



EDULIA

Expanding food worlds of pre-adolescents

Practical guidelines to support
pre-adolescents in eating healthy outside
home in a tempting food environment



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PRE-ADOLESCENCE AS UNIQUE LIFE STAGE

Adolescence is a time of **development** and is characterized by many physical, mental and social changes. As children become adolescents, they develop a higher level of autonomy and engage in new patterns and habits. This developmental life stage among pre-adolescents (aged 10-14 years) tends to involve deteriorating eating habits.

This brochure shows what is known about the change in **eating habits of pre-adolescents** (part 1) and how their **food environment** makes it challenging to eat healthy (part 2). It also presents guidelines and tips to make the **healthy food choice** easier, more attractive and more normal (part 3).

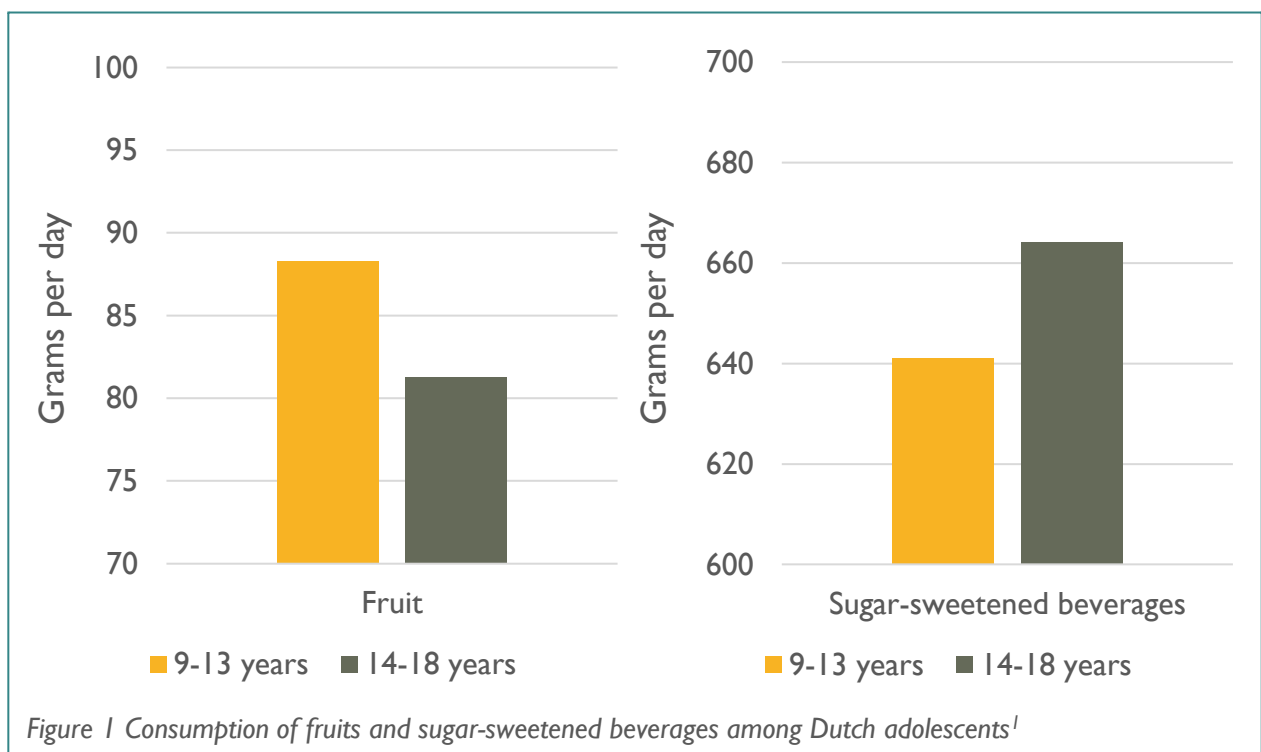




1 EATING HABITS OF PRE- ADOLESCENTS

EATING BEHAVIOUR CHANGES THROUGHOUT CHILDHOOD

Adolescence is a period of **deterioration in eating habits** (see Figure 1), which often tracks into adulthood. For example, fruit, vegetable and dairy consumption of most adolescents fall below recommended guidelines, whereas consumption of unhealthy sugar-sweetened beverages, energy drinks and fast-food increases, making this a vulnerable period for overweight development.



