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WP6 final report: Social influences of children's eating behaviours

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EDULIA

WP6. Final report

Social influences of children's eating behaviours

Table of Contents

Executive summary
Social influences of children's eating behaviours

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BACKGROUND

The rising childhood obesity rate is a major public health challenge. Previous research has shown that eating habits established during childhood can persist into adolescence and adulthood, and that parents, peers, siblings and social media play a key role in the development of children's eating habits. Besides, it is established that cognitive abilities may also drive food rejections especially in young children.

In order to promote healthy eating in children from a young age, it is crucial to more properly assess how these factors interact and contribute to the early development of eating behaviours and food preferences/rejections. Interestingly, the review of the scientific literature revealed that the number of studies about fathers and feeding is still limited, and that there is a lack of studies examining how peer and sibling impact is related to children's and adolescents' eating behaviour. Moreover, it is worthy to note that much research of this project was conducted during the COVID-19 pandemic, which provided a unique opportunity to investigate this unseen situation and according changes in people's habits in relation to children's eating behaviours and parental eating and feeding behaviours.

This WP aimed to gain more insight into the micro- and macro-social influences that shape child's eating behaviours and eating socialization, including both parents, peers and siblings.

KEY FINDINGS

Both maternal and paternal feeding practices and styles were predictors for child eating behaviours.

Fathers and mothers perceived their child's eating behaviors in similar ways, despite mothers taking significantly more meals with their child than fathers.

Fathers reported using **more pressure to eat and food as reward**, but reported **lower levels of "family meal setting" than mothers**.

In households where both parents used **higher levels of pressure to eat**, the child showed a significantly **lower food enjoyment and a higher food neophobia** than expected if only one parent used this pressuring practice.

Parents also use a wide range of practices to determine **the "right portion"** for their child, mostly determined by **"intuition", and not by sanitary recommendations.** For most parents, determining portion sizes is an intuitive action that depends **on habits** and mainly arises **from experiences** with feeding their child and **his/her appetitive traits**.

Most parents do not search for information/recommendations to guide their practices. However, stimulating optimal self-regulation of eating in children is important and parents can play a crucial role in this.

The strict lockdown elicited a drastic change in eating and feeding habits both on parent and child level. This unusual sanatory situation drove some parents to turn a blind eye to the usual feeding rules, and **to privilege enjoyment and comfort at home**.

Changes in child boredom and parental stress were found to influence eating and feeding behaviors.

Children with higher levels of food rejection have **poorer knowledge of foods conventionally eaten together, or foods for specific mealtimes.**

Educating children about foods, eating situations and conceptual knowledge can be an effective strategy for **increasing familiarity and promoting greater food acceptance**.

Peers influence on healthy eating is **more often negative than positive**, i.e. that **peers rather increase the consumption of unhealthy foods rather than increasing the consumption of healthy food**.

Sibling influences have little importance as the parents govern meal structure and availability of healthy food at home.

To encourage preadolescents children's healthy eating behaviour, an app "Food Boss" has been developed and validated. This app constitutes a useful and pleasant tool, helping children to learn about healthy food and to make food diaries.

CONCLUSIONS AND RECOMMENDATIONS

- These findings underline the importance of studying the individual role of each parent in child feeding research and that both parents within families **should avoid using coercive practices**. This could finally stimulate new interventions and recommendations addressed **to both parents**.

- Stimulating optimal self-regulation of eating in children is important and parents can play a crucial role in this. One way to accompany parents in providing appropriate portion sizes is **1- to inform them about the capacity of the child in regulating food intake based on their hunger and satiety sensations, and 2- to help them to include children in this process.**

- The exceptional sanatory context imposing a strict lockdown provided unique insights into how a drastic change in habits is accompanied by changes in eating and feeding habits both on parent and child level. These insights could be useful for future studies and interventions, and could be of interest to policy makers. Even though the COVID-19 lockdown was an unusual situation, the increased manifestation of these food approach behaviors and their link **with child boredom and parental stress could be cause for concern**. It suggests that these **children did not merely rely on their internal cues of hunger and satiety when asking for foods/drinks (crucial for an optimal self-regulation of food intake); and ignoring internal cues could possibly make children overeat and induce weight gain if maintained for a long period** (Monnery-Patris et al., 2019). With age, research has shown that children rely less on their internal cues for their food intake (e.g., Fox, Devaney, Reidy, Razafindrakoto, & Ziegler, 2006). **It is therefore important to encourage children (and their caregivers) from a young age to listen to their inner sensations for food intake, and to maintain this even in more challenging situations**.

- Parents and schools could play an important role in guiding pre-schoolers in using adaptive self-regulation strategies and in modeling these strategies. In both children and adults, several types of interventions **such as mindfulness-based interventions and appetite awareness training have**

been proposed to increase awareness of hunger and satiety cues, with various levels of success. More researches are still warranted to more properly assess these opportunities.

- The research highlighting the relationship between food rejections and conceptual knowledge in 3-4-year-olds suggested opportunities for development psychologist and public health professionals to improve children's knowledge of food and foster increased dietary variety. Guidelines have been developed for the implementation of practical recommendations for managing feeding practices of caregivers, in the family and school food catering context, and of nudges for improving food choice at home and in broader food choice environments (e.g., school) have been developed (See Annexe 1). These guidelines have been developed as a complement to existing guidelines (EFSA, European directives), and provides ideas and activities for parents and caregivers to teach children about food and boost food acceptance and wider dietary variety.

- **To encourage preadolescents children's healthy eating behaviour, the "Food Boss"" app** could serve as an attractive and low-cost intervention to reach a wide population of children for the promotion of healthy eating and prevention of childhood obesity.

1 Introduction

1.1 Scientific background

According to an old saying, “it takes a village to raise a child”: children do not grow up in isolation, but are exposed to many relationships (with immediate family, extended family, neighbours, teachers etc.) and external factors that can influence their development and life course.

In order to promote healthy eating in children from a young age, it is important to understand **which factors contribute to the early development of eating behaviours and food preferences**. It is known that a person is a product of its genes/biological predisposition and its environment, and there is evidence that eating behaviours have strong heritabilities. Nevertheless, there is also evidence that implicates that heritable traits or their expression can still be influenced by **the child’s environment** (Wood et al., 2020). A systemic approach will be applied in this WP to identify factors inherent to the child and in the environment of the child that may influence his/her eating behaviours. Bronfenbrenner’s ecological systems theory (1979) seems very suitable for this. Indeed, according to this theory (1979) and his later bioecological model of human development (1994, 2005, 2006), children’s biological dispositions (e.g., their temperament, physical characteristics, cognitive abilities etc.) and many factors in children’s environment join to influence their development in unique ways. He states that children grow up in **a complex system of relationships which are influenced by multiple levels in the environment, ranging from children’s immediate home environment to their larger environment encompassing culture, norms and values**. Bronfenbrenner divided a child’s environment in five levels or so-called nested systems: the micro-, meso-, exo-, macro- and chronosystem.

