How to make children choose the healthier option: The effect of smileys as motivational incentives on children’s food choice

A report on the findings of the I.Family study canteen experiments carried out in 2014 in Estonia, Germany, Hungary, Poland and Sweden

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We thank all the schools for their participation and contribution.

Introduction

Obesity is a major problem in many regions of the world. In particular, the problem of obese children is important to act on, because obese children are more likely to become obese adults than normal weight children. An important factor to combat obesity is a healthy diet, yet many children’s diets do not adhere to nutritional guidelines. In particular, fruit and vegetable consumption is consistently reported at low levels – way below most dietary recommendations. In most American, Australian and European studies, children aged between two to eleven years eat on average two to three servings per day of fruits and vegetables instead if the recommended five servings. A recent European study demonstrated that only 8.8% of children meet the five-a-day target.

Children’s eating behaviour is strongly linked to their food preferences. There is evidence across countries that vegetables are among the least liked foods. One of the causes for this could be that children experience food neophobia, i.e. a dislike for food they don’t know. Food neophobia can be overcome through repeated exposure; studies have shown that on average, it takes 8-10 times for primary children to become familiar with a particular vegetable. Furthermore, research and dietary practice has shown that habits can eventually be formed through repeated exposure. There is therefore cause to believe that ensuring children repeatedly taste fruits and vegetables will increase the children’s consumption of these foods in the longer run.

Furthermore, children are an ideal target group to change behaviour: behaviour learned in childhood is likely to be transferred into adulthood. As habits are not yet formed as solidly as in adults, it is easier to develop new healthy eating habits among children than adults. However, children are only partly responsible for their own food choices – a large part of this responsibility falls on parents, caretakers, teachers, canteen management and school authorities. By influencing children’s eating behaviour in a school setting, a lot of children...
can be reached with fairly modest means. This study aims to explore how schools can motivate children to make healthier eating choices using a friendly smiley stamp on a card as simple motivational incentive. Testing whether a smiley affects children choice of vegetables/salads, we carried out a field experiment in five countries: Estonia, Germany, Hungary, Poland and Sweden.

The idea

Several factors influence the effect of an incentive: the setting, the type of food, the type of incentive (food reward, monetary versus non-monetary reward, social reward), the initial preference for the food and more. The main objective of the experiment was to investigate whether the smiley was a strong enough incentive to make the children eat more vegetables/salad.

In the experiment a smiley stamp was chosen as the motivational incentive. Children receive a smiley on their personal stamp card (see Figure 1) for choosing a portion of vegetables/salad. Each child can have a maximum of one smiley per day and hence up to five smileys a week on a stamp card.
The experiment

The overall aim of the study was to investigate the effect of a simple incentive to promote vegetable and salad consumption among primary school children. The desired outcome was for the children to choose and ultimately eat more vegetables/salads. However, the effect of the smiley is assumed not to be permanent, and the effect is thus suspected to decrease once the smiley is removed.

A field experiment was conducted in ten primary schools in five European countries within the I.Family Study between September and December of 2014. In each country, one school was assigned as a treatment school and the other as a control school (see Table 1 for school characteristics). In the treatment schools, the smiley was employed as incentive, while there was no intervention in the control schools. This is a necessary setup to control for increases in
vegetable/salads that are not due to the smiley (e.g., change in diets due to cultural traditions such as during the Christmas time).

**Table 1: School characteristics**

<table>
<thead>
<tr>
<th>Country</th>
<th>Control – treatment</th>
<th>Students (total)</th>
<th>% lunch at school</th>
<th>Lunch provider</th>
<th>Style food is served</th>
<th>Recent Nutrition campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estonia</td>
<td>T</td>
<td>730 (156)</td>
<td>91-100%</td>
<td>Private under contract of school</td>
<td>Self-served</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>532</td>
<td>91-100%</td>
<td>Private under contract of school</td>
<td>Self-served</td>
<td>No</td>
</tr>
<tr>
<td>Poland</td>
<td>T</td>
<td>106 (106)</td>
<td>91-100%</td>
<td>School</td>
<td>Offer only*</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>110</td>
<td>91-100%</td>
<td>School</td>
<td>Offer only*</td>
<td>Yes</td>
</tr>
<tr>
<td>Sweden</td>
<td>T</td>
<td>432 (174)</td>
<td>91-100%</td>
<td>Private under contract of school</td>
<td>Self-served</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>550</td>
<td>81-90%</td>
<td>Private under contract of school</td>
<td>Self-served</td>
<td>Yes</td>
</tr>
<tr>
<td>Germany</td>
<td>T</td>
<td>1,000 (115)</td>
<td>91-100%</td>
<td>Private under contract of school</td>
<td>Family style</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>850</td>
<td>0-10%</td>
<td>Private under contract of district</td>
<td>Offer only*</td>
<td>Yes</td>
</tr>
<tr>
<td>Hungary</td>
<td>T</td>
<td>104 (104)</td>
<td>81-90%</td>
<td>Private under contract of district</td>
<td>Self-served</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>120</td>
<td>81-90%</td>
<td>Private under contract of district</td>
<td>Self-served</td>
<td>No</td>
</tr>
</tbody>
</table>