Unhealthy eating and drinking habits are common. For example, 1 in 3 Dutch adolescents between 12 and 16 years old consume **sugar-sweetened beverages** every day. In addition, 71% feels that consuming sugar-sweetened beverages is normal².

¹ Dutch National Food Consumption Survey 2012-2016, <https://www.wateetnederland.nl/>

² Research study on sugar-sweetened beverage consumption of youth, <https://www.ggd.amsterdam.nl/publish/pages/1004382/jongeren-omgeven-door-suiker-frisdrankconsumptie-onder-jongeren-wt22.pdf>

PRE-ADOLESCENTS' FOOD-RELATED CHARACTERISTICS

1. Pre-adolescents have more control than children in when, what, where and how much they eat. They make many **food decisions on their own** due to their increased independence and autonomy¹.
2. They usually have personal spending money which they can use to make independent **food purchases**. Pocket money is on average €31 per month among Dutch adolescents between 12 and 18 years old². 76% of them spends their money on foods, candy or beverages with an average expenditure of €15 per month.
3. During adolescence, **peer influences** on decisions and behaviours increase, whereas parental influences decrease. However, the home environment remains a major factor shaping pre-adolescents' eating behaviours³.



¹ Reicks, M., Banna, J., Cluskey, M., Gunther, C., Hongu, N., Richards, R., ... & Wong, S. S. (2015). Influence of parenting practices on eating behaviors of early adolescents during independent eating occasions: implications for obesity prevention. *Nutrients*, 7(10), 8783-8801.

² Nibud school students research study 2020, <https://www.nibud.nl/wp-content/uploads/Nibud-Scholierenonderzoek-2020.pdf>

³ Yee, A. Z., Lwin, M. O., & Ho, S. S. (2017). The influence of parental practices on child promotive and preventive food consumption behaviors: a systematic review and meta-analysis. *International Journal of Behavioral Nutrition and Physical Activity*, 14(1), 1-14.

TRANSITIONING TO SECONDARY SCHOOL

The transition from primary to secondary school is a major life event for pre-adolescents with many changes in their physical and social environment. A longitudinal study followed Dutch pre-adolescents to explore how this transition would impact their eating habits.

At primary school, pre-adolescents in general felt competent to engage in healthy eating behavior challenges and were motivated to eat healthily, which was related to higher healthy intake at school¹. However, their healthy intake decreased after the transition to secondary school².



“I go to the supermarket more often or buy foods in the canteen.”

“At secondary school they encourage you to consume unhealthy foods [...] there are vending machines with sugar-sweetened beverages and candy in the canteen. Every day you can buy pizza, sandwiches, croquettes and more.”

“At primary school we had a fruit/vegetables day and water day. We had to conform [...] now we can decide ourselves.”

¹ van Nee, R. L., van Kleef, E., & van Trijp, H. (2021). Dutch Preadolescents' Food Consumption at School: Influence of Autonomy, Competence and Parenting Practices. *Nutrients*, 13(5), 1505.

² van Nee, R. L., van Kleef, E., & van Trijp, H. (in prep). Longitudinal changes in healthy intake from primary to secondary school.

FACTORS THAT INFLUENCE EATING BEHAVIOUR

Pre-adolescents' eating behaviours affect and are affected by **multiple levels of influence**. According to the socio-ecological framework, different individual, interpersonal and environmental factors interact and influence pre-adolescents' food choices¹ (see Figure 1).

For example, pre-adolescents' food choices depend on the **location** where they are eating (e.g., at home or at school). Other important influencing factors include **taste, price, convenience** and **social norms**. Perceived **healthiness** is less important in pre-adolescents' food choices^{2,3}.

