

The Effect of a Memory-Game with Images of Vegetables on Children's Vegetable Intake: an experimental study

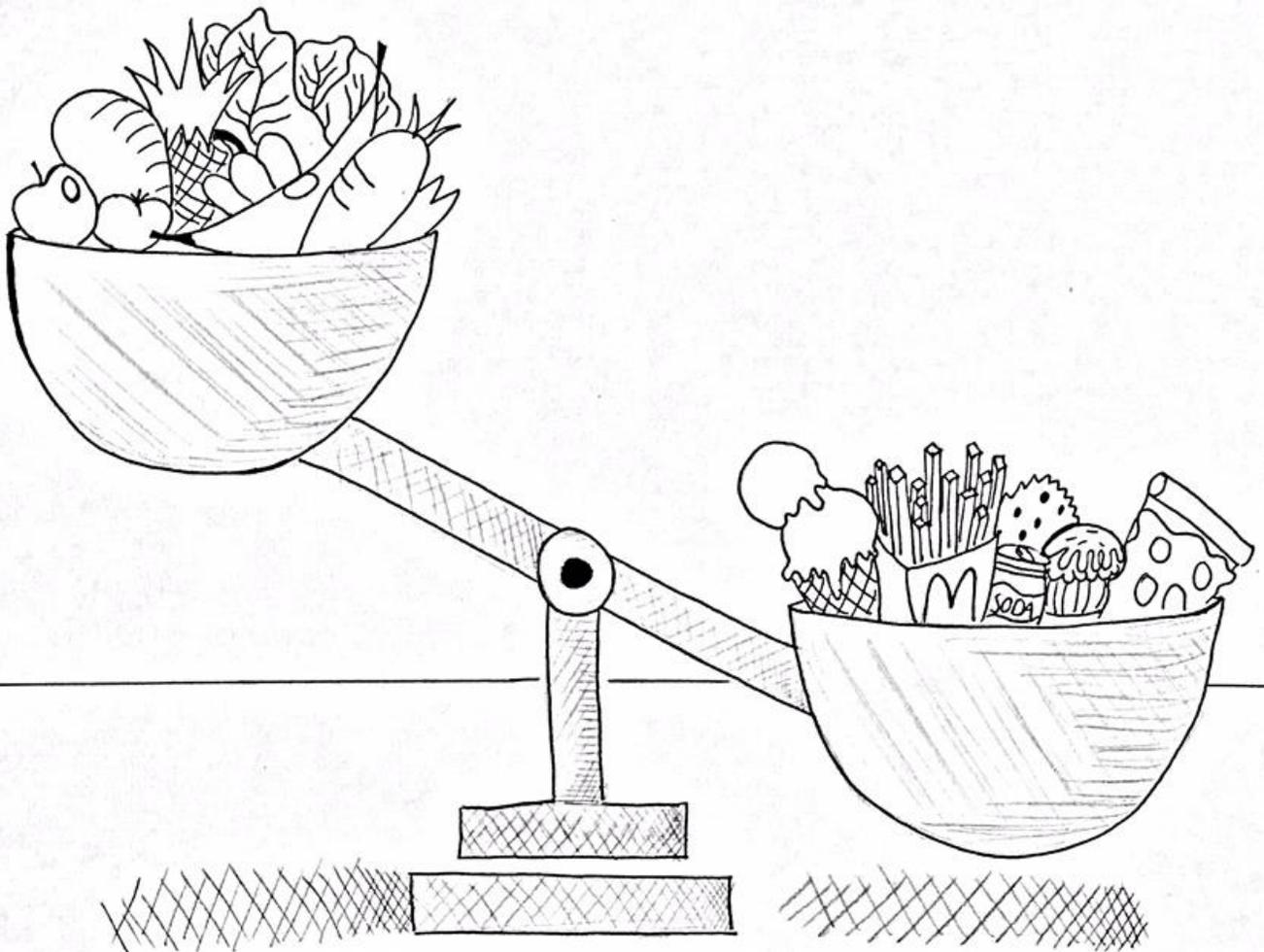
Illustrations by: Merel Hoosemans

Original paper written by: F. Folkvord and A. Laguna-Camacho

What is the problem?

