

Gender and Cognitive Ability: Word Search Puzzles for Grades 3, 6, and 9

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Abstract. Because girls tend to develop physically and interpersonally faster than boys, they tend to exhibit superior language skills and thus a greater ability to identify written words. However, this cognitive disparity is hypothesized to decline with increasing age during childhood. Students from a large New York suburban school district were selected from grades 3, 6 and 9, and administered a twenty-five entry word search puzzle. The number of words found by a student was identified as the student's score. Averages and standard deviations were calculated by sex and grade. Population differences were 0.6 standard deviations for grade 3 (57 students), 0.7 standard deviations for grade 6 (57 students), and 0.4 standard deviations for grade 9 (22 students). The trend towards smaller population differences is consistent with the hypothesis.

Keywords-behavioral science; psychology; etymology

INTRODUCTION

It is known based on the works of Lindley [1] that girls mature faster than boys. One of the ways they mature much more rapidly is language development. Among the evidence is puzzle solving ability. It is hypothesized that the variation in ability depends on the age, and that this disparity in the outcome of the age cohorts can be revealed with word-search puzzles.

METHODS

Sixty-four boys and seventy-two girls from ages 7 to 15 years (grades 3, 6, and 9 in a large New York suburban school district) were given word search puzzles to solve (Appendices) during class time. The students were allowed ten minutes to complete the puzzle to the best of their ability. Each word search puzzle consisted of 25 words. The task was designed to be challenging to complete within the allotted time. The number of words correctly identified was recorded as the score.

RESULTS

For the third grade test, the average score for boys was 2.9 (standard deviation 1.1), and the average score for girls was 3.6 (standard deviation 1.2); see Figure 1. For the sixth grade test, the average score for boys was 2.9 (standard deviation 1.1), and the average score for girls was 3.7 (standard deviation 1.2); see Figure 2. For the ninth grade test, originally reported in 2009 [2], the average score for boys was 12.9 (standard deviation 3.6), and the average score for girls was 14.4 (standard deviation 4.25); see Figure 3.

For the third grade test, the difference in scores divided by the average standard deviation was 0.6; that is, the girls performed somewhat better. For the sixth grade test, the difference in scores divided by the average standard deviation was 0.7; that is, the girls performed somewhat better. For the ninth grade test, the difference in scores divided by the average standard deviation was 0.4; that is, the girls performed insignificantly better.

DISCUSSION

The declining trend of the population differences with age, from 0.6 standard deviations to 0.4 standard deviations, is consistent with the hypothesis. The sixth grade word search puzzle was simpler than the one used in third and ninth grades. However, the score spread was similar in third and sixth grades.

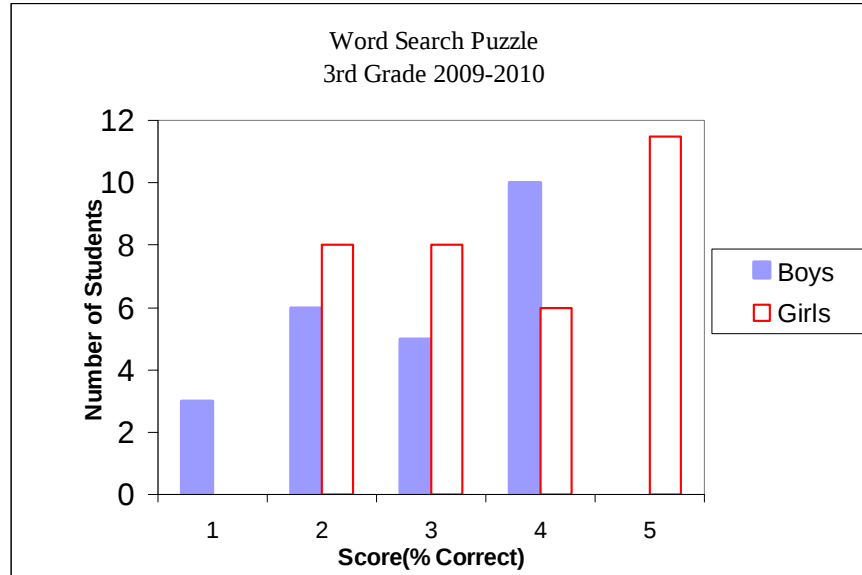


Figure 1: Third grade results. Each word search puzzle consisted of twenty-five words shown in Appendix 1. Twenty-four boys and thirty-three girls participated. The average scores were: boys 2.9 (standard deviation 1.1) and girls 3.6 (standard deviation 1.2) as illustrated above.