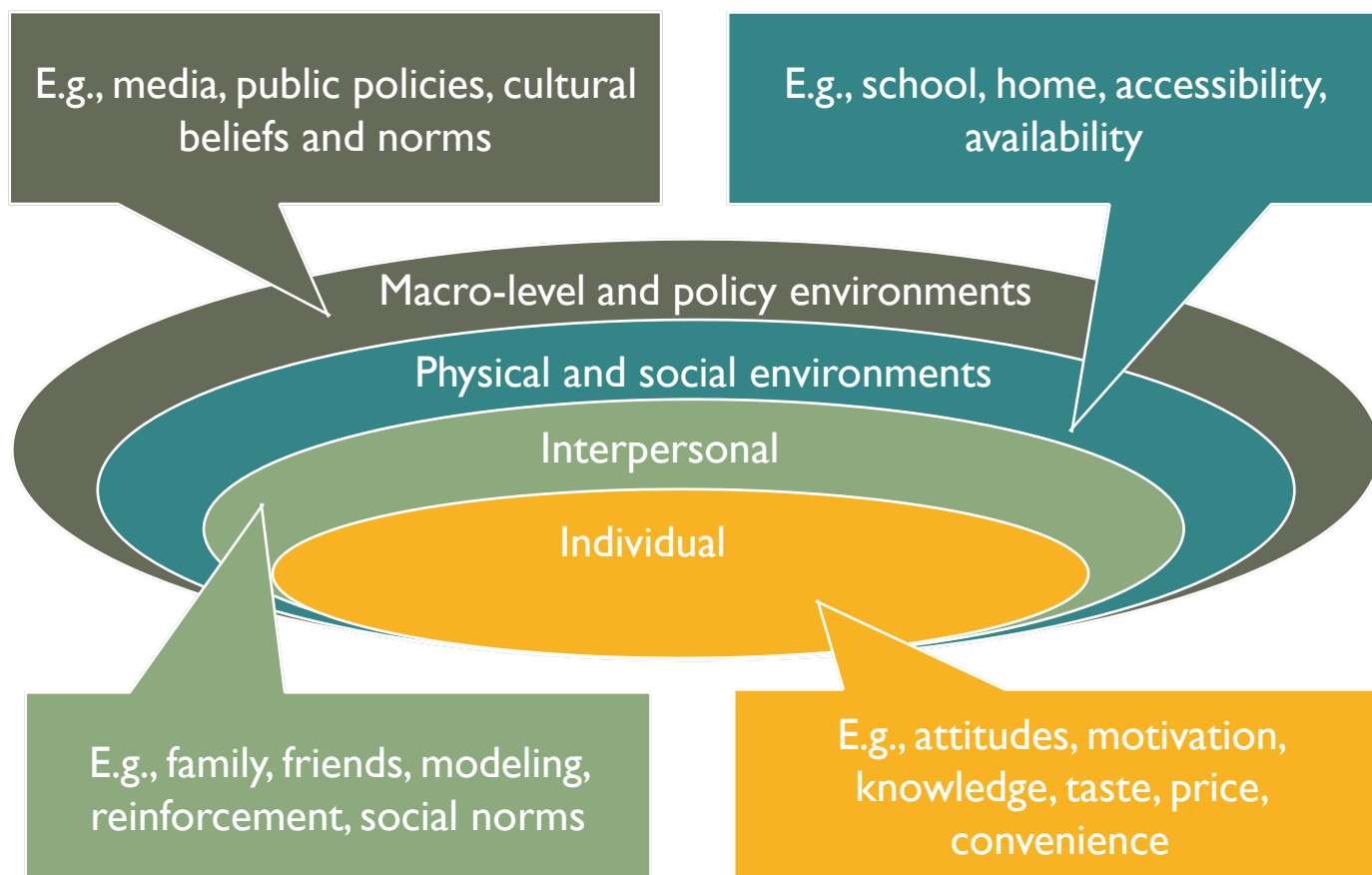


Figure 1 Influencing factors on eating behaviour. Adapted from Story et al. (2002) & Fox & Timmer (2020)

¹ Story, M., Neumark-Sztainer, D., & French, S. (2002). Individual and environmental influences on adolescent eating behaviors. *Journal of the American Dietetic association*, 102(3), S40-S51.

² Daly, A. N., O'Sullivan, E. J., & Kearney, J. M. (2021). Considerations for health and food choice in adolescents. *Proceedings of the Nutrition Society*, 1-30.

