

Preschooler's Perceptions of Food as a Possible Factor Related to Childhood Obesity

by

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An Honors Thesis

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Director, Honors College, College of Nursing (CON)

Abstract

Background

The epidemic of childhood obesity needs to be addressed. There are many facets related to this problem; however, to promote healthy eating habits in children, an understanding of their perceptions of food is key.

Methodology

In this comparative, descriptive design study preschoolers (n=28) aged 4-5 from two preschools were individually given a Preschool Food Perceptions Measurement Tool (PFPMTM) booklet and asked to circle either the “yummy” or “yucky” image for each food item in the taste preference section and the “good for me” or “bad for me” image in the healthfulness section. The PFPMTM was developed by the researcher to serve as a quantitative measurement tool for this study.

Results

Food preferences and indices of healthfulness were analyzed and data was compared related to demographic data and type of preschool. Chi Square (χ^2) scores showed Sig (p=.004) for relationship between taste preference and healthfulness of broccoli, Sig (p=.03) for relationship between taste preference and healthfulness of milk, Not Sig (p=.09) for relationship between taste preference and healthfulness of pizza. Additional χ^2 scores did not show significant findings.

Discussion

The majority of preschoolers responded “yummy” to all food items (except soda) and “good for me” to all food items (except soda and cookie). Association between taste preference and healthfulness should be considered when educating preschoolers on nutrition.

Advisor (signature)

Date

Department Chair (signature)

Date

Honors College Director (signature)

Date

Acknowledgement

I would like to acknowledge my honors advisor, Dr. Ellise Adams. In my opinion, Dr. Adams went above and beyond her role as advisor. She guided me in designing and implementing my research and provided constructive criticism in a respectful manner. Dr. Adams continuously supported me throughout my honors work, including attending all three presentations of this research study.

Additionally, I would like to acknowledge the two preschools used in this study for graciously welcoming me into their establishments, the parents for allowing their preschoolers to participate, and the preschoolers for their enthusiastic participation; all of which made this project possible.

Lastly, I would like to acknowledge The UAH Honors College. I am very grateful to have had the opportunity to participate in the honors college. Due to my honors' experience, I discovered my love of research. This love of research led me to apply to the Doctor of Philosophy (PhD) in Nursing program at the University of Alabama at Birmingham (UAB), to which I was accepted and will begin in the Fall of 2014.

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Introduction

Historically, an overweight child was considered a healthy child, one who was likely to survive the hardship of malnourishment and disease. However, in the past decade, obesity has become a major childhood health problem. Childhood obesity is associated with serious health problems and the risk of premature illness and death later in life (De Onis, Blössner, & Borghi, 2010). Due, in part, to the childhood obesity epidemic, the National Institutes of Health (NIH) predicts that the current generation of children in America may have shorter life expectancies than their parents (Olshansky et al., 2005).

The Center for Disease Control and Prevention (CDC) estimates approximately 17% (or 12.5 million) of children and adolescents aged 2—19 years in the United States (US) are obese (Ogden, Carroll, Kit, & Flegal, 2014). On a global level, the World Health Organization (WHO) reports that the number of overweight children under the age of five is estimated to be over 42 million and will increase to close to 60 million in 2020 (De Onis, Blössner, & Borghi, 2010). If trends are not reversed, increasing rates of childhood overweight and obesity will have enormous implications not only for future health care expenditures but also for the overall development of nations (De Onis, Blössner, & Borghi, 2010).

Review of Literature

Throughout their lives, children are exposed to information about food and health from their parents, peers, the media and school. From this information, children develop their own ideas about food and health. Slaughter and Ting (2010) studied children ages 5-20 to generate a comprehensive description of how children of different ages reason spontaneously about food and nutrition. Their results showed that between 5 and 8 years, there were significant increases in reasoning about food and nutrition. However, at age 11 and again at age 14, responses that

reflected more abstract reasoning increased significantly. These findings provide a developmental picture of changes in reasoning about these topics.

