there is limited research addressing the difficulties they encounter in comprehending and producing a second language. To shed light on how an individual with AS comprehends and produces a second language, this study aims to investigate the comprehension and oral production abilities in English of a young learner with AS within the context of a storytelling class in an EFL setting. In the subsequent section, the effects of utilizing storybooks for AS second language learners within the context of a storytelling class will be elaborated on.

### **Storybooks for Second Language Learners with AS in a Storytelling Class**

Learners with AS may encounter challenges in various cognitive domains, including figurative thinking, navigating hypothetical scenarios, interpreting sarcastic comments (Craig & Baron-Cohen, 2000), as well as in the development of social and communication skills (Hanley-Hochdorfer *et al.*, 2010). In addressing these challenges, the importance and utility of storytelling have been underscored (Martinovich, 2005; Sahin, 2016). Storytelling has been shown to offer various benefits, including facilitating social integration and enhancing figurative and imaginative thinking (Craig & Baron-Cohen, 2000).

Furthermore, Hanley-Hochdorfer *et al.* (2010) found that storytelling can enhance verbal initiation and responses, suggesting its value as a tool for individuals with AS to familiarize themselves with and

model social interactions (Martinovich, 2006). For instance, individuals could establish rapport and engage in interaction to establish connections and convey crucial information (Zak, 2013). Social stories, recognized as a popular intervention for improving the social behavior of individuals with AS (Gray, 2000), typically consist of an introduction, body, and conclusion, thereby aiding in the understanding of social contexts (Hanley-Hochdorfer *et al.*, 2010).

The present study seeks to investigate the comprehension and oral production abilities of a second language learner with AS in the context of a storytelling class. The research design was explained in the subsequent section.

## METHODOLOGY

This chapter provided detailed information regarding the background of the participant, procedure, materials, instrument, data collection, and data collection methods.

### Participant

The participant was a six-year-old boy diagnosed with AS at the age of two-year and eleven months. His diagnosis stemmed from various symptoms noted by his mother, prompting her to seek medical evaluation. Examples of these symptoms included difficulty maintaining eye contact with others, self-injurious behaviors such as spinning in circles, limited verbal interaction and communication, repetitive actions for extended periods, difficulty in taking time to observe his surroundings, and an apparent inability to sense danger, among others.

Since the age of two years and eleven months, the participant has been undergoing various therapies for a duration of two years. These therapies include Relationship Development Intervention (RDI), Occupational Therapy (OT), Individualized Education Program (IEP), language therapy, and physical activities such as swimming lessons. These interventions were coordinated by the participant's mother, therapists, and the kindergarten home-room teacher.

Following clinical observation, clinic consultations, and administration of the Wechsler Intelligence Scales, the participant received a diagnosis of AS. His Full-Scale IQ (FSIQ) was measured at 85, with a

Percentile Rank (PR) of 16 in the cognitive function section, indicating a developmental delay (See Appendix B). Refer to Table 1 for a summary.

**Table 1.**

*Cognitive Function Report in English*

Category	Evaluation Items	Assessment Tools, Results, and Training Direction
Cognitive Function	Cognitive Function	Assessment Date: 2017.03.07
	<input type="checkbox"/> No abnormalities <input type="checkbox"/> Borderline/suspected developmental delay <input checked="" type="checkbox"/> Developmental delay	Assessment Result: The comprehensive assessment indicates that overall cognitive function falls within the lower end of the normal intellectual range (FSIQ=85, PR=16).

However, in the language concepts section, comprehension appeared to be within normal limits, while there was evidence of a developmental delay in oral expression (See Appendix D). Refer to Table 2 for a summary.

**Table 2.**

*Oral Expression Report in English*

Category	Evaluation Items	Assessment
Oral Communication Function	Oral Comprehension	Assessment Date: 2017.03.07
	<input checked="" type="checkbox"/> No abnormalities <input type="checkbox"/> Borderline/Suspected developmental delay <input type="checkbox"/> Developmental delay	Assessment Result: Current ability is approximately <u>2</u> years <u>6</u> months

**Participant’s Second Language Learning Background**

He had been studying English for approximately eighteen months, participating in weekly one-on-one sessions with a native speaker, each lasting fifty minutes. His proficiency in reading and writing English was at the low-intermediate level, enabling him to understand and compose basic vocabulary and sentences typically consisting of 3 to 5 words. His listening and speaking skills were functional, allowing him to comprehend and respond to classroom instructions such as "point to...," "put...back,"

"read...out," "show me...," "help someone," and "write...down." He could respond with keywords, phrases, and occasionally with complete sentences.