Children consume too much energy-dense snack food and not enough fruits and vegetables.

(RIVM, 2016; INSP, 2016)



Original paper: Folkvord, F., & Laguna-Camacho, A. (2019). The effect of a memory-game with images of vegetables on children's vegetable intake: An experimental study. *Appetite*, 134, 120–124. doi:10.1016/j.appet.2018.12.023

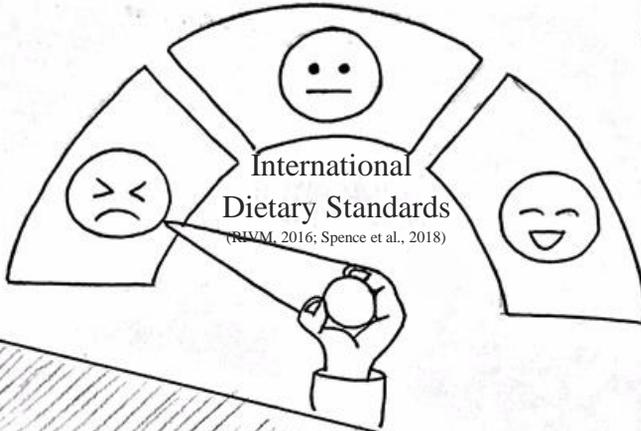
Online access via: <https://www.sciencedirect.com/science/article/abs/pii/S0195666318314338>

Project created for the class Visual Thinking and Composition, Spring 2020

Tilburg University, Department of Communication and Cognition

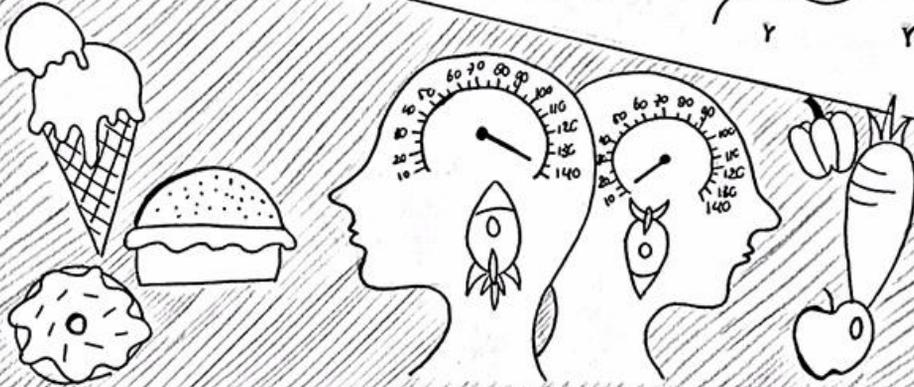
Instructor: Neil Cohn, neilcohn@visuallanguagelab.com, www.visuallanguagelab.com

Previous research has shown...



Oh...
The eating behavior
which I develop
during my childhood
will track into my
adulthood...

(Kaikkonen et al., 2013; Patton et al., 2011; Reddy & Katan, 2004; Story et al., 2002)

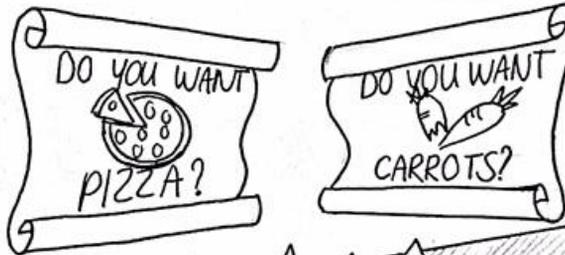


“Exposure to priming food cues of palatable foods can lead to consumption by activating automatic eating responses”

(Castellanos et al., 2009; Folkvord et al., 2016b; Nederkoorn & Jansen, 2002; Stice et al., 2009; Stice et al., 2009b, p.120)

“[...] increasing availability and priming children with cues of healthier foods can stimulate them to select healthier Food”

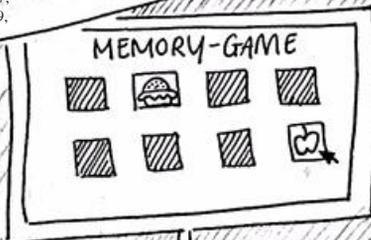
(Blanchette & Brug, 2005; Folkvord et al., 2017; Hoffman et al., 2009, p.121)



Idea of current experiment...

