

The Effectiveness of Concrete Poetry as a Strategy to Teach Reading Comprehension to Children with Asperger Syndrome

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Abstract

Asperger Syndrome, originally known as autistic psychopathy, was formally defined in 1944 by Hans Asperger, an Austrian pediatrician. The disorder causes difficulties in understanding the world and interacting with others. It impacts motor activities, social functioning and language learning, especially in the area of reading and listening comprehension. Many intervention strategies have been developed to help such children to tackle their comprehension deficits. In this study, the authors introduced concrete poetry as a strategy to teach reading comprehension to children with Asperger Syndrome.

The Effectiveness of Concrete Poetry as a Strategy to Teach Reading Comprehension to Children with Asperger Syndrome

During the 1950s and 1960s, although autism, also known as autism spectrum disorder (ASD for short), has become a recognizable diagnosis, Asperger Syndrome went largely unnoticed (Stillman, 2008). Asperger Syndrome (also known as Asperger Disorder) is not a disease or chronic mental illness, but a neurological condition that belongs to a subcategory of the pervasive developmental disorders (PDDs) characterized by severe and sustained impairments in social interaction and restricted and unusual patterns of interest and behavior (American Psychiatric Association, 2000; Klin & Volkmar, 1995). The syndrome may cause clinically significant impairment in social, occupational, or other important areas of functioning. Several studies (e.g., Edelson, 1999; Ehlers & Gillberg, 1993; Gillberg, 1989) have pointed out that Asperger Syndrome is more common in males than females.

First described by Dr Hans Asperger (1944), the disorder, originally known as autistic psychopathy, is based on his description of a number of cases of children whose clinical features were similar to those described by Dr Leo Kanner (1943) in his seminal work on early infantile autism (also see Kanner & Eisenberg, 1956). According to Stillman (2008), “Hans Asperger’s findings were published nearly simultaneously with the research of Leo Kanner ... in 1944, first distinguished the traits of autism ... Because Asperger’s paper was published in German, and Kanner’s in English, Kanner’s research received broader distribution and was subsequently popularized. Hans Asperger passed away in 1980 before his research was universally applied” (p.3).

However, Asperger’s (1944) description of the autistic psychopathy, as he called it then, differed from Kanner’s (1943) early infantile autism because speech was less commonly delayed, motor deficits were more common, age of onset appeared to be somewhat later, and all the initial cases were boys. Asperger (1944) also implicated a hereditary factor, suggesting that similar problems could be observed in family members, particularly fathers. Very little investigation was done on Asperger Syndrome until Wing (1981) published an influential review and series of case studies. Since then, both the usage of the term Asperger Syndrome or Asperger Disorder and the number of reported cases have been steadily increasing (Attwood, 2001; Klin, Volkmar, Sparrow, Cicchetti, & Rourke, 1995).

The question of whether Asperger Syndrome should be considered a distinct disorder differing from other PDDs remains a controversial issue (Rutter, 1985; Wing, 1991). In one explanation, Dawson, Finley, Phillips and Galpert (1986) pointed out that Asperger Syndrome and ASD cannot be the same because ASD appears to be a dysfunction of the left hemisphere, but Asperger Syndrome is that of the right. According to Bishop (1989), disagreements about the validity of Asperger Syndrome have meant that the disorder has been identified inconsistently by both psychologists and therapists working with such individuals. According to Klin and Volkmar (1995), confusion exists in differentiating individuals with Asperger Syndrome from those with ASD who have higher levels of intelligence (also known as high-functioning autistic disorder or HFAD for short). The Asperger Syndrome has also been used as a broad catchall for “atypical” individuals who do not fulfill the criteria for autism (Bishop, 1989). Volkmar et al (2000) argued that “patients with Asperger Syndrome displayed higher verbal IQs than those with autism and significantly greater social impairment than those with pervasive developmental disorder-not otherwise specified” (p.265). Although there are several informal rating scales, such as the Sohn-Grayson Rating Scale for Asperger Syndrome and High-Functioning Pervasive Developmental Disorder (Sohn & Grayson, 2005), and formal standardized instruments, such as the Gilliam Asperger’s Disorder Scale (Gilliam, 2001), available for the identification of individuals with Asperger Syndrome, the lack of consistency in usage of the term *Asperger Syndrome* and also the resulting lack of a uniform diagnostic instrument have hindered research on the Asperger Syndrome.