### **Procedure**

The participant attended English classes with the researcher for approximately five months, from February to June, meeting for two hours per week. The curriculum was theme-based, incorporating storybooks, nursery rhymes, hands-on activities, and workbooks as instructional materials. English was predominantly used as the language of instruction in the classroom. During the first hour, the instructor engaged the students with greetings, theme-based songs, and storybooks. The second hour focused on interactive workbook exercises, hands-on art projects, storytelling, and further interaction among the participants.

Before collecting the data, both the guardian of the participant and the participant consented to participate in the experiment.

The experiment took place twice at the end of June, during the 19th and 20th class sessions. Each observation and questionnaire session lasted for a total of 90 minutes. During this time, observations were made and questionnaire questions were asked to gather data for the experiment.

### **Materials**

The storybooks utilized in the experiment centered around two main themes: transportation and food, which are high-frequency themes relevant to daily life. Specifically, the storybooks "Good Night, Tractor" and "Good Night, Digger" were selected to address the transportation theme, while "On Top of Spaghetti" and "It is Yummy" were chosen to address the kitchen theme. Table 3 displays the essential vocabulary featured in each storybook.

**Table 3.**

*Key Vocabulary from the Storybooks*

Theme	Storybook	Part of Speech	Vocabulary
Transportation	Good Night, Tractor.	Verb	Count
		Noun	time, bed, good night, sleepyhead, farmer, plow, trailer, cow, dog, sheep, tractor, combine, truck, donkey, duck, pig, horse, hen, wagon, puddle, moon, star
		Verb	beep, go, leap, push, think, look up, tug shrug, shout, forget, steer, weep
	Sheep in a Jeep.	Noun	sheep, jeep, hill, steep, front
		Verb	sneeze, roll, sneeze, squeeze
		Noun	meatball, spaghetti, top, cover, cheese, table, floor, door, garden, bush, mush, tomato, sauce, tree
Food	On Top of Spaghetti.	Adjective	Poor
		Verb	do, eat
	It's Yummy.	Noun	fox, tofu, rabbit, food, carrot, dear, spinach, hippo, kimchi, penguin, fish, everything
		Adjective	yummy, yucky



## Instruments

Classroom observations encompass a variety of elements, such as classroom engagements and interactions. This includes verbal and nonverbal responses gathered through both close-ended questions, as outlined in Table 4, and open-ended questions, as detailed in Table 5. Two clinical consultation documents: cognitive function reports in Chinese (see Appendix A), and oral expression reports in Chinese (see Appendix C), along with English translations of the cognitive function report (see Appendix B) and oral expression report (see Appendix D), were collected. Additionally, the *Questionnaire of a Second Language Learner with AS* (see Appendix E) contains background information, the second language learning experiences of the participants, and self-reports from the participant's mother were utilized as instruments for analysis.

**Table 4.**

### *Close-Ended Questions*

Theme	Questions
Transportation	<p>Do you see where the books are?</p> <p>Do you want to drive this, yes or no?</p> <p>Is there a toy beside him, right?</p> <p>Do you know what they did before sleeping?</p> <p>If you are a horse, what do you like to eat?</p> <p>Do you want to drive this, yes or no?</p> <p>Can you name out few?</p>
Food	<p>Are you a boy, or are you a girl?</p> <p>Is he in the kitchen?</p> <p>Do you think those foods are yummy?</p> <p>Can you see other animals?</p>

**Table 5.**

Open-Ended Questions

Themes	Questions
Transportation	What do you say when we are ready to sleep?
	What is it? Tell me. It's...
	What animals are those?
	How about those?
	Which car do you like to drive?
	What do you love?
	Why the little boy didn't sleep?
	Where do you want to go?
Food	What can you say when you see this?
	What do you see?
	What is he doing?
	Where is the penguin?

**Data Collection**

The participant's mother provided the clinical consultation documents and completed the *Questionnaire of a Second Language Learner with AS* (see Appendix E). The responses to both close-ended and open-ended questions were collected twice, at the end of June, specifically during the 19th and 20th class sessions. Throughout these sessions, the instructor was also the researcher who observed and interacted with the participant to gather data aimed at examining their comprehension and oral production content. The participant was encouraged to initiate any difficulties they had verbally, while nonverbal behaviors were also observed to assess the participant's comprehension. Additionally, both class sessions were recorded and subsequently transcribed for further analysis.

**Data Analysis**

The data from the questionnaire and transcript of the close-ended and open-ended questions were analyzed qualitatively. Based on the transcript, the participant's responses were categorized into six types: (1) answer correctly in English, (2) answer incorrectly, (3) answer incorrectly but retrieve the

keyword and repeat it, (4) half correct, (5) answer correctly in Chinese, and (6) I do not know. The responses to the close-ended questions and open-ended questions are listed respectively in Table 6 and Table 7.

