

CODE DELICIOUS:

Focus on sensory preferences and **cognitive development** to increase fruit & vegetable intake in school-aged children

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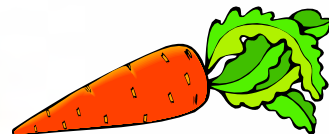
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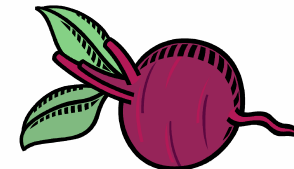
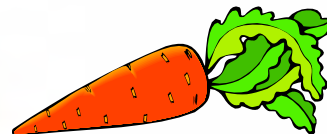
Background 1:



- F&V beneficial for health
- Children's consumption of F&V too low
- Obesity & overweight increasing
- Increase F&V intake

- Preference is most important determinant of food intake
(*Birch 1998; Gibson et al 1998; Bere et al 2004*)
- Focus on preference:
Make the healthy choice the tasty choice!

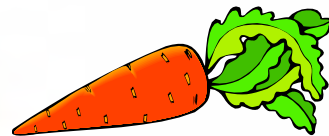
- Cognitive development almost never taken into account



Background 2:

- Cognition = The mental processes responsible for perception, attention, learning, memory, thought, communication
- How a " child perceives, thinks and gains understanding of the world through interaction and influence of genetic and learned factors" (Plotnik, 1999)
- During childhood four stages 4-5y 7-8y 11-12y

Aim: To develop age-specific strategies to increase fruit and vegetables intake in school-aged children

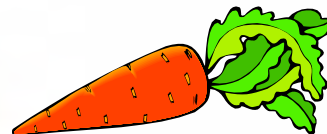


Background 3:

- To change intake → change preference
- Problems with measuring preference in children:
 - Cognitive skills
 - Inconsistency
 - Extreme/ random answers



We need a good method to measure preference



Facial expressions in infants

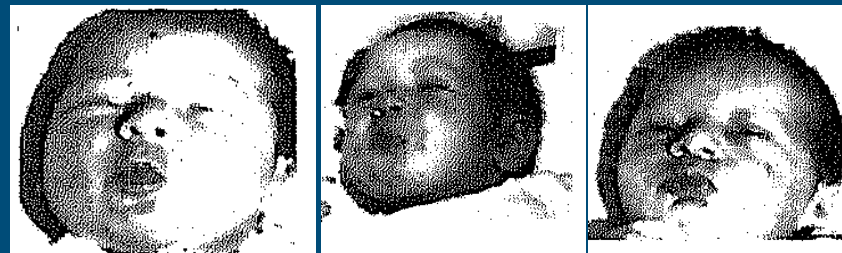
Preference sweet



Dislike bitter



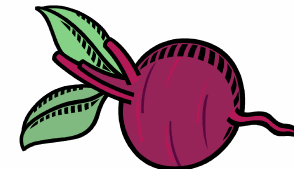
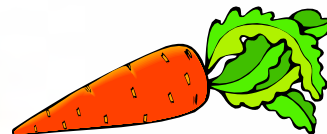
Dislike sour



Steiner et al, 1979



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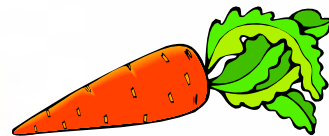


Pilot-study FACE-EXPRESS



Are facial expressions a useful and objective method to measure food preferences in school-aged children?