There is little information on the prevalence of Asperger Syndrome. Attwood (2001) reported that Asperger Syndrome is much more common than was previously thought, affecting up to 1 in 300 people. According to Stillman (2008), he reported that “as our

culture is becoming more aware and better educated to such social issues, more females with Asperger are being identified. Conservative estimates conclude that 1 in every 1000 children has Asperger Syndrome” (p.18). One total population study done in Sweden by Ehlers and Gillberg (1993) reported a prevalence of 7.1 per 1000 children ages 7 to 16, with a male to female ratio of 2.3 males to 1 female.

Stewart (2007) described Asperger Syndrome is as a neuro-cognitive or neuro-behavioral disorder resulting from dysfunctions in the brain’s processing of information. However, “the disorder is not a cognitive retardation, but a difference in processing information of all kinds that causes difficulties in understanding the world and interacting with others” (Stewart, 2007, p.5). According to Attwood (2005), “[T]he brain is wired differently, not defectively. The child prioritizes the pursuit of knowledge, perfection, truth, and the understanding of the physical world above feelings and interpersonal experiences. This can lead to valued talents, but also to vulnerabilities in the social world” (p.105). Hence, it impacts motor activities that involve visual-spatial processing and sensory-motor integration, social and organizational skills, information processing, and language learning, especially in the area of reading and listening comprehension. The term *hyperlexia* is now used to describe a severe comprehension deficit that is commonly observed in individuals with Asperger Syndrome and other non-verbal learning disabilities (see Chia & Ng, 2008). Many intervention strategies such as scaffolding interrogatives method (Chia, 2002) and sentence-by-sentence self-monitoring approach (Buettner, 2002; Chia & Ng, 2008) have been developed to help such children to tackle the comprehension deficits. In this study, the authors introduced concrete poetry as a strategy to teach reading comprehension to children with Asperger Syndrome.

What is Concrete Poetry?

Concrete poetry is a unique genre of poetry in which poems can come in all kinds of shapes, sizes, colors, textures, and even flavors. Pravda (2007) defined a concrete poem as “a poem that forms a picture of the topic or follows the contours of a shape that is suggested by the topic” (p.1). Two good representative collections of such poetry are *An Anthology of Concrete Poetry* edited by E. Williams (1967) and *Concrete Poetry: An International Anthology* edited by S. Bann (1967).

From the pedagogical perspective, concrete poetry offers teachers in both mainstream and special schools a stimulating technique with which to improve reading comprehension and entice children’s interest in poetry. Of particular interest to children with Asperger Syndrome, concrete poems also serve to increase visual awareness of the shape, size, and physical layout of the letters that form a meaningful word; allow the meaning of a word to be expressed through the shape, size, and physical layout of its letters; enhance memory for word shapes so as to enable children to read and/or write recognizable words; and provide children with a channel for creative expression (Chia, 1993, 2006).

When teaching reading and/or writing through concrete poetry, the emphasis on the visual appearance of letters becomes very important. There is a need for both the teacher and the student to consider the following factors (Chia, 1991): “the shape of each letter in

a word; the size of each letter in the word; and the physical layout of all the letters in the word” (p.21) in order to know and understand what each word expresses through its concrete poem.

According to Wing (1981), individuals with Asperger Syndrome are reported to have difficulty comprehending subtle, abstract language even when they have developed good grammatical language skills. Such individuals comprehend better through what Siegel (2003) described as the *visual mapping* of what they see, rather than the auditory processing of what they hear. Hence, concrete poetry becomes a choice strategy to teach reading comprehension to such children who are visual learners.

