

The Influence of Electronic Media on Young Children's Cognitive Development

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Observation

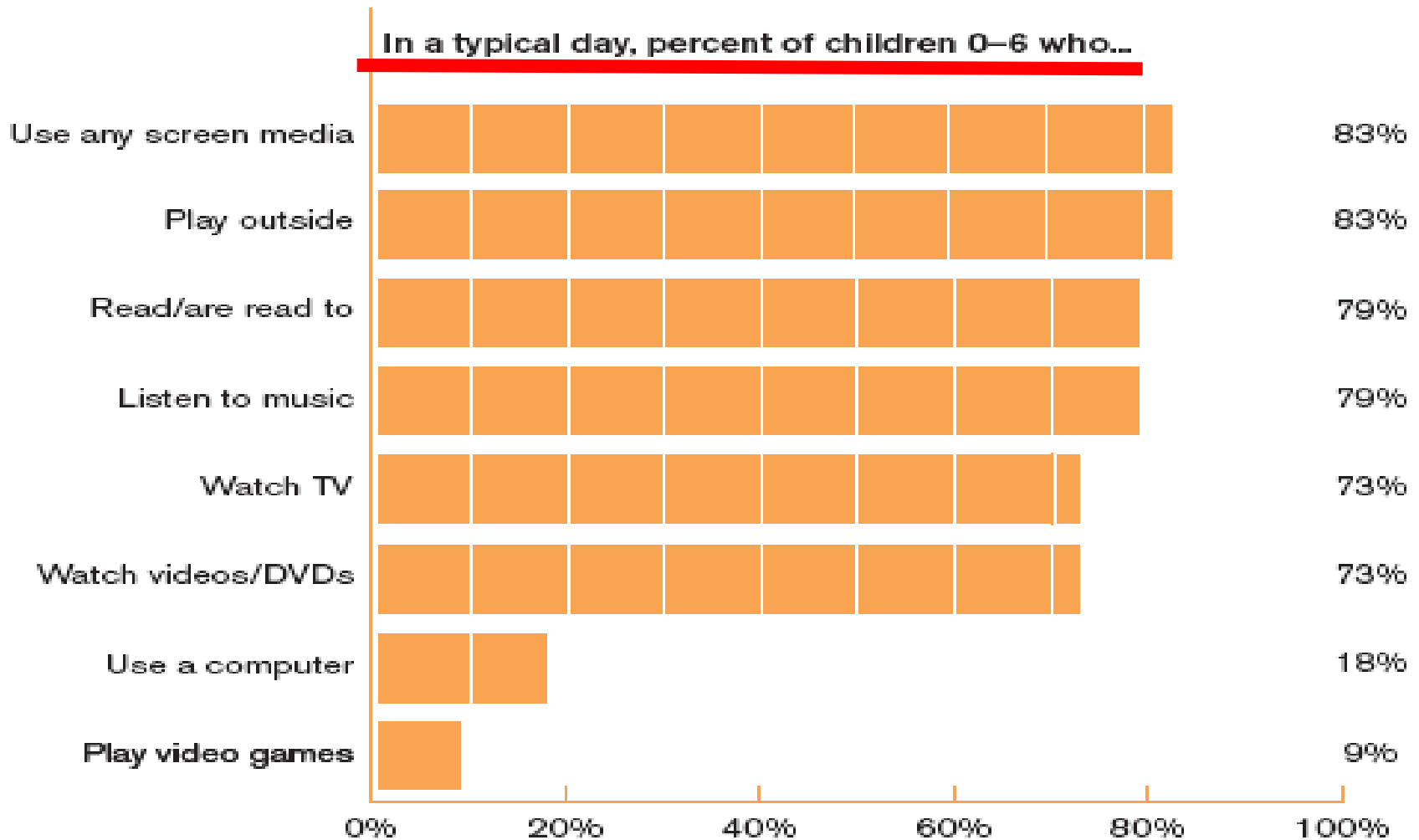
- ▶ 1 year old watched cartoon on ipod.
 - ▶ Eyes wide open without blinking.
- ▶ 5 year old played angry bird.
 - ▶ Laugh and sigh