**Table 6.**

Participant's Responses to Close-Ended Questions

Types	Participant's Responses
Type 1	<p>Q: Are you a boy, or are you a girl?</p> <p>A: Boy.</p> <p>Q: Do you want to drive this, yes or no?</p> <p>A: No.</p> <p>Q: Can you name out few?</p> <p>A: rocket, good night train, boat, airplane, fire engine, *bulls</p> <p>Q: Do you want to drive this, yes or no?</p> <p>A: No.</p> <p>Q: Can you see other animals?</p> <p>A: horse, pig, cat</p> <p>Q: Do you think those foods are yummy?</p> <p>A: Yummy Yummy.</p>
Type 2	<p>Q: Is he in the kitchen?</p> <p>A: 他他他他只吃吃那個魚。(He...He...He...He eats that fish.)</p>
Type 3	<p>Q: Do you see where the books are?</p> <p>A: Books.</p> <p>Q: Is there a toy beside him, right?</p> <p>A: Toy.</p> <p>Q: Do you know what they did before sleeping?</p> <p>A: Sleeping.</p>
Type 5	<p>Q: Is he in the kitchen?</p> <p>A: Yes. 因為它有烤箱有刀子有砧板 (There is an oven, a knife, and a cutting board.)</p> <p>Q: If you are a horse, what do you like to eat?</p> <p>A: 乾草 (hay)</p>

**Table 7.**

*Open-Ended Questions and Participant's Responses*

Types	Questions & Participant's Responses
Type 1	<p>Q: What do you say when we are ready to sleep?</p> <p>A: Good night.</p> <p>Q: What is it? Tell me. It's...</p> <p>A: 一個 big bus (a big bus)</p> <p>Q: What animals are those?</p> <p>A: hippo, hippo, hippo</p> <p>Q: How about those?</p> <p>A: duck</p>
Type 2	<p>Q: What do you see?</p> <p>A: 老師, 農人在哪裡? (Teacher, where is the farmer?)</p> <p>Q: What is he doing?</p> <p>A: Hmm, sheep, horse, 那是牧羊犬, pigs. (Hmm, sheep, horses, sheepdogs, and pigs.)</p>
Type 3	<p>Q: Where is the penguin?</p> <p>A: Penguin.</p>
Type 5	<p>Q: Which car do you like to drive?</p> <p>A: 我我以後要要要開的, 就只有 the the 休旅跟 Van 以及兩....輪車 (I want to drive a van and a two-wheeled vehicle. )</p> <p>Q: What do you love?</p> <p>A: 動物我都不喜歡, 我只喜歡牧羊犬。 (I don't these animals. I only like sheepdogs.)</p> <p>Q: Why the little boy didn't sleep?</p> <p>A: 因為他睡不著(He can't fall asleep.)</p>
Type 6	<p>Q: What can you say when you see this?</p> <p>A: I don't know.</p> <p>Q: Where do you want to go?</p> <p>A: I don't know.</p>

In summary, there are ten answers categorized as type one, three answers categorized as type two (12.5%), four answers categorized as type three (16.6%), no answers categorized as type four (0%), five answers categorized as type five (16.6%), and two answers categorized as type six (8.3%)(refer to Table 8).

**Table 8.**

Overview of Participant Response Types

Types of Participant's Responses	Quantity	%
Type One: answer correctly in English	10	41.6%
Type Two: answer incorrectly	3	12.5%
Type Three: answer incorrectly but retrieve the keyword and repeat it	4	16.6%
Type Four: half correct	0	0%
Type Five: answer correctly in Chinese	5	20.8%
Type Six: I don't know	2	8.33%
Total	24	
SD	3.11	

### Result

From the participant's responses to 24 questions, a standard deviation (SD) of 3.11 suggests that the data points are relatively spread out from the mean. Notably, there is a trend indicating that the participant was able to answer correctly in English 41.6% of the time or in Chinese 20.8% of the time. This indicates a level of comprehension where the participant was capable of understanding the questions and providing correct responses, addressing research questions one and two as follows:

How does participation in a storytelling class affect the comprehension of a second language learner with AS?

How does participation in a storytelling class affect the oral production of a second language learner with AS?

Even when the participant answered incorrectly, they were able to retrieve the keywords from the

question and repeat them with 16.6%. It revealed that a second language learner with AS was able to grasp the keywords from the questions, suggesting a level of using cognitive strategies to engage in attempting to comprehend the content.