³ Ziegler, A. M., Kasprzak, C. M., Mansouri, T. H., Gregory, A. M., Barich, R. A., Hatzinger, L. A., ... & Temple, J. L. (2021). An ecological perspective of food choice and eating autonomy among adolescents. *Frontiers in psychology*, 12, 1098.



2 FOOD ENVIRONMENT

A TEMPTING & UNHEALTHY FOOD ENVIRONMENT

The food environment is a major contributor to unhealthy food intake. The range of food and drinks that you can buy in shops, restaurants and fast food chains has changed dramatically in recent decades. There are many more highly processed, fatty and sugary products than ever before and their prices have fallen.

For example, a recent study in the Netherlands showed that **90% of the food in restaurant chains does not meet dietary guidelines**. The advertising of these chains also mainly advertises unhealthy products and dishes (73%). In supermarkets, 79% of the supply falls outside the nutritional guidelines¹.



¹ Poelman, M.P., Dijkstra, S.C., Djojoseparto, S.K., de Vet, E.W.M.L., Seidell, J.C. en Kamphuis, C.B.M., 2021. Monitoring van de mate van gezondheid van het aanbod en de promoties van supermarkten en out-of-home-ketens; Inzicht in de huidige stand van zaken en aanbevelingen voor het opzetten van een landelijke monitor. Wageningen Universiteit, 118 blz.
<https://doi.org/10.18174/555613>

SCHOOL FOOD ENVIRONMENT

Pre-adolescents spend much time at school and consume up to 50% of their daily calorie intake at school¹. The school food environment includes the foods and drinks available within or near schools, for example at **canteens** or **vending machines**.



A complicating factor is that there is a rise in unhealthy **food outlets** and marketing outside schools. Many schools are surrounded by stores and (fast food) restaurants, which give adolescents easy access to inexpensive unhealthy foods (see figure 1 for an example of a school food environment around a Dutch secondary school).