**Children today are growing up
immersed in media**



Age zero to six

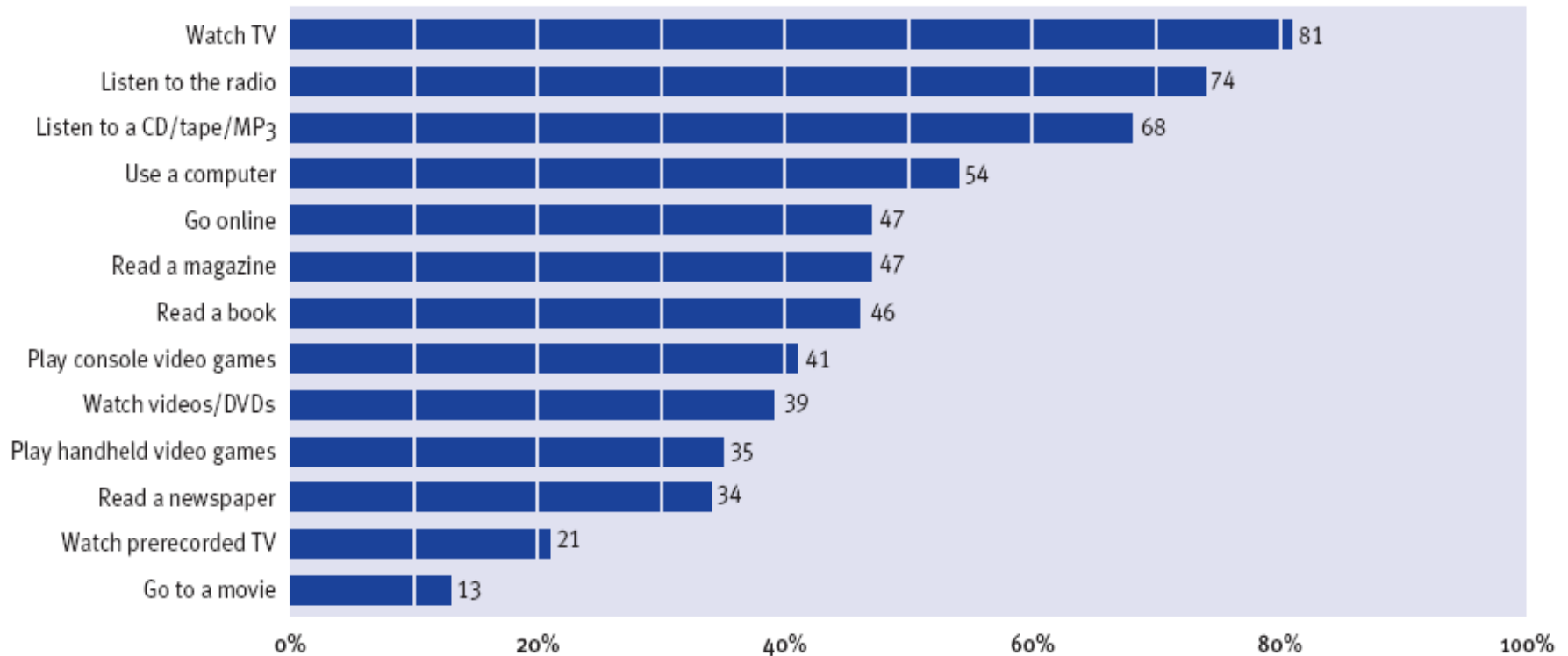


(A Kaiser Family Foundation Report, 2003)

