Rapid categorization of food and non-food items by 3- to 4-years old children

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Introduction

Food neophobia and picky/fussy eating behavior are presented as the two main factors responsible for children’s food rejections and the reduction of their dietary repertoire. Food neophobia, or the reluctance to eat novel foods, peaks at around 2-6 years during childhood.

At around three years, children’s ability to distinguish between food and nonfood items appears to improve rapidly.

Thus, Food neophobia seems to peak when a food categorization system is thought to emerge. Is this mere coincidence or are the two somehow related?

Objectives

The aim of this study is to investigate young children’s abilities to discriminate visually between food and nonfood items, and the possible relationship between this ability and their level of food neophobia.

Method

1-Participants

- 42 French children age 3 to 4,5 years old (19 girls, 23 boys)
- Mean age = 44 months (36-53)
- Mean food neophobia score = 39 (14-68)

2-Stimuli

- 40 color photographs (half food, half non-food items)
- Food items were fruits or vegetables
- Each food item was paired with a non-food item matched by color and shape

3-Procedure

- Individual setting and individual presentation of pictures for 80 ms on a computer screen
- Categorization task: « Indicate for each picture whether it is food or not food, as accurately and quickly as possible »

4-Recording and data analysis

- Per picture :
  - Type of response
  - Response time (ms)
- On full picture set:
  - Discriminability index A’
  - Decision criterion B”
  - Mean response time (ms)

Results

1-Types of response

<table>
<thead>
<tr>
<th>Response Stimulus</th>
<th>Yes it’s Food</th>
<th>No it’s not food</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food item</td>
<td>84%</td>
<td>16%</td>
</tr>
<tr>
<td>Non-Food item</td>
<td>51%</td>
<td>49%</td>
</tr>
</tbody>
</table>

- High rate of hits, but non-food items considered as edible in 51% of the cases
- Rather liberal in their decision criterion

2-Effect of age on neophobia

- Pearson’s correlation r = .40, p = .008**
- Increase in food neophobia scores between 3 and 4 years of age

3-Effect of age on discriminability

- Pearson’s correlation r = .30, p = .05*
- Mean A’ = 0.76 (0.50 - 0.97)
- Efficient discrimination between food and non-food items

4-Correlation between discriminability and neophobia

- Pearson’s correlation r = .09, p = .45, ns
- Higher neophobia tends to be associated with higher discriminability

5- Effect of age on response times

- Age in months correlated significantly with response times (r = -.66, p < .001), with response times decreasing with age.

6-Effect of sex on discriminability

- We also found a significant effect of sex on A’, with girls outperforming boys on this index.
  (girls: M = .80, SD = .10, n = 19; boys: M = .73, SD = .10, n = 23; Mann-Whitney U test, U = 121.5, p = .01).

Conclusion

The food categorization system present in 3-4.5 years old children is under construction, and rather liberal as it accepts a large amount of non-food items as edible.

Perspectives

Future studies could extend the investigation of children’s categorization abilities in the food domain to a larger age span (e.g., from age 2 to age 6), as well as to alternative categorization tasks or instructions (e.g., picture sorting task).

Moreover, it would be worth considering children’s food likes and dislikes, their familiarity with the targeted food items, as it might also play a role in the development of a food categorization system during childhood.

The authors would like to acknowledge the “Fond Français pour l’Alimentation et la Santé” for the funding support they gave to this project.