IX CONVENCIÓN NAOS

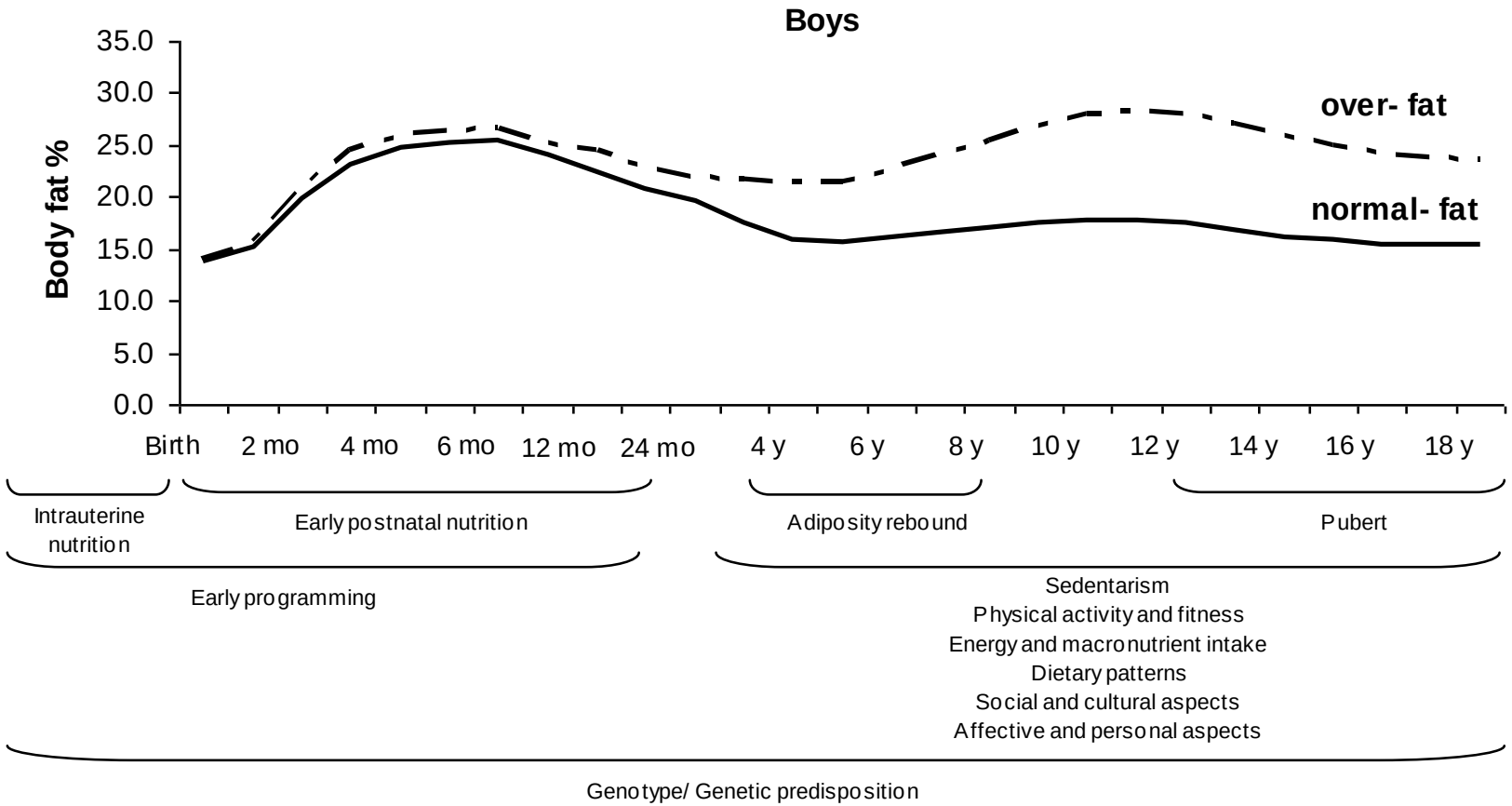
Sedentarismo y obesidad

Luis A. Moreno

Grupo GENUD

Universidad de Zaragoza

Factors influencing obesity development along life



(Moreno LA et al. World Rev Nutr Diet 2013;106:119-26)

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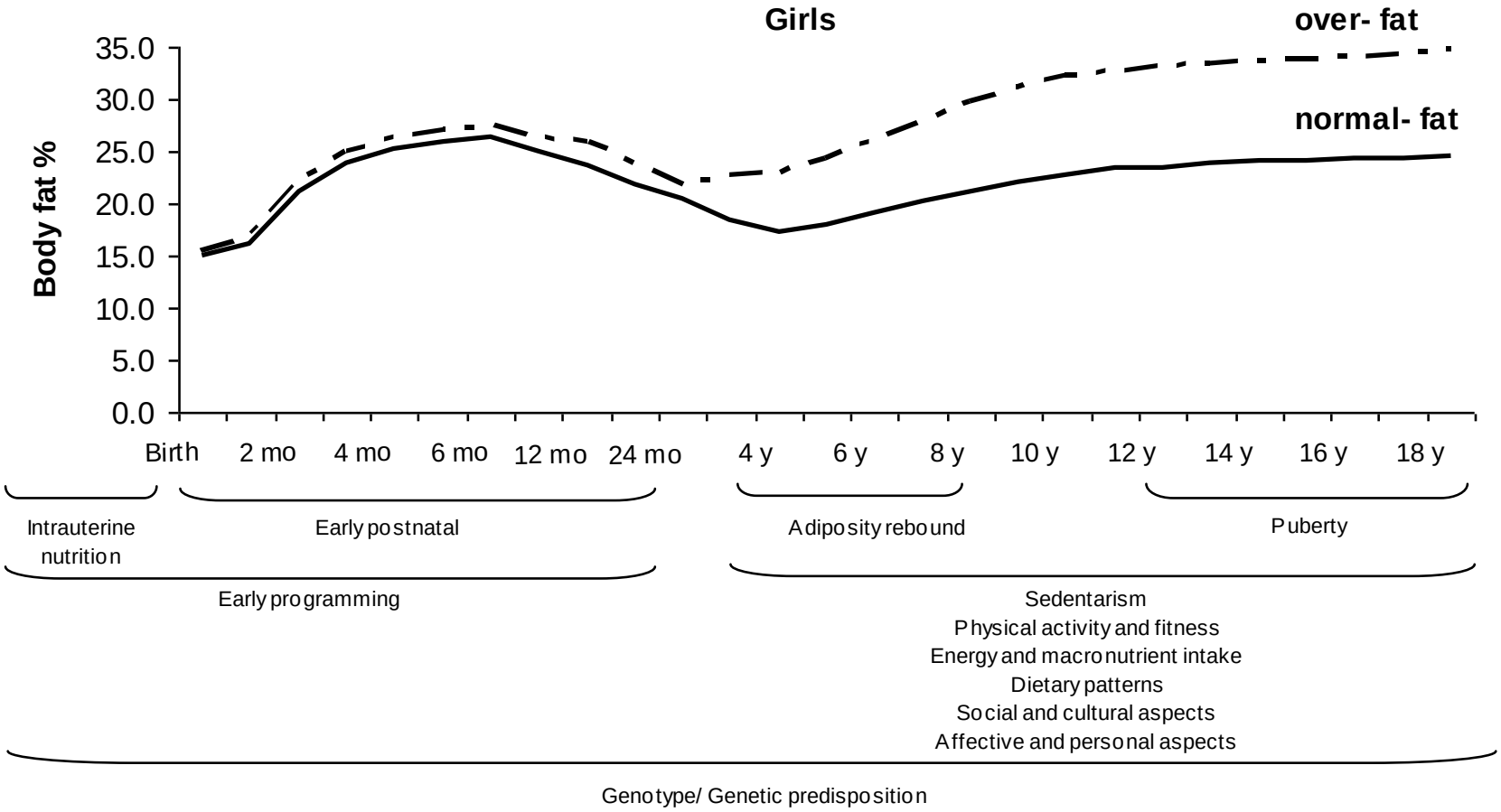
Factors influencing obesity development along life



(Moreno LA et al. World Rev Nutr Diet 2013;106:119-26)

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Masa grasa (%) en función de la permanencia diaria ante el televisor en adolescentes

	0-2 horas	2-4horas	>4horas	P
Varones	21.2	23.4	23.2	0.01
Mujeres	23.7	25.7	26.3	0.03

(Moreno LA et al. JAMA 1999; 280: 1230-1231)

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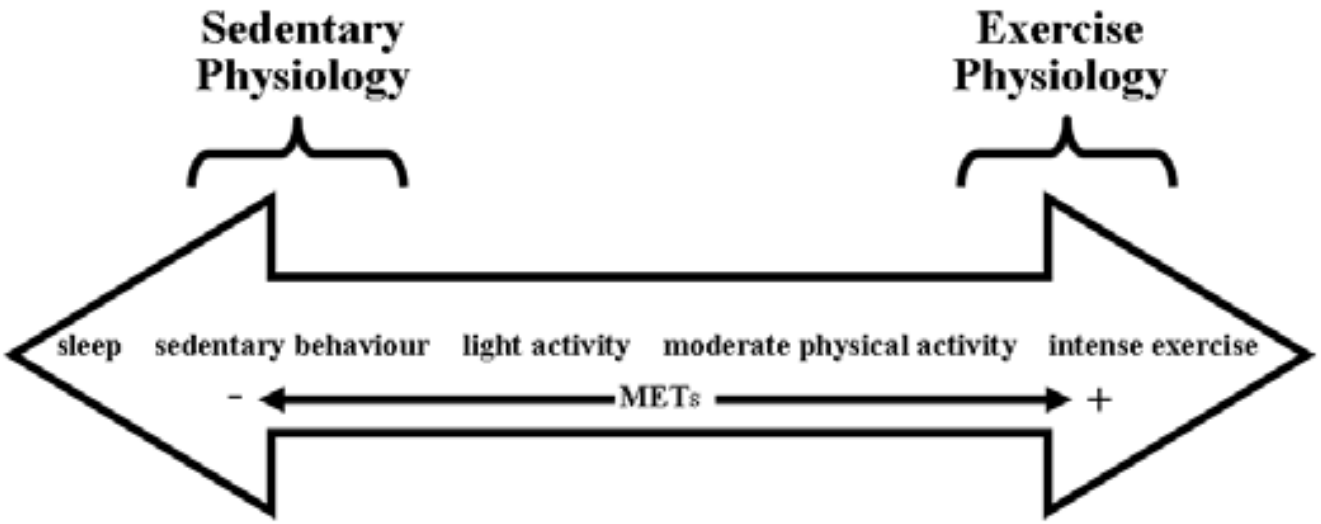
Sedentarismo vs actividad física