A concrete poem need not have line, meter, rhyme, rhythm, stanza, or title. It consists of a word or a string of words (as in a phrase or clause) whose letters actually “act out” its meaning (Chia, 2006). When reading a passage consisting words that are made up of concrete poems, the visual form of each concrete poem provides a self-explanatory meaning. Stringing all the concrete poems together is like putting the words together to provide the contextual meaning of a sentence. On the other hand, when writing a concrete poem, the focus is on the visual appearance of individual letters based on the shape and size of each letter in a word, and the physical layout of all of the letters that make up the word (see Appendix 1 for examples of concrete poems). This technique does not seem that much different from the stimulus shaping techniques that were developed in the 1970s to teach sight-word reading to children with mental retardation (see Duker, Didden, & Sigafoos, 2004, for a review of several such studies).

In one study done by the first author in 2003 at the now-defunct Center for Exceptional Children, Singapore, Chia (2006) reported that as a result of teaching concrete poems, five boys, ages nine through ten years old, diagnosed with Asperger Syndrome showed a significant improvement in their reading comprehension. “In addition, concrete poetry also allows them an opportunity to express their creativity and showcase their masterpieces, and to appreciate concrete poetry in their own unique ways” (Chia, 2006, p.18).

The Study

Subjects

Fifteen Singapore-born Chinese children (nine boys and six girls), ages 9 through 11 years old (see Table 1), formally diagnosed with Asperger Syndrome by psychologists and therapists, participated in this study. They are still attending mainstream primary schools where the special needs officers continue to work closely with them. All the 15 subjects have performed very poorly in their English language, especially in the area of reading comprehension.

Table 1

The Cohort of Subjects in this Study

Age Range (years:months)	Male (N = 9)	Female (N = 6)
9:00 – 9:11	3	2
10:00 – 10:11	3	2
11:00 – 11:11	3	2
Grand Total	15	

In terms of the 15 subjects' WISC-III IQs, their Verbal IQ (VIQ) range fell between 89 and 119 with a mean VIQ of 108; the Performance IQ (PIQ) range, between 79 and 86 with a mean PIQ of 84. In other words, the mean VIQ is 24 points greater than the mean PIQ.

Setting

The study was carried out at the Learning Disabilities Center, Singapore, where all the 15 subjects were taught by the third author over a period of six months (May 2, 2008, to October 31, 2008). They came to the center after their regular school hours.

Instrumentation

The following two standardized instruments were administered by a blinded examiner not related to either of the authors of this paper at the beginning (pre-test phase) and at the end (post-test phase) of the six-month reading comprehension program:

- ***Gilliam Asperger's Disorder Scale (GADS)*** (Gilliam, 2001)
This is a behavioral rating scale of 32 items that identifies and helps diagnose individuals ages 3 to 22 with Asperger Syndrome. It can be completed by parents and takes 10 minutes to complete.

GADS consists of four core subscales (Social Interaction, Restricted Patterns of Behavior, Cognitive Patterns, and Pragmatic Skills), and an optional subscale (Early Development) that consists of eight questions. Each core subscale yields a raw score that is then converted into standard score and percentile rank. From the sum of standard scores, an Asperger's Disorder Quotient (ADQ) is obtained. An ADQ that is greater than 80 indicates a high probability of Asperger Syndrome, while someone with an ADQ below 69 has a very low probability of Asperger Syndrome or unlikely to have the disorder. Any ADQ between 70 and 79 falls within the borderline range of probability of Asperger Syndrome, i.e., such an individual might have a mild condition of the disorder.

