

# Brain Gym<sup>®</sup> research:

## using Brain Gym movements in the classroom

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# **Reading improvements for children with a range of educational needs**

# How do the effects of Brain Gym on Reading compare to typical changes for normal and poor readers?

- Normal readers improve their Reading Age at average of 1 month per month.
- **Poor readers** typically improve reading by only **0.5 – 0.8** months per month with normal interventions.
- For five studies with systematic use of **Brain Gym** movements in the classroom, each with groups of about 20 poor readers, the average improvement is **~ 2.0** months improvement per month of intervention for poor readers, compared to **0.4 months per month for controls**.
- These improvements brought about by Brain Gym intervention are **4 to 5 times greater than expected**.

# American reading measurements

- Most research on Brain Gym has taken place in the U.S.A.
- In America, reading achievement is measured in terms of reading grade level.
- Students enter school in 1<sup>st</sup> Grade at age 6.
- A reading grade of 2 indicates that a student is reading at the level of an average student in 2<sup>nd</sup> Grade, i.e. between 7 and 8 years of age.
- An academic year is assumed to be 10 months in length, so that a change of 0.6 in grade score is equivalent to 6 months change in reading age.

Control group study by  
Spielmann (2005)  
Master's thesis

# Improvements in Reading – Spielmann 2005

- Spielmann, C. (2005). “The effects of movement based learning on student achievement in the elementary school classroom”. MEd Thesis. Black Hills State University. (Retrieved September 16, 2006, from <http://doe.sd.gov/curriculum/SDReads/docs/SpielmannActionResearch.pdf>)
- Two classes of 2<sup>nd</sup> Grade children, 7 - 8 years old, one group of 19\* did 6 months of Brain Gym in the classroom, the other group of 18 students did not.
- STAR reading test used.
- \*[Two children in the Brain Gym group had VERY much higher grade scores than any of the other children in either group (grades of 4.3 and 4.6) so they were excluded from this analysis. Both groups then started at almost exactly the same average score after excluding these two anomalously high-scorers.]

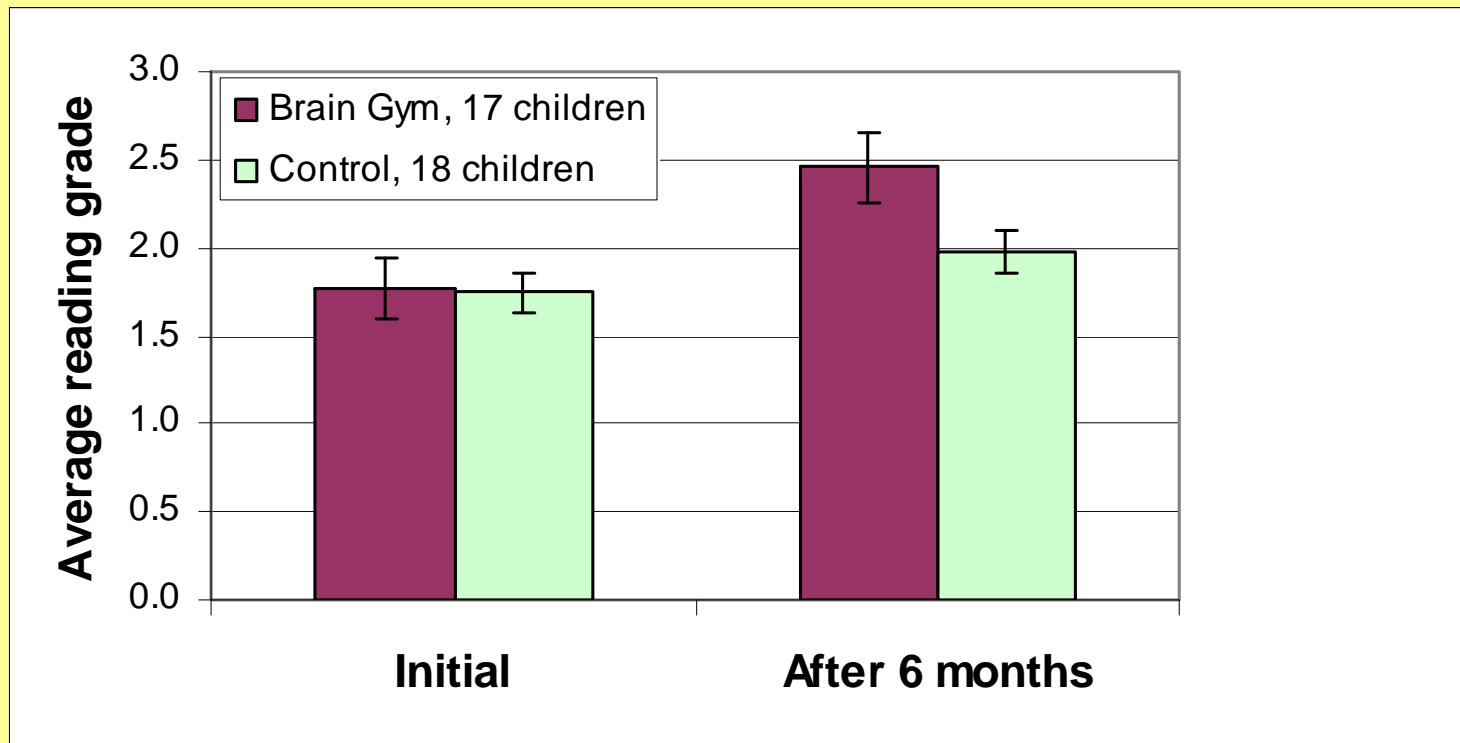
# Spielmann (2005)

2<sup>nd</sup> Grade students, 7-8 yrs

	Initial Mean Grade	Mean Grade after 6 months
Brain Gym group (17 students)	1.77	2.46
Control group (18 students)	1.74	2.00

- The Brain Gym group improved their reading grade significantly more than the control group (at 95% confidence)
- 1.05 months of improvement per month of intervention for Brain Gym group compared to 0.4 months per month elapsed for the control group.
- Teacher for the Brain Gym group reported an increase in innovative thinking and enhanced self esteem.

# Spielmann (2005)– Master's thesis 7 to 8 yr old children



- All children were initially about 3 months behind the average in reading.
- Reading age improvement for the Brain Gym group was over four months more than the control group improvement.