Health recommendations should also include **sedentary PA**

Health recommendations based on the accumulation of **moderate to vigorous PA**

Hamilton et al. 2004

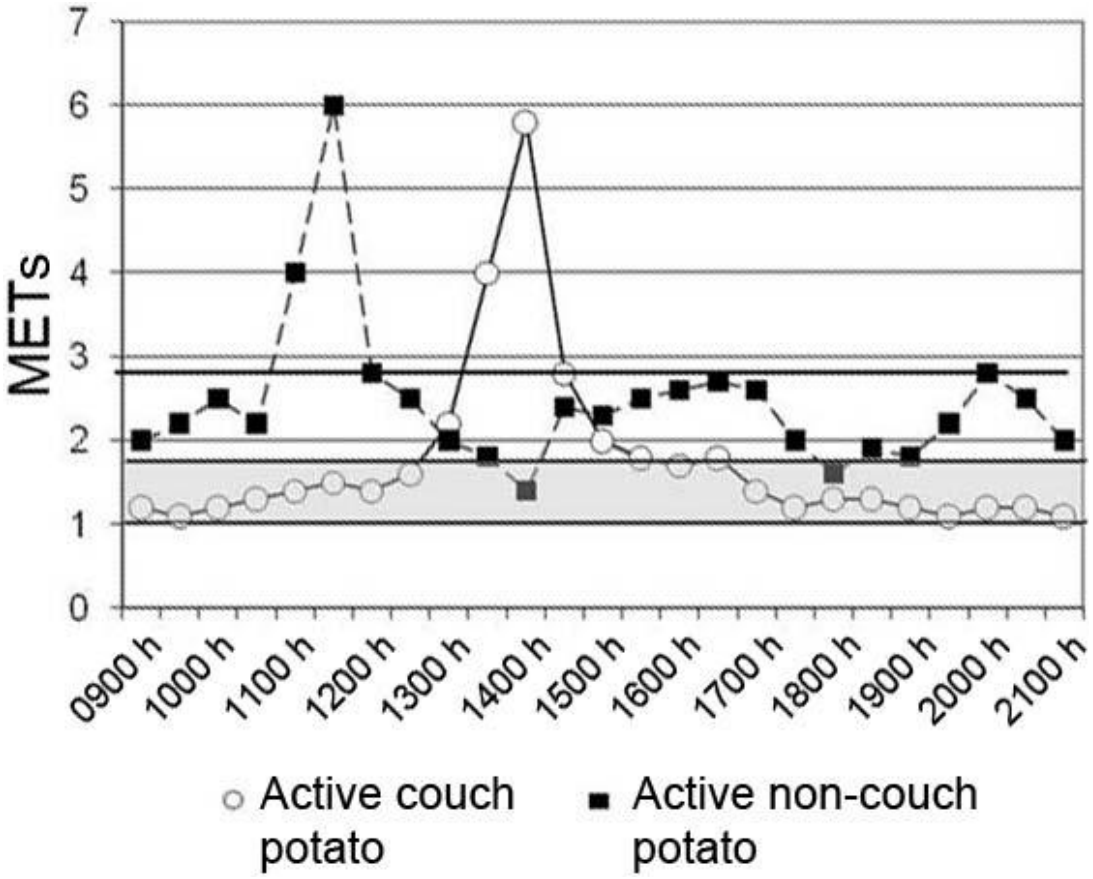
Morris et al. 1953



Sedentarismo vs actividad física

Sedentary behaviours vs meeting PA recommendations

Sedentary behaviours ≠ absence of moderate to vigorous physical activity (Pate et al. 2008)



ActiGraph GT1M

Sedentary behaviours assessment

- Direct observation
- Video recording
- Questionnaires
- Diaries
- Parental reporting

(Rey-López JP et al. In: Moreno LA et al. (Eds.). New York: Springer, 2011)

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Healthy Lifestyle in Europe by Nutrition in Adolescence

Sedentarism - reliability

Test-Retest values of sedentary behaviours (week days) and weighted Cohen´s Kappa (κ) reliability coefficients (n=183)

Sedentary behaviours (min/day)	Test	Retest	κ
Television viewing	77.6 ± 52.65	80.1 ± 52.8	0.71
Computer games	23.9 ± 45	21.7 ± 43.4	0.82
Console games	9.4 ± 26.5	10 ± 25.7	0.82
Internet non-study	53.5 ± 52	52.3 ± 49.3	0.86
Internet for study	25.6 ± 25.8	27.3 ± 27.2	0.46
Study	82.6 ± 58.4	88.6 ± 55.4	0.73

(Rey-López JP et al. Eur J Publ Health 2012; 22: 373-377)

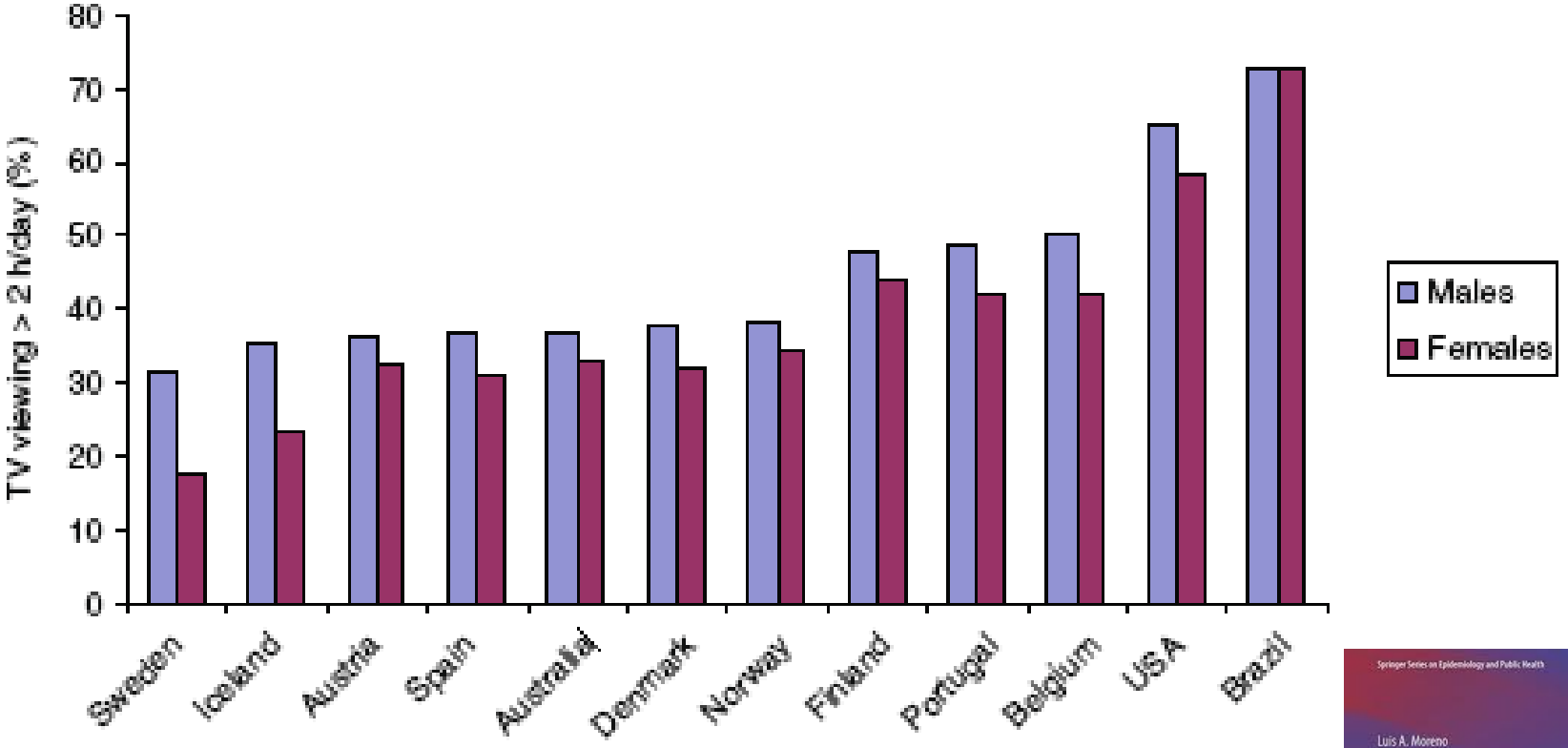
Sedentarism - reliability

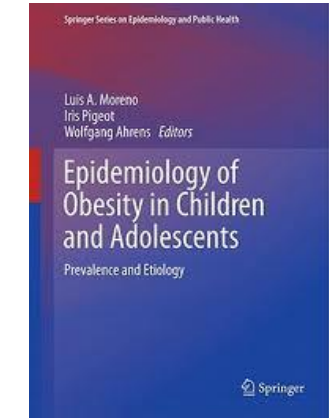
Test-Retest values of sedentary behaviours (weekend days) and weighted Cohen´s Kappa (κ) reliability coefficients (n=183)

Sedentary behaviours (min/day)	Test	Retest	κ
Television viewing	127 ± 65.9	133.3 ± 62	0.68
Computer games	53.9 ± 71.5	42.8 ± 60	0.79
Console games	32.1 ± 56.3	26.7 ± 45.2	0.81
Internet non-study	99.2 ± 70.2	98 ± 68	0.71
Internet for study	32.6 ± 38.5	36.2 ± 41.4	0.33
Study	102.2 ± 72.5	101.7 ± 67.5	0.82

(Rey-López JP et al. Eur J Publ Health 2012; 22: 373-377)

Prevalencia de los comportamientos sedentarios





(Rey-López JP et al. In: Epidemiology of obesity in children and adolescents. Moreno LA; Pigeot I, Ahrens W (Eds.) New York: Springer, 2011)

Total screen time in European children

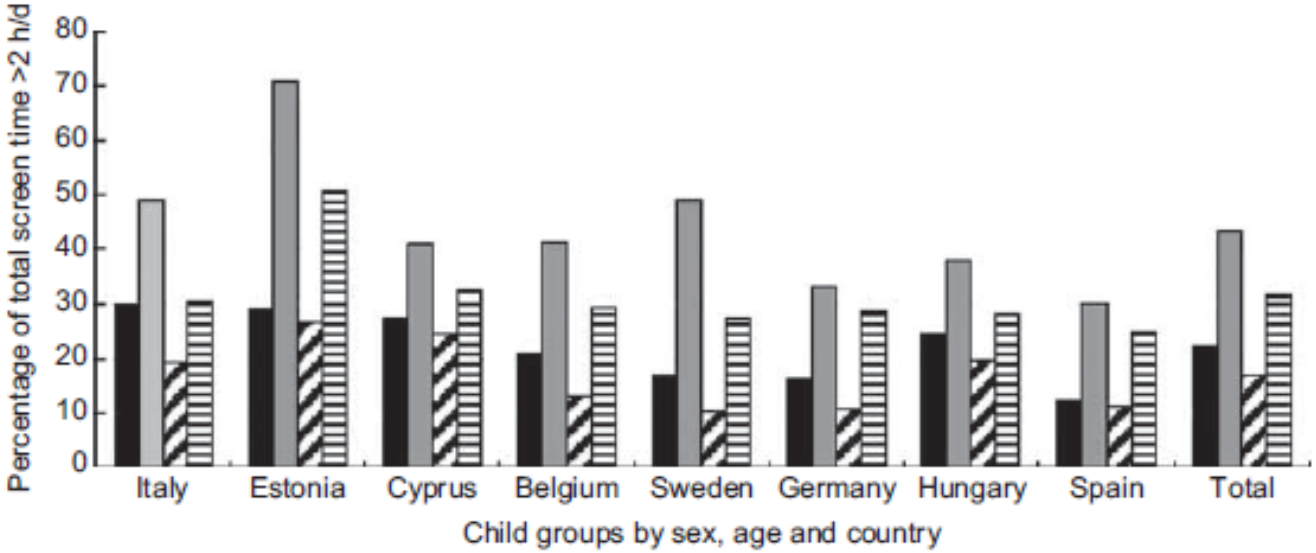


Fig. 1 Prevalence of weekly total screen time viewing >2 h/d among 15 330 children in eight European countries by sex and age group (■, younger males (2 to <6 years old); □, older males (6 to <10 years old); ▨, younger females (2 to <6 years old); ▤, older females (6 to <10 years old); IDEFICS (Identification and prevention of dietary- and lifestyle-induced health effects in children and infants) study, September 2007–June 2008

(Santaliestra-Pasías A et al. Publ Health Nutr 2014; 17: 2295-2306)

Sixth Framework Programme

Sedentarism

Proportion of adolescents having TV, computer and consoles at home and their bedrooms

Table 2
Proportions of adolescents having TVs, computers and consoles at home and in the bedroom (the HELENA study, Europe, 2007).