Age 8 to 18

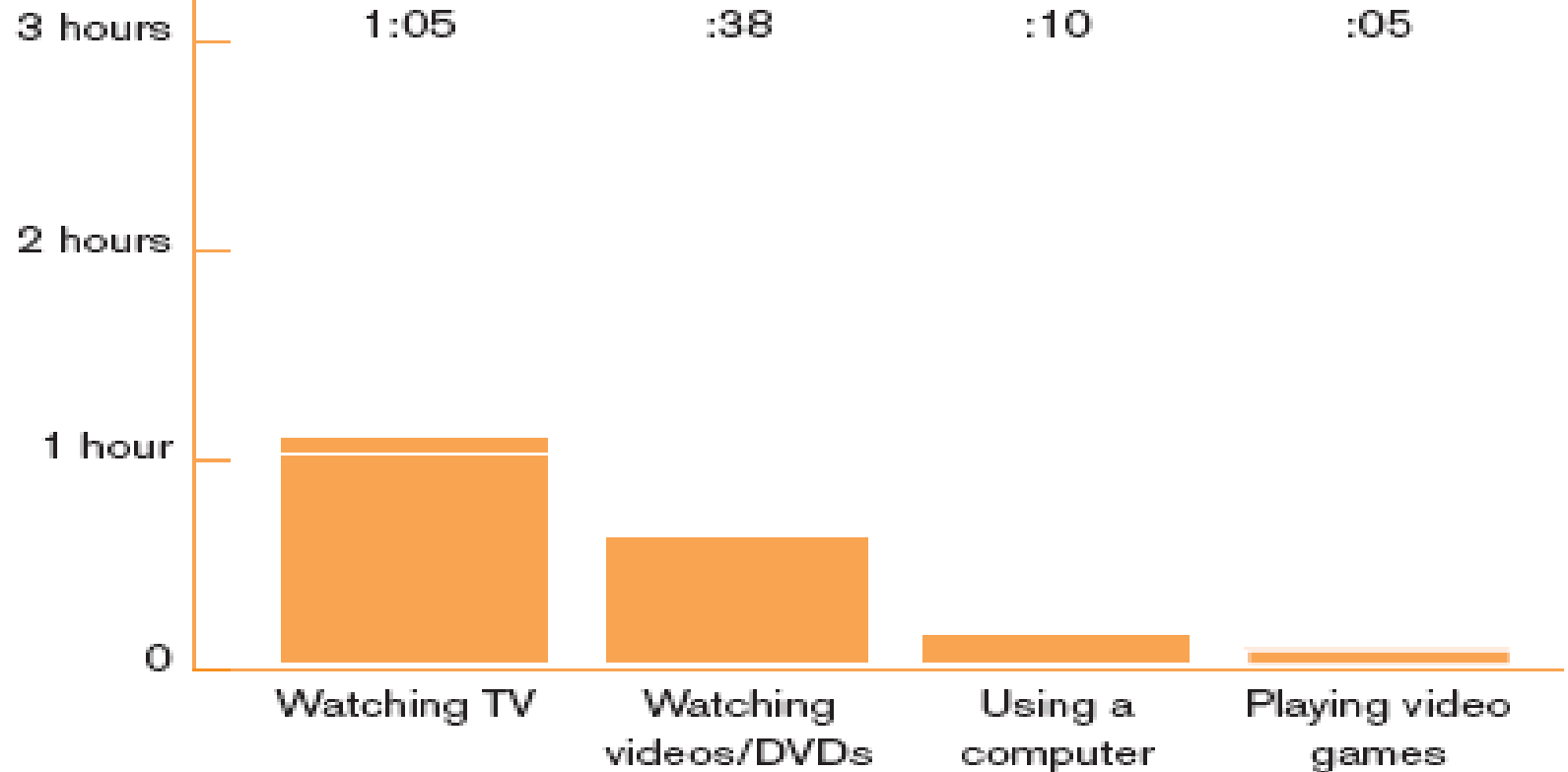
Which Media Young People Use

In a typical day, percentage of 8- to 18-year-olds who...



(A Kaiser Family Foundation Study, 2005)