The microsystem is the innermost level of the child’s environment according to Berk (2010, p.24); it consists of activities and interaction patterns in the child’s immediate surrounding. For a child, this is, for example, the immediate family, the school environment and leisure activities. All relationships on this level are assumed to be bidirectional: **children are influenced by their parents, siblings, teachers and peers but children and their biological and social characteristics also affect their environment’s behaviours**. The second level, the mesosystem, encompasses the links between a child’s microsystems. This can, for example, refer to the interactions between parents and the child’s school. The third level, the exosystem, consists of social settings that do not contain the child but nevertheless affect his/her experiences in immediate settings (Berk, 2010, p.25). For example, a parent’s workplace and its policies (flexible work hours, parental leave, etc.) can influence this parent’s interactions with the child. The fourth, outermost level is called the macrosystem. This system refers to the large context in which a child develops, including the **customs, laws, cultural values and norms**. A country that provides high-quality childcare or financial support to parents can for example influence their childrearing practices. The fifth level, the chronosystem, embodies the temporal dimension of Bronfenbrenner’s model. This system builds on the idea that a person’s environment is not static but ever-changing. Changes in a person’s environment can arise from both within a person (e.g., changing schools) or can be exposed externally (e.g., loss of a parent).

In sum, according to Bronfenbrenner, a person’s development results from the complex interplay between an individual, its characteristics (e.g., biological dispositions) and its environment. A person’s environment is dynamic and ever-changing and every person is both a product and a producer of its own environment.

With regard to the development of children's eating behaviours, we can therefore also assume that influencing factors may be situated both within the child (e.g., temperamental traits, cognitive abilities, categorization processes etc.) and in the environment of the child: in the child's direct environment (siblings, peers, parents, caregivers, parental feeding practices etc.) but also in more distal, indirect systems around the child (culture, social media, pandemic situation, etc).

1.2 Objectives of the Work Package 6

The WP6 is titled *"Social influences on pre-schoolers and preadolescents healthy eating habits: impact of parenting and of interactions with peers*". This WP aims at studying the role of social factors (parents, other caregivers, siblings and peers) and of cognitive factors influencing children's eating behaviour, and to provide a holistic picture of the type and strength of the interacting social and cognitive factors influencing child' eating behaviors, with a specific focus on those factors that potentially can be tackled by social marketing and nudging techniques.

More specifically, the first aim was to assess the impact of feeding practices on children's eating behaviour in terms of food repertoire and intake regulation, using both declarative and qualitative approaches (**ESR7 - Kaat Philippe, INRA**).

The second objective aimed at measuring the influence of cognitive abilities (i.e., the ways of categorizing foods) on food rejections and then, from science to innovation, developing prototypes in eating device design to facilitate foods recognition which in turn will foster acceptance (**ESR10 - Abigail Pickard, IPBR**)

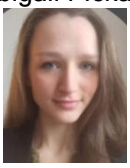
Finally, the third objective was to investigate the influence of secondary socialization agents (peers and siblings) and social media on children's healthy eating behaviour in preadolescents of different family compositions (**ESR9 - Tija Ragelienė, WUR**).

The final goal of this WP was to generate recommendations for public health campaigns aimed at improving healthiness of children´s eating habits through modification of the social environment and through cognitive tacks at early and later stages.

1.3 Work Package organisation

This WP is divided into 3 main tasks (see Table 1).

Table1: Organisation of WP6.

Task	Title	Leader	ESR	Partners
Task 6.1	Impact of feeding practices on children's eating behaviour	Sandrine Monnery-Patris	ESR7 Kaat Philippe 	MAPP-AU, IPBR
Task 6.2.1.	Cognitive factors influencing children's eating behaviour.	Jérémie Lafraire	ESR10 Abigail Pickard 	NOFIMA; Elior
Task 6.2.2.	Sibling and peer influences on children's eating habits	Alice Grønhøj	ESR9 Tija Ragelienė 	WUR; Kidvertising Agency

2 Task 6.1 Impact of feeding practices on children's eating behaviour

2.1 Background and objective(s)

Previous research has shown that eating habits established during childhood can persist into adolescence and adulthood (Nicklaus et al., 2005; Nicklaus & Remy, 2013), and that parents play a key role in the development of children's eating habits (Birch, 1999). Parental feeding practices, or the

behavioural strategies parents use to control what, how much, when and where the child eats (Ventura & Birch, 2008), have been identified as possible levers to prevent the development of « unhealthy » eating behaviours and obesity in children (Birch, 1999). However, the review of the scientific literature revealed that the number of studies about **fathers** and feeding is still limited, generally but also especially in France. Therefore, a first focus of this study was on fathers' feeding practices and possible gender differences between mothers and fathers regarding feeding their child. Moreover, thanks to a secondment of Kaat Philippe ESR8 in Denmark, a country where fathers are culturally more involved in feeding than in many countries in Europe, the topic of fathers and feeding appeared very relevant.

A second objective was dealing with the influence of parental **portioning** practices. The period between the ages of 2-6 years is known as a sensitive period in feeding. On the one hand, this period is characterized by a deterioration of children's ability to self-regulate their food intake under the influence of the external environment (Fisher & Birch, 2002). Children are born with an innate ability to self-regulate their food intake. As they grow older, external stimuli like controlling food parenting practices (e.g., pressure to eat) and inappropriate portion sizes, can divert children from their internal feelings of hunger and satiation (Monnery-Patris, Rigal, Peteuil, Chabanet, & Issanchou, 2019). This could cause them to overeat and could induce weight gain (Kral et al., 2012; Monnery-Patris et al., 2019). It is well established that when children are served larger portions, they tend to eat more (this is called the "**portion size effect**"). However, little is known about parental portioning practices and drivers of these practices. Then a second focus was on parental portioning practices used for pre-schoolers, as we discovered that the literature on this topic was rather limited thus far and still unexplored in France. Little is known about motivations underlying parental decisions when determining portion sizes for their child, the division of responsibility between parent and child when determining portions, and about parental use of information sources and recommendations on this topic.

A third focus was dedicated to **factors influencing parental feeding practices and portioning practices**, which could help us to better understand the use of these practices and to identify possible barriers and facilitators for changing these practices. Following the theory of Bronfenbrenner's systems, Kaat Philippe and her supervisors assumed that these factors could be situated in different systems around the child and the parents. For example, knowing that cultural specificities may exist around eating and child feeding, we considered (food) culture (macrosystem) to be an interesting theme for interpreting the results throughout this project.

Finally, it is important to frame this project in the circumstances that took place: during **the COVID-19 pandemic**. This context gave the unique opportunity to investigate this unseen situation and according changes in people's habits in relation to children's eating behaviours and parental eating and feeding behaviours (impact chronosystem).