	At home								In the bedroom	
	0		1		2		≥3		Yes	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
Television	0.4	0.6	15.9	17.3	37.9	40.1	45.8	42.0*	63.4	54.2***
Computer	4.9	7.5	47.0	48.2	28.1	27.3	20.0	17.1*	62.0	48.9***
Console	25.0	43.1	44.3	37.9	17.1	11.6	13.6	7.4***	51.1	23.0***

Gender significant differences using Pearson Chi-square test (* $p<0.05$; ** $p<0.01$; *** $p<0.001$).

(Rey-López JP et al. Prev Med 2010; 51: 50-55)

Sedentarism

Factors predicting TV use more than two hours per day in adolescents

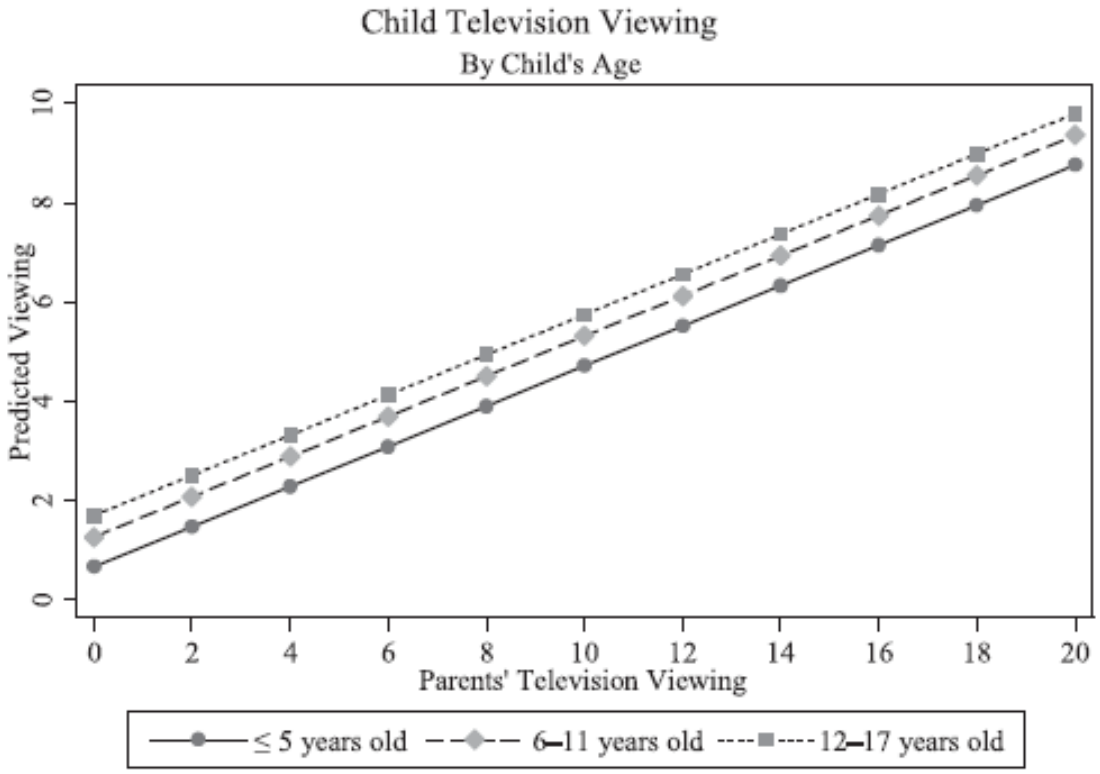
Table 4
Binary logistic regression analyses predicting TV viewing >2 h/day (the HELENA study, Europe, 2007).

Variable	OR	95% CI	*p*
Gender (boys ref)	1.11	0.94–1.32	0.21
Age (< 15 years ref)	0.78	0.65–0.92	0.004
TV in the bedroom	2.66	2.23–3.18	<0.001
Computer in the bedroom	0.57	0.48–0.68	<0.001
Console in the bedroom	1.92	1.61–2.28	<0.001

Adjusted OR by socioeconomic status (FAS, Family Affluence Scale).

(Rey-López JP et al. Prev Med 2010; 51: 50-55)

Predicted values of child television viewing by parent television viewing, by child age group, adjusted for all covariates



(Bleakley A et al. Pediatrics 2013; 132: e364-e371)

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Tracking of television viewing

TV viewing	Age 3–5 years at baseline				Age 6–11 years at baseline		Age 12–18 years at baseline	
	Hancox et al., 2004 and Landhuis et al., 2008[a]	Janz et al., 2005	Taylor et al., 2009	Salbe et al., 2002	Davison et al., 2005	Hesketh et al., 2007	Berkey et al., 2003	Motl et al., 2006
Length of follow-up								
1 year			BG = 0.56***				BG = 0.51nr	
2 years	BG = 0.35§		BG = 0.56***		G = 0.73nr			BG = 0.53nr
3 years		B = 0.46§ G = 0.44§				BG = 0.48nr		
4 years	BG = 0.33§							
5 years				BG = 0.22**				
6 years	BG = 0.21§							
8 years	BG = 0.19§							
10 years	BG = 0.16§							
16 years	BG = 0.08*							
27 years[a]	BG = 0.33***							

§$p<0.0001$, ***$p<0.001$, **$p<0.01$, *$p<0.05$, nr = p value not reported.
BG = assessed boys and girls together (i.e. total sample), B/G = boys and girls assessed separately, G = girls only.
[a] All values from Hancox et al. except for 27 years. The report by Landhuis et al. (2008) aggregates baseline weekday TV viewing for ages 5–15 years and correlates this with weekday TV viewing at aged 32 years. Follow-up, therefore, includes values from 17 to 27 years.

(Biddle S et al. Prev Med 2010; 51: 345-351)

Tracking of total screen time

Total screen time (ST)	Age 3–5 years at baseline	Age 6–11 years at baseline				Age 12–18 years at baseline
	Taylor et al., 2009	Hesketh et al., 2007	Janz et al., 2000	Pate et al., 1999	Laurson et al., 2008	Berkey et al., 2003
Length of follow-up						
1 year	BG = 0.56***		B = 0.56*			B I = 0.46nr
						B II = 0.50nr
			G = 0.59*			G I = 0.47nr
						G II = 0.51nr
18 months					B = 0.37**	
2 years	BG = 0.58***		B = 0.65*		G = 0.38**	
			G = 0.16 ns			
3 years		BG = 0.46nr	B = 0.40*	BG = 0.41***		
			G = 0.26 ns	B = 0.42***		
				G = 0.39***		
4 years			B = 0.48*			
			G = 0.16 ns			

§$p<0.0001$, ***$p<0.001$, **$p<0.01$, *$p<0.05$, nr = p value not reported.
BG = assessed boys and girls together (i.e. total sample), B/G = boys and girls assessed separately, G = girls only.
For reference Berkey et al. (2003), I = sample under 13 years of age, II = sample 13 years and over.

(Biddle S et al. Prev Med 2010; 51: 345-351)