Amount of time children 0–6 spend each day with screen media, on average



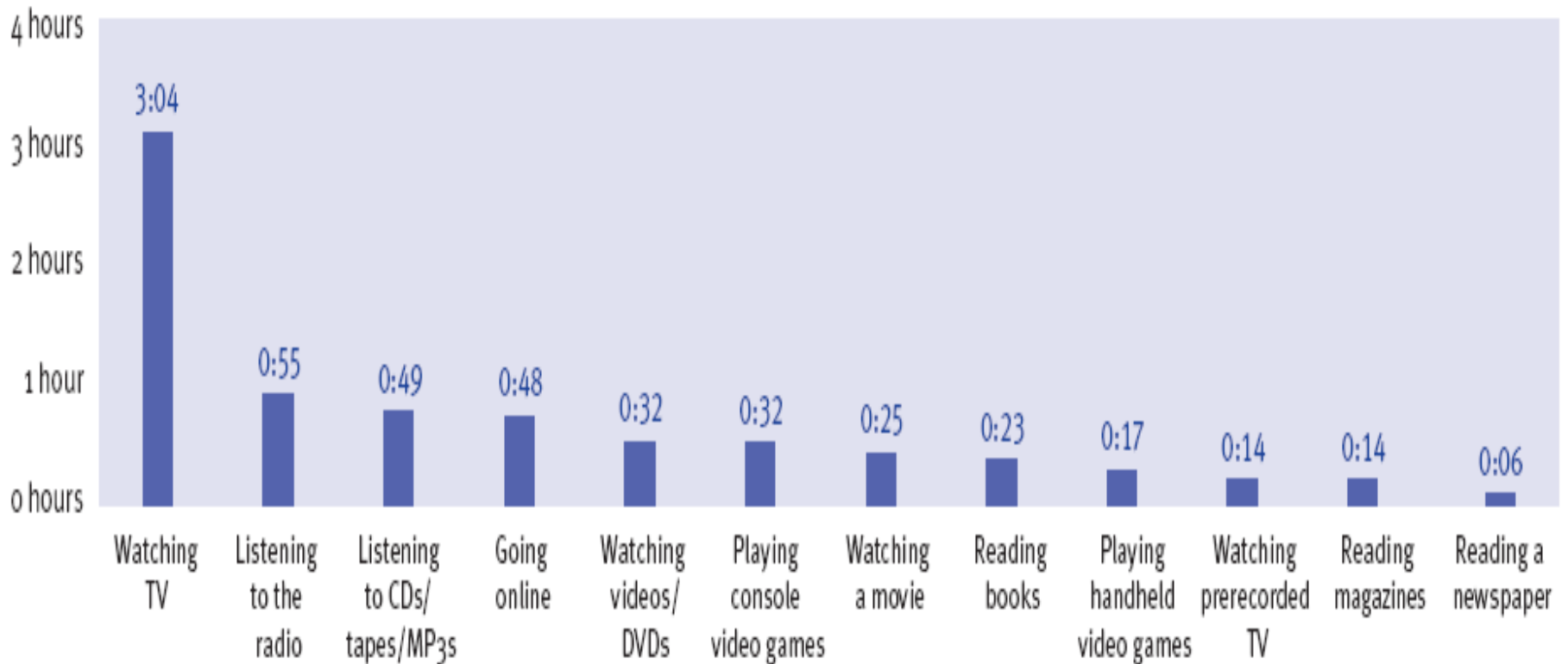
Note: Average is among all children, across all days of the week, including those who don't do certain activities yet at all.

(A Kaiser Family Foundation Report, 2003)



Time Spent With Media

Average amount of time 8- to 18-year-olds spend per day...



(A Kaiser Family Foundation Study, 2005)