Research into how children's eating is shaped is still underdeveloped (Jansen, Daniels, & Nicholson, 2012), although researchers argue that parent behaviors such as modelling of eating behaviors and the food they give their young children have a significant impact on eating behaviors of children (Slusser et al., 2012). Parents' behaviors and eating patterns are likely to be particularly influential in early childhood as children of this age make few independent food choices. A review by Faith, Scanlon, Birch, Francis, and Sherry (2004) shows evidence for the relationship between parental feeding strategies and food intake as well as the weight status of the child. Kroller and Warschburger (2008) found that overweight children have less control over their food choice or the amount of food they eat.

A possible environmental influence on young children's food understanding is television advertising (Ferguson, Muñoz, & Medrano, 2012). A modest effect of television advertising on children's understanding of healthy and unhealthy foods was identified in a WHO review (Cairns, Angus, & Hastings, 2009), but just two of the experiments reviewed included preschool-aged samples, and these did not find effects. However, these studies were conducted several decades ago, and researchers have argued that if children view advertisements for foods (especially those high in sugar and salt) they should be viewed infrequently, otherwise their perception of a normal diet may be distorted (Keller & Schulz, 2010).

There are many facets related to childhood obesity; however, to promote healthy eating habits in children, an understanding of their perceptions of food is key. Yet, little research exists related to children's perceptions of healthy eating. Without understanding how children think about food, parents and/or educators cannot communicate as effectively as possible. The risk of

obesity needs to be addressed before children establish a pattern of eating that will be difficult to break. A child who is exposed to healthy eating habits will translate that knowledge into adulthood and will perpetuate a cycle of healthfulness for future generations.

The purpose of this comparative, descriptive design study is to identify preschooler's perceptions of foods. The research questions for this study are 1) Which foods do preschooler's like/dislike? 2) Which foods do preschooler's perceive as healthy/unhealthy? 3) How are preschooler's likes/dislikes related to their perceptions of foods as healthy or unhealthy? Results from this study may aid healthcare professionals/educators in designing developmentally appropriate interventions to prevent and reduce childhood obesity.

Instrument

The Preschool Food Perceptions Measurement Tool (PFPMTM) (Appendix A) was developed by the researcher to serve as a quantitative measurement tool for this study that would be developmentally appropriate for preschoolers. Food images consisted of seven healthy items (broccoli, apple, milk, banana, corn, black-eyed peas and water) and five unhealthy items (pizza, hot dog, soda, french fries, and cookie). Nine of the food items (broccoli, apple, milk, banana, corn, black-eyed peas, pizza, hot dog, and french fries) were obtained from the Huntsville city schools lunch menu which was followed by one of the research sites and should have been familiar to the children in the study. The remaining two, soda and cookie, were chosen by the researcher to be included in the study based on them both being common preschooler snacks. Possible answer bias, due to dietary preferences and/or food allergies/intolerances, were considered for pizza and hot dog. Therefore, dietary preferences and food allergies/intolerances were included on the demographic form (Appendix B). Food images were carefully chosen to allow preschoolers to self-identify the items without being prompted by the researcher.

The PFPMT™ has two sections, a Taste Preferences section and a Healthfulness section. In the Taste Preferences section, two response options of “yummy” and “yucky” were displayed. In the Healthfulness section, two response options of “good for me” and “bad for me” were displayed. “Good for me” was defined as “you should eat lots of this food to help you be strong and grow tall”. “Bad for me” was defined as “you should not eat too much of this food if you want to be strong and grow tall”. Age appropriate images were used to depict the four response options. The images were also described by the researcher to the participants. The order by which food images were displayed was different in the two sections by design.

Before conducting the study, an initial validation of the PFPMT™ was done with a preschooler that was not enlisted in this study. The initial validation was aimed at ensuring that the preschooler was able to self-identify the food items, circle the correct images for their responses to “yummy”/“yucky” and “good for me”/“bad for me”, and stay focused for the duration of the procedure.

Methodology

A total of 28 preschoolers from two preschools in Madison County, Alabama participated in the study. Preschoolers were aged 4–5 years. Consent (Appendix C) and demographic (Appendix B) forms were obtained from parents. Institutional Review Board (IRB) approval (Appendix D) was obtained for this study from the University of Alabama in Huntsville Review Board prior to the recruitment process.