According to Gilliam (2001), the items on the four GADS subscales have strong criterion-prediction validity because they are based on the diagnostic criteria for Asperger Syndrome listed in the Diagnostic and Statistical Manual of Mental

Disorders, Fourth Edition-Text Revision (DSM-IV-TR for short) (American Psychiatric Association, 2000) and the International Classification of Diseases and Related Health Problems, Second Edition-Tenth Clinical Revision (World Health Organization, 1994).

GADS has good psychometric properties and has proven to be effective in identifying individuals with Asperger Syndrome (Gilliam, 2001). According to the GADS manual (Gilliam, 2001), the instrument has a test-retest reliability between .71 and .77 ($p < .95$ and $p < .01$) for its subscales and .93 ($p < .01$) for its Asperger's Disorder Quotient (ADQ), and an inter-rater reliability between .72 and .84 ($p < .01$) for its ADQ.

In this study, the authors used only the pre-test and post-test ADQs based on the GADS (Gilliam, 2001) for their data analysis.

- ***Neale's Analysis of Reading Ability-Revised (NARA-R)*** (Neale, 1988)
This is an individually administered standardized diagnostic test that measures the rate, accuracy and comprehension of oral reading in terms of age equivalents. It is widely used by both teachers and clinicians in diagnosing children with reading difficulties (Pumfrey, 1976).

NARA-R (Neale, 1988) has parallel form reliability coefficients for rate, accuracy, and comprehension for the following age groups: (i) Form 1 followed by Form 2: reliability coefficient is .67 (rate), .72 (accuracy), and .89 (comprehension) for 6 to 7 years old; reliability coefficient is .71 (rate), .94 (accuracy), and .92 (comprehension) for 8 to 9 years old; and reliability coefficient is .95 (rate), .86 (accuracy), and .87 (comprehension) for 10 to 11 years old; and (ii) Form 2 followed by Form 1: reliability coefficient is .90 (rate), .97 (accuracy), and .96 (comprehension) for 6 to 7 years old; reliability coefficient is .86 (rate), .98 (accuracy), and .88 (comprehension) for 8 to 9 years old; reliability coefficient is .89 (rate), .95 (accuracy), and .85 (comprehension) for 10 to 11 years old.

NARA-R (Neale, 1988) has also a good internal consistency reliability coefficients (r-Cronbach's Alpha) for accuracy and comprehension: (i) Form 1 Accuracy: reliability coefficient is .81 (6 to 7 years old), .87 (8 to 9 years old), and .84 (10 to 11 years old); and Form 2 Accuracy: reliability coefficient is .82 (6 to 7 years old), .86 (8 to 9 years old), and .85 (10 to 11 years old); and (ii) Form 1 Comprehension: reliability coefficient is .93 (6 to 7 years old), .91 (8 to 9 years old), and .90 (10 to 11 years old).

In this study, the authors used only the pre-test and post-test results of the reading comprehension subscale based on age equivalents provided by the NARA-R (Neale, 1988) for their data analysis.

Reliability of the Pre-Test/Post-Test Results

In order to preserve the reliability of the pre-test and post-test results, the authors had approached an external consultant to appoint a blinded examiner to complete the above

assessments. This is to avoid the potential for bias and hence, to prevent the reliability of the post-test results being compromised.

Research Design

In this quasi-experimental study, a pre-test/post-test experimental/control group design was used. The 15 participating subjects were randomly placed into two groups as follows:

- **Group A (Control):**

N = 8 (5 boys and 3 girls)

The eight children, ages 9 years 3 months through 11 years 10 months old, diagnosed with Asperger Syndrome (see Table 2 and Table 3), were taught reading comprehension the normal way as is done in a regular English lesson in the following procedure:

- (1) a passage for reading is given;
- (2) new words selected from the passage are taught with the meaning of each word explained;
- (3) the child reads the passage aloud on his/her own to the teacher; and
- (4) the child has to answer correctly some five to ten questions based on the passage.