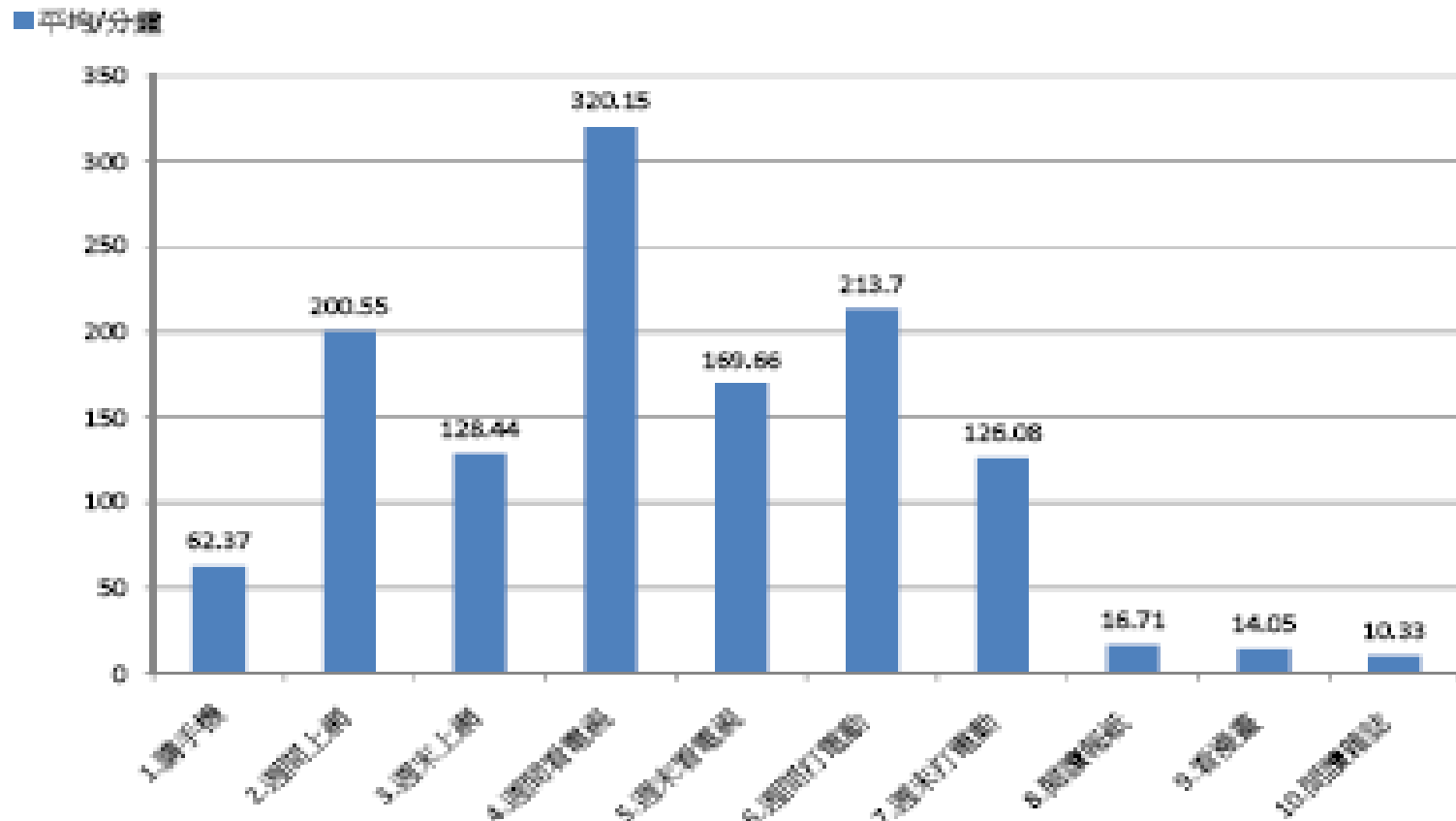
More statistics

- ▶ Children below 1 year old exposed to electronic media averaged 2 hours daily in America and the total media exposure time increased with age (Rideout & Hamel, 2005; Roberts, Foehr & Rideout, 1999; Roberts, Foehr, & Rideout, 2004).



Grades 3 to 6 in Taiwan

兒童媒體使用每週平均時間21小時



media influence on children's development

▶ Health problems

- ▶ Sleeping problems (Owens, Maxim, McGuinn, Nobile, Msall, & Alario, 1999 ; Thompson & Christakis, 2005; Shochat, Flint-Bretler, & Tzischinsky, 2010)
- ▶ Obesity problems (Klesges, Shelton, & Klesges, 1993)

▶ Increased aggressive behaviors (Browne & Hamilton-Giachritsis, 2005; Milavsky, Kessler, & Stipp, 1982)

▶ Language ability (Linebarger & Piotrowski, 2009 ; Linebarger & Walker, 2005; Rice, 1984; Rice, Huston, Truglio, & Wright, 1990; Rice & Woodsmall, 1988)



media influence on cognitive development

- ▶ **Attention** (Christakis, Zimmerman, DiGiuseppe, & McCarty, 2004; Foster & Watkins, 2010; Lillard & Peterson, 2011; Zimmermann & Christakis, 2007;)
- ▶ **Problem-solving** (Greenfield, Camaioni, Ercolani, Weiss, Lauber, & Perucchini , 1984)
- ▶ **Spatial skills** (Subrahmanyam & Greenfield, 1994;)
- ▶ **School performance** : reading comprehension, math ability, digit span (Morgan, 1993 ; Zimmermann & Christakis, 2005;)



Why study media's impact on cognitive development

- ▶ Cognitive development is the development over time of the ability to understand the world in which we live (R. Sternberg).
- ▶ It is the foundation of understanding.
- ▶ It is the base for learning.



