

# How can classical conditioning learning procedures support the taste development in toddlers (REWARD): rationale, design and methods.

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## INTRODUCTION

The daily intakes of most essential food groups (e.g. vegetables) of young children are below the minimum recommendations. The strongest barrier for vegetable consumption in children is their preference for these foods. Surveys show that vegetables are children's least liked food category. Also, food neophobia (the tendency to reject new, unknown food) is common during childhood, affecting 8% to 50% of children. When food neophobia persists it can lead to the development of a very selective eating pattern which is a risk factor for eating problems in adolescence. The environment can influence the eating pattern of children by means of strategies that can facilitate or hamper preference for these foods. However, also characteristics of the child should be taken into account. As such, the development of food preferences can be seen as a learning process.

## RATIONALE

Learning Theory can be considered as the principal framework to understand learning processes in the achievement of new behaviour. Much research on tasting behaviour of young children, has focused on the effects of rewarding consequences on change in liking of certain foods. However, we assume that willingness to taste (WtT) is a crucial step in the process of liking healthy food. This study aims to examine how classical learning processes can effect children's WtT. We hypothesize that positive stimuli in the eating environment can serve as an antifear agent as they reduce stressful arousal and neophobia and as such can support children's WtT. Thereby, we expect differential effects (eg more willingness to taste) when exposed to positive cues depending on individual differences (Reward Sensitivity, RS).

## DESIGN AND METHOD

Table 1: Selection of the stimuli for the exposure(+stimuli) intervention, based on results study Focusgroups child friendly table architecture (Vervoort et al., 2014)

Results of the Focusgroups	Involvement	Involvement/modeling	Positive atmosphere /presentation
Antifear Stimuli	Identify and illustrate the vegetable to be tasted	Safety figure present	Colorfull plates and cutlery

Table 2: Assessment procedure based on Anzman-Frasca, Savage, Marini, Fisher & Birch (2011)

	Week1	Week2	Week3	Week4	Week 5	Week 12
Pre test liking assessment	X					
Pre test intake assessment	X					
Tasting trials (WtT and liking)		Trial 1, 2 & 3	Trial 4, 5 & 6	Trial 7, 8 & 9		
Post test liking assessment					X	
Post test intake assessment					X	
Follow up liking assessment						X
Follow up intake assessment						X

Children in day care (N= 75) will be randomly allocated to three conditions (exposure 'meal as usual', child friendly table architecture (+) or a controlgroup (no intervention) and will be exposed to an unknown food item from the category of (cooked) vegetables. Children's liking and usual intake of the vegetable will be assessed before (pre test). The manipulation includes a three week exposure(+stimuli) intervention consisting of 9 tasting trials (3/week). Stimuli were selected based on results from focusgroup discussions with parents, nannies and daycare assistants (table 1). During each trial, children's WtT (tasting or not) will be observed. Their liking will be measured using a 2-point visual 'faces' scale (VFS): 'yummy' (smiling) or 'yucky' (frowning) on trial 3, 6 and 9. After the intervention phase, the child's usual vegetable liking and intake will be assessed, 5 weeks from baseline (post test) and 3 months from baseline (follow-up 1); see table 2. The child's RS and neophobia will be assessed respectively by the **BIS/BAS Questionnaire** and the 6-item **Food Neophobia Scale**. Both parents and caregivers will be asked to fill out this questionnaire.

## DISCUSSION

This study can provide knowledge on how (1) RS may predict change in willingness to taste and liking behavior of vegetables; and (2) the tasting and liking process can develop faster when the child is exposed to positive stimuli via the process of associative learning (compared to mere exposure and the control group). This could lead to more successful interventions tailored to individual characteristics of children.