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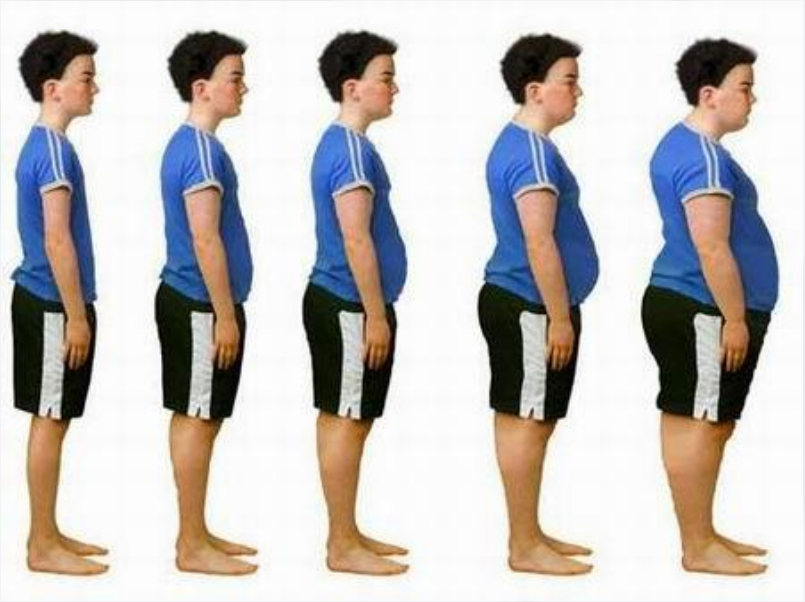
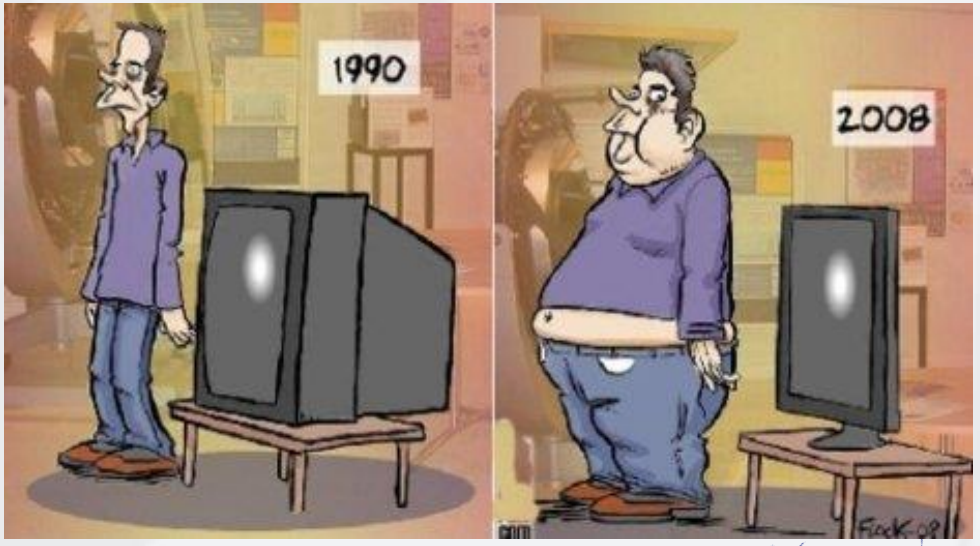
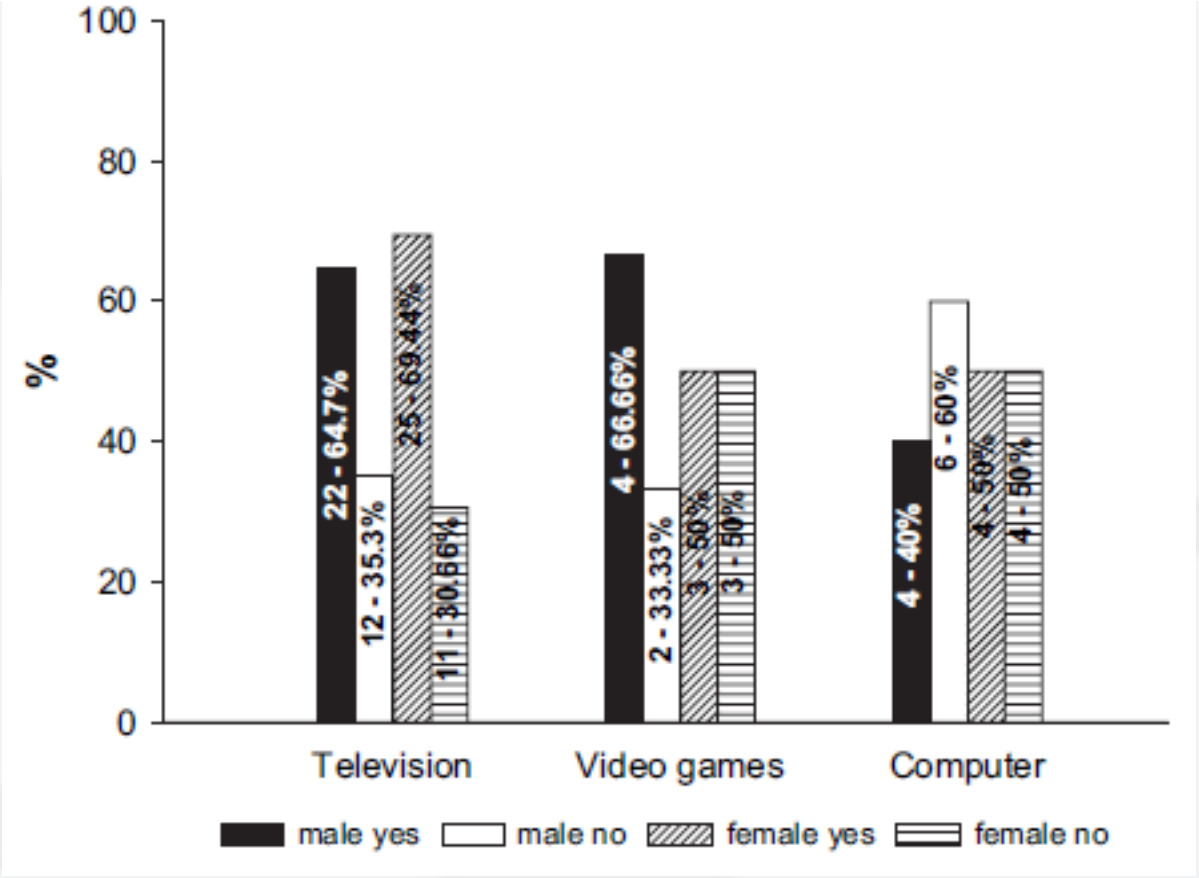
Sedentarism and obesity





Sedentarism

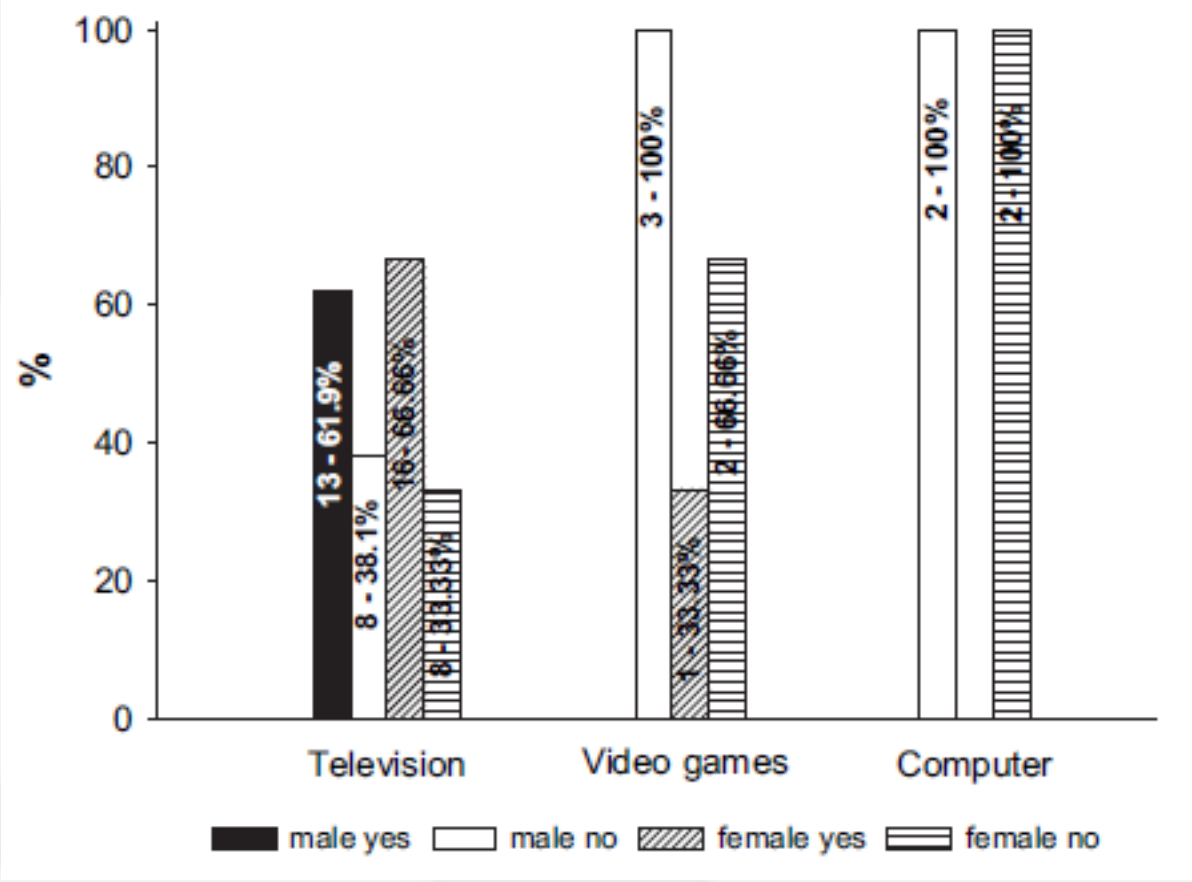
Proportion of cross-sectional studies with a significant relationship between sedentary behaviour and overweight



(Rey-López JP et al. Nutr Metab Cardiovas Dis 2008; 18: 242-251)

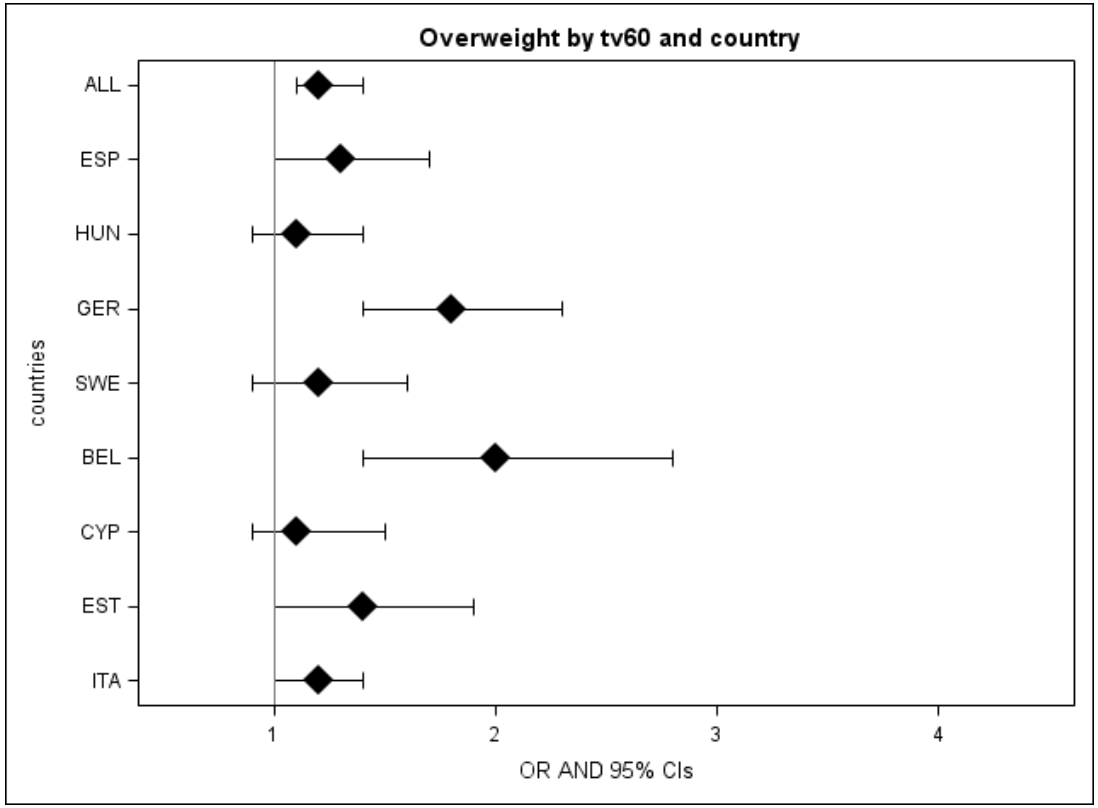
Sedentarism

Proportion of longitudinal studies with a significant relationship between sedentary behaviour and overweight



(Rey-López JP et al. Nutr Metab Cardiovas Dis 2008; 18: 242-251)

Odds ratios for overweight in 8 survey centers and in all countries combined for watching TV at least 60 minutes/day. The IDEFICS study



(Lissner L et al. Eur J Epidemiol 2012; 27: 705-715)