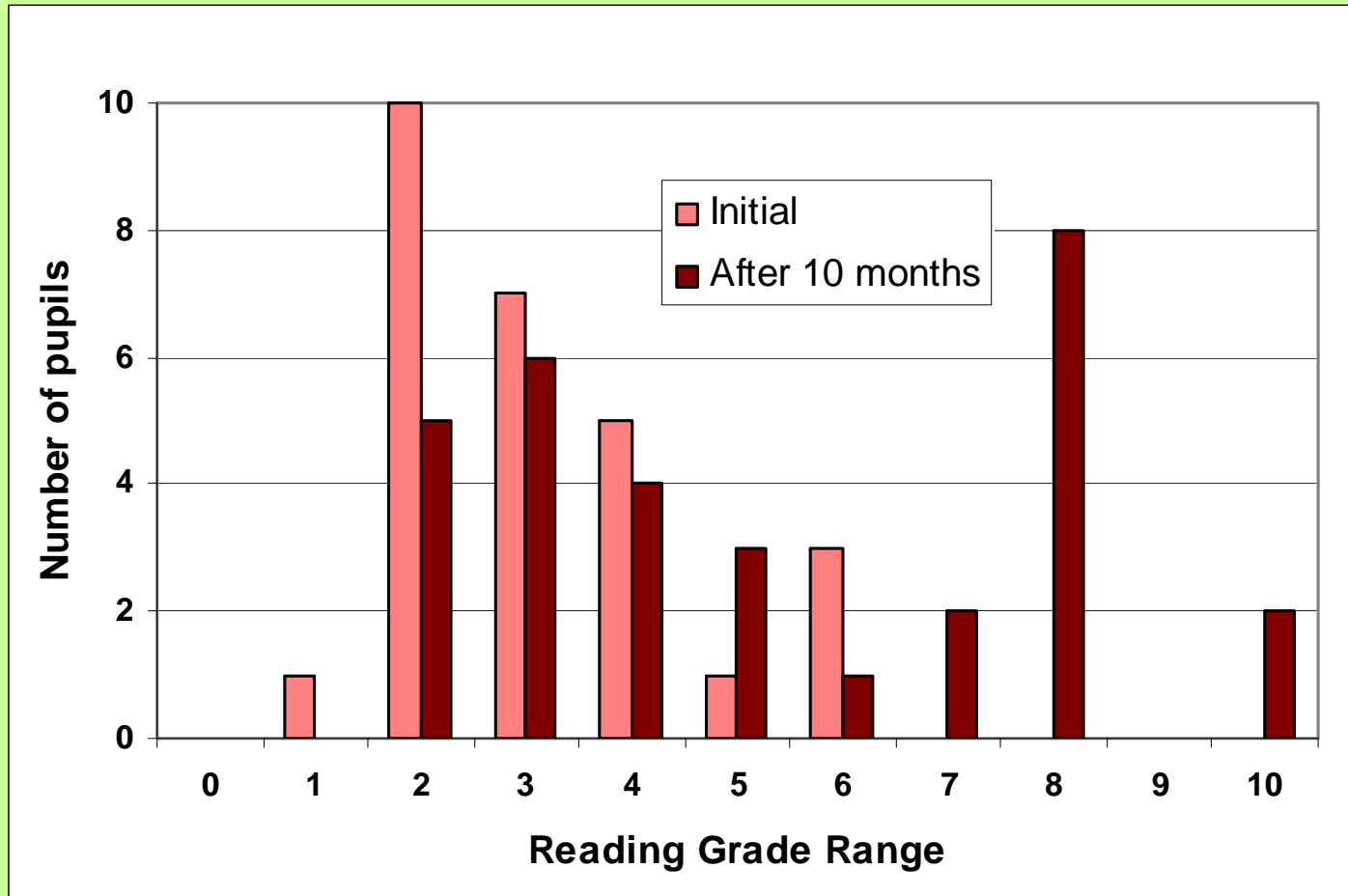


# Improvements in Reading – Dodson 2006

- 27 children considered “academically at risk”, 4<sup>th</sup> Grade, 9 - 10 years old.
- 10 months of Brain Gym movements used in the classroom.
- Gates MacGinitie reading test used.
- Group Mean Reading Grade **BEFORE** Brain Gym = 3.7, i.e. 3 months behind a typical student of this age.
- Group Mean Reading Grade **AFTER 10 months of Brain Gym = 5.3; now 4 months ahead.**
- **This is a statistically significant improvement at 95% confidence.**
- **1.7 months of improvement per month of intervention**
- Carmel Dodson reports that the children had learned to love reading and had gained in social skills.
- From Dodson, C., 2006. “I’m not the same teacher I used to be”. *The Brain Gym Journal*, Vol XXX (3), p4. PDF available at <http://www.braingym.org/archives>

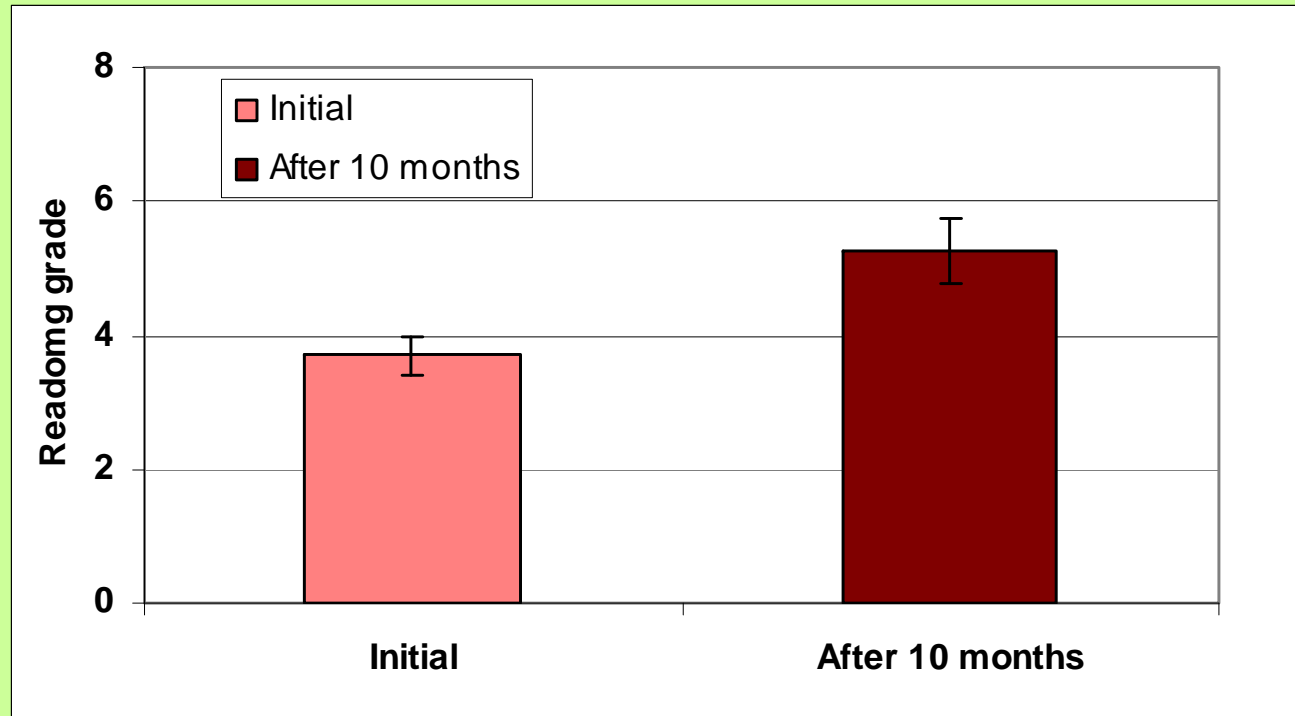
# Dodson (2006)

- 27 “at risk” children (4<sup>th</sup> Grade, 9 – 10 yrs)



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- 27 “at risk” children (4<sup>th</sup> Grade, 9 – 10 yrs)



Brain Gym group reading grade improved by 1 ½ years in one school year, helping improve confidence and social engagement.

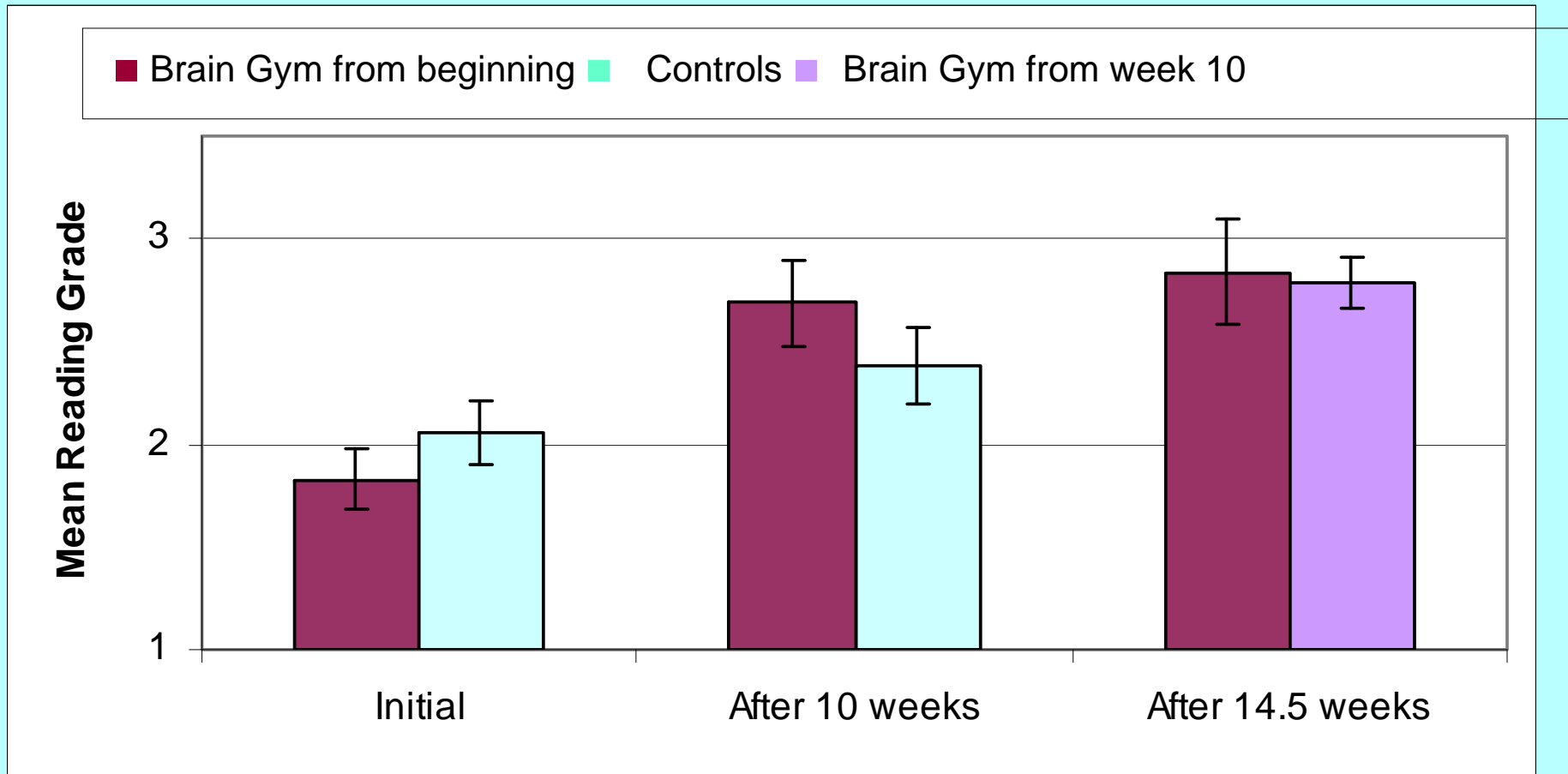
# Improvements in Reading – Trahan, 2004