Fun & enjoyment experienced during playing could be automatically transferred into more positive associations about healthier food

(Branowski et al., 2013)



Children ate more energy-dense food, but no more fruit, only when there was no unhealthy food included in the experiment

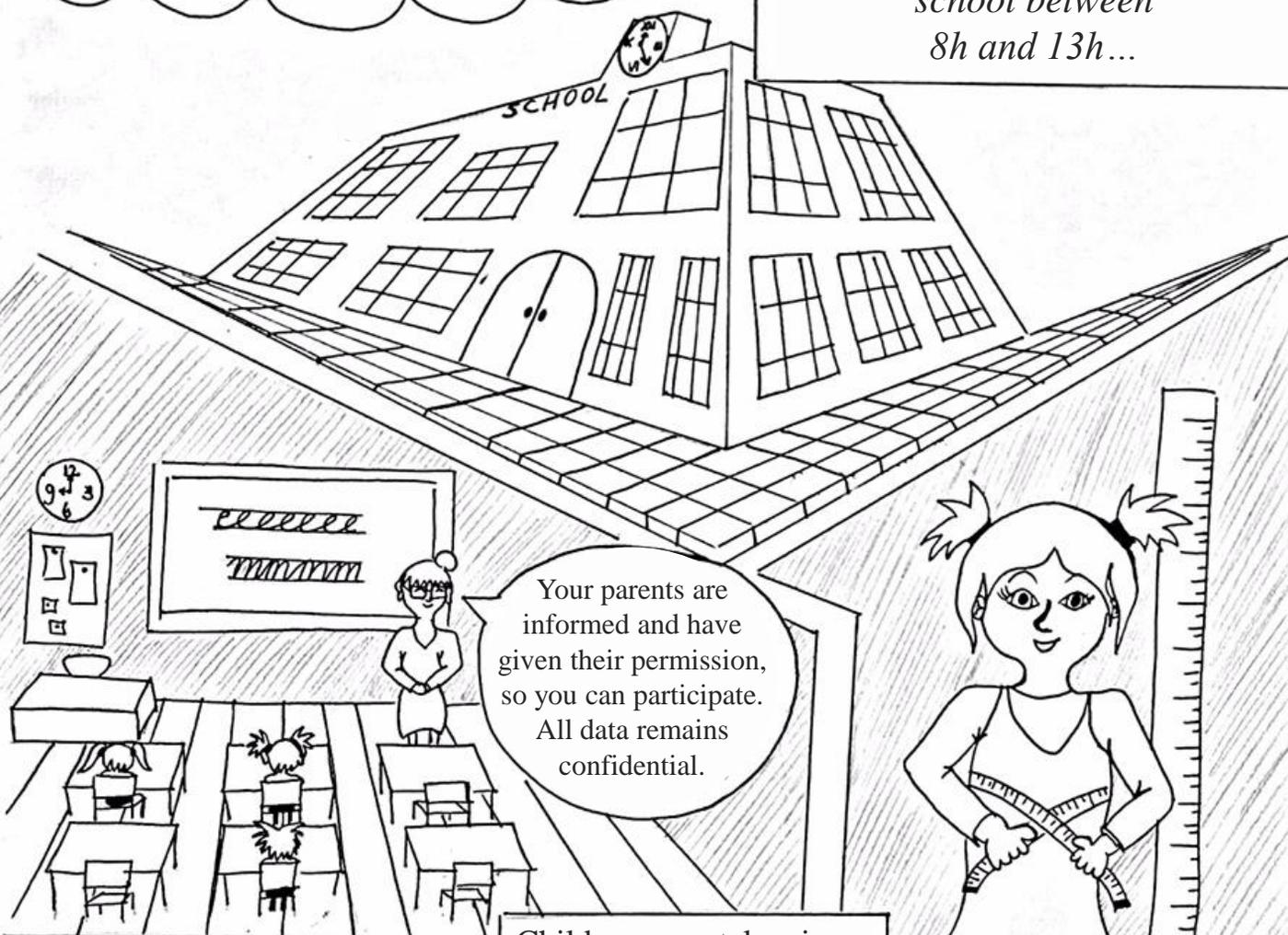
(Folkvord, Anschutz, Buijzen, & Valkenberg, 2013; Folkvord, Anastasiadou, & Anschutz, 2017)