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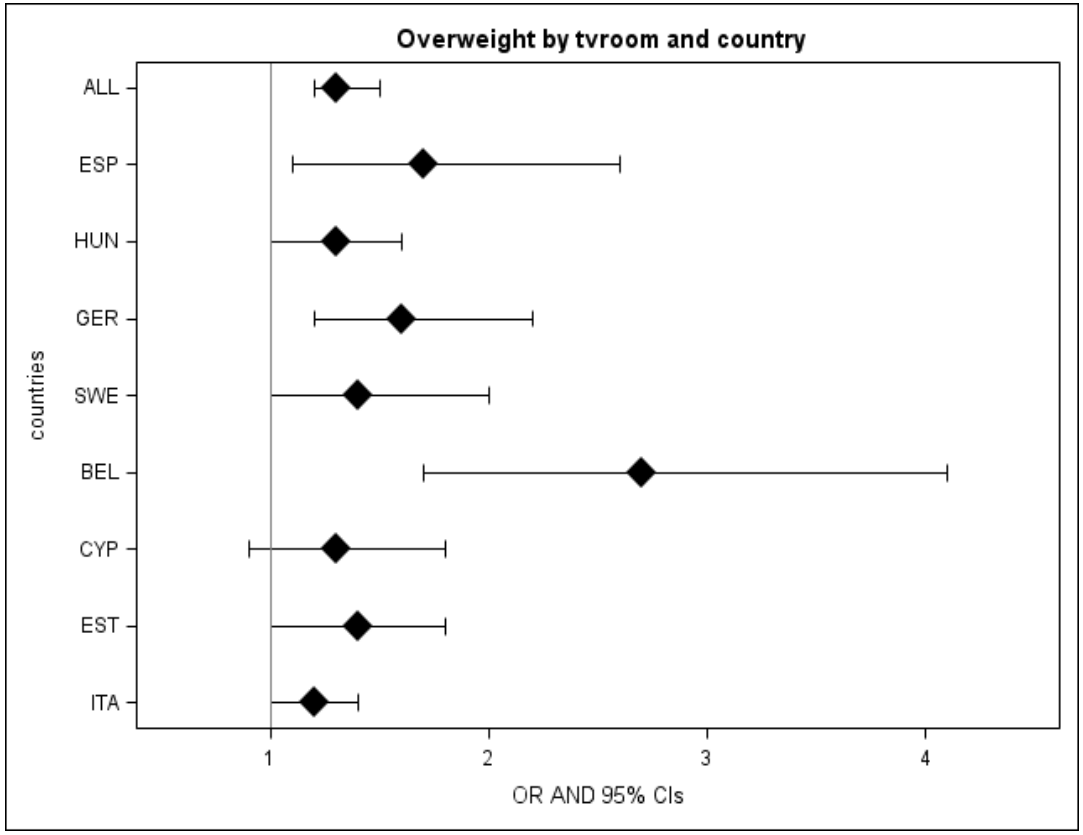
Odds ratios for overweight in 8 survey centers and in all countries combined for having a television/video/DVD in bedroom. The IDEFICS study



(Lissner L et al. Eur J Epidemiol 2012; 27: 705-715)

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Sedentarism

Crude odds ratio (OR) 95% CI for overweight/obesity among European adolescents by frequency of meals in front of television

Frequency of meals watching TV	Males (n=1599)		Females (n=1778)	
	OR	95% CI	OR	95% CI
Never	1		1	
Rarely	1.13	0.83-1.54	1.11	0.79-1.56
Not everyday 1-2 meals/week	1.19	0.75-1.89	1.02	0.60-1.71
Not everyday >2 meals/week	1.34	0.89-2.02	1.43	0.93-2.21
Everyday	1.42	1.05-1.92	1.90	1.38-2.61

Product Categories of Promotional Spots Aimed at Children

Food-Related Advertising on Preschool Television: Building Brand Recognition in Young Viewers

Susan M. Connor

Pediatrics 2006;118;1478-1485
DOI: 10.1542/peds.2005-2837

Product Advertised	No. (%)			
	Disney	PBS	Nickelodeon	Total
Fast food	9 (36)	23 (82)	18 (17)	50 (32)
Toys	4 (16)	2 (7)	16 (15)	22 (14)
Cereal	0	0	18 (17)	18 (11)
Candy/snacks	0	0	8 (8)	8 (5)
Other child-oriented advertisements[a]	12 (48)	3 (11)	44 (42)	59 (38)
Total	25	28	104	157

[a] Media (movies, CDs, and software) and entertainment destinations (eg, theme parks and live stage shows).

(Connor SM. Pediatrics 2006; 118: 1478-1485)

SSB and sedentary behaviors

Sugar sweetened beverages intake (ml) according to sedentary behaviors in male adolescents

	< 2 hours	2 – 4 hours	> 4 hours	P
TV week days	340.0 (12.61)	433.6 (20.98)	509.1 (45.68)	< 0.05
TV weekend	340.1 (16.15)	375.4 (16.76)	453.0 (26.58)	< 0.05
Computer week days	350.7 (11.60)	433.0 (27.94)	590.4 (51.75)	< 0.05
Computer weekend	344.6 (13.58)	353.6 (21.4)	514.4 (27.7)	< 0.05
Internet week days	358.3 (11.4)	419.7 (33.4)	593.5 (51.1)	< 0.05
Internet weekend	344.3 (12.30)	428.9 (24.85)	518.5 (37.52)	< 0.05

(Santaliestra-Pasías A et al. Arch Pediatr Adolesc Med 2012; 166: 1010-1020)

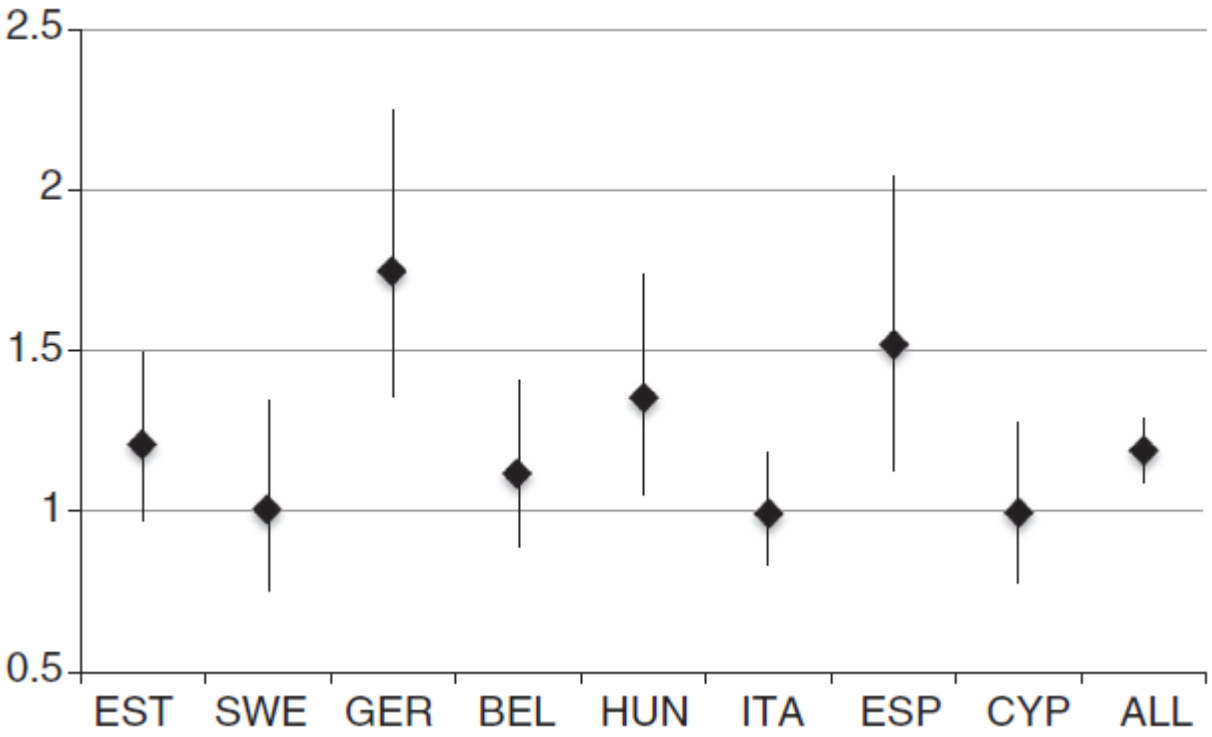
SSB and sedentary behaviors

Sugar sweetened beverages intake (ml) according to sedentary behaviors in female adolescents

	< 2 hours	2 – 4 hours	> 4 hours	P
TV week days	197.9 (7.53)	239.0 (12.31)	323.8 (26.65)	< 0.05
TV weekend	196.4 (9.42)	215.2 (9.60)	262.2 (16.40)	< 0.05
Computer week days	208.5 (6.56)	297.6 (2.48)	275.2 (46.75)	< 0.05
Computer weekend	205.5 (6.93)	257.3 (18.17)	270.4 (26.68)	< 0.05
Internet week days	204.7 (6.96)	259.2 (17.03)	278.7 (30.39)	< 0.05
Internet weekend	200.6 (7.63)	231.1 (13.95)	284.6 (15.53)	< 0.05

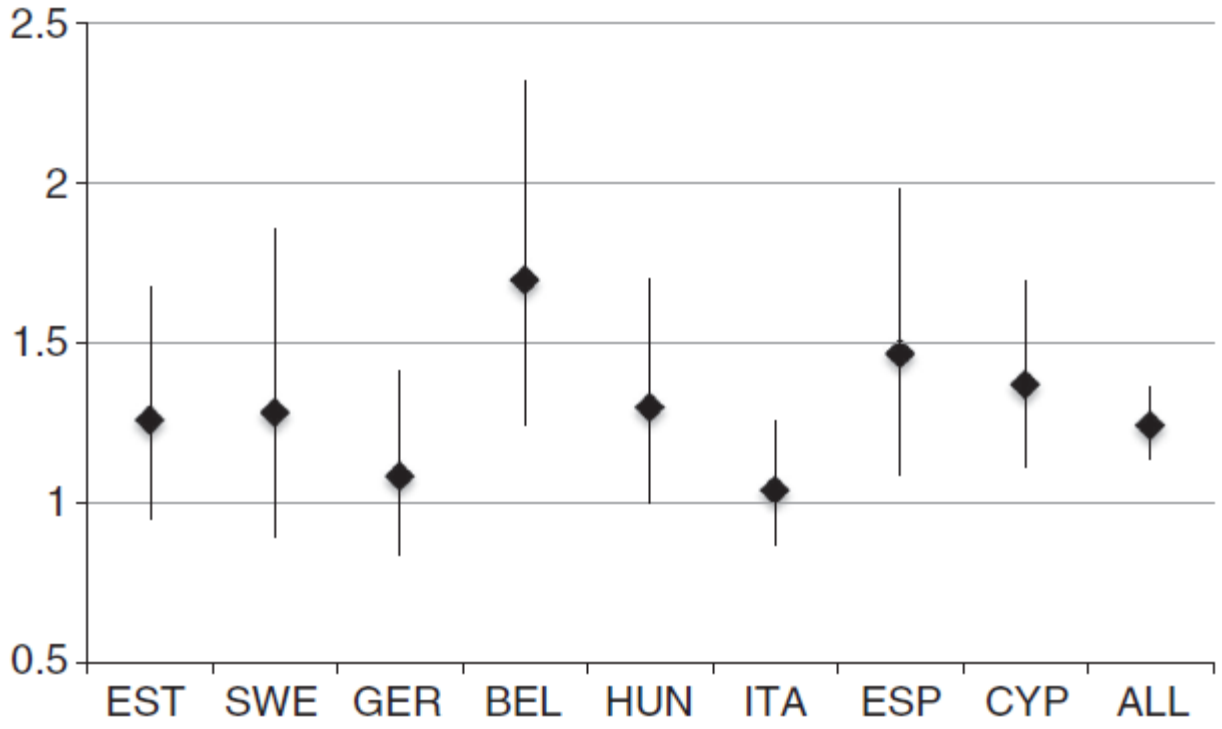
(Santaliestra-Pasías A et al. Arch Pediatr Adolesc Med 2012; 166: 1010-1020)