- US 3<sup>rd</sup> Grade students, performing in the bottom 25% of the school (poor readers)
  - Initially 15 children did Brain Gym activities combined with extra balance work and 9 poor readers acted as controls, for 10 weeks.
  - Because significant improvements in reading were observed for the Brain Gym group, the control group then began Brain Gym activities after 10 weeks.
  - Statistically significant improvements in reading were observed for the 10 week Brain Gym intervention group.
- 
- From TRAHAN, T. (2004). A movement-based learning lab. *The Brain Gym Journal* XVII (3), 3 and 10-11.

# Improvements in Reading – Trahan, 2004

- Reading Grade improved by 0.63 in 10 weeks for the Brain Gym group (i.e. + 6.3 months or **2.52 months per month**)
- Reading Grade improved by 0.09 in 10 weeks for the control group (i.e. 0.9 months or **0.36 months per month**)
- One student in the Brain Gym group started with a grade score of 1.4 and ended the year-long programme with a grade score of 4.4, an improvement of 3 years in reading age
- After 14.5 weeks into the experiment, the group who were initially the control group had done 4.5 weeks of Brain Gym and their reading grade improved by 0.4 or 4 months, but this was not significant at 95% confidence levels.

# Trahan, 2004



# New study by Cooke 2009

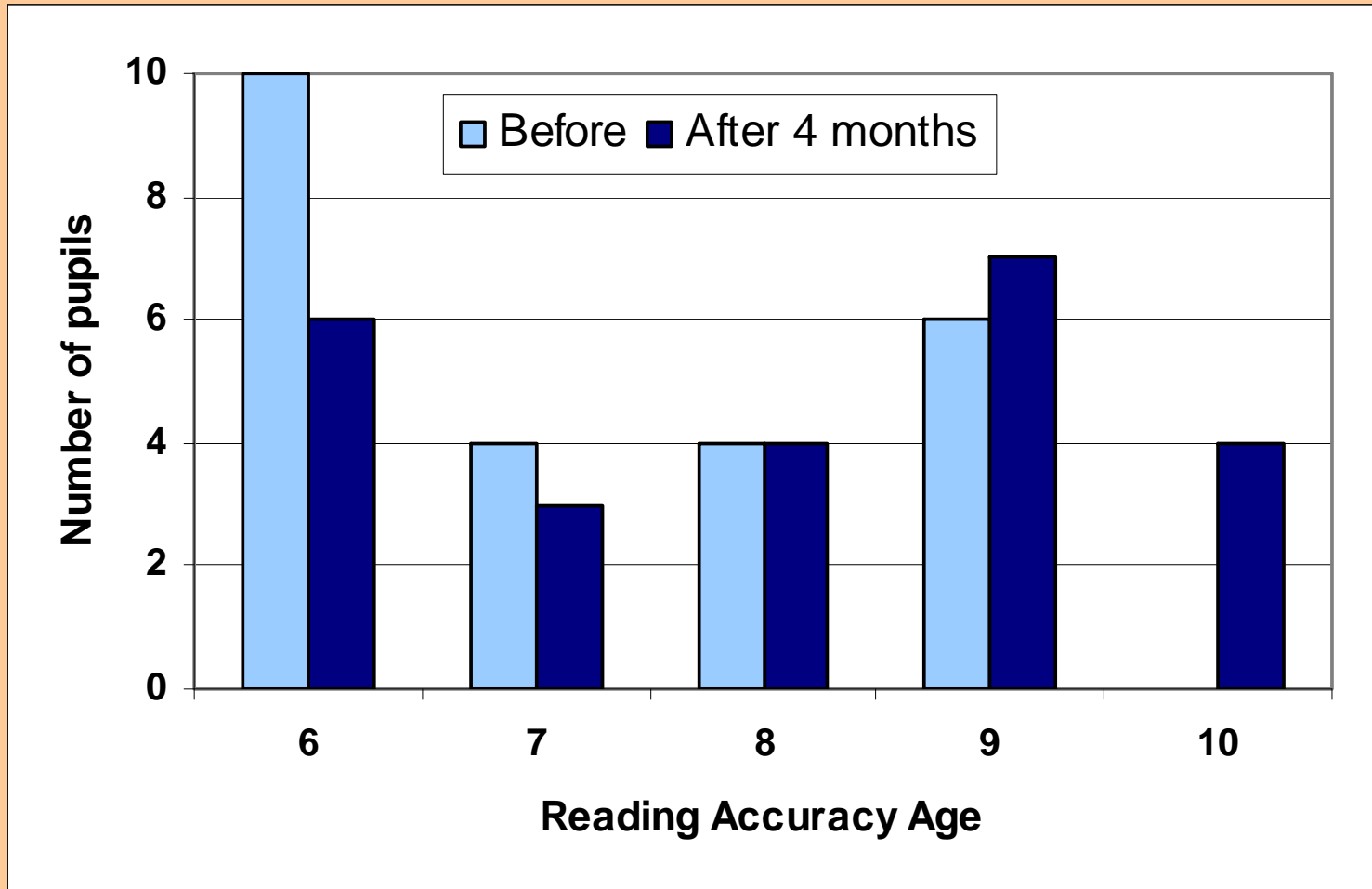
- 24 children from area of high unemployment and socio-economic decline in NW England.
- 12 weeks of intervention using 12 Brain Gym movements in the classroom.
- Neale Analysis reading test used for accuracy and comprehension. Two assessments, four months apart.

# Cooke 2009: Reading Accuracy

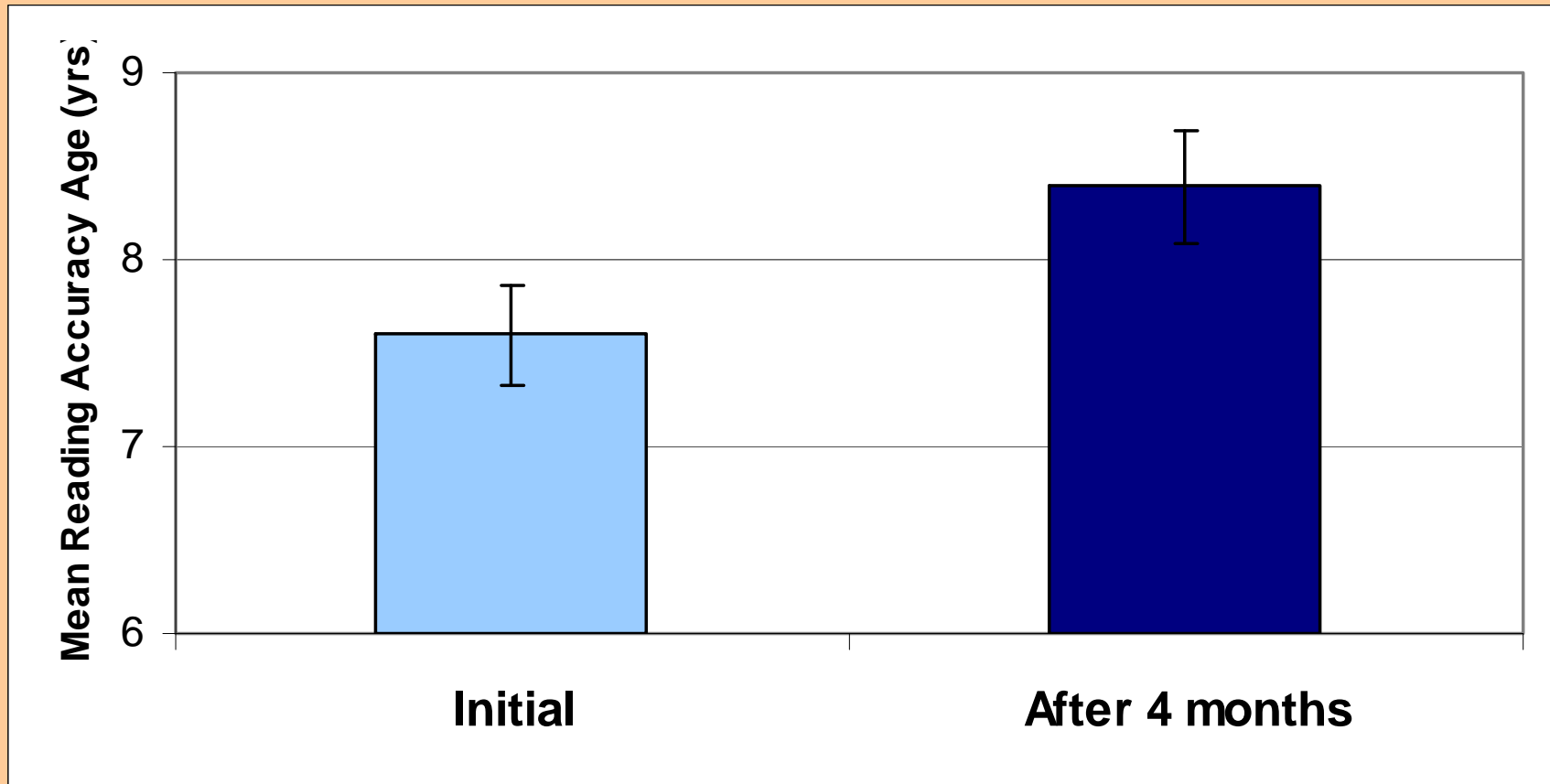
- Group Mean Reading Accuracy Age **BEFORE** Brain Gym = 7.6 yrs, i.e. 8.21 months behind a typical student of this age.
- Group Mean Reading accuracy Age **AFTER 12 weeks of Brain Gym = 8.39**; now only 2.7 months behind.
- This is a statistically significant improvement at 95% confidence.
- The mean reading accuracy age improves at 2.37 months of improvement per month elapsed