I'm playing a fun online memory-game



The current experiment...

Mexico, November 2016
Somewhere on a primary
school between
8h and 13h...

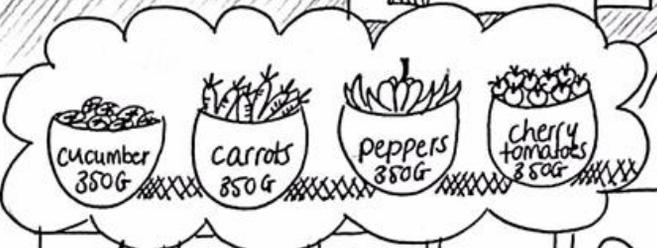
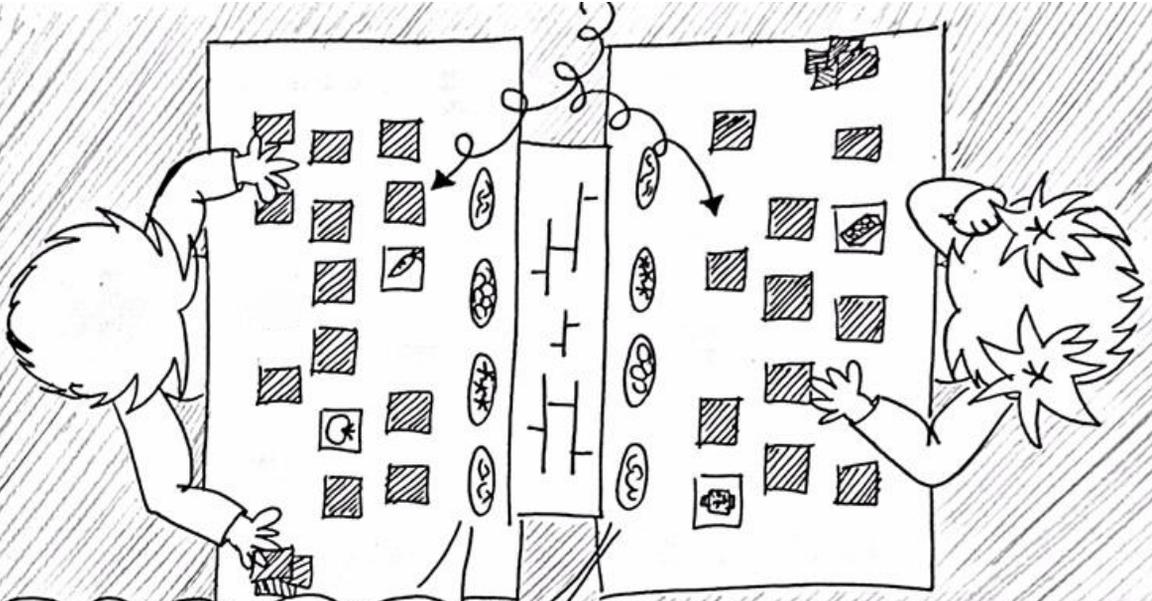


Children were taken in pairs from their class. Their BMI was measured, and they had to fill out a questionnaire



Questionnaire ①

1. What is your gender?
2. What is your age?
3. In which class are you?
4. Rate your extent of hungry:
1-2-3-4-5-6-7-8-9-10
not hungry at all very hungry



“You are going to play a memory-game with ten pairs of cards. You should try to finish the game as fast as possible. You have to turn one card, and then another card. If they match, you can take these two cards and put them aside. If they do not match, you can start again as many times as you need. If you collect all the ten pairs, you are finished. You can eat while playing the game. Do you have any questions?”