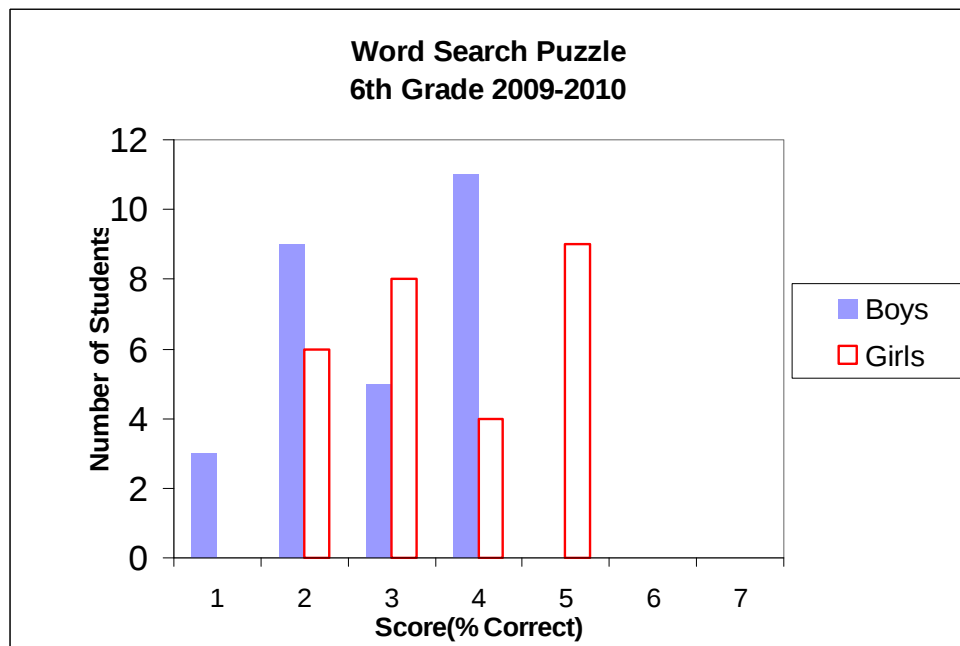


Figure 2: Sixth grade results. Each word search puzzle consisted of twenty-five words shown in Appendix 2. Twenty-eight boys and twenty-nine girls participated. The average scores were: boys 2.9 (standard deviation 1.1) and girls 3.7 (standard deviation 1.2) as illustrated above.