# Cooke, 2009: Reading Accuracy



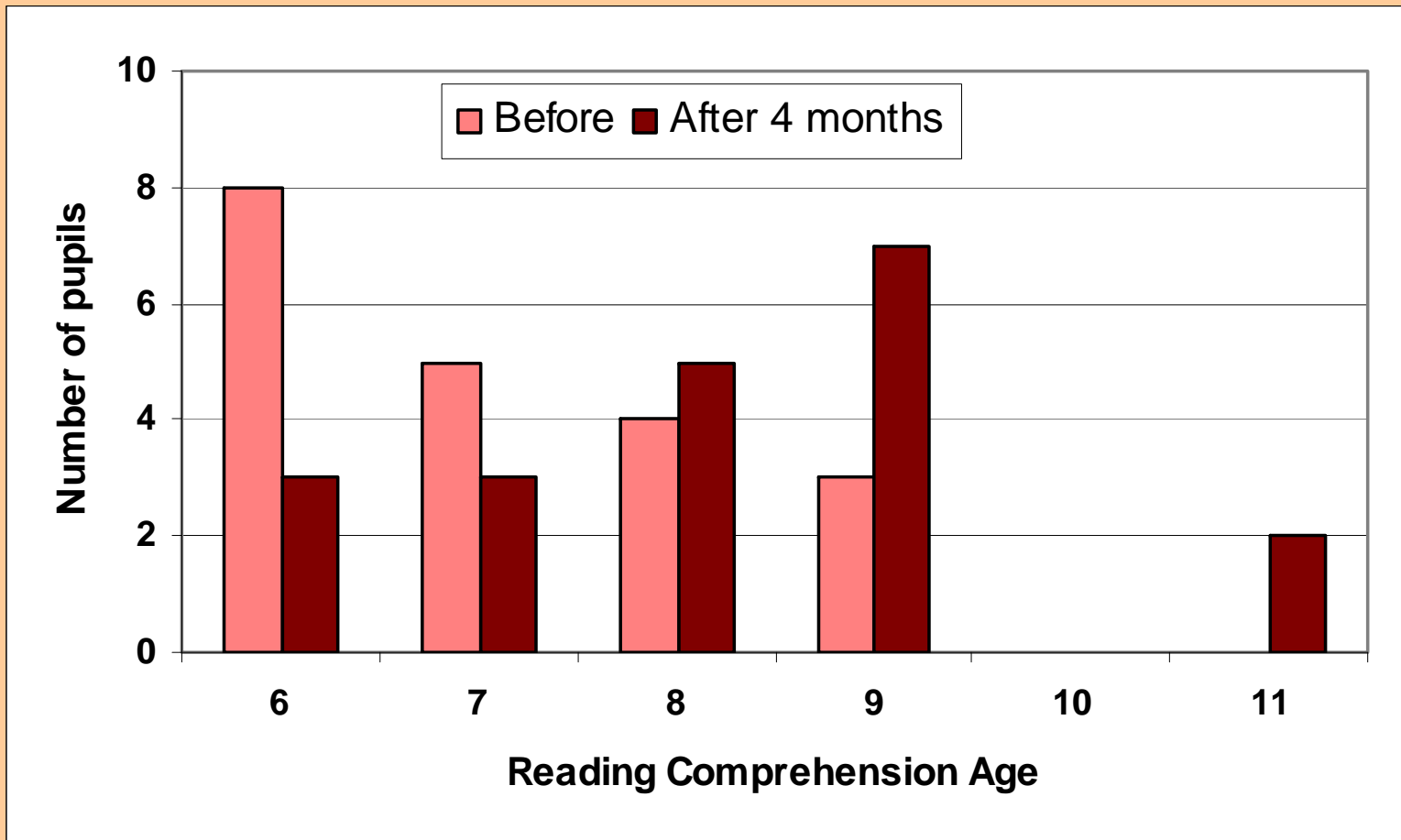
# Cooke, 2009: Reading Accuracy



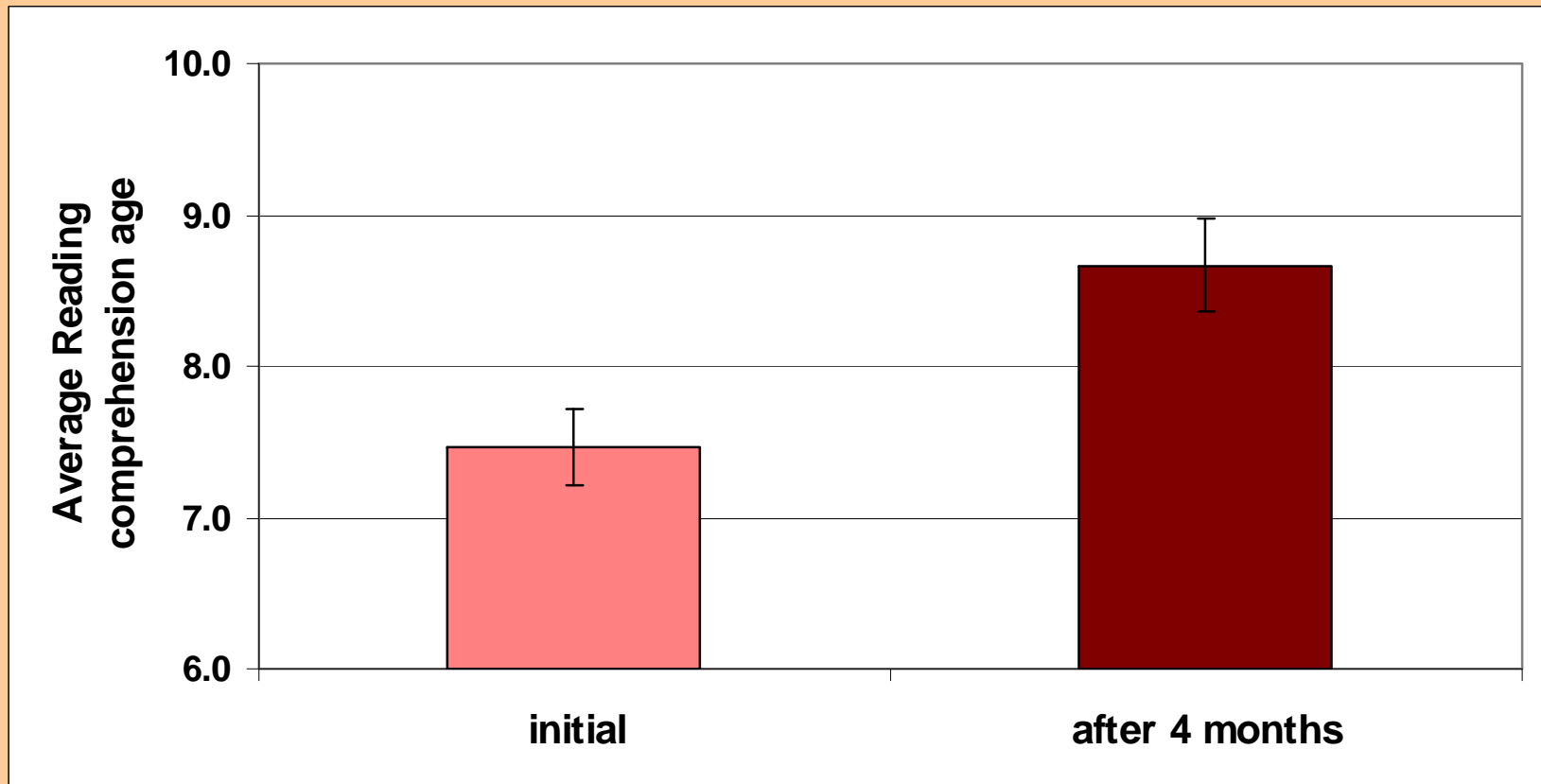
# Cooke 2009: Reading Comprehension

- Group Mean Reading Comprehension Age **BEFORE** Brain Gym = 7.47 yrs, i.e. 10 months behind a typical student of this age.
- Group Mean Reading accuracy Age **AFTER 12 weeks of Brain Gym** = 8.67; now 1 month ahead.
- This is a statistically significant improvement at 95% confidence.
- Mean comprehension age improves at 3.60 months per month of time elapsed.