As for quantitative analysis, based on the classroom observations, it became evident that the participant could effectively follow instructions in English and engage with the instructor both verbally and non-verbally, such as pointing to the illustrations in the storybooks, putting something back, reading something out, nodding and shaking his head. Additionally, when faced with comprehension difficulties, the participant demonstrated the ability to seek clarification and responded to the questions by switching the language of English and Chinese. During the storytelling classes, the participant exhibited greater interest and higher levels of engagement in the storytelling section.

### **Conclusion**

In this section, the research objectives will be recapped, followed by a summary of the findings, the details analysis, comparison of prior literature including second language learning for learners with AS, as well as storybooks for second language learners with AS in a storytelling class, implications, limitations, future research directions, and conclusion will be presented.

The study aims to investigate the comprehension and oral production of second language learners with AS, specifically examining the influence of storybooks in storytelling classes. Additionally, it seeks to provide recommendations for educators to enhance the comprehension and oral production of young learners with AS while learning a second language. Through the analysis of participant responses, classroom observations, self-reports from the participant's mother, and clinical consultation documents, it was found that in storytelling classes, the participant exhibited a high level of interest by actively engaging in the sessions, interacting with others using appropriate language, seeking clarification swiftly in both Chinese and English and demonstrating comprehension of the storybooks. The participant answered related questions with moderate to high correctness and repeated keywords, utilizing cognitive strategies to aid understanding. These findings highlight the value of incorporating storybooks within storytelling classes to motivate young learners with AS, enhance their comprehension, foster oral production, and increase chances of engagement and practice opportunities in second language learning for individuals with AS.

In responding to the findings and the literature, the two main concepts will be explained: second language learning for learners with AS, and storybooks for second language learners with as in a storytelling class.

### **Second Language Learning for Learners with Asperger Syndrome**

Saalasti *et al.* (2008) highlighted learners with AS displayed impairment in communication skills within social contexts (Koning & McGill-Evans, 2001; Saalasti *et al.*, 2001), social language vulnerabilities (Murphy, 2001) and lack of pragmatic use of language, such as the ability for communication, social language use, interpreting utterances (Rapin & Dunn, 2003), as well as facing difficulties in understanding semantics, including multiple-word meanings (Kerbell & Grunwell, 1998; Koning & McGill-Evans, 2001; Shriberg *et al.*, 2001). It could be concluded that through examining the prior literature, learners with AS faced the challenges of comprehending, interpreting, communicating, and producing the proper use of language. However, in this current study, the findings showed that the participant with AS demonstrated the ability to communicate and seek clarification with the instructor, interpreting the meaning of the questions and answering in English with moderately high correctness (refer to Tables 6, 7 & 8).

### **Storybooks for Second Language Learners with AS in a Storytelling Class**

Prior studies have demonstrated that storytelling facilitates social integration, enhances figurative and imaginative thinking (Craig & Baron-Cohen, 2000), and improves verbal initiation and responses (Hanley-Hochdorfer *et al.*, 2010). This suggests that storytelling can be a valuable tool for individuals with AS to familiarize themselves with and model social interactions (Martinovich, 2006), such as establishing rapport, increasing engagement, and delivering important information (Zak, 2013). The results from the previous literature are consistent greatly with the finding in this present study that the participants with AS attempted to accustom himself to situated learning, showing a high level of interest engagement, initiating doubts, and responding to the questions both verbally and nonverbally while learning a second language with the use of storybooks in storytelling classes (refer to Table 6, 7 & 8).

Based on the valuable findings, it is suggested that educators and practitioners employ storybooks with social story content for young learners with AS in storytelling classes. Social stories typically consist of an introduction, body, and conclusion, which facilitate learners' understanding of social contexts (Hanley-Hochdorfer *et al.*, 2010). It is also encouraged to employ strategies when implementing storytelling and storybooks in educational settings. These techniques can enhance comprehension of the story content and oral production in young learners with AS while teaching a second language.

However, several limitations were identified in the current study, including the small number of participants, limited data collection sessions, lack of systematic selection of storybooks, and the absence of strategy use and a comprehensive questionnaire specifically tailored for second language young learners with AS. Future researchers could address these limitations, conduct more extensive research, and thereby contribute to improving second language education for young learners with AS.