(p.121)

After you are finished, you have a short break, you can read a magazine, and you can still eat as much as you like! And finally...



Final questionnaire
 1. Rate your attitude toward the game
 * nice
 * stupid
 * cool
 * boring
 1-2-3-4-5-6-7-8-9-10
 not at all a lot

The experimenter weighed the amount of vegetables before and after the experiment per child

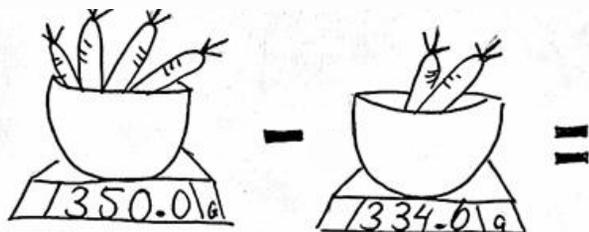


Table 2
Pearson's correlations between the model variables.^a

	Gender	Baseline hunger	BMI	Age	Attitude to the game
Gender (boy = 1, girl = 0)					
Baseline hunger (cm on VAS)	.07				
BMI (kg/m ²)	-.20 ^b	.03			
Age (y)	-.03	-.02	.33 ^b		
Attitude to the game	-.05	.03	-.04	-.02	
Vegetable intake (g)	.09	.28 ^b	.18	.19	.66 ^c

^a (N = 100).

^b p < 0.05.

^c p < 0.01.

Results

Table 1
Variables measured in each condition.^a

	Non-food memory-game (n = 53)	Vegetable memory-game (n = 47)
Gender (boy)	47%	36%
Baseline hunger (cm on VAS)	4.4 ± 5.3	3.6 ± 4.8
BMI (kg/m ²)	19.7 ± 4.4	18.1 ± 3.5
Age (y)	8.9 ± 1.7	8.6 ± 1.5
Attitude to the game	5.3 ± 1.3	5.5 ± 1.2
Cucumbers (g)	15.8 ± 19.5	11.1 ± 11.1
Carrots (g)	17.0 ± 18.6	15.8 ± 16.8
Peppers (g)	1.9 ± 3.1	1.9 ± 3.3
Tomatoes (g)	12.2 ± 2.0	12.1 ± 2.2
Vegetable intake (g)	45.7 ± 31.9	36.3 ± 27.7