# Cooke, 2009: Reading Comprehension



# Cooke, 2009: Reading Comprehension



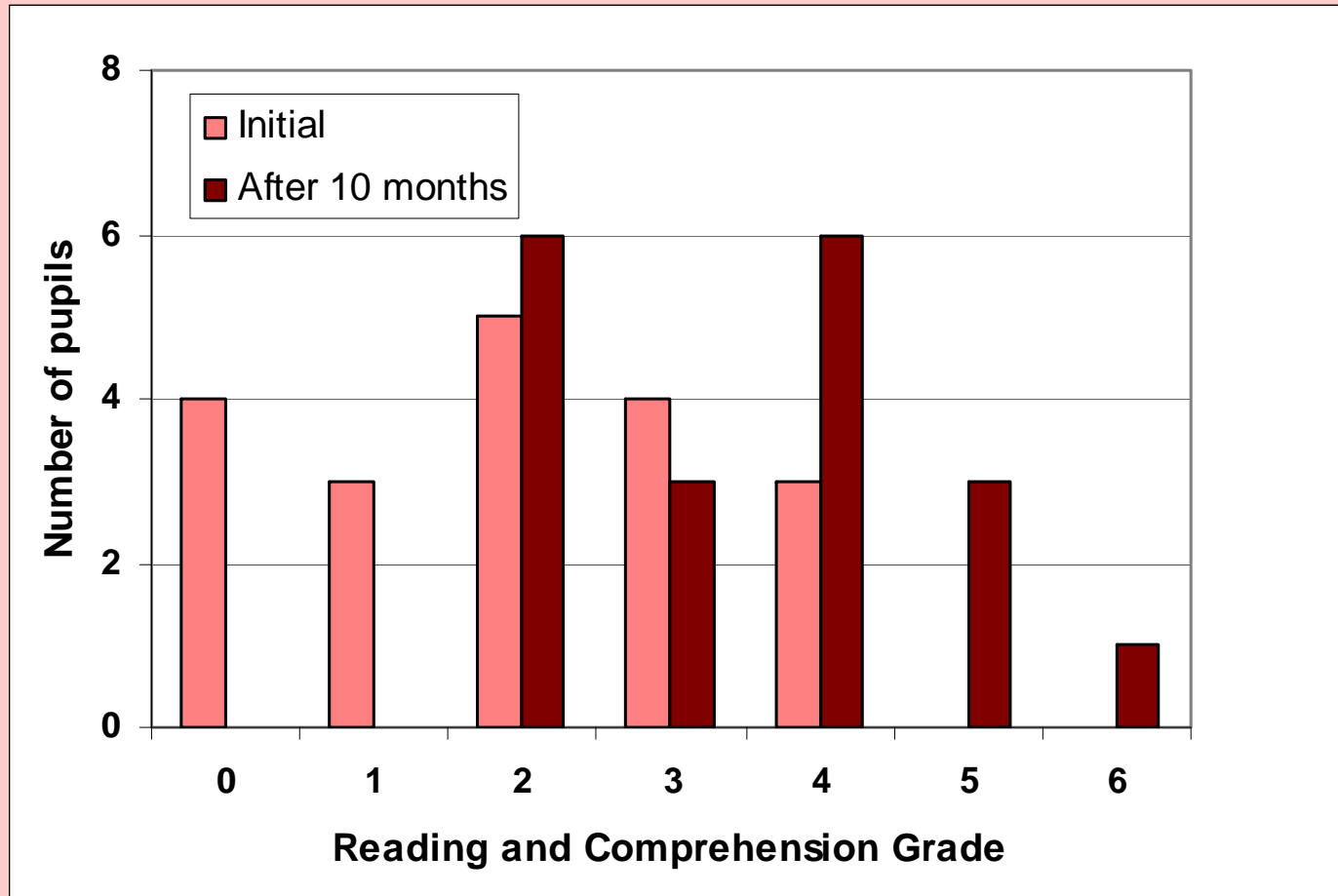
Brain Gym studies aimed at helping children with more severe special educational needs

# Improvements in Reading – Hannaford 2005

- From the book *Smart Moves* by Carla Hannaford.
- 19 Special Needs children, 5<sup>th</sup> Grade, 10 - 11 years old.
- 10 months of Brain Gym movements used in the classroom.
- Brigance Inventory of Basic Skills used.
- Group Mean Reading Grade **BEFORE** Brain Gym = 1.95,            i.e. 3.05  
years behind a typical student of this age.
- Group Mean Reading Grade **AFTER** 10 months of            Brain  
Gym = 3.53; now only 2.4 years behind.
- This is a statistically significant improvement at 95% confidence.
- 1.58 months of improvement per month of intervention
- Improvements reported in behaviour, self-esteem and ability to focus on task.

# Hannaford (2005) *Smart Moves*

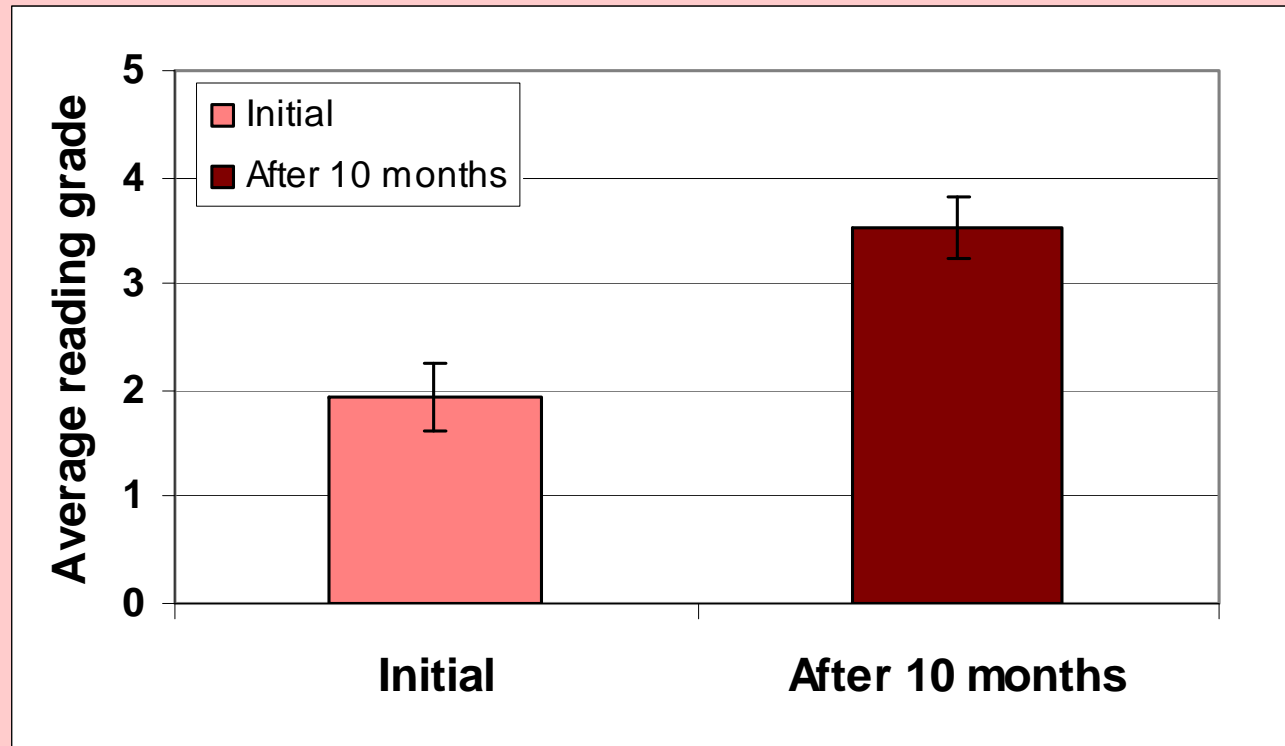
- 19 children with special educational needs (5<sup>th</sup> Grade, 10-11yrs)





# Hannaford (2005)

- 19 children with special needs (5<sup>th</sup> Grade, 10-11yrs)



Brain Gym group reading grade improved by 1 ½ years in one school year, a very impressive improvement for children who were so far behind at the start.