The study was conducted on site at each preschool in a private room away from other preschoolers to avoid distraction and answer bias. Both the researcher and the researcher's advisor were present in the room. Preschoolers enrolled in the study were individually brought to the private room and given a PFPMT™ booklet. The researcher sat beside the preschooler as

they paged through the PFPMT™ together. After selecting a crayon of their choice, the preschooler was asked to identify the food item and then to circle either the “yummy” or “yucky” image for each food item in the taste preference section and then to circle either the “good for me” or “bad for me” image for each food item in the healthfulness section. To ensure that preschoolers stayed focused and did not get fatigued, the procedure was designed to be completed in ten minutes or less. Upon completion of the PFPMT™ the researcher thanked the preschooler for their help and escorted them back to their classroom.

To aid parents' understanding of their child's taste preference and perception of healthfulness as well as increasing their knowledge of nutritional sources of food for preschoolers, parents were given their child's completed PFPMT™ as well as healthy food tips for their preschoolers at the completion of this study.

Data Analysis and Results

Food preferences and indices of healthfulness were analyzed and data was compared related to demographic data and type of preschool utilizing International Business Machines Corporation (IBM) Statistical Package for the Social Sciences (SPSS). Frequency scores of demographic data of the preschoolers (n=28) revealed: gender (boys=14, girls=14), age (4 years=16, 5 years=12), ethnicity (Caucasian=16, African American=4, Latino=1, East Asian=3, South Asian=4), breastfed (yes=21, no=7), breastfeeding duration (0-3 months =3, 4-6 months=2, 7-12 months=11, 13-18 months=4, 19-24 months=0, >24 months=1), dietary preferences (Halal=2, Kosher=0, Vegetarian=1, Other=4, None of the above=21), food allergies or intolerances(yes=6, no=22). Additionally, there were 14 preschoolers at each of the two research sites.

Frequency scores of taste preferences and healthfulness showed that the majority of the preschoolers responded “yummy” to all food items, except soda (Figure 1). These scores also showed that the majority of the preschoolers responded “good for me” to all food items, except soda and cookie (Figure 1). These results indicate an association between taste preference and healthfulness (Figure 2).

A Chi-square test for independence means (with Yates Continuity Correction) indicated a significant association between taste preferences of broccoli and healthfulness of broccoli, $\chi^2 (1, n=28)=8.31, p=.004$ (Table 1), a significant association between taste preferences of milk and healthfulness of milk, $\chi^2 (1, n=28)=4.52, p=.033$ (Table 2), and not significant association between taste preferences of pizza and healthfulness of pizza, $\chi^2 (1, n=28)=2.87, p=.09$ (Table 3).

Preschoolers had difficulty in identifying the black-eyed peas image. After being informed by the researcher that the image was of black-eyed peas, several of the preschoolers stated that they had never eaten them. Therefore, black-eyed peas were not included in the data analysis. All other food items were easily identified by the preschoolers without any prompting from the researcher.

Answers to the research questions for this study were: 1) Preschoolers liked all foods, except soda. 2) Preschoolers perceived all foods as healthy, except soda & cookie. 3) Preschooler's taste preferences tend to guide their perceptions of healthfulness of foods.

Discussion

In general, preschoolers in this study perceived “yummy” foods as “good for me” and “yucky” foods as “bad for me”. There was an exception to this with cookie. Ninety-seven percent of the preschoolers responded “yummy” as their taste preference for cookie, but responses to the healthfulness of cookie, “good for me” or “bad for me”, was split fifty-fifty.

Preschooler comments about cookies included: “cookies make your teeth black”, “cookies have sugar”, and “cookies are bad for kids”. These comments show that teaching has been done with some of these preschoolers on the healthfulness of cookies and their understanding of the concept. Hence, nutritional education in preschoolers is essential.

In the researcher's opinion, the preschoolers in this study seemed to have difficulty with the abstract concept of healthfulness of foods when responding to “good for me” or “bad for me”. Instead, their responses appeared to me driven by taste preference. This association between taste preference and healthfulness should be considered, continuing to validate the PFPMT™. It also an important fact when creating a developmentally appropriate nutritional education program for preschoolers. Healthfulness of foods needs to be explained in an age appropriate way in which preschoolers can understand. Further research needs to be conducted to develop appropriate conversations.