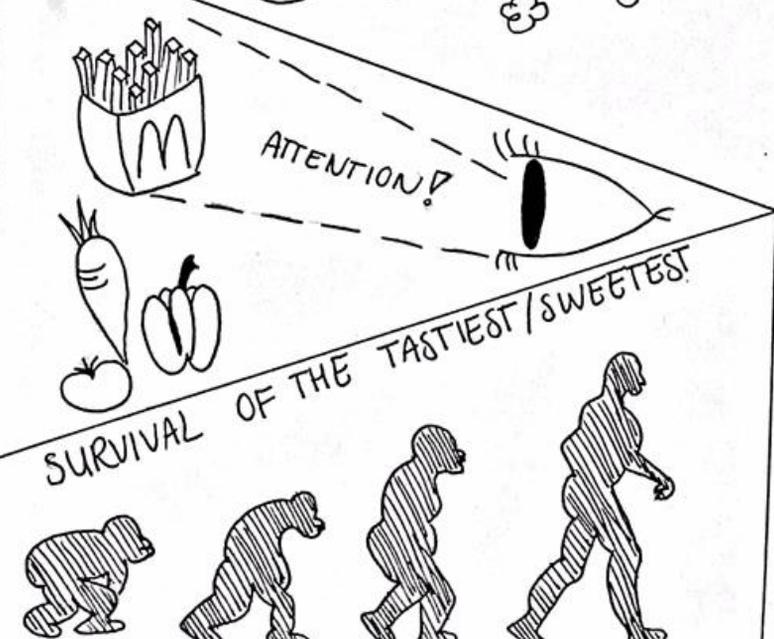
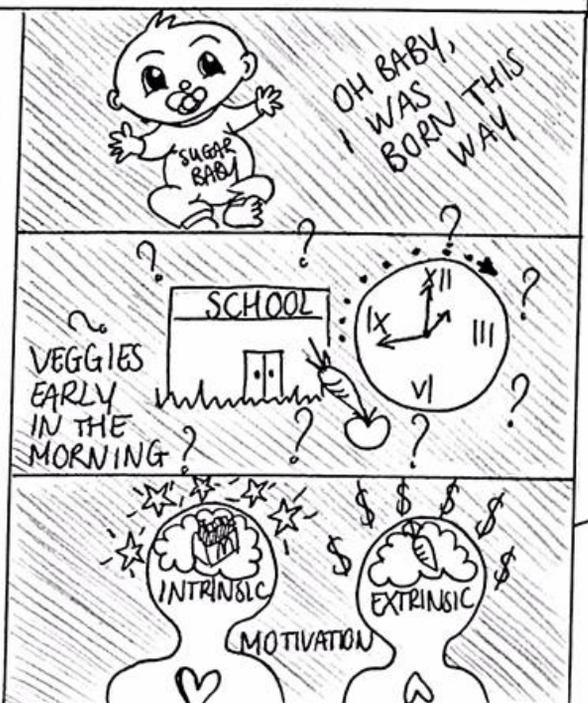
^a Mean ± SD (all such values). VAS, visual analogue scale.



Hmm...
We've found no evidence that the memory-game increased the vegetable intake



Possible explanations...



Strengths

We can compare the results to other memory-game experiments. Moreover, the game is popular among children, which makes it an attractive intervention option. Finally, the large group and randomization minimize confounding factors.

Weaknesses

The children only played the game for a few minutes, which might be not enough for exerting an effect on vegetable consumption.

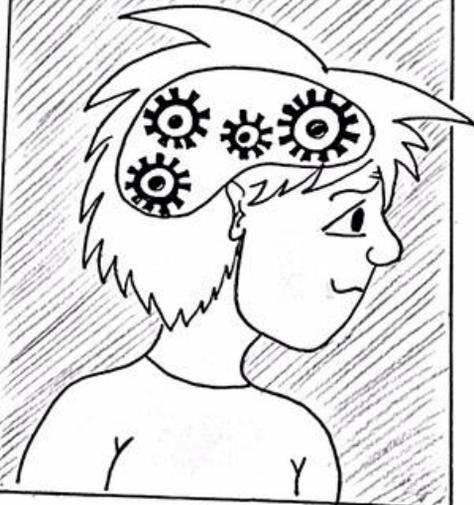
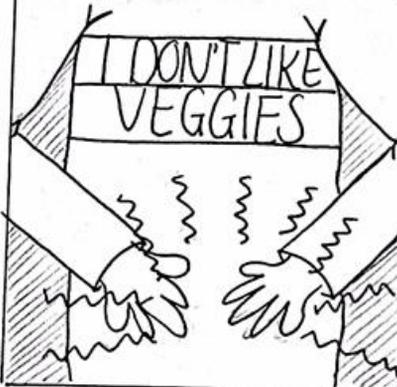
We also didn't evaluate liking for vegetables at baseline. Lastly, the sample lacked socioeconomic diversity, so the findings may not be generalizable to other populations.

For the future...



Measure effect on vegetable consumption in a more familiar context

Measure individual preferences, like baseline of liking vegetables



Understand psychological mechanisms how memory-games influence eating behavior

“The obesogenic environment will not change rapidly into a healthier one, and stimulating children to consume fruits and vegetables via entertaining techniques like memory-games might be an addition to existing intervention approaches” (p.129)

To be continued...