OR and 95% CI for relative increase in SSB consumption by TV viewing in hours per day



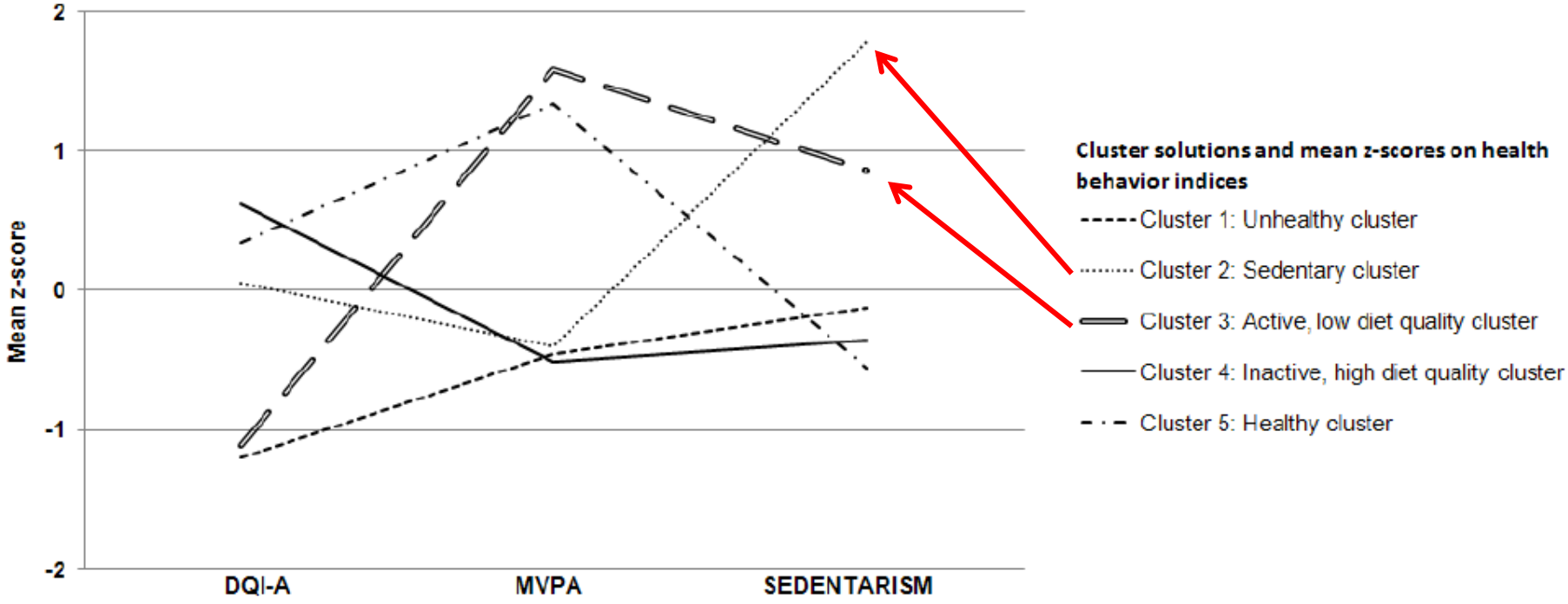
(Olafsdottir S et al. Eur J Clin Nutr 2014; 68: 223-228)

OR and 95% CI for being in the highest quintile of relative increase in WHtR for each hour per day of TV viewing



(Olafsdottir S et al. Eur J Clin Nutr 2014; 68: 223-228)

Clustering patterns of physical activity, sedentary and dietary behaviour in adolescents



(Ottevaere C et al. BMC Publ Health 2011; 11: 328)

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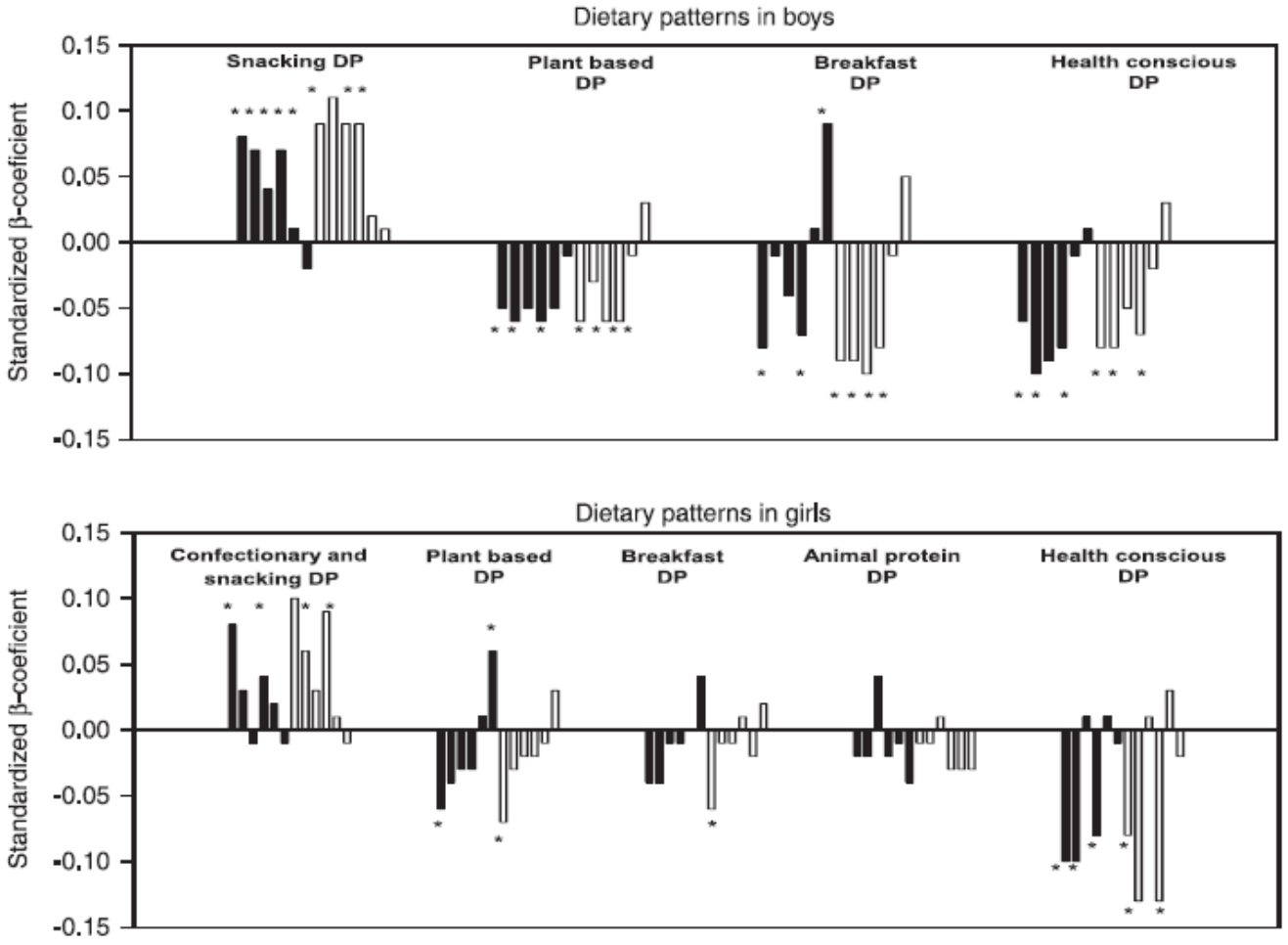
Standardized regression coefficients between individual sedentary behaviours during weekdays and weekend days, and mean scores of DPs in boys and girls



DP: dietary patterns

* Significant differences were found between each category (>4h/day) compared with the reference category (<2h/day) ($p<0.05$)

■ TV, Computer, Video games, Internet, Internet for study and Study respectively, during weekdays (>4h/day)

□ TV, Computer, Video games, Internet, Internet for study and Study respectively, during weekend days (>4h/day)

(Santaliestra-Pasías A et al. Eur J Clin Nutr 2014; 68: 300-308)

Binary logistic regression analyses between clusters of obesity-related behaviors and excessive BMI, abdominal adiposity and body fat

Clusters	*BMI z-score OR (95%CI)*	*Waist circumference z-score OR (95%CI)*	*Sum of skinfolds z-score) OR (95%CI)*
Boys			
Cluster 1	1.04(0.76,1.41)	0.95(0.70,1.30)	1.05(0.75,1.45)
Cluster 2	**1.33(1.01,1.74)**	**1.41(1.06,1.86)**	1.31(0.97,1.78)
Cluster 3	1.22(0.90,1.65)	1.09(0.80,1.49)	1.11(0.80,1.54)
Cluster 4	0.95(0.67,1.35)	0.72(0.49,1.06)	0.79(0.53,1.17)
Cluster 5	0.98(0.74,1.30)	0.93(0.69,1.24)	0.99(0.72,1.36)
Cluster 6	Ref	Ref	Ref
Girls			
Cluster 1	0.85(0.63,1.13)	0.79(0.59,1.07)	0.85(0.63,1.16)
Cluster 2	1.03(0.80,1.33)	1.25(0.96,1.62)	1.08(0.83,1.42)
Cluster 3	1.13(0.84,1.51)	0.96(0.70,1.30)	1.22(0.90,1.65)
Cluster 4	0.88(0.64,1.21)	0.78(0.55,1.10)	0.82(0.58,1.15)
Cluster 5	0.85(0.66,1.10)	0.85(0.65,1.11)	0.85(0.65,1.12)
Cluster 6	Ref	Ref	Ref

(Santaliestra-Pasías A et al. Eur J Clin Nutr 2015; 69: 811-816)