- Independent of age
- Reliability = inter coder agreement $\geq 70\%$
- Validity = comparison preference measurements:
1) Rank order + 2) 5-point-smiley + 3) facial expressions



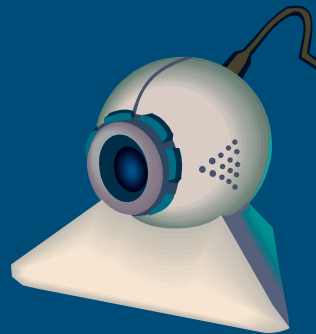
Methods FACE-EXPRESS 1

■ 6 Subjects

- Healthy children
- 3 age groups:
4-5 & 7-8 & 11-13 year

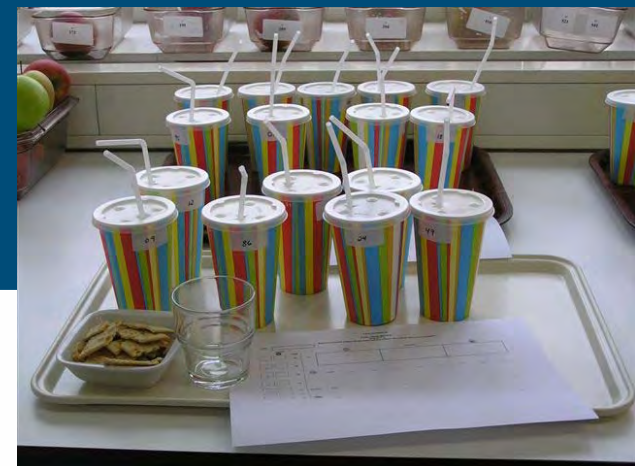
■ 3-stage procedure:

- Familiarization
- Rank order (*Birch et al, 1982*)
- 5-point-smiley scale



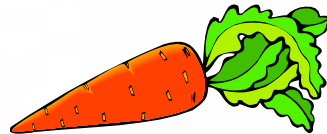
■ Stimuli: 7 liquids

- Sweet solution
- Bitter solution
- Red beet juice
- Sauerkraut juice
- Asparagus solution
- Skimmed milk
- Apple juice



Methods FACE-EXPRESS 2: Video Coding

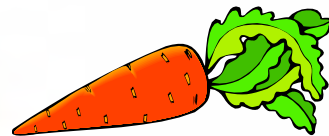
- Facial Action Coding System (FACS): 58 AUs
(*Ekman & Friesen, 1979*)
- AU = minimally distinguishable action of the facial muscles
- Coding scheme literature (pos/ neg): 25 AUs
- Scoring:
 - One coder
 - Frame by frame
 - Occurrences in first 6 seconds



Negative Facial Configuration



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Example of coding procedure





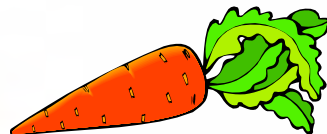
Results 1

- Total AUs = 121:
 - 74 Negative
 - 16 Neutral
 - 31 Positive

1 = best taste

7 = worst taste

Liquid	Mean preference rank order	
Apple juice	2.0	
Sweet	3.0	
Milk	3.2	
Red beet	3.4	
Asparagus	5.0	
Sauerkraut	5.4	
Bitter	6.0	