Limitations

This study was limited to two preschools, therefore results cannot be generalized. Also, due to limited use of the PFPMT™, validity and reliability of the instrument cannot be ensured. The food images chosen were partially dictated by the availability of photographs of sufficient clarity for preschoolers to readily identify the items. For example, baked chicken was originally intended to be included as a healthy food but a suitable photograph that preschoolers could easily identify as chicken meat was not available. For this reason the healthy food group was limited to fruit, vegetables, water, and milk; future research should explore other foods and drinks.

Implications for nursing practice

Future use of the PFPMT™ by health professionals/educators may aid in identifying children at risk for unhealthy eating behaviors and possible obesity. The PFPMT™ may be

implemented in school settings, local health departments, and during routine healthcare provider's office visits. Parental teaching should include their child's completed PFPMT™ as well as healthy food resources for their preschoolers.

Implications for future research

Further research needs to be conducted using larger samples to obtain more conclusive results regarding the relationship between preschooler's perception of food item healthfulness and taste preference. Also, additional food and drink items should be explored. Additionally, a longitudinal study following the children who used the PFPMT™ to discern their food choices and obesity risks as they age would be recommended for future research.

Plans to Disseminate

























This research was presented at the Sigma Theta Tau International Honor Society of Nursing Beta Phi Induction Reception, University of Alabama in Huntsville (UAH) College of Nursing (CON) where it was the first place winner of the undergraduate and graduate research poster presentation. It was also presented at the University of Alabama System Honors Research Conference (UASHRC), University of Alabama at Birmingham (UAB) where it won first place in Biomedical and Health-Related Sciences podium presentation. Additionally, it was presented at the UAH Honors College Lecture Series. Current plans are to develop a manuscript for a peer-reviewed nursing publication.

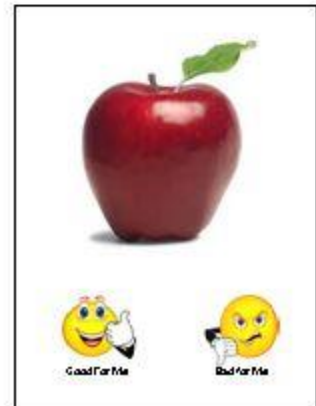
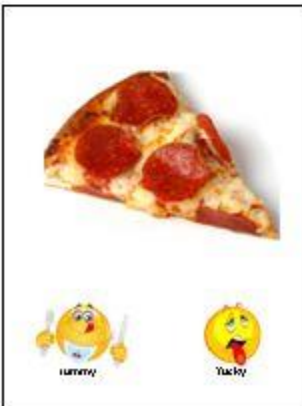
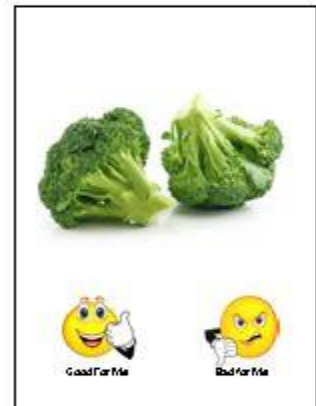
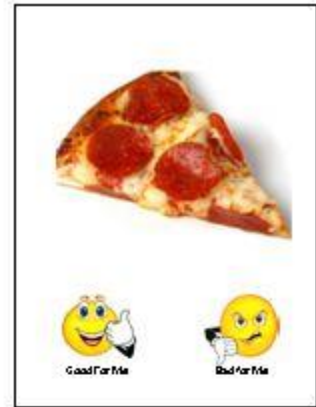
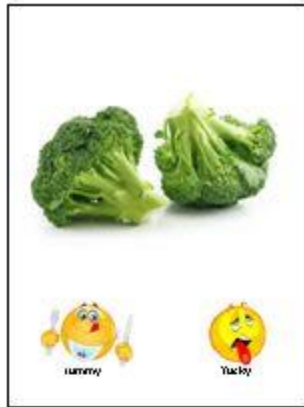
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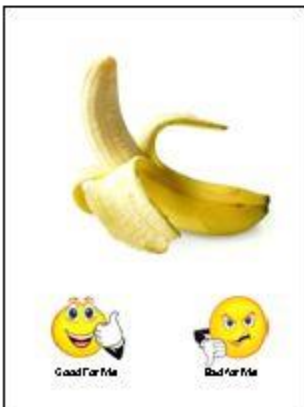
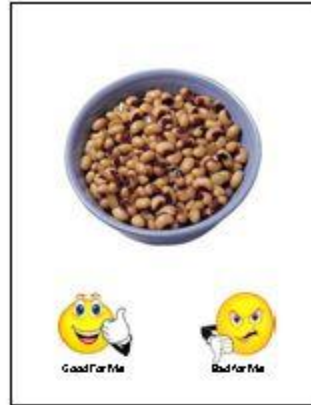
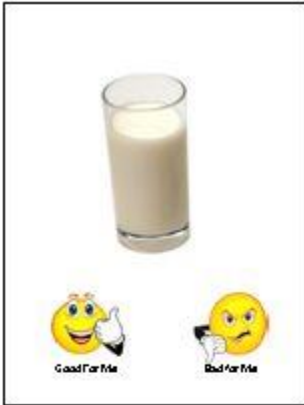
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Appendix A: Preschool Food Perceptions Measurement Tool (PFPMT)TM