Cognitive ability

- ▶ **Cognitive abilities**

- ▶ Inductive reasoning

- ▶ Quantitative skills

- ▶ Memory

- ▶ Attention :

- ▶ Youngsters are easy to get distracted.

- ▶ They need to learn to concentrate.

- ▶ Too much noisy is not good for concentration.



Purpose of this study

- ▶ Most studies investigated single variable.
- ▶ One shot study
 - ▶ Could children grow out of the influence?
 - ▶ Could the severity of the media's impact on different cognitive ability be different?
- ▶ This study is mean to be cross-sectional and longitudinal (follow up).
- ▶ To examine the overall influence of electronic media on young children's cognitive development.



Participants

	North				South			
	Exposure +		Exposure -		Exposure +		Exposure -	
	M	F	M	F	M	F	M	F
4-5 yrs	15	15	15	15	15	15	15	15
5-6 yrs	15	15	15	15	15	15	15	15
6-7 yrs	15	15	15	15	15	15	15	15
total	180				180			



Instruments used

- ▶ Language

- ▶ Peabody Picture **Vocabulary** Test

- ▶ **Memory**

- ▶ Digit memory task,

- ▶ Quantitative skills

- ▶ **Number** task

- ▶ Inductive **reasoning (spatial)**

- ▶ Raven's Progressive Matrices

- ▶ Attention

- Tasks are not applicable for age 4



questionnaire on background & exposure

- ▶ Family SES
- ▶ Media used in the house
 - ▶ television, video players, audio media (radio, tape, and compact disc players), video games (both console-based and handheld), computers, new digital media such as cell phones, personal digital media players , and Internet access.
- ▶ Children's early media exposure experience
 - ▶ Age : At what **age first** watch TV (DVD, computer, website, e-mail)
 - ▶ Availability
 - ▶ Media in the bedroom?
 - ▶ Quantity
 - ▶ How much time your child spent watching TV/a day?