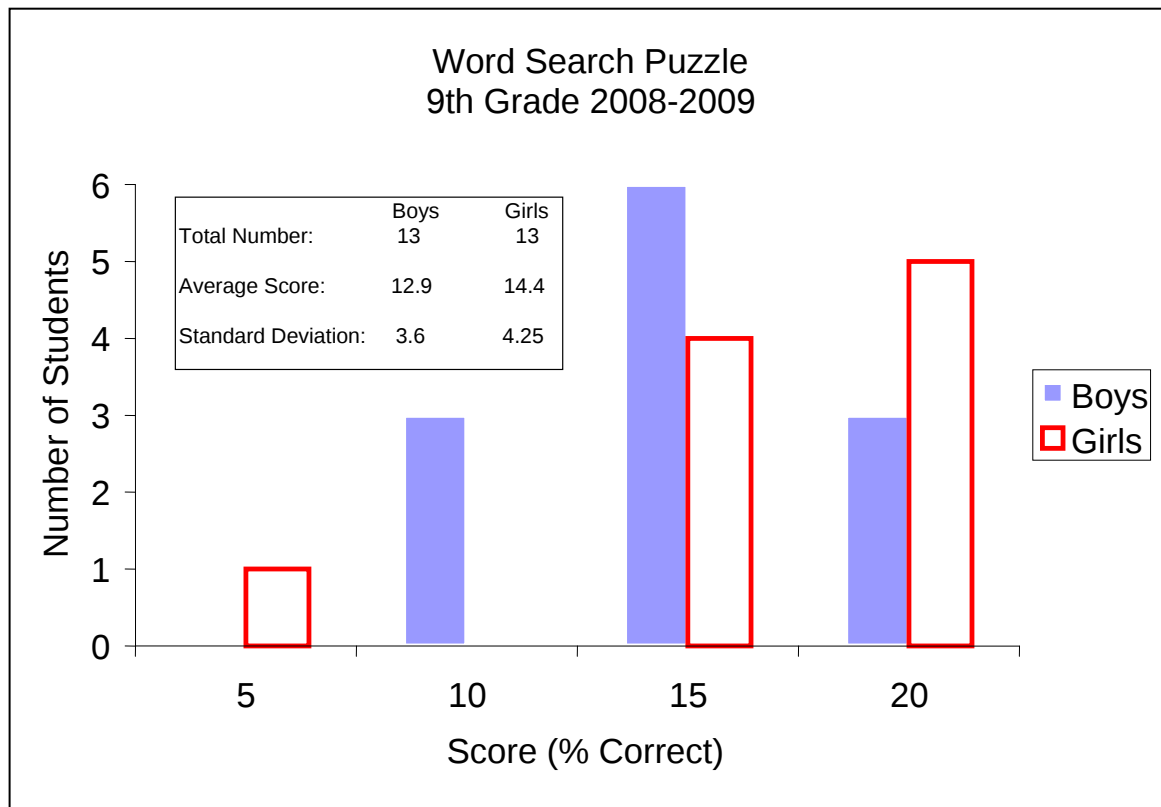


Figure 3: Ninth grade results. Each word search puzzle consisted of twenty-five words shown in Appendix 1. Twelve boys and ten girls participated; one boy and three girls declined to participate. The average scores are: boys 12.9 (standard deviation 3.6) and girls 14.4 (standard deviation 4.2) as illustrated above. (Reprinted from [2].)

CONCLUSIONS

Girls perform word search puzzles better than boys. The differences decline with increasing age.

ACKNOWLEDGMENTS

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REFERENCES

1. Lindley, H. Ernest A Study of Puzzles with Special References to the Psychology of Mental Adaaptation.1 Enigmatology, <http://www.jstor.org/pss/1411772>
2. Ehomo, Veronique, 2009, FHS Gender Age and Cognitive Ability Word Search Puzzles

APPENDICES

Appendix 1

The Word search Puzzle used for testing Gender, Age and Cognitive Ability 3rd and 9th Grade.

COLORS

T	U	A	O	O	B	P	Y	P	G	L	T	Z	U	W
M	U	Y	T	R	R	R	L	R	L	P	E	S	O	R
E	M	R	O	N	O	C	E	Y	O	U	K	B	D	R
W	G	N	Q	V	E	E	H	S	Q	R	N	R	J	O
T	Z	N	I	U	N	G	A	I	B	P	I	O	P	L
E	E	C	A	E	I	P	A	R	D	L	P	W	T	A
L	B	U	A	R	P	O	E	M	M	E	A	N	M	M
R	H	B	L	H	O	D	S	U	L	M	O	C	D	E
A	V	Y	I	B	P	O	Y	E	H	M	H	L	K	T
C	W	R	F	U	C	H	S	I	A	Y	A	H	R	H
S	E	H	O	A	Q	U	A	M	A	R	I	N	E	Y
T	E	L	O	I	V	I	O	R	E	U	J	F	B	S
H	Z	Z	V	F	E	Z	G	M	P	R	E	D	M	T
Y	Z	P	U	N	A	L	E	Q	B	K	J	Q	A	W
Y	D	N	U	G	R	U	B	A	Z	U	R	E	W	Q

AMBER
AZURE
BRONZE
EMERALD
GREEN
ORANGE
PURPLE
SAPPHIRE
VIOLET

AMETHYST
BLACK
BROWN
FUCHSIA
IVORY
ORCHID
RED
SCARLET

AQUAMARINE
BLUE
BURGUNDY
GRAY
MAGENTA
PINK
ROSE
TURQUIOSE

Appendix 2

The Word search Puzzle used for testing Gender, Age and Cognitive Ability 6th Grade.

6th Grade Puzzle

By: Veronique Ehomo

O	I	C	C	B	U	Y	C	E	A	A	A	L	C
S	P	U	R	P	L	E	C	U	E	R	A	E	M
N	E	O	O	E	S	L	J	S	B	L	U	E	A
E	W	L	S	E	R	L	I	P	U	R	C	R	R
N	R	N	S	H	K	O	G	S	C	U	H	I	G
R	D	E	W	L	U	W	S	C	S	O	A	H	O
S	M	P	O	Q	I	N	A	A	K	T	K	P	N
P	W	L	R	N	R	T	W	R	I	S	P	P	O
U	K	U	D	O	S	Y	H	L	B	T	S	A	M
H	T	E	G	N	A	R	O	E	U	H	G	S	R
E	R	C	A	R	I	S	W	T	R	G	T	I	N
O	T	R	G	I	G	T	E	L	O	I	V	W	I
S	T	O	D	E	H	T	T	C	E	N	N	O	C
H	E	R	P	I	N	K	R	B	L	A	C	K	L

Red

Black

Brown

Sudoku

Jigsaw

Nights Tour

Yellow

Blue

Orange

Slither Ink

Crossword

Monogram

Pink

Gray

Purple

Peg Solitair

Rubiks Cube

Connect the Dots

Sapphire

Scarlet

Turquoise

Violet