<p>Preschool Food Perceptions Measurement Tool (PFPMT)TM</p> 	   Yummy Yucky	   Yummy Yucky
<p>I. Taste Preferences</p>   Yummy Yucky	   Yummy Yucky	   Yummy Yucky
   Yummy Yucky	   Yummy Yucky	   Yummy Yucky





Appendix B: Demographic Form

For the purposes of this study, please complete this demographic form and return it to the preschool along with the consent form. All information is kept strictly confidential.

Child's Name: _____ Age: _ Gender: Female Male

Which of the following best represents your child's racial or ethnic heritage? **Choose all that apply**

- Non-Hispanic White or Euro-American
- Black, Afro-Caribbean, or African American
- Latino or Hispanic American
- East Asian or Asian American
- South Asian or Indian American
- Middle Eastern or Arab American
- Native American or Alaskan Native
- Other

Was your child breastfed?

- Yes
- No

➤ If yes: For how long?

- 0-3 months 4-6 months 7-12 months 13-18 months 19-24 month > 24 months

Child' dietary preferences:

- Halal
- Kosher
- Vegetarian
- Other _____
- None of the above

Does your child have food allergies or intolerances?

- Yes
- No

➤ If yes: please list _____

Appendix C: Parental Consent Form

You are invited to participate in a research study about preschooler's perceptions of food. This study is designed to help us to better understand possible factors related to childhood obesity, which may aid educators in designing developmentally appropriate interventions to prevent and reduce childhood obesity.

The primary investigator is Jennifer Bail from the University of Alabama in Huntsville (UAH) College of Nursing (CON) and the advisor is Dr. Ellise Adams who is also from the UAH CON.

PROCEDURE TO BE FOLLOWED IN THE STUDY: Once written consent is given, each child will be individually given a Preschool Food Perceptions Measurement Tool (PFPMPT)TM booklet and will be asked to circle either the "yummy" or "yucky" image for each food item in the Taste preference section. The child will then be asked to circle either the "good for me" or "not good for me" image for each food item in the Healthfulness section. This session will take a maximum of 10 minutes per child. Following data collection, parents will receive a copy of their child's PRPMT booklet and nutritional fact sheets to assist with providing health meals to preschoolers. The processes outlined above will occur between January and April 2014.

DISCOMFORTS AND RISKS FROM PARTICIPATING IN THIS STUDY: Possible risks include fatigue and loss of confidentiality. Children will be monitored for signs of fatigue & researcher will end the session if fatigue is observed. See below for precautions taken to avoid loss of confidentiality.

EXPECTED BENEFITS: Upon completion of the study, parents will be given their child's completed PFPMPT TM as well as healthy food tips for their preschoolers.