In sum, four main questions were explored within this task:

> *1. How do maternal and paternal feeding practices and styles relate to pre-schoolers' eating behaviours and intake regulation?*
>
> *2. Which factors (in which systems) influence parents' feeding and portioning practices?*
>
> *3. Are there gender differences with regard to parental involvement in feeding related tasks, parental perceptions of children's eating behaviours, parental feeding practices, and predictors of feeding practices?*
>
> *4. Which child factors relate to (changes in) children's eating behaviours?*

These questions were challenged within the doctoral project of Kaat Philippe, resulting in the publication of six scientific articles:

Philippe, K., Chabanet, C., Issanchou, S., & Monnery-Patris, S. (2021). Child eating behaviors, parental feeding practices and food shopping motivations during the COVID-19 lockdown in France: (How) did they change? Appetite, 161, 105132. https://doi.org/10.1016/j.appet.2021.105132

Philippe, K., Chabanet, C., Issanchou, S., & Monnery-Patris, S. (2021). Are food parenting practices gendered? Impact of mothers' and fathers' practices on their child's eating behaviors. Appetite, 105433. https://doi.org/10.1016/j.appet.2021.105433

Philippe, K., Issanchou, S., Roger, A., Feyen, V., & Monnery-Patris, S. (2021). How do French parents determine portion sizes for their pre-schooler? A qualitative exploration of the parent-child division of responsibility and influencing factors. Nutrients, 13(8), 2769. https://doi.org/10.3390/nu13082769

Philippe, K., Issanchou, S., Monnery-Patris, S. (2022). Contrasts and ambivalences in French parents' experiences regarding changes in eating and cooking behaviours during the COVID-19 lockdown. Food Quality and Preference, 96, 104386 https://doi.org/10.1016/j.foodqual.2021.104386

Philippe, K., Chabanet, C., Issanchou, S., & Monnery-Patris, S. (2021). Young children's eating in the absence of hunger: links with child inhibitory control, child BMI, and maternal controlling feeding practices. Frontiers in Psychology, 12, 653408. https://doi.org/10.3389/fpsyg.2021.653408

Philippe, K., Chabanet, C., Issanchou, S., Grønhøj, A., Aschemann-Witzel, J., & Monnery-Patris, S. (2022). Parental feeding practices and parental involvement in child feeding in Denmark: gender differences and predictors. Appetite, 170, 105876. https://doi.org/10.1016/j.appet.2021.105876

2.2 Methodology

Note that this project was conducted within an unseen sanitary context, the COVID-19 pandemic which meant that the timing and methods of several studies had to be adapted to the possibilities of the situation (e.g., favouring the **use of online questionnaires and telephone interviews**).

Table 2 gives an overview of the methods used in each study conducted by Kaat Philippe within her PhD work (from Kaat Philippe's PhD manuscript).

Table 1. Overview of the studies and articles resulting from the doctoral project and their characteristics.

Study/Article + Chapter	Population	Country	Method	Main aim(s)	System Bronfenbrenner
Study 1 – Article 1 **Chapter II**	105 mothers and 105 fathers (105 couples) of children aged 2-6 years	France	Questionnaire with closed-ended questions	- To identify possible gender differences regarding parental feeding practices/styles and parental perceptions of the child's eating behaviours. - To assess the associations between maternal and paternal feeding practices/styles and child eating behaviours.	Microsystem
Study 1 – Article 2 **Chapter III**	621 mothers of children aged 2-6 years	France	Questionnaire with closed-ended questions	- To assess the influence of variables related to children's eating behaviour, EAH and appetite, on children's BMI z-score, and the influence of child inhibitory control and maternal controlling feeding practices on EAH.	Microsystem
Study 2 (interviews) –Article 3 **Chapter IV**	32 mothers and 5 fathers of children aged 3-5 years	France	Semi-structured telephone interviews + short survey	- To capture the variety of parental food portioning practices used for French pre-schoolers and to identify factors that underlie these practices.	Microsystem Mesosystem Macrosystem
Study 3 (COVID-19) – Article 4 (quantitative part) **Chapter V**	357 mothers and 141 fathers of children aged 3-12 years	France	Questionnaire with closed-ended and open-ended questions	- To evaluate changes in children's eating behaviours, in parental eating and cooking behaviours, in parental feeding practices, and in parental food shopping motivations during the lockdown, compared to the period before the lockdown.	Microsystem Exosystem Macrosystem Chronosystem
Study 3 (COVID-19) – Article 5 (qualitative part) **Chapter V**	357 mothers and 141 fathers of children aged 3-12 years	France	Questionnaire with closed-ended and open-ended questions	- To explore which food-related changes parents perceived as positive during the lockdown (1), which changes they perceived as negative (2), and which changes they would like to maintain after the lockdown (3).	Microsystem Exosystem Macrosystem Chronosystem
Study 4 (Denmark) – Article 6 **Chapter VI**	261 mothers and 321 fathers of children aged 3-6 years	Denmark	Questionnaire with closed-ended questions	- To identify possible gender differences regarding parental feeding practices, parental involvement in child feeding and possible related factors. - To identify predictors of parental feeding practices.	Microsystem Mesosystem Exosystem Macrosystem

2.3 Main results and conclusion

The main key results are summarized below.

Gender differences: key results

The results showed that French mothers and fathers perceived their child's eating behaviours in similar ways, and that **both maternal and paternal feeding practices and styles were significant predictors for child eating behaviours**.

French fathers reported using significantly more pressure to eat and food as reward than mothers, two practices that were associated **with less favourable eating behaviours in children**. Moreover, when both parents used higher levels of pressure to eat, the effect on child **low food enjoyment and higher food neophobia** was stronger than a simple additive effect.

Overall, these findings **underline the importance of studying the individual role of each parent in child feeding research, and that it is important that both mothers and fathers avoid the use of coercive feeding practices at home**.

In the Danish survey, it's worthy to note that **gender differences were also observed**; **fathers reported using higher levels of coercive control practices, while mothers reported using higher levels of structure practices and autonomy support practices.**

Both mothers and fathers reported to be highly involved in feeding their child. Regressions showed that **a higher concern for child weight and a higher motivation for child preference were linked to a higher use of coercive control practices while a higher motivation for health control, cooking confidence, feeding/general self-efficacy and perceived responsibility for feeding were linked to a higher use of structure and autonomy support practices**.

Conclusion and perspectives.

These results have implications for future studies, interventions and recommendations: **they should strive to focus on both parents in order to create an optimal eating environment for the child.**

More research is recommended: studies with bigger sample sizes and more diverse populations are needed to draw more comprehensive conclusions. Studies investigating feeding coparenting among parents (i.e., how mothers and fathers cooperate with regard to feeding their child; Tan, Domoff, Pesch, Lumeng, Miller, 2019; Tan, Lumeng, Miller, 2019) **but also studies with divorced/separated parents can be of interest.**

Furthermore, it is important to keep in mind that **including fathers in feeding research and interventions can be challenging** (e.g., Jansen, Harris, Daniels, Thorpe, Rossi, 2018). There is an urgent need for targeted **recruitment strategies, tailored intervention messages and materials, and validated outcome measures and methods. It is essential to find ways to engage fathers and to account for diversity among fathers** (Daniels et al., 2020; Peeters, Davison, Ma, Haines, 2019).

Parental portioning practices: key results

Concerning the **parental portioning practices**, the results revealed **most French parents are in control when serving and portioning food**, but, at the same time, they are also responsive to the child's requests and characteristics.

Another key result highlighted that for parents, portioning food is **an intuitive action that is guided by habits**, **their experience, and "knowing their child"**. They are confident about their portioning skills and most of them declare that they do not search for information to guide them in this action.