Table 2

Group A (Control)

Age Range (in years and months)	Male (N = 5)	Female (N = 3)
9:00 – 9:11	2	1
10:00 – 10:11	1	1
11:00 – 11:11	2	1
Grand Total	8	

Table 3

Group A: Chronological Ages and Asperger Disorder Quotients

Group A Subjects	Gender (Chronological Age in years and months)		Asperger Disorder Quotient (ADQ)
	Male (N = 5)	Female (N = 3)	
A1		9:03	88
A2	9:05		97
A3	9:09		112
A4	10:02		101
A5		10:10	95
A6	11:07		114
A7	11:08		108
A8		11:10	116

- **Group B (Experimental):**

N = 7 (4 boys and 3 girls)

The seven children, ages 9 years 4 months through 11 years 9 months old, diagnosed with Asperger Syndrome (see Table 4 and Table 5), were taught reading comprehension using concrete poems. The procedure for teaching reading comprehension via concrete poetry is as follows:

- (1) the passage for reading has been re-written in concrete poems;
- (2) new words selected from the passage are presented in the form of concrete poems with self-explanatory meanings;
- (3) the child reads the passage aloud on his/her own to the teacher; and
- (4) the child has to answer some five to ten questions based on the passage.

Table 4
Group B (Experimental)

Age Range (years:months)	Male (N = 5)	Female (N = 3)
9:00 – 9:11	1	1
10:00 – 10:11	2	1
11:00 – 11:11	1	1
Grand Total	7	

Table 5
Group B: Chronological Ages and Asperger Disorder Quotients

Group B Subjects	Gender (Chronological Age in years:months)		Asperger Disorder Quotient (ADQ)
	Male (N = 4)	Female (N = 3)	
B1		9:04	106
B2	9:07		87
B3	10:05		99
B4		10:07	117
B5	10:09		103
B6	11:03		93
B7		11:09	110

Program Schedule

The two groups were taught by the third author at the Learning Disabilities Center, Singapore, on different days from 2.30pm to 3.30pm. The program schedule is as follows:

- Group A (Control): Monday and Wednesday

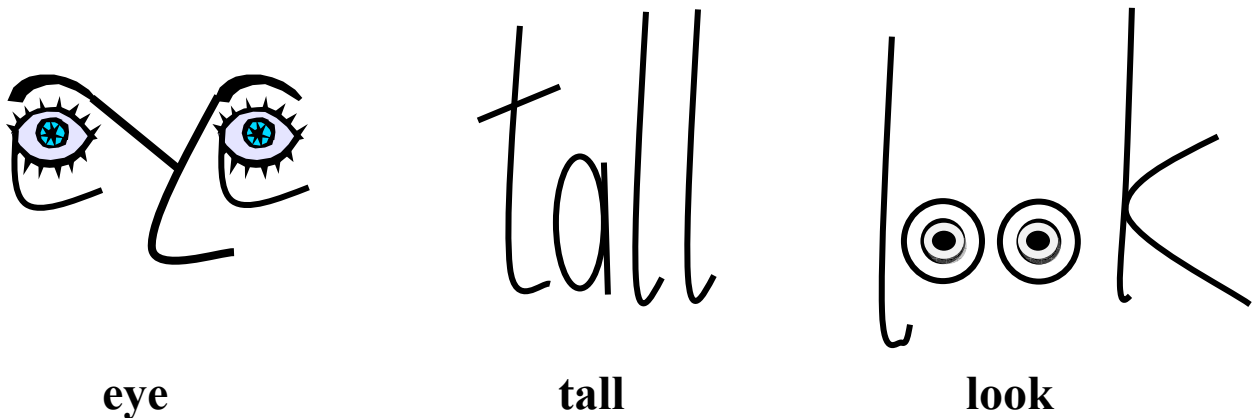
- Group B (Experimental): Tuesday and Thursday

Teaching Strategy

Over a period of six months, children with Asperger Syndrome in both groups were taught reading comprehension by the third author. As described earlier, children in Group A were taught reading comprehension the following way: (1) select new words from a given passage and teach them to the children in this group; (2) read the passage orally so that the third author could record those words each child was unable to read or recognize; and (3) answer some five to ten questions based on the same passage.