Note: Number of participants in school in parentheses

* Canteens with offer only changed the provision of vegetables/salads in the beginning of the school year so that students got used to choosing the amount themselves

To measure the potential smiley-effect, the experiment took place over six weeks. These were split into three two-week periods: two weeks before, two weeks during, and two weeks after the experimental treatment (i.e. giving the children the smiley stamp for choosing vegetables/salad with their meal). Throughout the experiment, vegetable and salad choice, consumption and waste were measured daily. The children’s consumption was measured by weighing the vegetables/salads (including any refills) offered on the buffet or table and subtracting the leftover vegetables/salads. To calculate consumption and control for waste, field workers sorted vegetable and salad waste from the children’s plates once they finished
lunch. Everything was weighed with appropriate kitchen scales. With the calculations for consumption and waste, it was possible to see which effect the smiley stamp had on the children’s behaviour in relation to eating vegetables/salad.

**Findings**

The analysis of the data from the experiment focused on how the children’s choice, consumption and waste was impacted by the introduction of the smiley stamp in Week 3 and 4 of the six week experiment. It also looked at how the children behaved after the smiley stamp was removed in Week 5 and 6 of the experiment.

Before the experiment began, no statistically significant difference was measurable between the treatment and control schools, as Table 2 demonstrates. This ensures that children in the treatment and control school eat about the same amount of vegetables/salad before we introduced the smiley, so that we can isolate the effect the smiley has on children’s food decisions.

**Table 2: Vegetable/salad choice, consumption and waste before treatment (Week 1 and 2)**

<table>
<thead>
<tr>
<th>Vegetable/salad</th>
<th>Treatment schools</th>
<th>Control schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice (kg)</td>
<td>8.3</td>
<td>7.5</td>
</tr>
<tr>
<td>Consumption (kg)</td>
<td>7.2</td>
<td>6.7</td>
</tr>
<tr>
<td>Waste (kg)</td>
<td>1.1</td>
<td>.8</td>
</tr>
<tr>
<td>Obs. (days)</td>
<td>43</td>
<td>45</td>
</tr>
</tbody>
</table>

*Note: No statistical significant difference between treatment and control schools.*

**Comparison of treatment and control schools**

The development in behaviour throughout the six weeks of the experiment can be seen in Figure 2. It depicts the mean vegetable and salad choice, consumption and waste (in kg) for treatment and control schools per experiment day. The horizontal red bars signal the start and the end of the incentive period, where the smiley stamp was used. Fluctuations in choice, consumption and waste depend strongly on the offered foods; for example, the peak in Day 6 is due to the popularity of peas in Hungary. While there does not seem to be a pattern of
higher choice and consumption of vegetables/salads in the treatments schools compared to treatment schools before the incentive was given (Day 1 – 10), Figure 2 shows that choice as well as consumption are consistently higher during the incentive period. Only Day 20 is an exception; here children in the treatment school in Poland are offered Sauerkraut, and not even a smiley could convince the majority of children to choose a portion. After the incentive is removed, the pattern is less clear again. We can also see that the gap between choice and consumption increases during the incentive period, which is reflected in increased waste.

**Figure 2:** Vegetable/salad choice, consumption and waste by day of experiment

Comparison within the treatment schools: before, during and after the smiley

On the individual level, the analysis showed that the percentage of children choosing a portion of vegetable/salad increases from 40.06% before to 76.89% during the period the smiley was given and decreases to 53.40% after the smiley has been removed. This means that
- the smiley significantly increases the proportion of children choosing a portion
- despite an expected drop after the removal of the smiley we still find a significantly larger share of children opting for a portion of vegetables/salads than in Weeks 1 and 2.