# Personal Reading Success Stories from Hannaford 2005

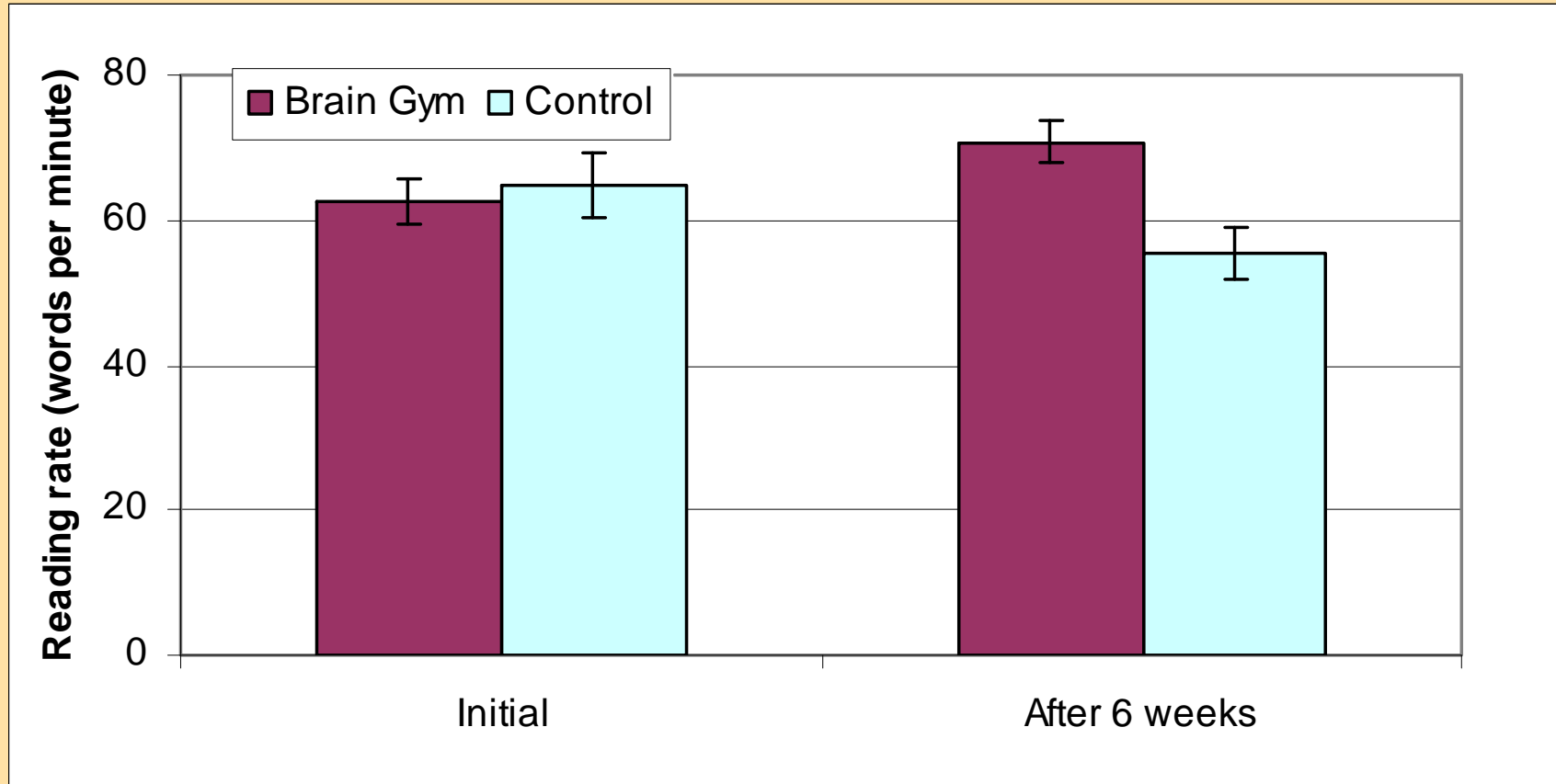
- 4 children, aged 10 to 11 yrs, were unable to score on the test at all at the start of the year.
- So these 4 had hardly improved at all despite 4 years of dedicated special needs help.
- After a year of Brain Gym, each of these 4 now had a reading grade score of 2, a two year improvement!

# Improvements in Reading Speed – Donczik, 1997

- Children with severe dyslexia, age 9 – 14 yrs, attending a special clinic.
- Control group of 37 children took part in the usual dyslexia training activities.
- Experimental group of 81 children experienced Dennison Laterality Repatterning three times over a 6 week period, as well as the usual dyslexia training activities.
- Luria 90 Test Battery applied weekly.
- Brain Gym group reading speed improved significantly more than the control group.
  
- Donczik, J., 1997. "Können Brain-Gym-Übungen Legasthenikern helfen? - Kontrolluntersuchung zu einer Pilotstudie." *Die Sprachheilarbeit* , **V42**, 230-237

# Donczik (1997)

- children with severe dyslexia – aged 9 – 14 yrs



Brain Gym group reading speed improved significantly more than the control group.

Could the same benefits be  
achieved by doing any  
movement?

# Brain Gym seems to have more effect than other movements

- A research experiment compared the effect on reading speed and comprehension for 8 yr olds with reading difficulties, for three movement groups using 15 minutes per day for 8 weeks.
  - ▶ Fine-motor control games such as tiddly-winks and construction games
  - ▶ Balance and coordination games, ball games and fitness movements.
  - ▶ Brain Gym movement group.
- **Statistical analysis demonstrated that after the intervention, the Brain Gym group read significantly faster, made fewer mistakes and had better comprehension than the other 2 movement groups.**
- Data from Beigel et al, 2002. English abstract at [http://www.braingym.org/brochures/BG\\_Research.pdf](http://www.braingym.org/brochures/BG_Research.pdf)

Are there any studies which don't show improvements in reading with Brain Gym?

Yes! It takes time for Brain Gym movements to have an impact on reading, so if the intervention is too short, then the effect is small or non-existent.

# Bundens (2000)

- Fourteen 3rd Grade students (aged 8-9) who were 'learning disabled' took part.
- 7 used Brain Gym movements for two weeks.
- 7 had no extra intervention
- No significant gains in reading were observed on this short timescale.
  
- Bundens, S.P. 2000. Brain Gym And Its Effect On The Reading Comprehension Of Third Grade Students With Learning Disabilities. MA thesis, Rowan University, Glassboro, New Jersey (accessed online 27.11.09 at USA[http://www.rowan.edu/library/rowan\\_theses/RU2000/0014BRAI.pdf](http://www.rowan.edu/library/rowan_theses/RU2000/0014BRAI.pdf))