Unlike the first group, children in Group B were taught in the following way: (1) select new words from the passage to be read; (2) create concrete poems out of these new words; (3) teach them to the children in this group (see the 3 examples of concrete poems below);

Examples of concrete poems: eye, tall and look



(4) read the given passage with selected words substituted with concrete poems (see Appendix 2 for an excerpt of a sample passage); (5) read the same passage again and this time, without concrete poems; and (6) answer some five to ten questions based on the passage.

Research Aim

The aim of this research study was to find out if children with Asperger Syndrome would perform better in answering questions for their reading comprehension if they were given reading passages re-written in concrete poems. Their performance in reading comprehension was measured via the administration of NARA-R before and after the six-month reading comprehension program.

Results and Discussion

Two sets of pre-test and post-test results were obtained from the administration of GADS (Gilliam, 2001) and NARA-R (Neale, 1988) before and after the six-month reading comprehension program for both Group A and Group B. The first set of pre-test and post-test results were based on the ADQs obtained from the administration of the GADS (Gilliam, 2001). The second set of pre-test and post-test results were based on the Reading Comprehension Ages (RCAs) obtained from the administration of the NARA-R (Neale, 1988).

Pre-test and Post-test Results of Group A

Table 6 shows the pre-test and post-test results (ADQs and RCAs) of the Group A.

Table 6
Pre-test and Post-test Results of Group A

Subjects	Pre-test ADQs	Post-test ADQs	Pre-test RCAs (in years and months)	Post-test RCAs (in years and months)
A1	97	93	6:01	6:09
A2	112	111	6:08	7:02
A3	88	86	6:04	7:01
A4	101	103	7:03	7:08
A5	95	94	7:11	8:07
A6	114	114	8:07	8:10
A7	108	109	8:03	8:09
A8	116	115	9:00	9:05

The findings suggested that out of eight subjects in Group A, the ADQs of five of them (i.e., subjects A1, A2, A3, A5 and A8) showed a drop between 1 and 4 standard scores. Two of them, A4 and A7, showed an increase in their ADQs by 2 and 1 standard scores respectively. Only one subject A6 did not show any difference in his pre-test and post-test ADQs. The post-test ADQs of all the eight subjects remained within the range of high probability of Asperger Syndrome.

In terms of the reading comprehension age (RCA) equivalents, the subject A3 in Group A showed the greatest improvement by 9 months from the pre-test RCA of 6 years 4 months to the post-test RCA of 7 years 1 month. Subjects A1 and A5 demonstrated an improvement by 8 months from their respective pre-test RCAs to post-test RCAs. They were followed by subjects A2 and A7 with by an increase of 6 months in their post-test RCAs. Subjects A4 and A8 increased their respective post-test RCAs by 5 months. The subject A6 showed the least improvement in his post-test RCA, up by 3 months from his pre-test RCA. In fact, the authors did not consider any subject whose post-test RCA had increased by 6 months from the pre-test RCA to be an improvement. It was more a result

of developmental maturity over the six-month reading comprehension program. Any subject with a RCA increase of less than 6 months was not considered an improvement at all. Hence, only the post-test RCAs of three subjects A3, A1, and A5 in Group A were regarded as slight improvement, although their RCAs were still lagging behind their respective chronological ages (CAs).

In the overall reading comprehension performance of the eight subjects in Group A, their mean pre-test RCA and mean post-test RCA were 7 years 6 months, and 8 years 0 months, respectively. Although there was an increase of six months between the mean pre-test and mean post-test ADQs, such an increase did not translate into a significant improvement. As mentioned earlier above, an increase of six months in RCA over a period of six months during which the eight subjects underwent the reading comprehension program could be best explained as a result of developmental maturity, not a real improvement.