The effect of the smiley is even larger when looking at the group of children who did not have a portion of vegetables/salads every day before the smiley was introduced: before the smiley, 32.71% choose a portion which increases to 74.85% when the smiley is given. Here we also find a significant drop after taking away the smiley; however, the share of children choosing a portion is still 17.10% higher than before.

Comparing the results from the different countries, it is interesting to note that the starting levels of children choosing a portion vary a lot between countries. While we find the majority of children choosing a portion in Hungary (78.93%) and Poland (57.11%), we find only few children opting for a portion in Sweden (28.75%) and Estonia (15.19%). We will not try to explain those initial differences, as there are numerous potential factors such as food cultures, canteen setting, food taste etc., which are unobservable, and any guess would thus be speculative.

Focussing on the countries with a low starting level (see Figure 3), we find interesting differences of the smiley effect between Sweden and Estonia: the number of children choosing a portion once the incentive is given increases markedly and in similar veins – in Sweden from 28.75% before to 80.35% and in Estonia from 15.19% to 52.35%. However, after the smiley has been taken away, the proportion of children opting for a portion falls back to the baseline levels in Estonia, but remains relatively high in Sweden (see Figure 3). In Sweden, compared to 28.75% before the smiley, 48.95% of the children still opt for a portion of vegetables/salads even without receiving the smiley anymore. In Germany, we find a large increase of the number of children choosing a portion when given the incentive and significant decrease once it has been removed. However, with 60.00% of children choosing a portion after the removal of the incentive is still significantly higher than before the incentive was given (36.85%).
To sum up, we find interesting differences across countries. In particular, the effect of the smiley is as expected in Sweden and Germany, i.e., increase during the smiley period and a slight decrease after its removal, but still higher than before the smiley was given. In Estonia and Hungary, we find an increase of children choosing a portion of vegetables/salads due to the smiley, but after its removal, this number decreases and is similar to the number prior to the incentive. In Poland, in contrast, we find the smiley effect to continue after its removal, but given the design of the study, it is impossible to say how long this effect lasted, since there are no measurements beyond week 6.

**Discussion**

Summarizing the results, we find on average a strong effect of the smiley on children’s food choice and consumption. Once the incentive is taken away, the effect levels off but is still higher than before the smiley. As we do not have any further measurement points after the
removal of the incentive, we do not know the development of the smiley effect, but would assume that it disappears slowly and a similar number of children choose a portion of vegetables/salad compared to prior to the incentive.

Looking at the main target group of these types of incentive programmes, i.e., children who dislike vegetables/salad and thus, choose and consume them at low levels, we find that more of these children chose a portion even after the incentive has been taken away compared to before the incentive.

Finally, we find tremendous differences across countries both in initial vegetable and salad choice and consumption as well as in the smiley effect. Many factors are potentially responsible for these observed differences, i.e., canteen settings, taste of foods, food culture, lunch provider, food prices, educational campaigns and so forth. However, in all countries, we see that the smiley incentive works.

Consequently, this study demonstrates that low-cost motivational incentives such as a smiley stamp card can be used across different countries to motivate school children into increasing vegetable and salad consumption and hence making healthier eating choices. A more permanent positive effect could likely be reached if the school several times a year introduces a “smiley week”. Theory predicts that a continued use of the smiley through repeated exposure to vegetables/salad for the children could lead to changes in children’s eating habits and, hence, make them choose a larger amount of vegetable/salad in the long run. Hence, we recommend several rounds of this - or a similar type of - incentive during the school year, eventually alternating with phases of educational campaigns on healthy lifestyles and phases of programmes promoting physical activity.
**Manual for implementing smiley weeks at schools**

**Rationale and requirements**

It is easily possible for your school to implement the smiley as motivation to increase healthy food choice among children. Empirical evidence suggests that repeated exposure and choice of vegetables/salads will increase vegetable/salad consumption in the long run and change children’s dietary habits. Our experiment demonstrated that such a small motivational incentive as a simple smiley can make children choose vegetables/salads more often and also eat them. The smiley incentive works for children in primary schools aged between 5 and 12 years.