Conclusion and perspectives.

Even though parents seem to adopt responsive portioning practices, it may be important to encourage them **to be more aware of their children's capacity to self-regulate their food intake and how to stimulate this capacity.** Parents can, for example, help their children to listen to their inner sensations of hunger and fullness and encourage them to adjust their intake to match this. **Parents can grant their children some autonomy/responsibility in this action, adapted to the child's age and development. Downsizing strategies could also be recommended to parents**.

Since parents will not look for this guidance, it may, however, be challenging to find a way to pass on these recommendations. **Industries and governments should also be encouraged to take responsibility and limit the portion sizes of products made for children.**

Lockdown impact: key results

We observed that **the strict lockdown imposed by the COVID-19 pandemic affected significantly families' habits in many domains, especially in the eating domain**.

Comparing the (child's) current situation during the lockdown, and retrospectively on the period before the lockdown, the results undelighted **that many parents reported changes in child eating behaviours, feeding practices, and food shopping motivations.**

When changes occurred, **child appetite, food enjoyment, food responsiveness and emotional overeating significantly increased during the lockdown. Increased child boredom significantly predicted increased food responsiveness, emotional overeating and snack frequency in between meals.** When parents changed their practices, they generally became **more permissive: less rules, more soothing with food, more child autonomy.** They also bought **pleasurable and sustainable foods more frequently, prepared more home-cooked meals and cooked more with the child.**

Level of education and increased stress level predicted changes in parental practices and motivations.

Conclusion and perspectives.

In sum, this unusual situation drove some parents t**o turn a blind eye to the usual feeding rules, and to privilege enjoyment and comfort at home.** Changes in **child boredom and parental stress** were found to influence significantly eating and feeding behaviors.

It suggests that these children did not merely rely on their internal cues of hunger and satiety when asking for foods/drinks (crucial for an optimal self-regulation of food intake); and ignoring internal cues could possibly make children overeat and induce weight gain if maintained for a long period (Monnery-Patris et al., 2019). With age, research has shown that children rely less on their internal cues for their food intake (e.g., Fox, Devaney, Reidy, Razafindrakoto, & Ziegler, 2006). It is therefore important to

encourage children (and their caregivers) from a young age to listen to their inner sensations for food intake, and to maintain this even in more challenging situations.

2.4 Further reading

Kaat Philippe. Maternal and paternal feeding practices: links with young children's eating behaviours and influencing factors: a systemic approach. Psychology. Université Bourgogne Franche-Comté, 2021. English.

Edulia Deliverable D6.1. Caregiver feeding practices, sibling and peer influence on children's food choice in a social context. Authors: Sandrine Monnery-Patris, Kaat Philippe, Sylvie Issanchou, Tija Ragelienė, Alice Grønhøj

Kaat Phillipe (ESR7) gave three online lectures about her PhD research for the online part of the symposium "Symposium on Healthy, sustainable food and lifestyle for children" (Gezonde, duurzame voeding en leefstijl voor kinderen) given by WUR (2022) targeted for policy makers. The web-site of the symposium https://www.wur.nl/nl/show/Symposium-Gezonde-duurzame-voeding-en-leefstijl-voor-kinderen.htm

https://edulia.eu/edulia-presents-quality-food-time-in-quarantine/

3 Task 6.2.1 Cognitive factors influencing children's eating behaviour.

3.1 Background and objective(s)

Internal factors, especially **cognitive mechanisms (i.e., categorization) play a crucial role in understanding and in accepting/rejecting foods.** Different categories underly the food domain, such as the taxonomic categories (i.e., lamb is meat), the thematic categories (i.e., lamb goes on a plate), or the script (i.e., lamb is eaten at dinner).

It has been shown that these knowledges may help the consumer to identify the foods, but also to develop appropriate interaction when confronted with foods in different contexts. If conceptual knowledge is underdeveloped in the food domain, this could in turn lead to increased displays of food rejection, food neophobia and fussy eating in children.

The aim of Abigail Pickard, ESR10, was to expand upon these previous findings **by determining whether food rejection is related to deficits in specific knowledge structures (script and thematic categories), or a global deficit in knowledge of food.**

This PhD work contributes to the publication of 2 scientific papers:

Pickard, A., Thibaut, J. P., & Lafraire, J. (2021). Strawberries and cream: the relationship between food rejection and thematic knowledge of food in young children. Frontiers in Psychology, 12, 626701.

Pickard, A., Lafraire, J., Thibaut, J. P., Philippe, K., Bian, L., & Markman, E. (2021). 'The soup and the spoon': the Relationship Between Food Rejection and Thematic Categorization Development in young children (3-6 years). Appetite, 157, 104863.

3.2 Methodology

The first study reported by Abigail Pickard was designed to examine the previously untold relationship between thematic category knowledge and food rejection tendencies in children between 3 and 7-years-old. To do so, **a forced-choice analogy task was developed and conducted with 85 French children.** In this task, children were provided with a thematically or taxonomically related pair of foods (i.e., ice cream & cone or apple & banana, respectively), proceeded by a target food with both a thematically and taxonomically related choice. The children then **had to refer to the conceptual relation between the example pair to select the analogous associate to pair with the target food.**

In parallel, the child's level of food rejection was measured using a previously validated questionnaire : the Child Food Rejection Scale (CFRS; Rioux et al., 2017).

In the second part of her PhD thesis, Abigail Pickard has reported a comprehensive empirical research, based on three consecutive experiments based on **forced-choice analogy tasks,** investigating the

development of the specific script and thematic structures in the food domain and their respective links with food rejection.

To examine the developmental trajectories of these four category subtypes (food-food pairs, food-utensil pairs, event scripts, and meal scripts), 32 children aged from 2 to 5 years living in the United States took part in the first study. A second study was a replication of this study with 129 French children, including assessment of food neophobia and pickiness using a validated questionnaire (CFRS; Rioux et al., 2017). The third study entailed a more demanding task in which potential thematic and script associates were pitted against one another. In this last study, 72 children between 3-7y were asked to select the conceptual relation most appropriate to the task demands. In the script condition, children had to select an alternative meal script exemplar as a possible substitute for the target food. By contrast in the thematic condition, children were asked to select the conventional associate to accompany the target food.

3.3 Main results

The first key results of the first study indicated that poor analogical reasoning in the **thematic condition is linked with increased levels of food pickiness and food neophobia**. The analogical ability for thematic knowledge in the food domain is reduced in children with high levels of food neophobia and pickiness.

Second, the main results of the second part of her PhD work revealed relevant developmental trend in children, suggesting that **age was a strong predictor of improved conceptual knowledge in the food domain.**

More specifically, **functional thematic concepts (food-utensil) were acquired earliest, followed by knowledge of conventional food pairs (food-food) and script representations (event scripts)** in a US sample. Interestingly, these developmental findings were replicated in the French sample, **with meal script categories mastered significantly later than food-utensil, food-food, and event script relations**. Neither food neophobia nor food pickiness were significant factors in the models predicting conceptual knowledge.