# Other academic skills

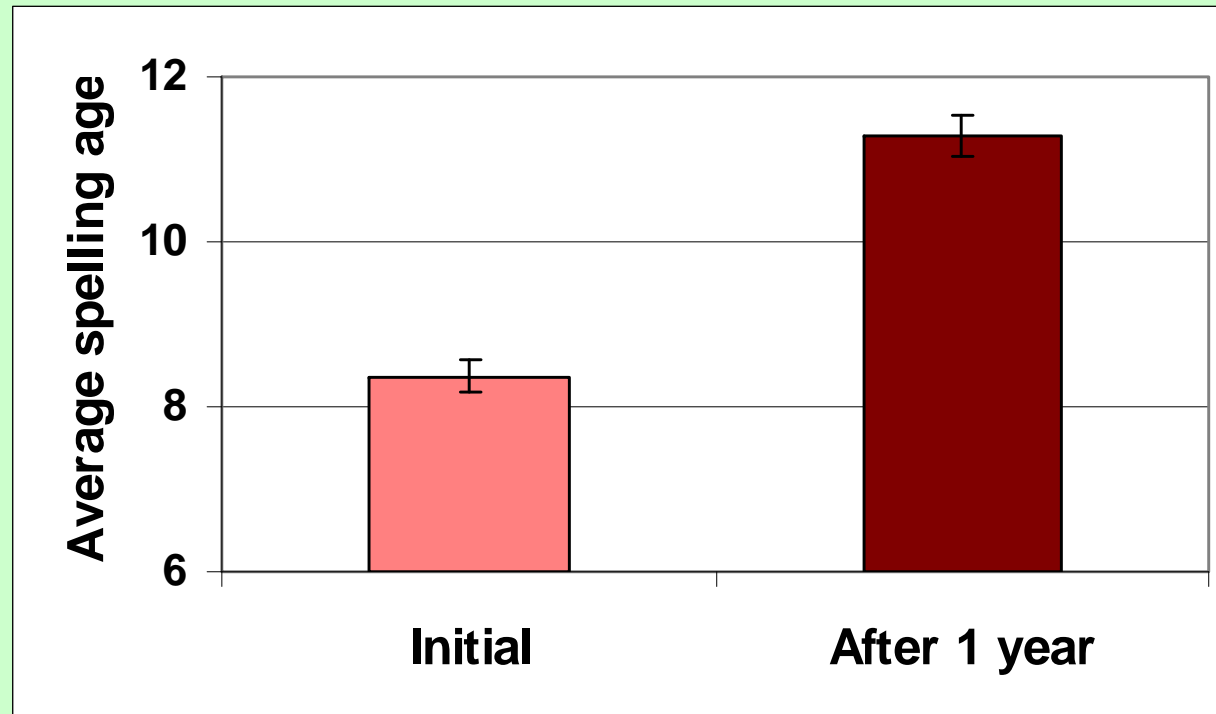
# Spelling Improvements for children already performing above average

# Underwood, 2007

- 19 children in Year 3 (7-8 yrs)
- Brain Gym used throughout school year
- Blackwell Spelling test used.
- Initial Group Mean Spelling Age at start of year = 8.4 yrs
- Group Mean Spelling Age at end of year = 11.3 yrs
- Improvement of more than 2 yrs ABOVE and BEYOND calendar age change of 10 months
- Highly statistically significant change
- Teacher reports improvements in confidence and self-esteem, also high performance in national SATs tests.
  
- Underwood, L., 2007. Spelling, Science and SATs: What movement-based learning has brought to our school. *The Brain Gym Journal*, Vol XXI (3), p4.

# Spelling Age

## Underwood (2007) 7 - 8 yr old children



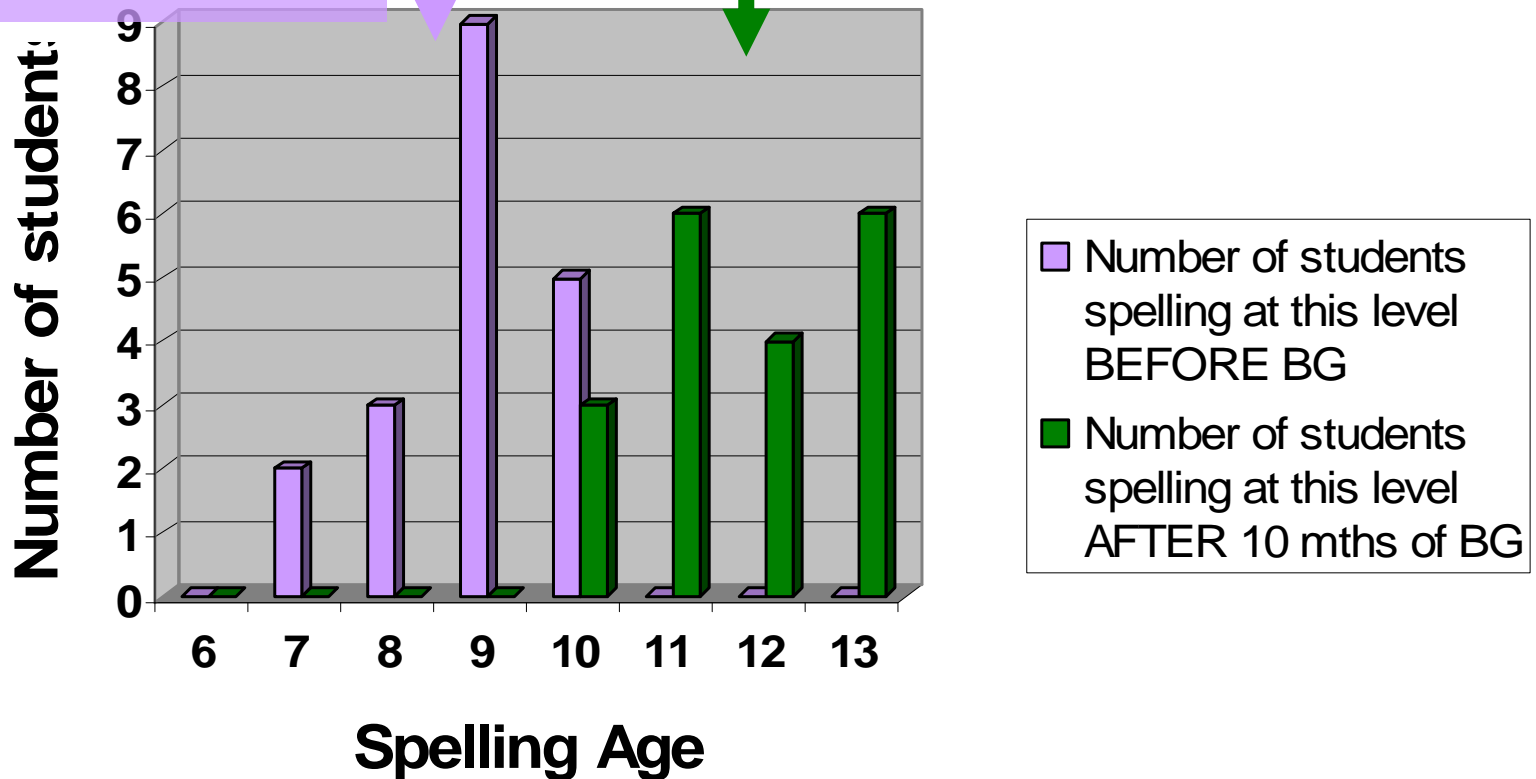
- All children were **already spelling well**. One academic year experiment.
- Spelling improved dramatically throughout the year of Brain Gym, Lynda Underwood reported increases in confidence and self-esteem, and also high performance in National SATs tests.

# Effect of Brain Gym on Spelling

Data from Underwood 2007 (Brain Gym Journal, Vol XXI (3), p4)

Group Mean Spelling Age BEFORE BG = 8.4 yrs

Group Mean Spelling Age AFTER 10 mths of BG = 11.3 yrs



# Personal Spelling Success Stories from Underwood 2006

- 5 children had a Spelling Age at or below their calendar age at the start of the year.
- After a year of Brain Gym, these 5 now had a Spelling Age an average of 2 ½ years above their calendar age!

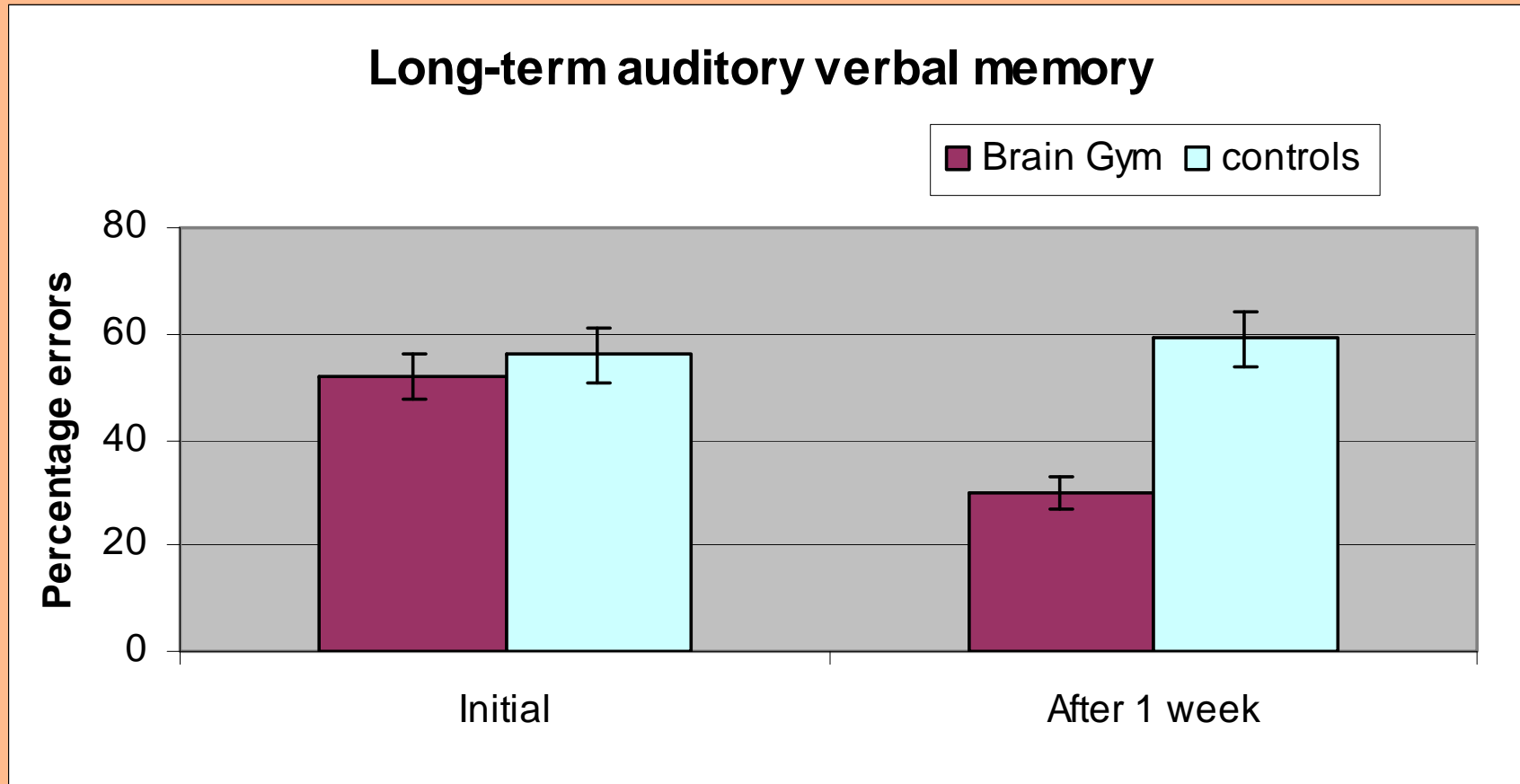
# Memory improvements for children with severe dyslexia