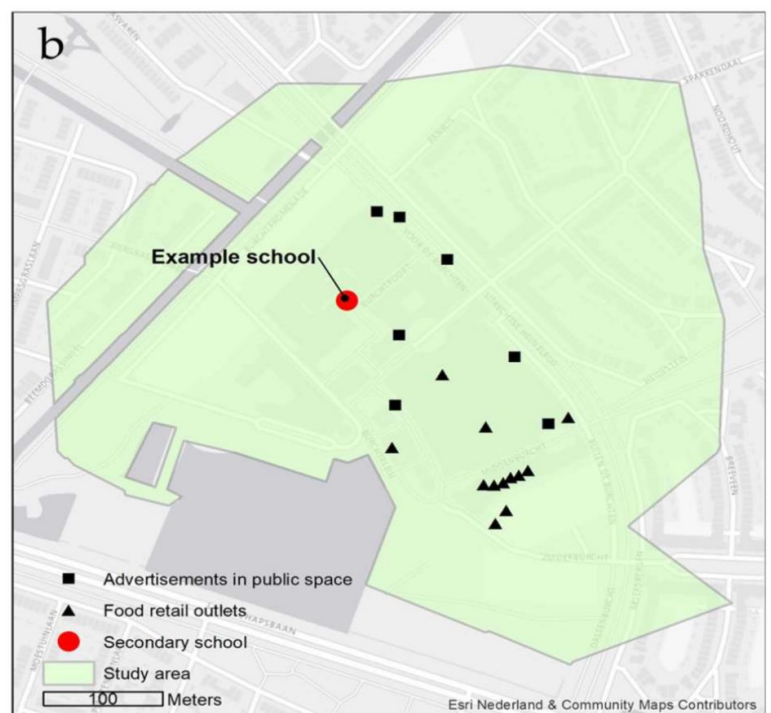


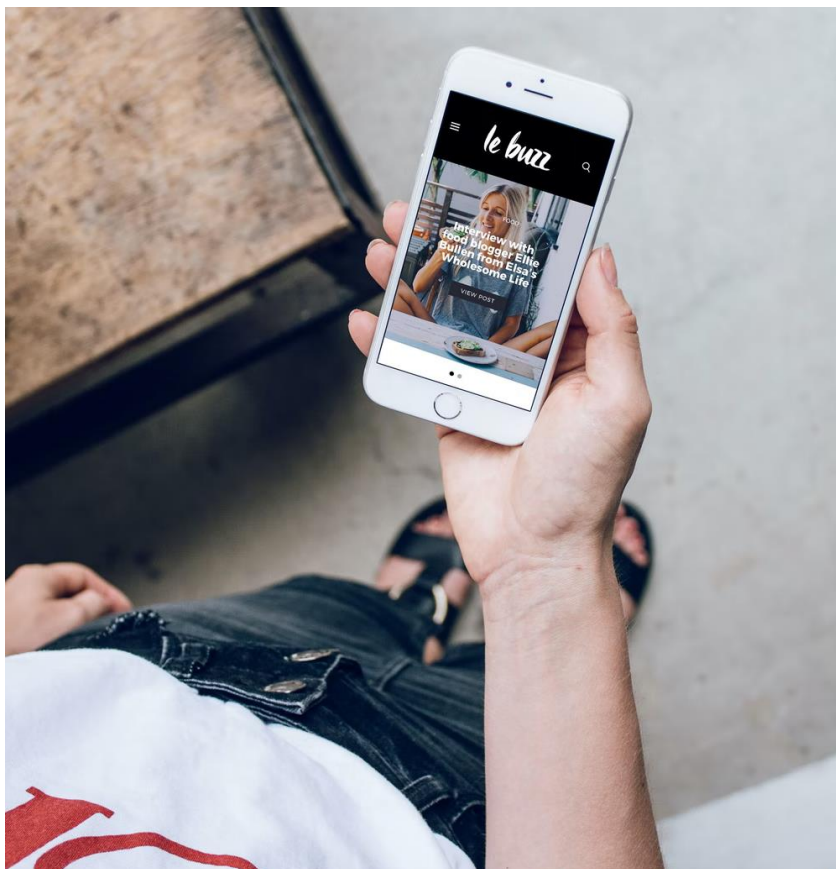
Figure 1 Food retail outlets and advertisements within 400 meters of a Dutch secondary school²

¹ Story, M., Nannery, M. S., & Schwartz, M. B. (2009). Schools and obesity prevention: creating school environments and policies to promote healthy eating and physical activity. *The Milbank Quarterly*, 87(1), 71-100.

² Timmermans, J., Dijkstra, C., Kamphuis, C., Huitink, M., Van der Zee, E., & Poelman, M. (2018). 'Obesogenic' school food environments? An urban case study in the Netherlands. *International journal of environmental research and public health*, 15(4), 619.

MEDIA FOOD MARKETING

Pre-adolescents are active social media users. Almost all Dutch 12-15 year olds (90.9%) use internet for social media¹. Marketing techniques to young people on (social) media cleverly respond to their food preferences and entertainment needs. Advertisements are embedded in social media feeds with **engaging and interactive content**. It is difficult for pre-adolescents to recognize these ads. Digital food marketing has been related to increased purchases and unhealthy intake in pre-adolescents². Users and influencers also create food-related content themselves or share online food marketing ads. This **peer-generated content** is seen as credible³ and may impact their unhealthy intake.



¹ Statistics Netherlands (CBS) 2019, <https://opendata.cbs.nl/statline/#/CBS/nl/dataset/83429NED/table>

² Qutteina, Y., De Backer, C., & Smits, T. (2019). Media food marketing and eating outcomes among pre-adolescents and adolescents: A systematic review and meta-analysis. *Obesity Reviews*, 20(12), 1708-1719.

³ van der Bend, D. L. M., Beunke, T., Shrewsbury, V., Bucher, T., van Kleef, E. (in prep) "Do I buy it or not?" Adolescents' perceptions of food marketing content on social media.



3 SUPPORTING HEALTHY FOOD CHOICES

KEY FACTORS FOR HEALTHY SCHOOL ENVIRONMENTS

Schools provide an important setting to promote healthy intake among pre-adolescents¹. Schools can create a food environment that supports pre-adolescents in making healthy food or beverage choices by incorporating these crucial factors:



1. Availability of healthy foods

Healthy options should be available at school. A larger assortment of healthier foods and beverages has been shown to tempt pre-adolescents to choose healthier options, while remaining freedom of choice².