In sum, children as young as 3 and 4 years old may already rely **on common cooccurrence to guide their food acceptance in eating situations, while older children may depend on script norms**. As with taxonomic knowledge, children with poorer conceptual knowledge of both script and co-occurring relations in the food domain exhibit increased food rejections.

3.4 Conclusion and perspectives

The results showed that children with higher levels of food rejection have poorer knowledge of foods conventionally eaten together, or foods for specific mealtimes.

Educating children about foods and eating situations could be a beneficial way to increase children's familiarity with food and subsequently promote food acceptance (see Annexe 1, D6.2. Guidelines: managing feeding practices of caregivers, in family and school food catering context; nudges for improving food choice at home and beyond. Authors: Abigail Pickard & Jérémie Lafraire).

3.5 Further reading

Pickard, A. (2021). *Spilling the beans: The development of conceptual knowledge about food and its links with food rejection in young children (3-7-years-old)* (Doctoral dissertation, Université de Bourgogne).

Deliverable 6.2. Guidelines: managing feeding practices of caregivers, in family and school food catering context; nudges for improving food choice at home and beyond. Authors: Abigail Pickard & Jérémie Lafraire. (see Annexe 1).

4 Task 6.2.2 Sibling and peer influences on children's eating habits.

4.1 Background and objective(s)

The rising childhood obesity rate is a major public health challenge. **Peers and siblings are considered an important influence on children's and adolescents' food choice.** However, **there is a lack of studies examining how peer and sibling impact is related to children's and adolescents' eating behaviour.**

A first purpose of the studies conducted by Tija Ragekiene (ESR9) within her PhD work was **to analyse peers' and siblings' impact on children's and adolescents' healthy eating behaviour** identified from a systematic literature review.

Children's food preference was found to be an important determinant for food choice and consumption. A second aim of her research was then **to explore children's food preferences using drawing as a projective technique** in terms of healthy and sustainable eating, and **to compare food preference patterns in Denmark and Lithuania.**

More specifically, **the aim was to get a broader understanding of children's food preferences using drawing as a projective method and to examine and compare children's food preferences patterns in Denmark as representative of Western-High income country, and in Lithuania as representative of Former Soviet Union country.**

Moreover, to **assess the prominent role in children's food-related consumer socialization played by social agents such as peers, siblings and social media**, Tija Rageliene conducted a study using a parallel, **mixed-methods approach to more properly target their impact on children's healthy eating**. The underlying mechanisms for peer-related social influence on preadolescents' healthy eating behaviour were also assessed by including factors closely linked with the quality of preadolescents' relationship with peers (i.e., peer-related social norms of healthy eating, social self-efficacy, vegetable preference, etc).

Finally, to go further, Tija Rageline designed **an original interventional study based on smartphone application, to assess the impact of this app-based application for encouraging children's healthy eating in Denmark.**

This PhD work contributes to the publication of five scientific papers:

Ragelienė, T. and A. Grønhøj (2020), *The influence of peers' and siblings' on children's and adolescents' healthy eating behavior. A systematic literature review.* Appetite, **148**: p. 104592. https://doi.org/10.1016/j.appet.2020.104592

Ragelienė, T. and A. Grønhøj, (2020) *Preadolescents' healthy eating behavior: peeping through the social norms approach. BMC Public Health*, **20**(1): p. 1268. doi:10.1186/s12889-020-09366-1

Ragelienė, T. (2021). Do children favor snacks and dislike vegetables? Exploring children's food preferences using drawing as a projective technique. A cross-cultural study. Appetite, 165, 105276. doi:https://doi.org/10.1016/j.appet.2021.105276

Ragelienė, T., & Grønhøj, A. (2021). The role of peers, siblings and social media for children's healthy eating socialization: a mixed methods study. Food Quality and Preference, 93, 104255. https://doi.org/10.1016/j.foodqual.2021.104255

Ragelienė, T., Aschemann-Witzel, J., & Grønhøj, A. (2021). Efficacy of a smartphone application-based intervention for encouraging children's healthy eating in Denmark. Health Promotion International. https://doi:10.1093/heapro/daab081

4.2 Methodology

Different various and relevant methods have been developed/used during her PhD work.

First, the analyse of peers' and siblings' impact on children's and adolescents' healthy eating behaviour reported by Tija Rageliene was based on the **Systematic Literature Review** (SLR). Twenty-nine studies were included in this systematic review (Ragelienė, T. and A. Grønhøj (2020), *Appetite*),

Second, **a drawing as a projectile technique** was developed during the PhD work. In this task, children were asked to fill out a paper-pencil questionnaire and to draw their favorite meal for lunch or dinner on an empty plate template, write below what dish they have drawn, and list the name of ingredients of this dish (Ragelienė, 2021). The data were collected in children's classrooms during regular school hours. It took approximately 20 min to answer the questions about eating behavior and do a drawing task. In total, 484 children, aged between 8 and 13 years old, participated in the study (147 in Denmark and 337 in Lithuania). These data were completed by sociodemographic questions about children's age, gender, parents' employment, and family composition.

A **declarative approach** has been also used. More specifically, a questionnaire (containing sociodemographic questions, questions about food intake, peer-related social norms of healthy eating, social self-efficacy, vegetable preference, need for peer approval and feeling of belonging) was used in 278 Lithuanian preadolescents (Ragelienė & Grønhøj, 2020). This data was then analysed using structural equation modeling.

A **mixed-method, combined a self-reported questionnaire** (278 children aged 8-13 y) **and a semi-structured interview** (20 children selected randomly from the sample of 278 children) was also used (Ragelienė & Grønhøj, 2021).

Finally, an **interventional study** was developed to assess the efficacy of a smartphone app-based intervention for encouraging children's healthy eating in Denmark. In this study, two focus groups were conducted to explore children's experience of using the app. Then, a quasi-experimental design was used to evaluate the app's efficacy. The children were asked to use the app for three months. Afterwards, the effect of the intervention was evaluated. 118 children aged 9 to 13 years participated in the study.

4.3 Main results

Peers, and to a lesser extent siblings' influence on children's and adolescents' healthy eating behaviour more often is negative than positive. Friends can be a barrier for children to eat healthily.

Siblings' influence becomes important **in the context of eating together with the whole family**.

Positive emotions and communication with friends are the most important aspects of eating together with friends.

Children's communication and sharing experience with friends are the main reasons for using social media. Social media contributes to children's consumer socialization by exposing them to food products.

In Lithuania and in Denmark, **fruits, vegetables, highly-processed and animal-based foods were not included in a large part of children's most preferred meal composition**. Favourite meals' composition varied among children in both countries and included different products from separate food groups. **Vegetables were more likely to be present in the children's favourite meals together with meat products.**

Girls in both countries had more expressed vegetable preferences than boys. Boys in Lithuania had a relatively more expressed preference for highly-processed foods, while Danish girls had a more expressed preference for animal-based products.

The social self-efficacy predicts feeling of belonging to the peer group and need for peer approval.