# Donczik, 1997

- Children aged 9 – 14 yrs, diagnosed as severely dyslexic, attending a dyslexia clinic.
- Control group of 32 children took part in the usual dyslexia training activities.
- Experimental group of 45 children experienced Dennison Laterality Repatterning once, as well as the usual dyslexia training activities.
- Luria 90 Battery Tests applied twice, one week apart.
- Tests of word and random letter sequence learning, both by ear (auditory-verbal memory) and by reading (visual memory).
- Brain Gym group memory improved more than the controls.
- Data from: Donczik, J., 1997. "Können Brain-Gym-Übungen Legasthenikern helfen? - Kontrolluntersuchung zu einer Pilotstudie." *Die Sprachheilarbeit* , **V42**, 230-237

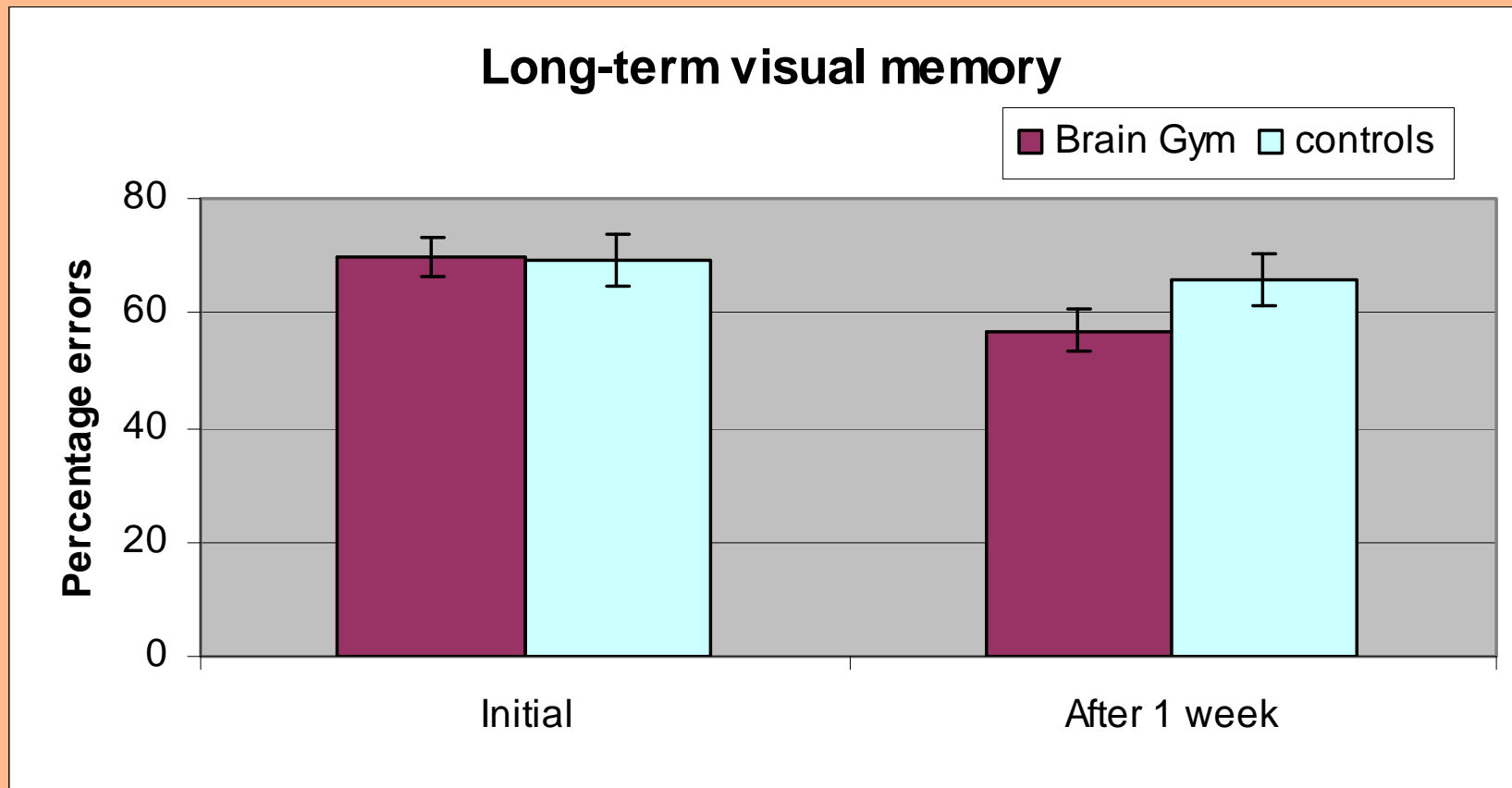


# Donczik, 1997



- Brain Gym produced a significant improvement in long-term auditory memory (REDUCTION in errors) compared to controls

# Donczik, 1997



- Brain Gym produced a greater improvement in long-term visual memory (REDUCTION in errors) compared to controls, although not significant at 95% confidence levels.

# Behavioural improvements for children with ASD, Dustow (2007)

- 6 week study of 3 to 5 year-old children with special needs, all with diagnoses of autism and/or developmental delay.
- Study was done as a main part of her doctorate in education with Argosy University. Neither Jennifer Dustow nor any of her assistants were trained or certified by Brain Gym International (the US training organisation), so this is an independent study of the effects of Brain Gym movements.
- The result indicates a highly significant improvement in behaviour and concentration on days on which the children did Brain Gym movements.
- Dustow, J., 2007. Bilateral exercises to decrease off-task behaviors in special-needs preschoolers. *The Brain Gym Journal*, Vol XXI (1), p4.

# Behavioural improvements for children with ASD, Dustow (2007)

- The experiment was designed to assess whether doing Brain Gym movements that cross the midline help to reduce “off-task” behaviours such as staring into space, refusal to comply, aggressive behaviour or property damage, wandering around when not appropriate, demanding attention at inappropriate times, crying or screaming.
- 9 children with diagnosis of ASD and/or developmental delay aged between 3 and 5 years took part.
- Each child was guided through Brain Gym movements that cross the midline (e.g. The Owl, Cross-crawl, Lazy 8).
- The study continued for 6 weeks = 30 days.

# Behavioural improvements for children with ASD, Dustow (2007)

- Movements were done by all the children for 5 minutes at the same time in the morning, then trained observers monitored each child's performance for the next hour.
- Movements were NOT done each day, but whether or not the movements were to be done that day was chosen by a random toss of a coin.
- Average of 6.2 “off-task” events were recorded per child per day per hour on days WITHOUT bilateral exercises
- Average of 1.4 “off-task” events were recorded per child per day per hour on days WITH bilateral exercises.
- DECREASE of **77%** in the number of off-task behaviours on the days when the movements were used. Highly statistically significant improvement in behaviour correlating with use of Brain Gym movements.

# Behavioural improvements Dustow (2007)