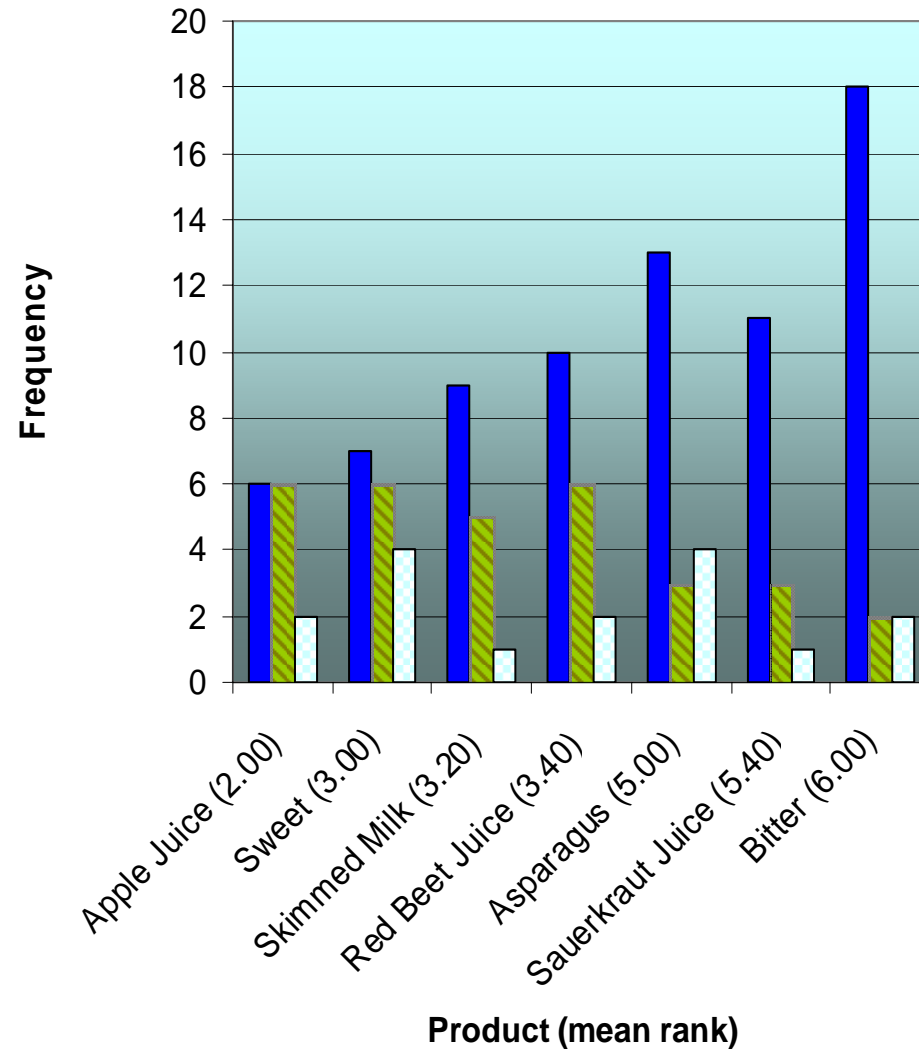
Results 2

Correlation between preference (Rank order 1-7) and sum of negative AUs = - 0.44 ($p < 0.05$)

→ More disliked → More negative AUs

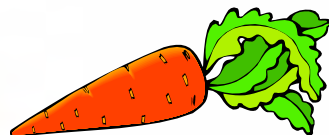
Total Action Units Per Drink

■ Total Negative AU ■ Total Positive AU □ Total Neutral/Unknown AU



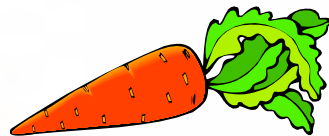
Results 3: Cross Table $\chi^2= 24.13$ $p<0.05$

		Positive AUs	Neutral AUs	Negative AUs	Total
😊 Like	Count	11	8	9	28
	Expected	7	4	17	
😐 Neutral	Count	13	4	16	33
	Expected	8	4	20	
😞 Dislike	Count	7	4	49	60
	Expected	15	8	37	
Total		31	16	74	121



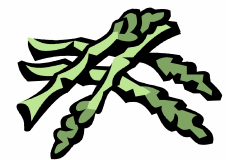
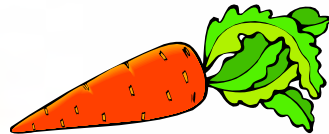
To summarize...

- No total agreement between the two methods: rank order method \neq facial Aus
- No distinction between liking & neutral
- Disliking is more distinguishable than liking
- Based on facial expressions alone: difficult to determine liking



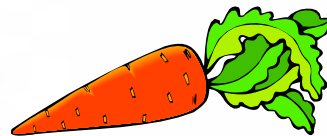
Discussion points

- Coding = time consuming (1-2 hrs/ 8 min video)
- Reliability = good (coder agreement 72%-75%)
- Objectivity?
 - free of self-reporting
 - clearly visible
 - differences between subjects
 - socially learned behavior
 - problematic combinations of AUs
- Are facial expressions the future?



Conclusion:

Facial expressions are suitable to measure disliking, but not yet sensitive enough to measure liking in school-aged children



Thank you for your attention!

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