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## Appendix A

### Chinese Version of Cognitive Function Report

國民健康署-- (104.06.16 修訂版)

類別	評估/訓練項目	評估工具、結果與訓練方向
認知功能	<p>□無異常</p> <p>□臨界/疑似發展遲緩</p> <p>■發展遲緩</p>	<p>評估日期: 106.03.07</p> <p>評估結果: 綜合評估表現整體認知功能表現屬正當中下智商水準 (FSIQ=85, PR=16, 分項能力表現不均, 其中語文理解未現落入臨界落後範圍 (VCI=78, PR=7), 主要在常見詞彙 (如: 名詞、動詞) 熟識理解顯著不足, 致使整體語文表現落後同齡許多, 其餘視覺空間與工作記憶表現均屬正常中等水準。因語文落後, 當前整體處於功能相較同齡兒屬顯著遲緩範圍。</p> <p>評估工具:</p> <ul style="list-style-type: none"> <li>■臨床觀察</li> <li>■臨床晤談</li> <li>■魏氏幼兒智力量表(WPPSI-R 或 IV)</li> </ul> <p>行為觀察及綜合結果:</p> <p>魏然氏學齡前記音智力量表(PPS— I V)</p> <p>智商 (百分位):</p> <p>&gt;總智商 85 近百分等級 16,屬正常中下下限智商範圍</p> <p>但因分項表現不均, 整體認知能力相較同齡顯著遲緩</p> <p>語文理解: 78** (PR=7**) 視覺空間: 94 (PR=34)</p> <p>工作記憶: 97 (PR=42)</p> <p>分量表 (SS):</p> <p>&gt;常識 9、聽詞指圖 3**、看圖命名 14、圖形設計 7、物型配置 11、矩陣推理 10、圖書記憶 11、動物圖 8</p> <p>* 智商分數平均值 100,標準差 15: 量表分數為平均值 10, 標準差 3。</p> <p>* 百分等級(PR): 表示測驗表現和同齡幼童比較, 一百個孩子當中勝過的人數。</p> <p>* 臨界遲緩: 總智商/分量表智商三者其中之一有介於 80~85(9≤百分等級≤16) 或分測驗表現不均勻組型</p>

類別	評估/訓練項目	評估工具、結果與訓練方向
		<p>綜合判斷未來有認知學習困難之疑慮。</p> <p>，顯著遲緩 總智商、分量表智商三者其中之一有低於 80(百分等級&lt;9); 或分測驗表現不均勻組型綜合判斷有顯著認知學習困難特徵。</p>
	<p>認知功能訓練</p> <p><input type="checkbox"/>不需要</p> <p><input type="checkbox"/>需要追蹤及諮詢</p> <p><input checked="" type="checkbox"/>需要訓練</p>	<p>訓練方向：</p> <p>■語彙 / 語意、基底常識、敘事、論述與對話能力</p> <p>■良好工作環境</p> <p>■結構環境策略</p> <p>具體建議：</p> <p>1.已提供家長認知和社會互動發展促發之建議與諮詢，如家長或校方仍有教養或評估後續相關問題可再來電與心理師約診諮詢。(04-23592525-5941)</p> <p>2.多做親子閱讀 透過圖書內容往來問答(詢問人事時地物)，累積常識與基礎語彙知識。</p>

## Appendix B

### English Version of a Cognitive Function Report

National Health Administration - Revised Version (June 16, 2015)

Category	Evaluation Items	Assessment Tools, Results, and Training Direction
Cognitive Function	<p>Cognitive Function</p> <p><input type="checkbox"/> No abnormalities</p> <p><input type="checkbox"/> Borderline/suspected developmental delay</p> <p><input checked="" type="checkbox"/> Developmental delay</p>	<p>Assessment Date: 2017.03.07</p> <p>Assessment Result: The comprehensive assessment indicates that overall cognitive function falls within the lower end of the normal intellectual range (FSIQ=85, PR=16).</p> <p>However, there is uneven performance in specific abilities. Particularly, language comprehension falls within the borderline range (VCI=78, PR=7), mainly due to significant deficiencies in common</p>

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Category	Evaluation Items	Assessment Tools, Results, and Training Direction
		<p data-bbox="669 247 1190 610">vocabulary comprehension, such as nouns and familiar verbs, resulting in overall language performance lagging behind many peers of the same age. Other abilities, such as visual-spatial skills and working memory, are within the normal range. Due to the language delay, the overall functional level is significantly delayed compared to peers of the same age.</p> <p data-bbox="669 678 856 703">Assessment Tools:</p> <ul data-bbox="669 726 1190 896" style="list-style-type: none"><li>■ Clinical observation</li><li>■ Clinical interview</li><li>■ Wechsler Preschool and Primary Scale of Intelligence (WPPSI-R or IV)</li></ul> <p data-bbox="669 917 1190 1087">Behavioral observation and integrated results: Wechsler Preschool and Primary Scale of Intelligence (WPPSI-IV) Intelligence Quotient (Percentile):</p> <p data-bbox="669 1155 1190 1228">Overall IQ of 85, percentile rank 16, falls within the lower end of the normal range.</p> <p data-bbox="669 1250 1190 1373">However, due to uneven performance in subtests, overall cognitive ability is significantly delayed compared to peers of the same age.</p> <p data-bbox="669 1441 1044 1468">Language Comprehension: 78 (PR=7)</p> <p data-bbox="669 1489 927 1516">Visual-Spatial: 94 (PR=34)</p> <p data-bbox="669 1537 968 1564">Working Memory: 97 (PR=42)</p> <p data-bbox="669 1586 875 1613">Subtest Scores (SS):</p> <p data-bbox="669 1634 817 1661">Information: 9</p> <p data-bbox="669 1682 861 1709">Word Reasoning: 3</p>