2. School food policies and regulations

Pre-adolescents' eating habits can be improved by specific food policies at school³, for example by providing healthy options (e.g. free fruit or vegetables or water bottle filling stations) or implementing guidelines for competitive foods or beverages.



3. Nutrition education

Programs on nutrition education can improve pre-adolescents' knowledge and eating habits. Topics important to pre-adolescents should be included⁴.

¹ Pineda, E., Bascunan, J., & Sassi, F. (2021). Improving the school food environment for the prevention of childhood obesity: What works and what doesn't. *Obesity Reviews*, 22(2), e13176.

² van Kleef, E., Meeuwssen, T., Riggerink, J., & Van Trijp, H. (2019). Moving towards a healthier assortment in secondary and vocational school food environments: Perspectives of Dutch students and school food policy professionals. *British Food Journal*.

³ Micha, R., Karageorgou, D., Bakogianni, I., Trichia, E., Whitsel, L. P., Story, M., ... & Mozaffarian, D. (2018). Effectiveness of school food environment policies on children's dietary behaviors: A systematic review and meta-analysis. *PloS one*, 13(3), e0194555.

⁴ Murimi, M. W., Moyeda-Carabaza, A. F., Nguyen, B., Saha, S., Amin, R., & Njike, V. (2018). Factors that contribute to effective nutrition education interventions in children: a systematic review. *Nutrition reviews*, 76(8), 553-580.

NUDGING: MAKING HEALTHY EATING MORE CONVENIENT, APPEALING AND NORMAL

Nudging may help to facilitate healthy choices by changing the physical environment in such a way that it is easier to make certain choices¹. This includes labeling, visibility or convenience enhancements or providing better portion sizes. A review showed that nudges facilitating action can reduce daily energy intake by up to 209 kcal¹.