Feeling of belonging and need for peer approval predict actual intake of vegetables via injunctive norms of healthy eating. However, neither feeling of belonging nor need for peer approval predicted descriptive norms of healthy eating. Contrary to Tija Ragelienė's expectations, **descriptive norms were found to be unrelated with actual intake of vegetables, though vegetable preference predicted actual intake of vegetables.** Vegetable preference was not predicted by injunctive or descriptive peers' social norms of healthy eating.

Finally, a key result indicated **that a smartphone application-based intervention may be efficient for encouraging children's healthy eating in Denmark. After using the app during three months, a significant increase in fruit, vegetable preferences and fruit intake was found in the interventional group.**

4.4 Conclusion

Peer, sibling and social media influence can be used in creating marketing strategies to promote healthy eating behavior among children.

Children's preferences for foods such as meat and animal-based products expressed in children's drawings, might be considered **as relatively positive in terms of sustainable eating. However, children's preferences and intake of fruits and vegetables should still be encouraged among young consumers**.

Cultural and gender differences in children's food preferences should be considered while creating interventions and marketing strategies for promoting healthy and sustainable eating among young consumers.

Finally, the findings of this study offer insight for informing parents, teachers and for social norms marketing interventions by **stressing the importance of social relations when the aim is to encourage healthy eating among preadolescents.**

Interestingly, **the smartphone app-based intervention could potentially serve as an attractive and low-cost intervention to reach a wide population of children for the promotion of healthy eating and prevention of childhood obesity.**

4.5 Further reading

Tija, Ragiliene (2021). Peer, sibling and social media influence on preadolescent children's healthy eating behaviour. PhD Thesis. Arhus University (School of Business and Social Sciences Department of Management).

5 Conclusion

To conclude, the studies conducted within the WP6 provided a holistic picture of the type and strength of **the interacting social and cognitive factors influencing child's eating behaviours**. Thanks to qualitative approaches (interviews), declarative methods (questionnaires), experimental designs (Forced-choice task adapted to young children) and interventional studies (app), the results highlighted the key role of parents, caregivers, peers and siblings in the development of children's eating preferences and behaviours, and the crucial impact of poor conceptual knowledge in food rejections.

- ***From Task 6.1*,** a first result showed that fathers and mothers perceived their child's eating behaviors in similar ways, despite mothers taking significantly more meals with their child than fathers. **Fathers reported using more pressure to eat and food as reward, but reported lower levels of "family meal setting" than mothers.** Interestingly, both maternal and paternal practices and styles were predictors for child eating behaviours. Moreover, in households where both parents used **higher levels of pressure to eat, the child showed a significantly lower food enjoyment and a higher food neophobia** than expected if only one parent used this pressuring practice.

- A second key result was dealing with the influence of parental portioning practices. It is well known that when children are served larger portions, they tend to eat more (this is called the "portion size effect"). However, little is known about parental portioning practices and drivers of these practices. A wide range of parental feeding practices have been described, mostly **determined by "intuition', and not by sanitary recommendations**. For most, determining portion sizes is an **intuitive action that depends on habits and mainly arises from experiences with feeding their child and his/her appetitive traits**. Interestingly, **most parents do not search for information/recommendations to guide their practices.**

- *Main learnings and recommendations for future research.* These findings underline the importance of studying the individual role of each parent in child feeding research and that both parents within families **should avoid using coercive practices**. This could finally stimulate new interventions and recommendations addressed **to both parents**.

- Another crucial point is related to **the portioning practices**. Stimulating optimal self-regulation of eating in children is important and parents can play a crucial role in this. One way to accompany parents in providing appropriate portion sizes is **1- to inform them about the capacity of the child in regulating food intake based on their hunger and satiety sensations, and 2- to help them to include children in this process.**

- Finally, the exceptional sanatory context imposing a strict lockdown provided unique insights into how a drastic change in habits is accompanied by changes in eating and feeding habits both on parent and child level. This situation drove some parents to turn a blind eye to the usual feeding rules, and **to privilege enjoyment and comfort at home**. **Changes in child boredom and parental stress** were found to influence eating and feeding behaviors. These insights could be useful for future studies and interventions, and could be of interest to policy makers. Moreover, even though the COVID-19 lockdown was an unusual situation, the increased manifestation of these food approach behaviors and their link with child boredom could be cause for concern. It suggests that these children did not merely rely on their internal cues of hunger and satiety when asking for foods/drinks (crucial for an optimal self-regulation of food intake); and ignoring internal cues could possibly make children overeat and induce weight gain if maintained for a long period (Monnery-Patris et al., 2019). **It is therefore important to encourage children (and their caregivers) from a young age to listen to their inner sensations for food intake, and to maintain this even in more challenging situations**. Parents and schools could play an important role in guiding children in using adaptive self-regulation strategies and in modeling these strategies. In both children and adults, several types of interventions **such as mindfulness-based interventions and appetite awareness training have been proposed to increase awareness of hunger and satiety cues, with various levels of success**. More researches are warranted to more properly assess these opportunities.

- ***From Task 6.2.1***, we have learned how children's food rejections are linked to knowledge acquisitions. In particular, children with higher levels of food rejection have poorer knowledge of foods conventionally eaten together, or foods for specific mealtimes. The studies provided evidence that educating children about foods, eating situations and conceptual knowledge can be an effective strategy for **increasing familiarity and promoting greater food acceptance**.

- *Main learnings and recommendations for future research.* The research suggested opportunities for development psychologist and public health professionals to improve children's knowledge of food and foster increased dietary variety. Guidelines for the implementation of practical recommendations for managing feeding practices of caregivers, in the family and school food catering context, and of nudges for improving food choice at home and in broader food choice environments (e.g., school) have been developed (See Annexe 1). These guidelines have been developed as a complement to existing guidelines (EFSA, European directives), and provide ideas and activities for parents and caregivers to teach children about food and boost food acceptance and wider dietary variety.

- ***From Task 6.2.2,*** new insights have been provided on the influence of peers, siblings, and social media on preadolescent children's healthy eating behaviour.

- Peers influence on healthy eating is more often negative than positive, i.e. that **peers rather increase the consumption of unhealthy foods rather than increasing the consumption of healthy food**. Sibling influences have little importance as the parents govern meal structure and availability of healthy food at home.

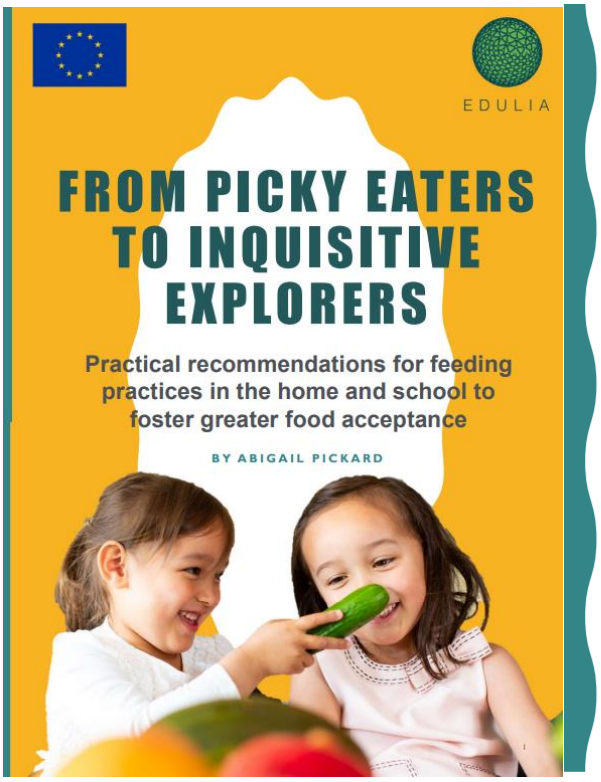
- Furthermore, **to encourage preadolescents children's healthy eating behaviour, an app "Food Boss" has been developed and validated.** This app constitutes a useful and pleasant tool, helping children to learn about healthy food and to make food diaries.