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Category	Evaluation Items	Assessment Tools, Results, and Training Direction
		<p>Picture Naming: 14</p> <p>Block Design: 7</p> <p>Object Assembly: 11</p> <p>Matrix Reasoning: 10</p> <p>Picture Memory: 11</p> <p>Animal Coding: 8</p> <p>The average IQ score is 100 with a standard deviation of 15; Subtest scores have a mean of 10 and a standard deviation of 3.</p> <p>Percentile rank (PR) indicates how the test performance compares to peers, representing the number of children out of 100 surpassed.</p> <p>Borderline delay: When one of the total IQ or subtest IQ falls between 80-85 (<math>9 \leq PR \leq 16</math>); or when there's an uneven test performance pattern, suggesting concerns about future cognitive learning difficulties.</p> <p>Significant delay: When one of the total IQ or subtest IQ is below 80 (<math>PR &lt; 9</math>); or when there's an uneven test performance pattern, suggesting significant cognitive learning difficulties.</p>
	<p>Cognitive function training</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Not needed</li> <li><input type="checkbox"/> Requires monitoring and consultation</li> <li><input checked="" type="checkbox"/> Requires training</li> </ul>	<p>Training direction:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Vocabulary/Semantics, Basic Knowledge, Narrative, Discourse, and Conversational Skills</li> <li><input checked="" type="checkbox"/> Positive work environment</li> <li><input checked="" type="checkbox"/> Structured environmental strategies</li> </ul> <p>Specific recommendations:</p>

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Category	Evaluation Items	Assessment Tools, Results, and Training Direction
		<p>Advice and consultations on parental cognition and social interaction development have been provided. If parents or schools still have questions related to parenting or assessment, they can call to make an appointment for a consultation with a psychologist (04-23592525-5941).</p> <p>Engage in more parent-child reading activities, using books to ask and answer questions about characters, settings, and objects, to accumulate common knowledge and basic vocabulary.</p>

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## Appendix C

### Chinese Version of an Oral Expression Report

國民健康署 (104.06.16 修訂)

類別	評估/訓練項目	評估工具、結果與訓練方向
口語溝通功能	口語理解 <input checked="" type="checkbox"/> 無異常 <input type="checkbox"/> 臨界/疑似發展遲緩 <input type="checkbox"/> 發展遂緩	評估日期: 2017.03.07 評估結果: 目前能力約__歲__個月 百分位: __發展商數: 評估工具: <input checked="" type="checkbox"/> 臨床觀察 <input checked="" type="checkbox"/> 臨床晤談 <input checked="" type="checkbox"/> 其他 (請敘明): 使用〈學齡兒童語言能力測驗〉進行個案之語言能力評估, 二歲半組得分為 14 分. 三歲組得分為 8 分, 通過二歲半組之發展水準。 行為觀察及綜合結果: 個案配合度尚可, 在引導下可配合施測, 教到一半會用簡單句表達不想施測了, 專注時間較短, 眼神接觸較少, 尚可與人互動. 可用辭彙、簡單句回應他人詢問之問句. 再玩玩具過程中堅持對玩具的玩法堅持, 例如在切水果的遊戲時, 堅行要才找到水果的另一半才要繼續切水果, 個案在認真玩玩具不太理會別人. 在玩車子時會將車子排隊排好。  個案在聲調方面會有將四聲字以三聲取代的情形(手奔→手去么ˇ、腳踏車→腳去丫ˇ車)。