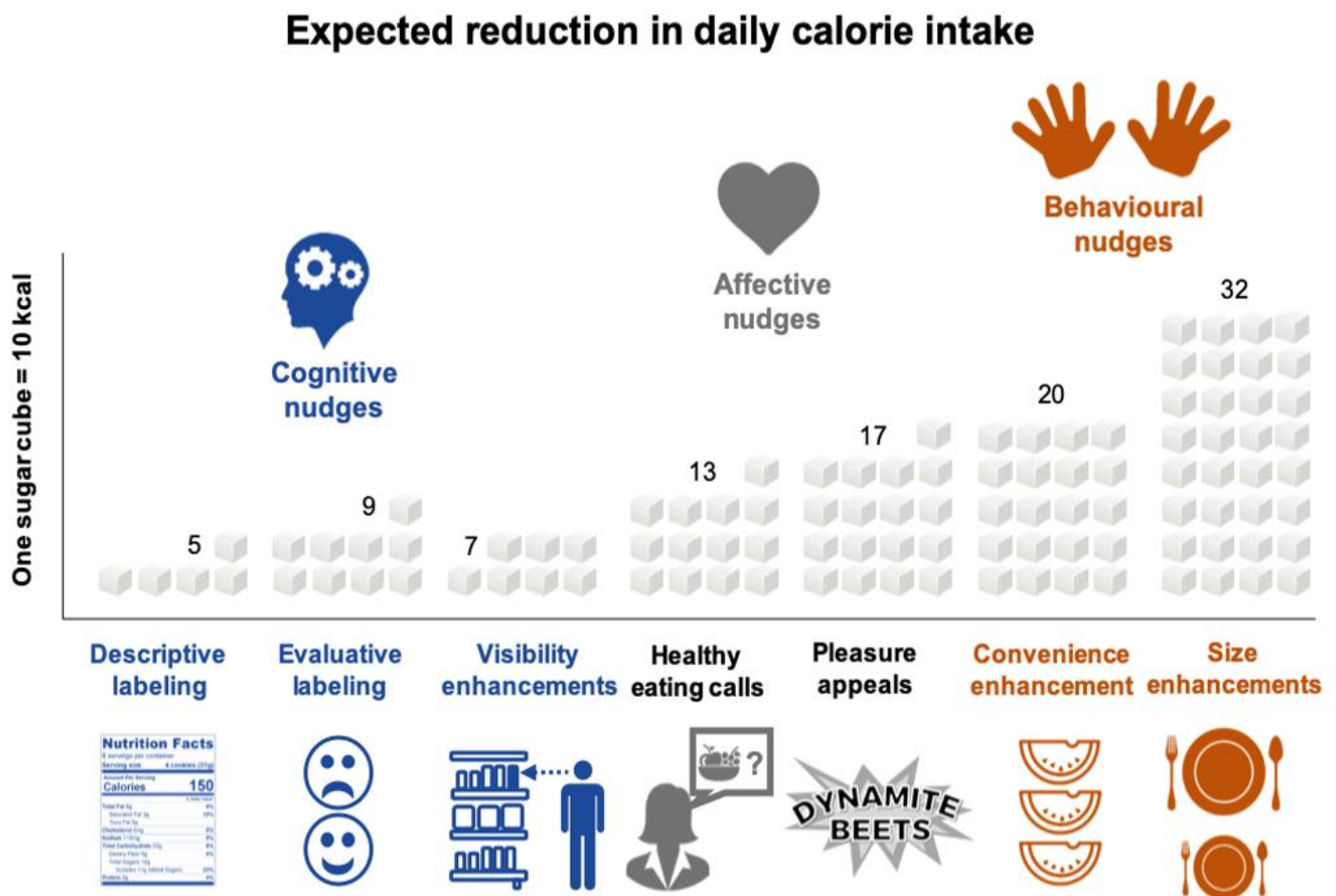


Figure 1 Effects of different nudge types on expected reductions in calorie intake^{1,2}

¹ Cadario, R., & Chandon, P. (2020). Which healthy eating nudges work best? A meta-analysis of field experiments. *Marketing Science*, 39(3), 465-486.

² <https://theconversation.com/seven-ways-restaurants-can-nudge-people-to-eat-more-healthily-119315>

NUDGING HEALTHY EATING IN SCHOOL CANTEEN

In the canteen illustrated below, several nudges have been used to promote healthy choices. For example, healthy items (including fruits) are prominently placed and it is convenient to buy these foods.



HOW CAN PARENTS AND CAREGIVERS HELP?

1. Create a home environment with high **availability** of healthy options.
2. Support pre-adolescents in practicing their food independence and give them freedom to learn and **practice** preparing their own meals or snacks.
3. **Encourage** and promote healthy food choices by making these choices accessible in the home.



TIPS FOR SUPPORTIVE HEALTHY EATING PRACTICES

Teachers and parents can use supportive practices to boost pre-adoleescents' healthy eating motivation^{1,2}. For example:

1. Set positive frame of reference

- Activate intrinsic motivation through focus on pleasure and enjoyment
- Acknowledge and respect negative responses

2. Talk with pre-adoleescents in a non-controlling way

- Use non-judgmental language when talking with pre-adoleescents about their healthy intake behaviour and reasons why they would change it
- Provide a rationale for changes in food environment

3. Give some freedom of choices

- Provide opportunities for pre-adoleescents to make their own choices

4. Involve and engage pre-adoleescents

- For schools: Determine rules and assortment in canteens and vending machines in cooperation with pre-adoleescents
- For parents: Involve pre-adoleescents in meal shopping, preparation and cooking. For example, make them responsible for preparing dinner once per week.



¹ Reeve, J. (2009). Why teachers adopt a controlling motivating style toward students and how they can become more autonomy supportive. *Educational psychologist*, 44(3), 159-175.

² Teixeira, P. J., Marques, M. M., Silva, M. N., Brunet, J., Duda, J. L., Haerens, L., ... & Hagger, M. S. (2020). A classification of motivation and behavior change techniques used in self-determination theory-based interventions in health contexts. *Motivation science*, 6(4), 438.