CONFIDENTIALITY OF RESULTS: Participant numbers will be used to record your child's data, and these numbers will be made available only to those researchers directly involved with this study, thereby ensuring strict confidentiality. This consent form will be destroyed within 12 months. The data from your session will only be released to those individuals who are directly involved in the research and only using your participant number.

FREEDOM TO WITHDRAW: You are free to withdraw from the study at any time. You will not be penalized because of withdrawal in any form. Investigators reserve the right to remove any participant from the session without regard to the participant's consent.

CONTACT INFORMATION: If any questions should arise about this study or your rights as a participant, you may contact Jennifer Bail at 256-777-5853 or at jrb0002@uah.edu. You may also contact Dr. Ellise Adams at 256.824.2442 or at Ellise.Adams@uah.edu. If you have questions about your rights as a research participant, or concerns or complaints about the research, you may contact the Office of the IRB (IRB) at 256.824.6101 or email Dr. Pam O'Neal at irb.@uah.edu.

If you agree to have your child participate in our research please sign and date below.

Child's Name (Please Print)

Parent/Guardian Signature

Date

Appendix D: IRB Approval

Jennifer Bail and Dr. Ellise Adams
College of Nursing

December 6, 2013

Dear Jennifer Bail and Dr. Adams,

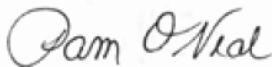
The UAH Institutional Review Board of Human Subjects Committee has reviewed your proposal, *Preschooler's Perceptions of Food as a Possible Factor Related to Childhood Obesity*, and found it meets the necessary criteria for approval. This proposal is approved, and you may begin your research. Your proposal seems to be in compliance with this institutions Federal Wide Assurance (FWA) 00019998 and the DHHS Regulations for the Protection of Human Subjects (45 CFR 46) and has been classified as expedited.

Please note that this approval is good for one year from the date on this letter. If data collection continues past this period, you are responsible for processing a renewal application a minimum of 60 days prior to the expiration date.

No changes are to be made to the approved protocol without prior review and approval from the UAH IRB. All changes (e.g. a change in procedure, number of subjects, personnel, study locations, new recruitment materials, study instruments, etc) must be prospectively reviewed and approved by the IRB before they are implemented. You should report any unanticipated problems involving risks to the participants or others to the IRB Chair.

If you have any questions regarding the IRB's decision, please contact me.

Sincerely,



Pam O'Neal PhD, RN
IRB Chair
College of Nursing, University of Alabama in Huntsville,
328 Nursing Building, Huntsville, AL 35899
phone: 256.824.2437 or 6100 and fax: 256.824.2850 email: irb@uah.edu

Table 1: Taste Preference and Healthfulness of Broccoli

				Health Broccoli		Total
				not good for me	good for me	
TP Broccoli	yucky	Count		8	3	11
		% within TP Broccoli		72.7%	27.3%	100.0%
		% within Health Broccoli		80.0%	16.7%	39.3%
		% of Total		28.6%	10.7%	39.3%
	yummy	Count		2	15	17
		% within TP Broccoli		11.8%	88.2%	100.0%
		% within Health Broccoli		20.0%	83.3%	60.7%
		% of Total		7.1%	53.6%	60.7%
	Total	Count		10	18	28
% within TP Broccoli			35.7%	64.3%	100.0%	
% within Health Broccoli			100.0%	100.0%	100.0%	
% of Total			35.7%	64.3%	100.0%	

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	10.811 ^a	1	.001		
Continuity Correction ^b	8.318	1	.004		
Likelihood Ratio	11.292	1	.001		
Fisher's Exact Test				.003	.002
Linear-by-Linear Association	10.425	1	.001		
N of Valid Cases	28				