類別	評估/訓練項目	評估工具、結果與訓練方向
口語溝通功能	<p>理解訓練</p> <p><input type="checkbox"/>不需要</p> <p>■寫要追蹤與諮詢</p> <p><input type="checkbox"/>需要訓練</p> <p>口語表達</p> <p><input type="checkbox"/>無異常</p> <p><input type="checkbox"/>臨界/疑似發展遲緩</p> <p>■發展遲緩</p>	<p>具體建議：個案可正常指認日常用品、身體器官，可理解簡單句、否定句並執行簡單指令（例如：把紙給媽媽），可理解方位詞如裡面、旁邊等。</p> <p>個案可加強：針對複雜句型的理解</p> <p>評估日期：2017.03.07</p> <p>評估結果：目前能力約__歲__個月</p> <p>T 分數：</p> <p>評估工具：</p> <p>■臨床觀察</p> <p>■臨床晤談</p> <p>■其他（請敘明）：使用《命名測驗》進行語言命名之能力評估，個案在 24 張圖卡中可正確答對 19 張命名能力佳。在命名時會以物品功能取代物品名稱，例如：梳子說成梳頭髮，掃把說成掃地。</p> <p>行為觀察與綜合結果：個案在進行命名時較不準確，會使用物品功能或相關名詞取代實際物品名稱。可使用完整句表達需求並回應日常生活對話可使用完整句型表達需求。缺乏主動溝通意圖，但有被動回應，玩玩具時易沉溺在自己的世界中，較不會理會旁人，與人眼神接觸較少，但可回應旁人詢問的問題。表達以簡單句為主。溝通之效度可，可理解並回應日常生活對話，但主動溝通意願較低，可能影響其溝通效度。</p> <p>訓練方向：</p> <p>■加強抽象詞彙的表達。如：好大的車子</p> <p>■增長語句長度</p> <p>■練習使用複雜句表達（如：因為...就...）</p> <p>具體建議：</p>
	<p>表達訓練</p> <p><input type="checkbox"/>不需要</p> <p><input type="checkbox"/>需要追蹤與諮詢</p> <p>■需要訓練</p>	<p>訓練方向：</p> <p>■加強抽象詞彙的表達。如：好大的車子</p> <p>■增長語句長度</p> <p>■練習使用複雜句表達（如：因為...就...）</p> <p>具體建議：</p>



類別	評估/訓練項目	評估工具、結果與訓練方向
		<p>1. 利用示範、引導及提示，鼓勵孩子表達新詞彙及拉長語句長度。隨時就孩子的表達進行延伸、擴展字數、示範完整結構句子。如孩子說：「小豬」，家長可反應「是，小豬吃餅乾」或「對，小豬肚子餓，要吃餅乾」。</p> <p>2. 建議繪本共讀習慣，從中學習更為豐富、高階的知識內容，在示範及鼓勵下，增加孩子敘述內容的完整性及語句的複雜度，並於互動中示範正確的語言用法（即什麼樣的狀況要說什麼樣的話），以減少孩子不符情境要求的回應，並以重複性的問句協助孩子練習對開放性問句的回應（可以先示範問句的答案後，再詢問孩子一次）。</p>
	說話	具體建議：語調異常
	<input type="checkbox"/> 無異常	
	<input checked="" type="checkbox"/> 異常	
	<input type="checkbox"/> 需要追蹤與諮詢	

## Appendix D

### English Version of an Oral Expression Report

National Health Administration (Revised on June 16, 2015)

Category	Evaluation Items	Assessment Tools, Results, and Training Direction
Oral	Oral	Assessment Date: 2017.03.07
Communication	Comprehe	Assessment Result:
Function	nsion	Current ability is approximately <u>2</u> years <u>6</u> months
	<input checked="" type="checkbox"/> No abnormalities	Percentile: __ Developmental Quotient
	<input type="checkbox"/>	Assessment Tools:
	Borderline/Suspe	<input checked="" type="checkbox"/> Clinical Observation
	cted	<input checked="" type="checkbox"/> Clinical Interview
	developmental	<input checked="" type="checkbox"/> Other (Please Specify):
	delay	Using the "School-Age Children's Language Ability Tes

Category	Evaluation Items	Assessment Tools, Results, and Training Direction
	<input type="checkbox"/> Developmental delay	<p>to assess the language ability of the case, the score of the two-and-a-half-year-old group is 14 points, and for the three-year-old group, it is 8 points, indicating performance at the level of the two-and-a-half-year-old group.</p> <p>Behavioral observations and comprehensive results: The case's cooperation is acceptable, and they can cooperate with testing under guidance. However, halfway through, they may express a desire not to continue testing using simple sentences. Their attention span is relatively short, and they make little eye contact, but they are still able to interact with others. They can respond to questions from others using vocabulary and simple sentences. During play, they insist on their preferred way of playing with toys such as in a game involving cutting fruits, where they insist on finding the other half of the fruit before continuing. The case is serious about playing with toys and may not pay much attention to others. When playing with toy cars, they organize them into queues.</p> <p>The case tends to replace four-tone characters with three-tone ones in terms of tone pronunciation (e.g. "手奔" pronounced as "手去么", "腳踏車" pronounced as "腳去丫~車").</p>