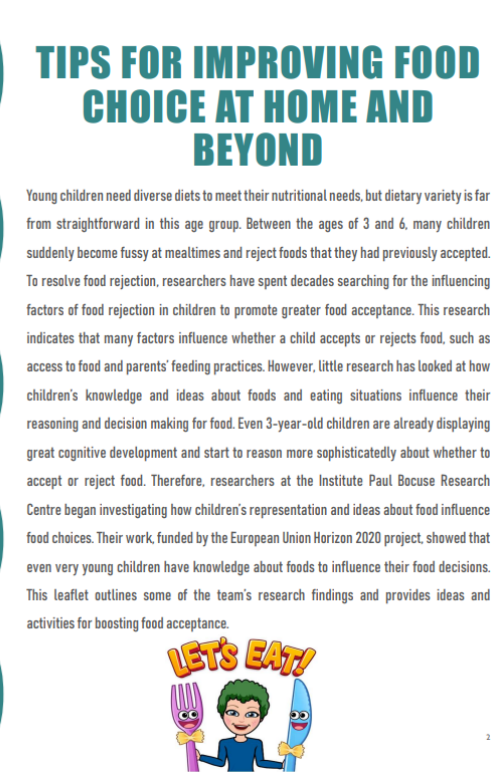
- *Main learnings and recommendations for future research.* Interestingly, this app could potentially serve as an attractive and low-cost intervention to reach a wide population of children

for the promotion of healthy eating and prevention of childhood obesity. Nevertheless, the medium- and long-term effects of this app are still unexplored as well as its adequation to different cultures/countries and age groups. Replications and longitudinal studies are still warranted.

Appendices

Appendix 1 Deliverable D6.2 Practical recommendations for feeding practices in the home and school to foster greater food acceptance





TIPS FOR IMPROVING FOOD CHOICE AT HOME AND BEYOND

Young children need diverse diets to meet their nutritional needs, but dietary variety is far from straightforward in this age group. Between the ages of 3 and 6, many children suddenly become fussy at mealtimes and reject foods that they had previously accepted. To resolve food rejection, researchers have spent decades searching for the influencing factors of food rejection in children to promote greater food acceptance. This research indicates that many factors influence whether a child accepts or rejects food, such as access to food and parents' feeding practices. However, little research has looked at how children's knowledge and ideas about foods and eating situations influence their reasoning and decision making for food. Even 3-year-old children are already displaying great cognitive development and start to reason more sophisticatedly about whether to accept or reject food. Therefore, researchers at the Institute Paul Bocuse Research Centre began investigating how children's representation and ideas about food influence food choices. Their work, funded by the European Union Horizon 2020 project, showed that even very young children have knowledge about foods to influence their food decisions. This leaflet outlines some of the team's research findings and provides ideas and activities for boosting food acceptance.

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HOW CHILDREN THINK ABOUT FOOD

Among the many abilities we acquire, we have developed great skills in classifying EVERYTHING around us and mentally grouping objects that are considered "equivalent" or have similarities (Murphy 2002). For example, we recognise a dog as an animal or trousers as clothing. The process of categorizing and grouping similar items allows us to make decisions more efficiently and interact appropriately with the millions of items we encounter throughout day-to-day life. This is an essential skill for humans because it allows us to recognise a new object as belonging to a familiar category allowing information we know about other category members to be extended to the new item. For example, when given a new pair of trousers placing them into the category of clothes would help us understand that the trousers are supposed to be worn rather than used to clean the dishes.

Categorising and grouping objects is very effective with food. A starting strategy is to classify items as either edible or inedible, as seen in the image on the right. Identifying objects as food versus non-food is particularly crucial to avoid ingesting substances that may invoke disgust or even toxicity.

Image courtesy of Foinant, Lafraire & Thibaut

Following on from the basic knowledge of what we can or cannot consume, we then develop more detailed ways *of deciding* what foods to consume. Sub-categories such as fruits, vegetables, dairy, as seen in the food pyramid on the right, help inform us of nutritional properties and what foods need to be included in our diet.

But equally, we create sub-categories as a basis of behavioural or cultural habits, such as foods that taste good together, things needed to eat foods, or even specific times or events to consume foods. These categories differ not solely from culture to culture but also from individual to individual. While some categories will be particularly culture based (i.e. bread and butter), others may stem from personal preference (e.g. avocado and toast). These categories allow us to represent food in certain situations so that we are familiar with food even when we have never encountered the same food.

Image courtesy of Allison Sweatman

Take the example of soup, a common representation for soup is that it is served in a bowl with a spoon at lunch or dinner. If we were served soup in a syringe at breakfast or even the dentist the fact that it is very unrepresentative of our ideas of soup situations would make us cautious to accept it.

Previous research shows that adults often rely on the knowledge of how or when to expect food to guide acceptance or rejection. For example, we wouldn't accept soup served in a syringe or at breakfast time.

The researchers at the Institute Paul Bocuse Research Centre found that young children are already using these representations and ideas too. Thus, when food is first presented to a child, the child will immediately "categorize" it based on its characteristics (Murphy 2002, Vauclair, 2004; Lafraire et al., 2016). The knowledge gained from this initial encounter will allow for increasingly easy and rapid categorization when subsequently presented with the same or similar food (Aldridge Dovey & Halford, 2009).

However, an important aspect to consider is that when such categories and food rules are established they are relatively strict and liable to restrict our food acceptance. For example, when selecting something for breakfast we are likely to default to the few food members we deem appropriate for the said category. For example, in France, it would be considered normal to eat a croissant dipped in coffee or milk for breakfast. French people are then more likely to think the idea of a croissant dipped in soup for breakfast is bizarre and even repulsive. However, until the 1940s, the majority of French people were more likely to consume bread dipped in soup (or wine!) than coffee, tea or cocoa.

This example demonstrates how such categories come to be formed through social norms and daily experience. Therefore, the problem arises in that young children tend to follow the same reasoning that certain foods belong to certain meal times or associations, but young children have much fewer category members. The researchers found that children who had fewer ideas of foods conventionally paired together or served at certain meal times displayed higher levels of food rejection.