EXAMPLES OF TEACHING ACTIVITIES

An autonomy-supportive workshop about healthy beverages was recently developed and pre-tested at a secondary school¹. The workshop consisted of several elements to create more awareness of pre-adolescents' beverage consumption and promote their motivation to make healthy choices. For example, the workshop included:



Quiz about sugar in beverages

A quiz about the amount of sugar cubes in several healthy and unhealthy beverages could be used to provide more insight into the healthiness of beverages and create more awareness of pre-adolescents' consumption.



Movie clip with healthy beverage swap

A short movie clip with a role model who demonstrates a healthy beverage swap could be used to talk about beverage choices and reasons to consume healthy beverages.

IN SUMMARY

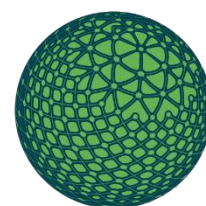
Pre-adolescence is a unique life stage associated with increased freedom and **independence regarding food choices**. Healthy eating during adolescence is necessary for optimal growth and development. However, eating habits become more unhealthy as pre-adolescents grow older. Many pre-adolescents have poor eating habits, which tend to continue into adulthood.

A major factor driving pre-adolescents' food choices is the **food environment**. Pre-adolescents nowadays grow up in a tempting food environment with high availability of unhealthy foods. It can be difficult for them to make healthy food choices in this environment.

Creating a healthy school food environment is important in order to **support healthy food choices** among pre-adolescents. In addition, policy actions are needed to improve the obesogenic food environment surrounding schools. Pre-adolescent values and motivations which drive their food choices should be taken into account.

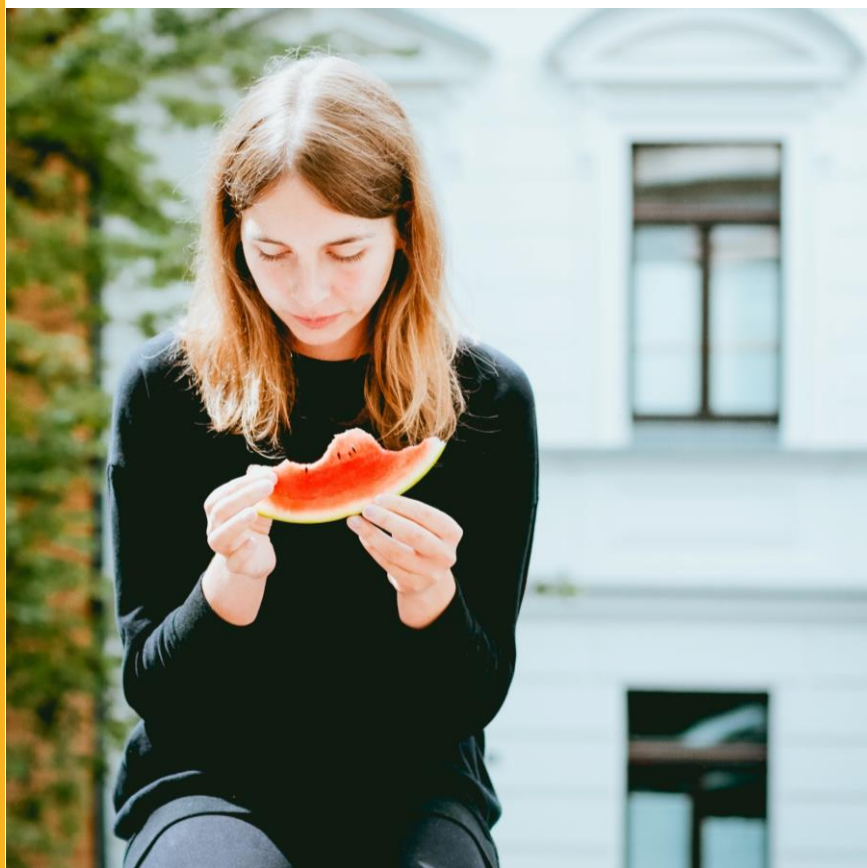


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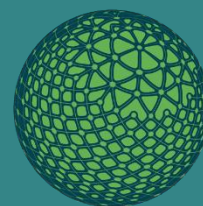


This document has been produced by Roselinde van Nee and Ellen van Kleef.

More information about the research conducted by the EDULIA consortium can be found at edulia.eu.



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