Pre-test and Post-test Results of Group B

Table 7 shows the pre-test and post-test results (ADQs and RCAs) of the Group B.

Table 7
Pre-test and Post-test Results of Group B

Subjects	Pre-test ADQ	Post-test ADQ	Pre-test RCA (in years and months)	Post-test RCA (in years and months)
B1	106	100	6:03	7:04
B2	87	82	6:05	7:10
B3	99	94	6:11	8:01
B4	117	110	6:06	7:07
B5	103	98	7:01	8:01
B6	93	88	8:08	9:10
B7	110	105	8:10	9:09

The findings suggested that all the seven subjects in Group B showed a drop in their respective post-test ADQs from the pre-test ADQs between 5 and 7 standard scores. The subject B4 showed the biggest decline in her ADQ. This is followed by the subject B1 with a drop by 6 standard scores in her post-test ADQ. The remaining five subjects saw a drop by 5 standard scores in their respective post-test ADQs. However, the post-test ADQs of all the seven subjects continued to stay within the range of high probability of Asperger Syndrome.

With regards to the reading comprehension age (RCA) equivalents, the subject B2 in Group B showed the biggest improvement in his RCA, up by 17 months from his pre-test RCA of 6 years 5 months to his post-test RCA of 7 years 10 months, while subjects B3 and B6 both showed an improvement in their post-test RCAs, up by 14 months from their

pre-test RCAs of 6 years 11 months, and 8 years 8 months, respectively. Subjects B1 and B4 were the next two with an improvement in their post-test RCAs by 13 months up from their pre-test RCAs of 6 years 3 months, and 6 years 6 months, respectively. The subject B5 improved in his post-test RCA by 12 months from his pre-test RCA of 7 years 1 month, while the subject B7's post-test RCA went up by 11 months from her pre-test RCA of 8 years 10 months. However, the RCAs of all the seven subjects in Group B still lagged behind their respective CAs.

The overall reading comprehension performance of the seven subjects in Group B in terms of their mean pre-test RCA and mean post-test RCA are 7 years 2 months, and 8 years 5 months, respectively. There was a significant increase of 15 months between the mean pre-test and mean post-test ADQs. Such an increase indicated a significant improvement in the performance of reading comprehension by the subjects in Group B.

Comparison of Results between Group A and Group B

When the results of Group A and Group B were compared, the subjects in Group B out-performed those in Group A. In fact, the best performer (i.e., the subject A3) for post-test RCA in Group A was lagging with at least 8 months behind the best (i.e., the subject B2) in Group B. Also, the weakest performer (i.e., the subject B7) in Group B for post-test RCA still out-performed the best in Group A, with at least 2 months ahead.

The improvement of performance in reading comprehension based on post-test RCAs for Group A in terms of the mean number of months for reading comprehension was about 6 months; for Group B, the mean number of months for reading comprehension was about 13 months. In other words, Group B was at least 7 months ahead of Group A in their performance in reading comprehension based on post-test RCAs. This finding suggested that the subjects in Group B had benefited from the concrete poetry that was taught as a strategy to enable them to understand better what they read. That, in turn, also improved their performance in answering reading comprehension questions.

The authors also noted several interesting discoveries in this study (see Table 6 and Table 7):

- In both Group A and Group B, subjects with higher ADQs demonstrated lower RCAs, while those with lower ADQs showed higher RCAs.
- Subjects with higher ADQs in Group B performed better in reading comprehension than those with higher ADQs in Group A.
- Subjects with lower ADQs in Group B performed better in reading comprehension than those with lower ADQs in Group A.
- Subjects with higher ADQs in Group B also performed better in reading comprehension than those with lower ADQs in Group A.
- Subjects with lower ADQs in Group B also performed better in reading comprehension than those with higher ADQs in Group A.
- Subjects in Group B showed a drop of between 5 and 7 standard scores in their post-test ADQs when compared with their respective pre-test ADQs, but this was not the case for the subjects in Group A.