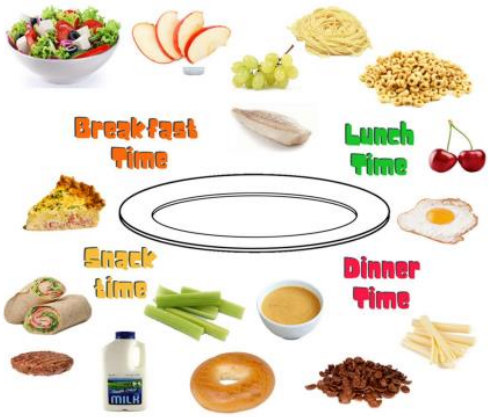
While we may see all the examples above as suitable breakfast foods, children with less experience will be likely to only have a few representations for possible breakfast foods (such as the few items highlighted below). This means that when you present them with something that does not seem to belong to a meal script (i.e. cheese) they will be less likely to accept the food. As such, not having lots of representations of foods that go together or appear in certain situations hinders the child from viewing the food as acceptable.

TIME TO INVESTIGATE...

Activity 1 – What food goes where?

A good way to investigate what ideas children already have about foods and meals is to ask them to come up with different meals that are normally eaten at breakfast, lunch, snack, dinner and even different events or situations (i.e. a picnic or the movies). This activity is a good insight into how a child thinks about food and what their meal script categories consist of. Young children may find it more difficult to provide 'typical' meals (even adults struggle to come up with different ideas) and may resort to unconventional or bizarre food items. However, this does not necessarily mean that the child would be willing to accept unconventional foods into certain meal categories in a real-life setting.

Activity 2 – What food when?



For younger children or children with less vocabulary, images of foods could be used.

Print out many different items of food and ask the child to sort them into scenes of different meal times or activities. Provide them with different scenes or scenarios and ask them to group the foods that they think belong to each mealtime.

This activity is also a great way for children to learn new vocabulary for foods.

Activity 3 – What food goes with what?

Similar tasks can also be conducted to see what foods children associate together. Again, print out many different cards and ask the child to pair up the images or group them with things that go well together or are served on the same plate.

SUMMARY

These activities provide a great insight into how children think about food and what knowledge and categories they already have. However, similar activities can also be conducted to improve children's knowledge of foods and eating situations so that they are more likely to accept foods. Read the next section for some easy ideas to boost children's ideas about food.

ACTIVITIES FOR BOOSTING CHILDREN'S FOOD KNOWLEDGE

Picture naming cards used in Montessori education are very useful to increase familiarity and think about foods belonging to more categories. Cardboard cards depicting fruits, vegetables and other foods can be initially used to enrich the child's vocabulary and develop reading skills.

The idea is to initially present the child with a few cards and then to expand his or her knowledge according to categories (e.g. summer vegetables, fruit from trees, different varieties of squash, etc.). They also allow for classification games for children (according to colours, seasons, seed or stone, etc.).

Image courtesy of Nathan education materials

Activity 1 – Find the food friends

Place pictures of foods that are often paired together facing up, so that the child has time to look carefully at the pictures. Then, turn all the cards over and take it in turns to turn over two cards. A player makes a match if the two cards turned picture-side-up form a typical food pair (the cards can be colour coded to help identify the association). When a match is made, the player takes both cards and places them in front of him or her. That player then takes another turn and continues taking turns until they miss.

The winner is the player that makes the most pairs.

Activity 2 – Travel the globe

Increasing a child's experience with food and eating situations increases the feelings of familiarity and certainty when confronted with such situations in the future.

At different mealtimes introduce different foods from other cultures that will initially appear unconventional to the child. For example, if a child is typically exposed to sweet breakfast foods found in French cuisine, try a savoury dish such as the classic Bulgarian dish of Banista or the Mexican dish of Huevos Rancheros. See the image below for some ideas!

Image courtesy of Mattress Clarity

14

Tips

Play upon children's food scripts by including other aspects of the meal's culture, such as traditional decorations and music. Treat this activity as a game by having a map of the world and colouring in the country that you are 'visiting'.

PERSEVERANCE IS KEY! Repeat the meal several times, because script categories are formed through regular experience and memory. The first few times the child may not be willing to try the new breakfast food, they should not be forced to try it but gently encouraged to appreciate that it is a possible food to be eaten for breakfast. The child will start to become familiar with eggs or tomatoes for breakfast and see them as a possible addition to their category of breakfast foods. They will also come to understand that despite the food not belonging to their meal category it is still appropriate and acceptable to eat.

15

EDULIA

Activity 3 – Books and Food education

Books are an easy and effective method to teach children not solely about the food itself but how they are likely to experience the food (i.e. at a party, served with other things). By providing 2- to 6-year-olds with picture books of leeks and carrots, Heath et al. (2011) and De Droog et al. (2 014) showed that toddlers consumed more of the vegetables they saw in their picture book, compared to a corresponding control vegetable. Picture books, stories told from personified fruits and vegetables, or stories in which a recipe, a family meal, are told are all promising ways of expanding children's food knowledge.

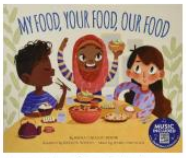


Image courtesy of Emma Carlson Berne

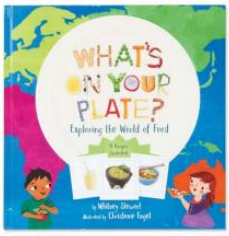


Image courtesy of Whitney Stewart

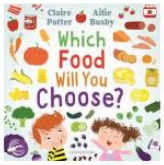


Image courtesy of Claire Potter & Ailie Busby

Image courtesy of Gita Varadarajan

Image courtesy of Gina Bellisario

Activity 4 – Pretend play

Games involving food such as pretend tea parties and children's play kitchens are the perfect opportunities to learn about food in real-life situations. This is a particularly effective method to engage children who are very apprehensive when it comes to food as there is no pressure to try the food. This is the perfect way to introduce new fruits and vegetables and you should try and include obscure or pretend foods for your child. Search online for play foods from different cultures or cuisines (such as mussels from France or sushi from Japan) to familiarize children with food before introducing it at the table.

Activity 5 – Get in the kitchen

'Home economics' classes for children, in which they do household activities such as cooking and cleaning could be a great opportunity to expose children to different food situations. Allowing the children to follow the process of growing, preparing and serving foods helps them become more familiar with what they are eating. As long as they are supervised, even children as young as 2 years old can help in the kitchen and many places sell children's kitchen utensils that can be used safely. Search the internet to purchase child friendly utensils such as wavy choppers or silicon knives.

IN SUMMARY...

It is expected that young children will display many food rejection tendencies during their early years. The most recent research on the factors influencing food rejection shows that reduced knowledge of acceptable foods and combinations may be lead children to feel uncertain and err on the side of caution by rejecting the food.

However, all hope is not lost.

As children are exposed to more eating situations and foods their knowledge and ideas of food will equally increase. If children lack experience with eating situations this will hinder their ideas about the appropriateness of food and lead to subsequent rejection. Therefore, the important takeaway message is to keep persevering with exposing children, not solely to a variety of foods, but a variety of eating situations and food combinations. This education will allow children to see the potential of different foods in different scenarios and foster greater food acceptance.

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This document has been produced by Abigail Pickard with the advice and guidance of Dr Jérémie Lafraire, Institut Paul Bocuse Research Centre.

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