Category	Evaluation Items	Assessment Tools, Results, and Training Direction
Oral	Comprehension Training	Specific Recommendation:
Communication Function	<input type="checkbox"/> Not required <input checked="" type="checkbox"/> To be tracked and consulted	The case can correctly identify everyday items and body parts, understand simple sentences, and negative sentences, and carry out simple

Category	Evaluation Items	Assessment Tools, Results, and Training Direction
	writing	instructions (e.g., giving a paper to mom). They also comprehend directional terms like "inside" and "beside".
	<input type="checkbox"/> Training required	The case can improve: Understanding of complex sentence structures.
	Oral Expression	Evaluation Date: Year __ Month __
	<input type="checkbox"/> No abnormalities	Evaluation Result:
	<input type="checkbox"/> Borderline/Suspected developmental delay	Current ability is approximately __ years __ months
	<input checked="" type="checkbox"/> Developmental delay	T-score: Evaluation Tools: <ul style="list-style-type: none"> <li>■ Clinical Observation</li> <li>■ Clinical Interview</li> <li>■ Other (Please Specify): Used the "Naming Test" to assess language naming ability. The case correctly answered 19 out of 24 picture cards, demonstrating good naming ability. However, they tend to describe objects by their function rather than their actual names. For example, referring to a comb as "hair comb" and a broom as "floor sweeper" during naming.</li> </ul> Behavioral observations and comprehensive results: The case demonstrates less accuracy in naming, often substituting object functions or related nouns for actual object names. They can express needs using complete sentences and respond to daily life conversations using full sentence structures. However, they lack proactive communication intent but exhibit passive responsiveness. When playing with toys, they tend to immerse themselves in their world,

Category	Evaluation Items	Assessment Tools, Results, and Training Direction
	<p>Expression Training</p> <ul style="list-style-type: none"> <li>□ Not required</li> <li>□ To be tracked and consulted</li> <li>■ Training required</li> </ul>	<p>paying less attention to others and making minimal eye contact. Nonetheless, they can respond to questions from others. Their expressions primarily consist of simple sentences. While their communication effectiveness is adequate, their willingness for proactive communication is lower, which may affect their overall communication effectiveness.</p> <p>Training Directions:</p> <ul style="list-style-type: none"> <li>■ Strengthening expression of abstract vocabularies, such as "big car".</li> <li>■ Increasing sentence length.</li> <li>■ Practicing the use of complex sentences, such as "because... then...".</li> </ul> <p>Specific recommendations:</p> <p>Utilize demonstration, guidance, and prompting to encourage the child to express new vocabulary and lengthen sentence structures. Continuously extend and expand upon the child's expressions, demonstrating complete sentence structures. For example, if the child says "小豬" (little pig), the parent can respond with "Yes, the little pig is eating cookies" or "That's right, the little pig is hungry. It wants to eat cookies."</p> <p>Encourage a habit of shared reading with picture books, allowing the child to learn richer and more advanced content. Through demonstration and encouragement, enhance the completeness of the child's narratives and the complexity of their sentences. Demonstrate correct language usage</p>

Category	Evaluation Items	Assessment Tools, Results, and Training Direction
	<p>Speech</p> <p><input type="checkbox"/> No abnormalities</p> <p><input checked="" type="checkbox"/> Abnormalities</p> <p><input type="checkbox"/> Requires tracking and consultation</p>	<p>during interactions (i.e., saying appropriate things for different situations) to reduce instances of inappropriate responses from the child. Use repetitive questioning to assist the child in practicing responses to open-ended questions (first demonstrating the answer to the question and then asking the child to respond).</p> <p>Specific Recommendation: Abnormalities in speech tone.</p>

## Appendix E

### Questionnaire of a Second Language Learner with AS

#### Part I. Background Information

Name: \_\_\_\_\_

Gender: \_\_\_\_\_

Age: \_\_\_\_\_ (years, months)

Months of learning English as a Second Language: \_\_\_\_\_

English proficiency in Listening:

Basic  Intermediate  Advanced

English proficiency in Speaking

Basic  Intermediate  Advanced

English proficiency in Reading

Basic  Intermediate  Advanced

English proficiency in Writing

Basic  Intermediate  Advanced

Part II. Self-Report from the Participant's Mother

What event occurred that made you feel the child needed a diagnosis?

Please provide details on the situation and the participant's response.

**Biographical notes:**

**Hsin-Chieh Chen**, a Ph.D. Candidate, specializes in foreign language education, , with a focus on bilingual education, Content and Language Integrated Learning (CLIL), and technology-assisted language teaching and learning. The expertise includes integrating various contexts, models, methods, and strategies within these areas.