The purpose of this manual is to enable schools to carry out the smiley incentive on their own and hence, improve eating habits of children. In particular, we provide guidelines for implementing the smiley stamp card scheme. There are not many requirements, namely:

- the possibility for children to self-serve vegetables and/or salads
- smiley stamp cards (see Appendix 1 for clipcard template),
- smiley stamps and
- engaged and motivated teachers/canteen staff to give the stamps to the children who choose a portion of vegetables/salad when eating in the school canteen.

**Guidelines and portion sizes**

Introducing the smiley incentive to your school is very simple. All you need to do is to have a smiley week a few times a year. This will make children more familiar with healthy food choices and potentially change their eating habits in the long run.

*What you need to do before starting a smiley week*

You need to print the stamp cards (templates provided in your language in the Appendix 1) according to the number of participating children. Consider to print the double amount of stamp cards as children might lose them, cards might break or other things can happen. Moreover, you need smiley stamps.
Teachers / canteen staff need to be involved and get to know the meaning of the smiley week and how it works.

**During the smiley week**

Stamp cards have to be distributed to all participating children the first day of the smiley week. The smiley can be introduced as a game to make children familiar with the rules: A child is eligible for one smiley per day. If a child is absent one day, there is no smiley. Children receive a smiley when taking a portion of vegetables/salad. A portion of vegetables/salad can be mixed, i.e., several types of vegetables/salad. A portion is defined as roughly 80 grams, however, the children can of course take more than the 80 grams and still get a stamp. Because 80 grams is difficult to understand, portion cards of too little, just a portion and more than a portion are provided (see Appendix 2 for examples). You can also make your own portion cards with common food that is served in your school. As an example of what a portion should look like, a large, printable version of Figure 4 below can be found in Appendix 2 and can be placed in the canteen for illustration purposes.

**Figure 4: Example of portion sizes**

![Example of portion sizes](image)

**Canteen setup**

The canteen setup differs between schools and depends on how the canteen environment is designed and how the children are served. Generally, three different types of canteen
environments are identifiable: Self-serving buffet, family style with food served on tables and offer only where the food is served by canteen staff. The type of canteen environment determines where in the canteen the children can receive the smiley stamp.

**Self-serving buffet:**

The smiley stamp can be given at the end of the buffet when the children have chosen their food and are on their way to their table. See also Figure 5 for an example.

![Diagram of Self-serving buffet]

**The family style:**

When the food is served on tables, the teacher/canteen staff can give smileys to the children while eating.

![Diagram of The family style]

**Offer only:**

The vegetables/salad should not be offered by staff but instead be available in large bowls for self-service by the children to promote the feeling of making an active choice. Ideally, the teacher or another school employee would be placed right after the self-
service bowls of vegetables/salad, giving smiley stamps to the children who have chosen to take a portion.

**Figure 5:** Self-serving buffet

![Self-serving buffet](image)

**Recommended duration and repetition**

The study demonstrated a significant effect of the smiley on children food choice for two weeks the smiley stamp was used. However, there might be a wearing off effect if the smiley is used for too long consecutively. We recommend having the smiley stamp for a week or two. Preferably, such a smiley week is repeated 2-4 times a school year which will ensure that children will be repeatedly exposed to a wider variety of vegetables/salads, influencing their food preferences by getting familiar with the different foods. Also other healthy food such as seasonal fruits can be included. Another advantage of the repeated exposure is to cover several times a year, i.e., different seasons, so the children become exposed to different kinds of seasonal vegetables/salads. Repeating the smiley period for one to two weeks at the time, two to four times a year is therefore considered ideal.
Expected benefits

The main benefit of the smiley stamp is that it increases the children’s intake of vegetables/salad. Beyond the immediate effect on increased intake, which the study demonstrates, there is also an expected long-term effect, as touched upon above, consisting of a decrease in children’s experience of food neophobia, i.e. a dislike for food they don’t know. Food neophobia can be overcome through repeated exposure; studies have shown that on average, it takes 8-10 times for primary school children to become familiar with a particular vegetable. This means that every repetition of the smiley period should have a beneficial effect on the children’s food neophobia and might help changing children’s dietary habits.
Appendix 1: Stamp card template
Appendix 2: Portion cards templates


9 Klein-Hessling, Johannes, Arnold Lohaus and Juliane Ball (2005), "Psychological Predictors of Health-Related Behaviour in Children," Psychology, Health & Medicine, 10 (February), 31–43.