Table 2: Taste Preference and Healthfulness of Milk

				Health Milk		Total
				not good for me	good for me	
TP Milk	yucky	Count		4	2	6
		% within TP Milk		66.7%	33.3%	100.0%
		% within Health Milk		57.1%	9.5%	21.4%
		% of Total		14.3%	7.1%	21.4%
	yummy	Count		3	19	22
		% within TP Milk		13.6%	86.4%	100.0%
		% within Health Milk		42.9%	90.5%	78.6%
		% of Total		10.7%	67.9%	78.6%
	Total	Count		7	21	28
% within TP Milk			25.0%	75.0%	100.0%	
% within Health Milk			100.0%	100.0%	100.0%	
% of Total			25.0%	75.0%	100.0%	

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	7.071 ^a	1	.008		
Continuity Correction ^b	4.525	1	.033		
Likelihood Ratio	6.327	1	.012		
Fisher's Exact Test				.021	.021
Linear-by-Linear Association	6.818	1	.009		
N of Valid Cases	28				

Table 3: Taste Preference and Healthfulness of Pizza

				Health Pizza		Total
				not good for me	good for me	
TP	Pizza	yucky	Count	2	0	2
			% within TP	100.0%	0.0%	100.0%
			% within Health Pizza	28.6%	0.0%	7.1%
		% of Total	7.1%	0.0%	7.1%	
	yummy		Count	5	21	26
			% within TP	19.2%	80.8%	100.0%
		% within Health Pizza	71.4%	100.0%	92.9%	
		% of Total	17.9%	75.0%	92.9%	
Total		Count	7	21	28	
		% within TP	25.0%	75.0%	100.0%	
		% within Health Pizza	100.0%	100.0%	100.0%	
		% of Total	25.0%	75.0%	100.0%	

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6.462 ^a	1	.011		
Continuity Correction ^b	2.872	1	.090		
Likelihood Ratio	6.034	1	.014		
Fisher's Exact Test				.056	.056
Linear-by-Linear Association	6.231	1	.013		
N of Valid Cases	28				

Figure 1: Preschooler's Food Perceptions

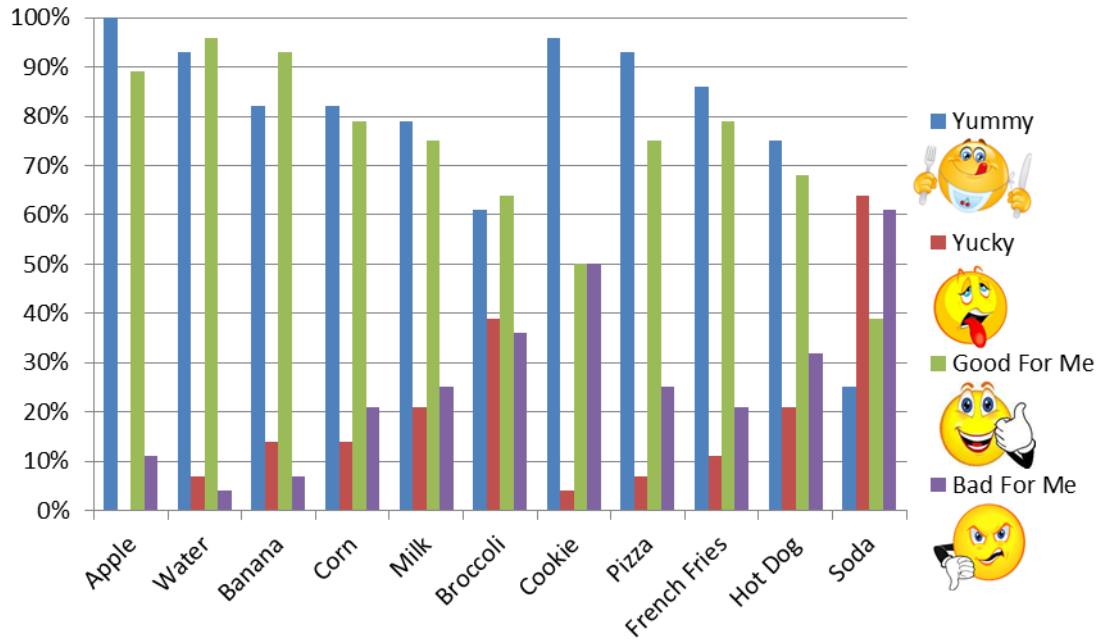


Figure 2: "Yummy" and "Good For Me" Association