Preliminary Results

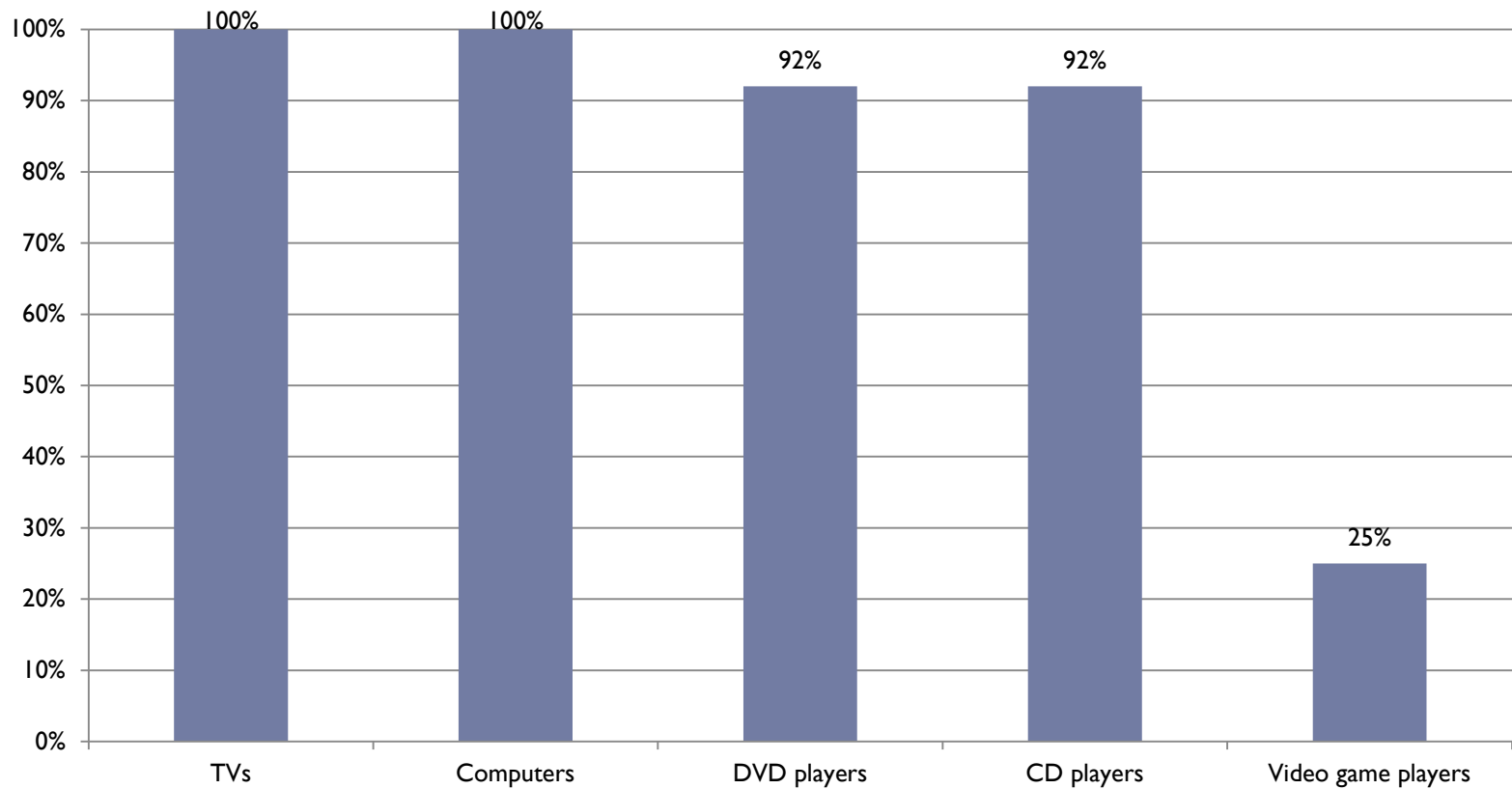


Parent's education

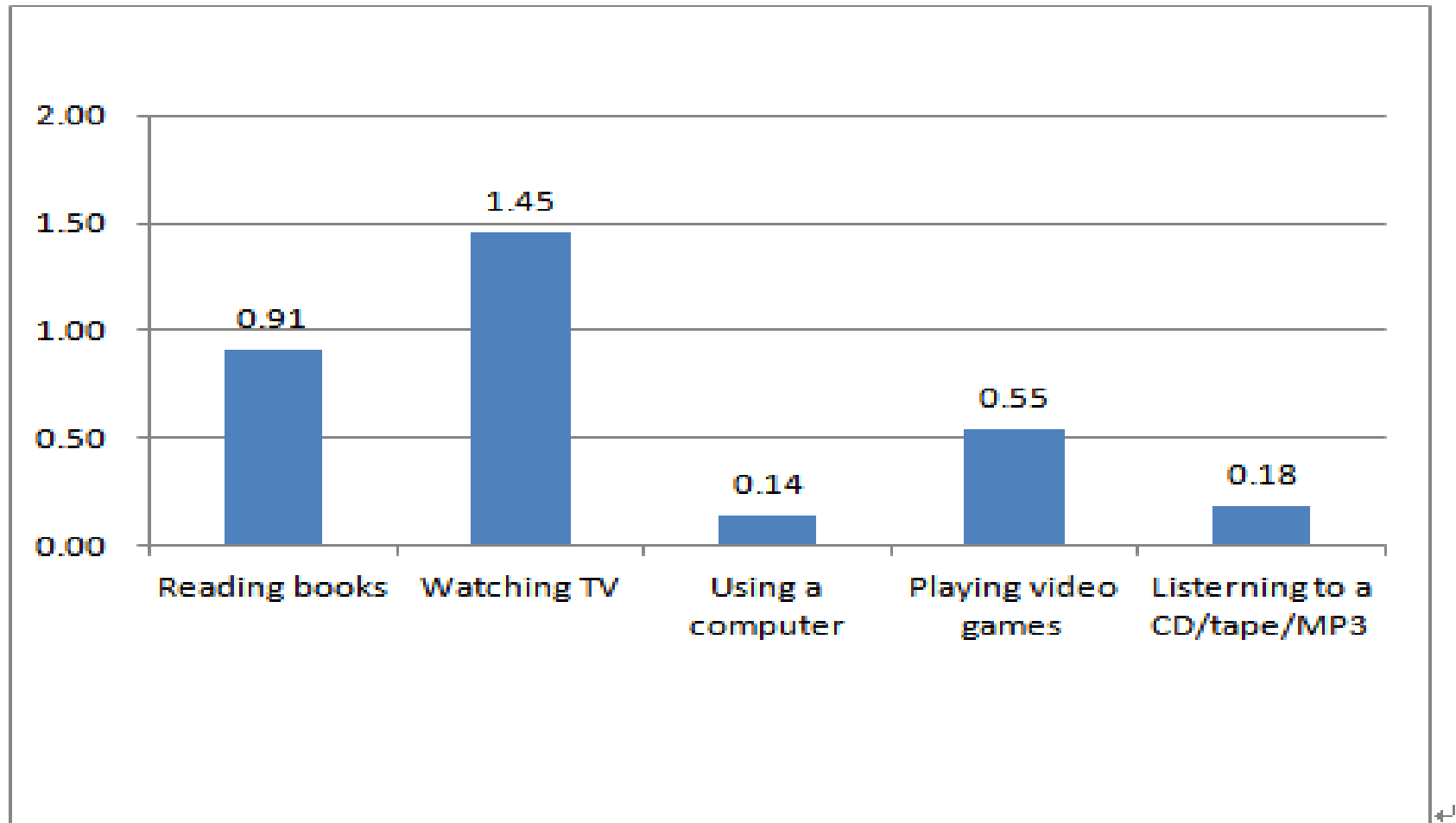
	college +	College degree	Hi school degree
Father	18%	55%	27%
Mother	9%	64%	27%



Electronic media owned in the household



Amount of time spend each day with



At what age **First watch TV**, video, DVD

- ▶ 67% at one-year-old
- ▶ 25% under one
- ▶ 8% at 3 years old



At what age **First use a computer** WITHOUT sitting on a parent's lap

- ▶ 42% at 4 years old
- ▶ 17% at 3 years old
- ▶ 17% at 6 years old
- ▶ 17% above 6 years old
- ▶ 8% children do not use computers



At what age First to play computer games

- ▶ 50% at 4 years old
- ▶ 17% at 3 years old
- ▶ 17% at 6 years old
- ▶ 8% above 6 years old
- ▶ 8% children do not use computers



Cognitive abilities

	5-5.4 yrs		5.5-5.9 yrs		6-6.4 yrs	
	N=6		N=8		N=6	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Peabody Picture Vocabulary Test	119.33	7.66	117.13	10.74	109.83	6.49
Digit memory	.58	.07	.54	.06	.51	.07
Number task	.82	.17	.91	.16	.77	.23
Raven's Progressive Matrices	.48	.07	.52	.13	.58	.18



Watching TV and Cognitive abilities

	Start at 1 yr	Start at 3 yrs
	M	M
Vocabulary	114	105
Spatial	.61	.47
Number	.82	.98
Memory	.56	.75



Using computer and Cognitive abilities

- ▶ No difference found between two groups
 - ▶ Age 4 vs. 6 and above
- ▶ Most participants first used computer at age 4. The experience is limited.



Conclusion for now

- ▶ TV did have impact on children's cognitive development.
 - ▶ For vocabulary & spatial ability
 - ▶ Not for number & memory
- ▶ Computer's impact is still to be clarified.
- ▶ The impact on eyes ?
- ▶ Longitudinal study is necessary.



My position

- ▶ Not against e- media.
- ▶ Development has its timeline.
 - ▶ When time has not come, we might spoil the child's interest of learning.
- ▶ When is the proper time to provide IT for learning?



Invitation
&
Thanks for your attention!

Project supported by NSC