- In both Group A and Group B, gender did not affect the results of the subjects' performance in reading comprehension (in terms of RCAs).

Limitations of the Study

After the completion of the study, the authors did self-reflection and evaluation, and two limitations were noted of the study.

Firstly, although the post-tests on reading ability suggest that the concrete poetry approach was statistically better than the normal way to teach reading to children with Asperger Syndrome, the differences are not large and probably not clinically significant.

Secondly, another related concern is that while the GADS (Gilliam, 2001) and NARA-R (Neale, 1988) are good measures, they are both indirect and based on third-party ratings. In a possible future study, the authors recommended that it would be better to use more direct dependent measures.

Conclusion

The findings of this study suggest some limited effectiveness of concrete poetry as a strategy to teach reading comprehension to children with Asperger Syndrome. The results are consistent with the findings of a previous study that Chia (2006) reported on using concrete poetry to teach reading comprehension to five boys with Asperger Syndrome. From this present study, it also shows that the use of concrete poems as a visual approach to teaching reading comprehension to children with Asperger Syndrome makes a lot of sense. These children are strong visual learners and they can use concrete poems to aid in their reading comprehension as well as answering the questions that come at the end of each reading passage. The authors do not deny the fact that it is not easy to come up with a concrete poem for every word that is found in a given reading passage. They want to encourage teachers, who are keen to use concrete poetry to teach reading comprehension, to be more open-minded, creative, and daring as they experiment to create new and more exciting concrete poems.

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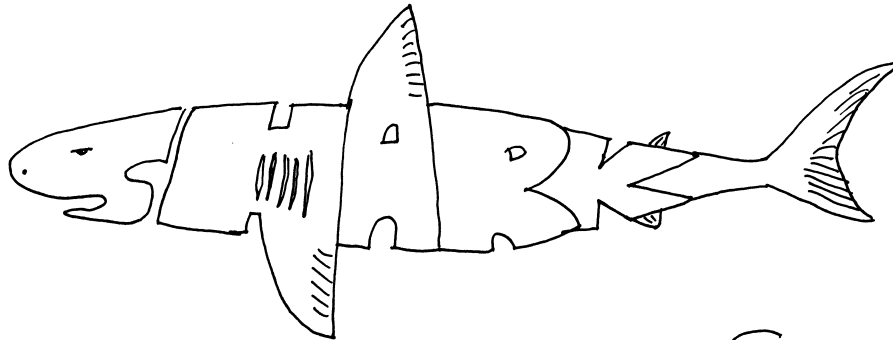
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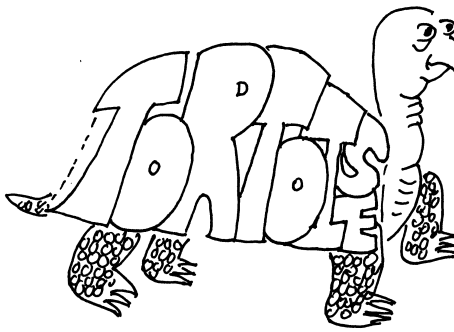
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Figure 1: Examples of concrete poems



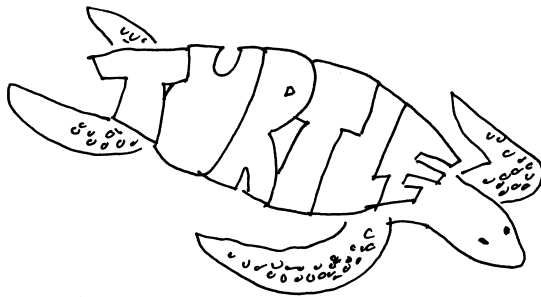
CUT



SHARK

CATERPILLAR

THIN










FAT

Lion

Old

Figure 2: An excerpt from a reading passage rewritten in concrete poems

The mother  
has  pouch. 
A  
sleeps  the pouch. 