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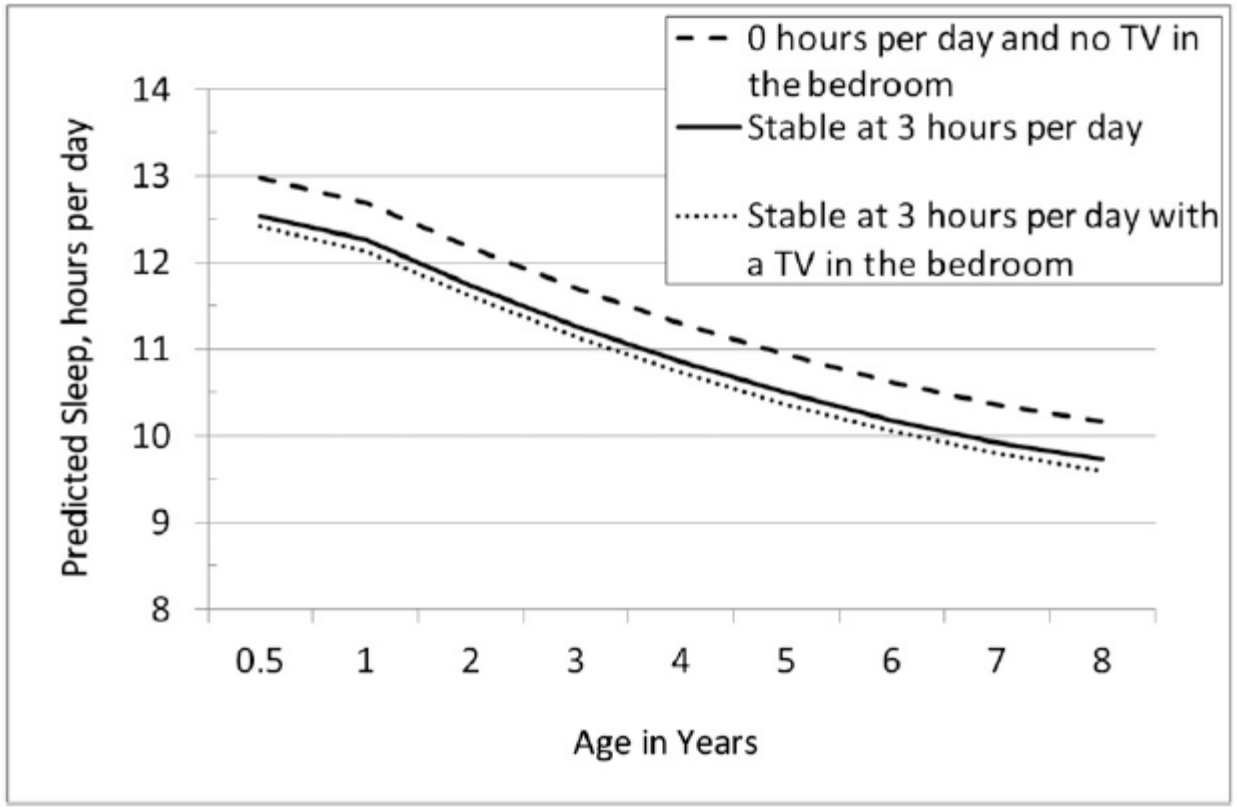
Predicted sleep time by TV watching and bedroom TV in non-Hispanic white boys



(Cespedes EM et al. Pediatrics 2014; 133: e1163-e1171)

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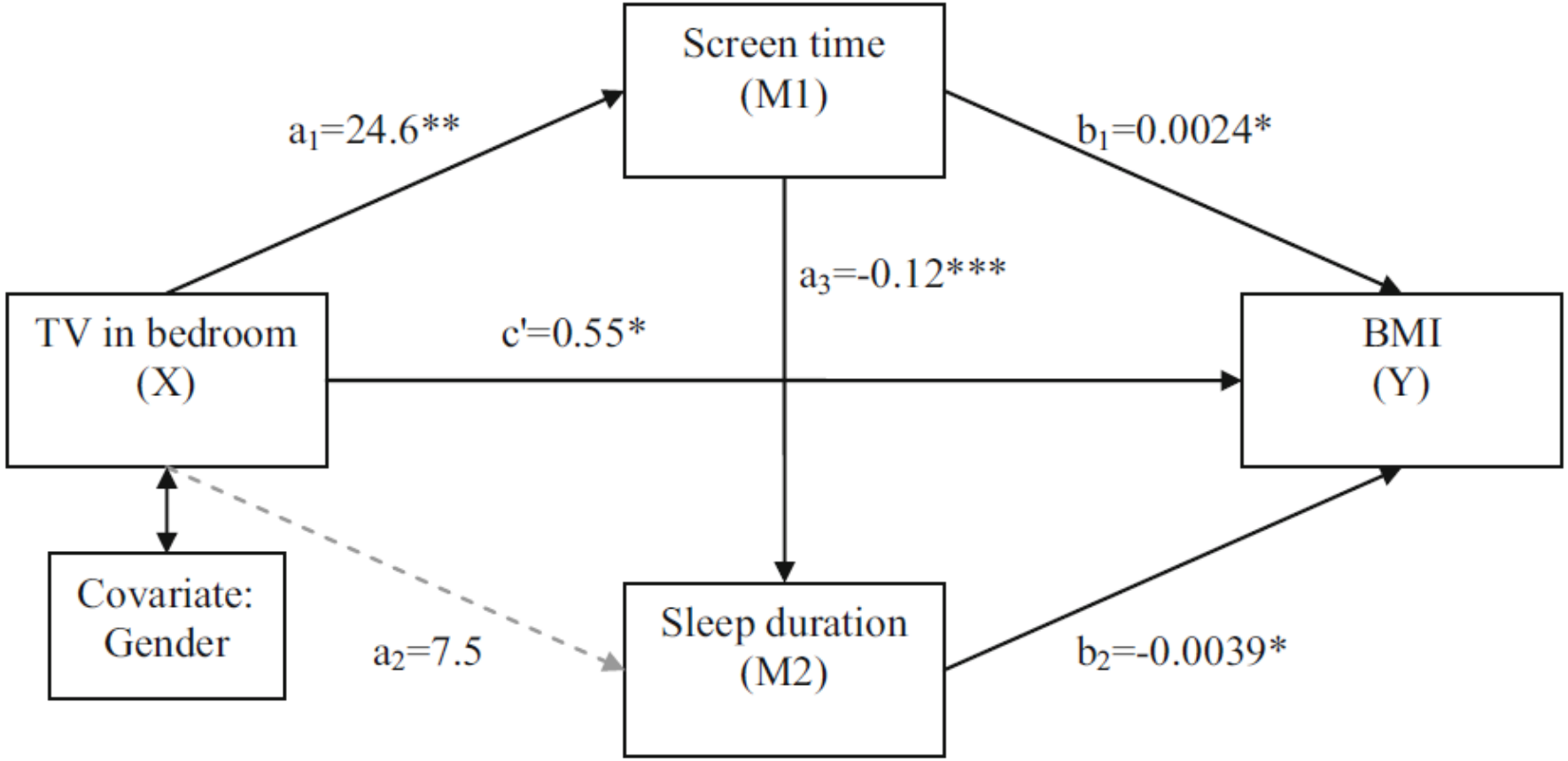
A multiple mediator model with television (TV) in the child's bedroom (no=0, yes=1), screen time (minutes/day), sleep duration (minutes/day) and BMI



(Sijtsma A et al. Eur J Pediatr 2015; 174: 631-639)

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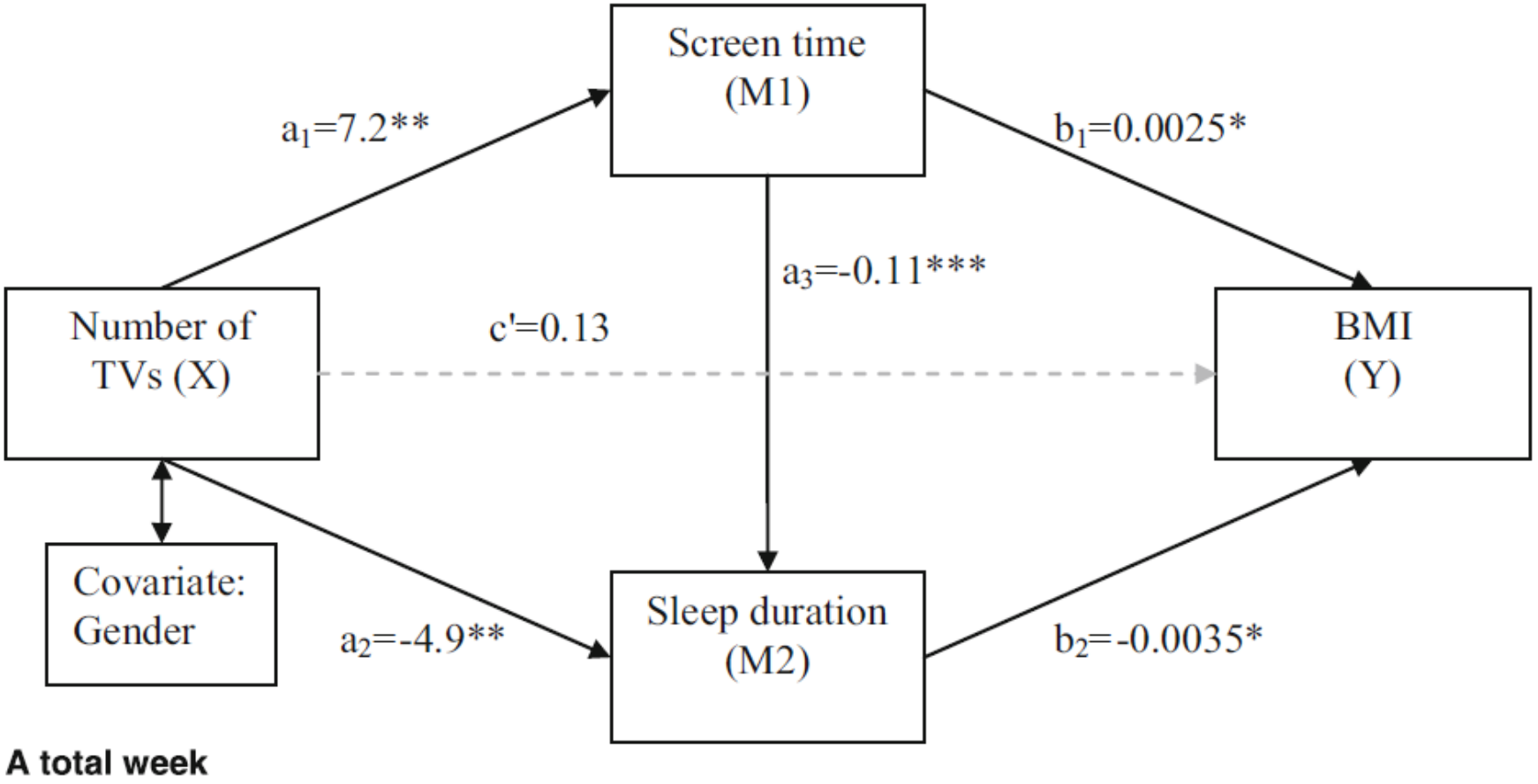
A multiple mediator model with number of televisions (TVs), screen time (minutes/day), sleep duration (minutes/day) and BMI



(Sijtsma A et al. Eur J Pediatr 2015; 174: 631-639)

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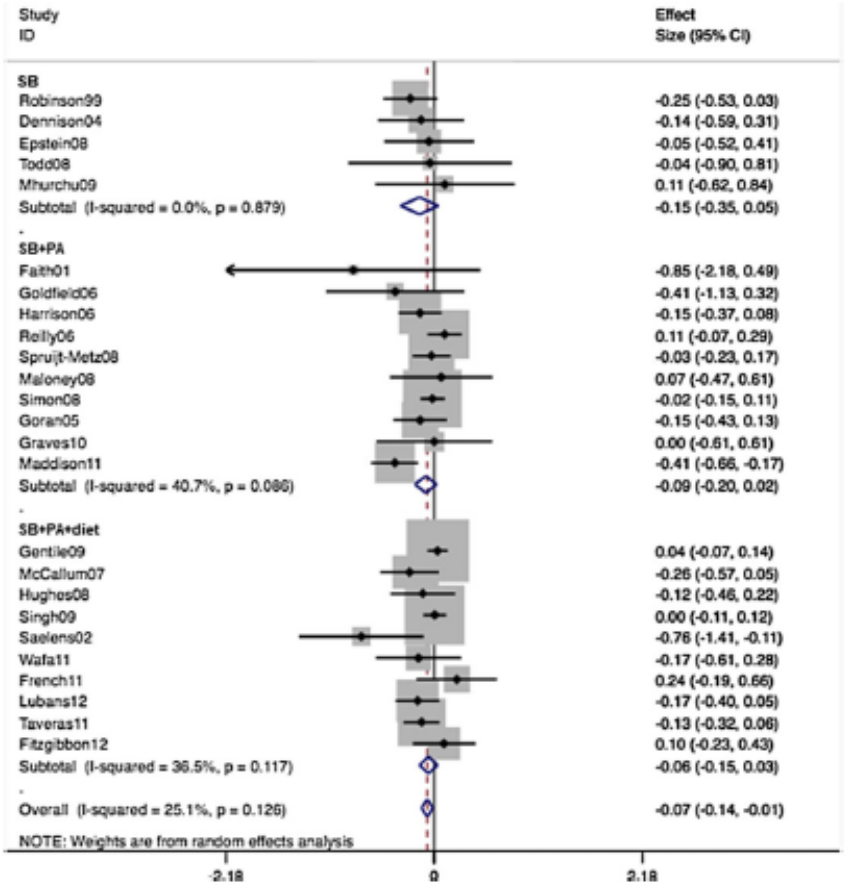
Effect size on body mass index reduction by sedentary behaviour intervention type



(Liao Y et al. Obes Rev 2014; 15: 159-168)

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Sedentary behaviour guidelines

Canadian Sedentary Behaviour Guidelines for Children and Youth

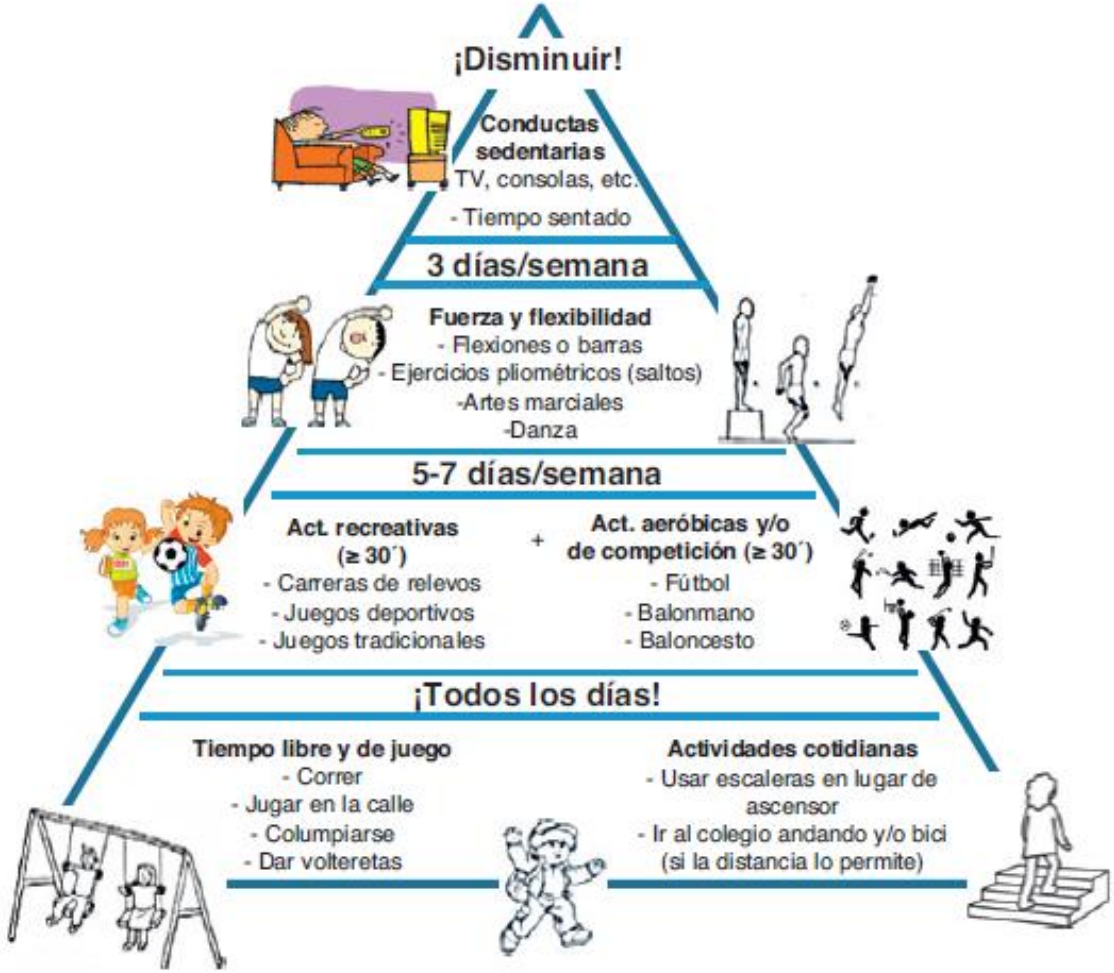
Mark S. Tremblay, Allana G. LeBlanc, Ian Janssen, Michelle E. Kho, Audrey Hicks, Kelly Murumets, Rachel C. Colley, and Mary Duggan

Children (aged 5–11 years) and youth (aged 12–17 years) should minimize the time being sedentary:

- **Limiting recreational screen time to no more than 2 h per day**
- **Limiting sedentary (motorized) transport, extended sitting time, and time spent indoors throughout the day**

(Tremblay MS et al. Appl Physiol Nutr Metab 2011; 36: 59-64)

Pirámide de actividad física en niños y adolescentes



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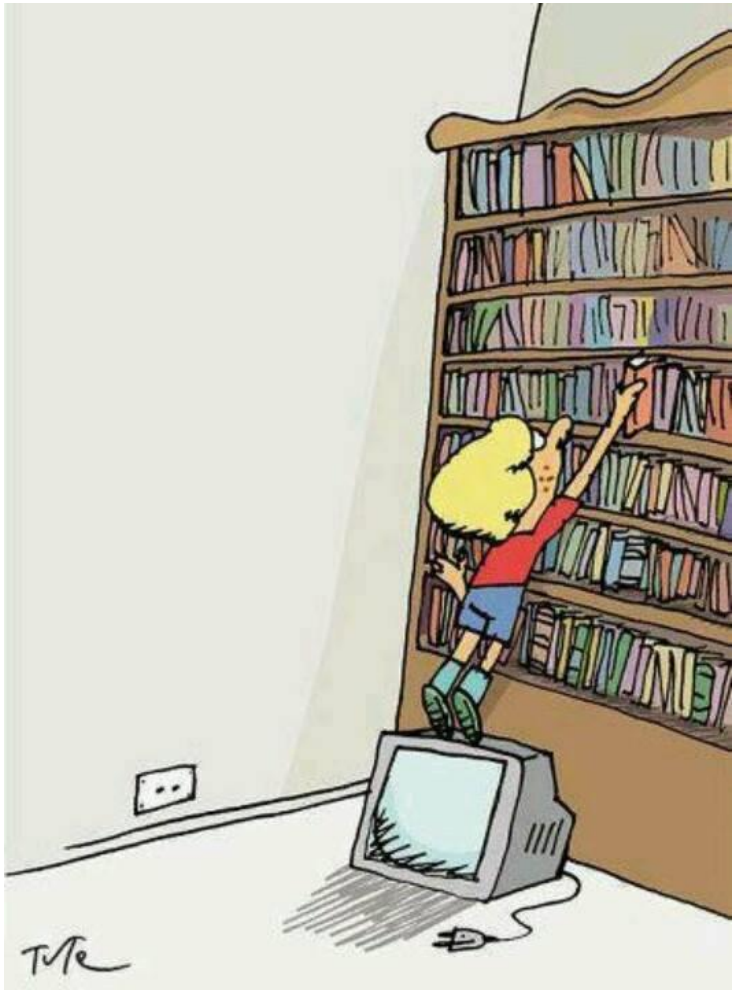
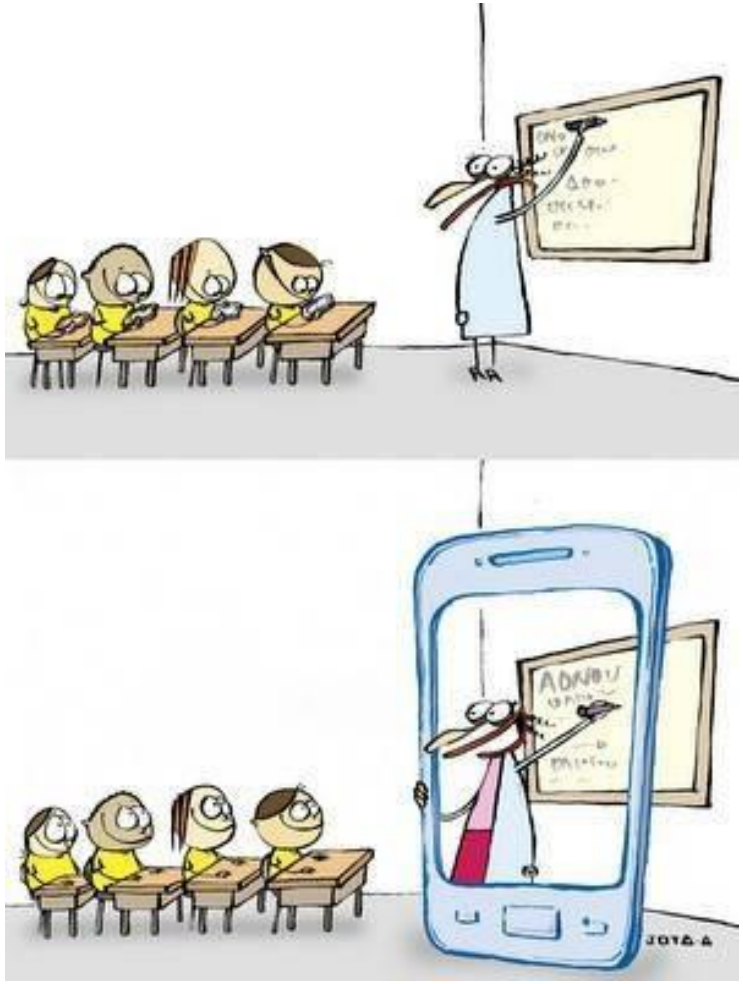
¡Muchas gracias por la atención!





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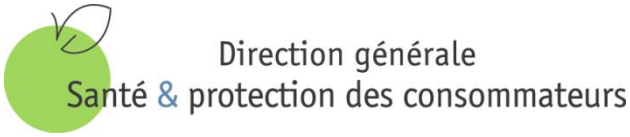
SIXTH FRAMEWORK
PROGRAMME


SÉPTIMO
PROGRAMA MARCO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Agradecimientos