

## Using Theory of Planned Behavior to predict snack food consumption among upper elementary school children

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## Introduction

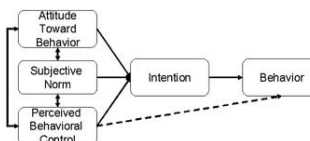
- Childhood obesity continues to be a major issue in the United States and all over the world.
- Many recognize as being multi-causative
  - Elements of the environment
  - Characteristics of individuals' lifestyles
- Dietary behaviors associated with childhood obesity often include
  - Snacking has increased among all age groups
  - Represent 25% total daily calorie intake
  - 91% report snacking at least 1 time per day

## Introduction

- Snack foods are heavily advertised to children.
  - Saturday morning television food advertisements
    - Ready to eat breakfast cereals (27%), restaurant foods (19%), snack foods (18%)
- Snack foods are relatively cheap
  - \$1.07 bought children 2.1 food/beverage items or 356.6 calories
- Snack foods have been targeted at the policy level as well.
  - "Nutrition Standards for Schools: Leading the way to Healthier Youth"

## Introduction/Purpose of study

- With policies - Health education strategies are needed.
  - Should have theoretical underpinnings
- The Theory of Planned Behavior



- The purpose of this study is to examine if the extent constructs of TPB can predict snack food consumption among school-aged children, which will help provide direction for future theory-based health promoting interventions.

## Methods

- Cross-sectional design
- Convenience sample 4<sup>th</sup> and 5<sup>th</sup> grade children in Midwest
- Theory of Planned Behavior Construct Measurement
  - 13-item survey
  - Constructs were measured on a 7-point scale
  - Intentions – 3 items
    - *I plan to choose lower calorie snack foods between my meals*
  - Subjective Norms – 3 items
    - *My friends think it is important for me to choose lower calorie snack foods in between meals*
  - Attitudes – 4 items
  - Perceived Control – 3 items

## Methods

- Snack Food Measurement
  - Children reported all foods eaten between meals in previous 24-hours
- Two rounds of Stepwise multiple regression were used
  - Intentions (DV) were predicted by attitudes, norms, and control (IV's).
  - Calories from calorically dense/nutrient poor snack foods (DV) and Calories from fruit and vegetable snacks (DV) were predicted by Intentions, age, race and gender (IV's).
- The *a priori* criterion to enter the predictor model was set at an alpha of 0.05 and the criterion to be removed from the model was an alpha of 0.10

## Instrument Validation

- **Content Validity/Face Validity**
  - Panel of six experts in a 2 round review process
- **Construct Validity**
  - Confirmatory factor analysis using principle component analysis
  - Scree plots and Eigenvalues
  - Each item loaded significantly on its given subscale, with all loadings greater than the *a priori* critical limit of 0.36.
- **Internal Consistency Reliability**
  - Cronbach  $\alpha$  (range 0.57-0.87)
- **Test-Rest Reliability**
  - Students took the survey twice within a same day (range 0.47-0.72)

## Results

- n=174
  - Male - 71 (41%)
  - Female - 102 (59%)
- White or Caucasian 82 (47%)
- Black of African American 28 (16%)
- Asian 5 (3%)
- Hispanic 36 (21%)
- Hawaiian/Pacific Islander 4 (3%)
- Other/ Multi-Racial 18 (10%)

### Means and standard deviations of total calories from snack foods among children and TPB constructs

	N	Min	Max	Mean	Standard Deviation
Typical Snack Foods (i.e. chips, cookies, candy)	174	0	1353	312.2	(280.95)
Fruits & Vegetables (not including 100% Juices)	174	0	552	54.5	(95.75)
Behavioral Intentions	173	3	21	14.7	(5.0)
Attitudes Toward Behavior	168	4	28	20.0	(4.9)
Subjective Norms	167	3	21	14.2	(4.2)
Perceived Behavioral Control	169	3	21	16.6	(3.9)

### Parameter estimates from the final regression model for intentions as predicted by attitudes toward behavior, subjective norms, and perceived control (Adjusted R<sup>2</sup> = 0.483) (n=171)

	Unstandardized coefficients B	Std. error	Standardized coefficients Beta	t	p-value
Constant	-1.53	1.42	-1.08		
Attitudes Toward Behavior	0.44	0.061	0.47	7.30	0.001
Subjective Norms	0.30	0.079	0.25	3.75	0.001
Perceived Behavioral Control	0.20	0.086	0.17	2.37	0.019

### Parameter estimates from the final regression model for calories from fruits and vegetables as predicted by intentions, and race (Adjusted R<sup>2</sup> = 0.085) (n=171)

	Unstandardized coefficients B	Std. error	Standardized coefficients Beta	t	p-value
Constant	-34.60	22.88			
Race	7.64	3.59	0.158	2.13	0.035
Behavioral Intentions	4.71	1.42	0.245	3.30	0.001

### Parameter estimates from the final regression model for calories from calorically dense snack foods as predicted by intentions, gender and race (Adjusted R<sup>2</sup> = 0.093) (n=171)

	Unstandardized coefficients B	Std. error	Standardized coefficients Beta	t	p-value
Constant	205.56	92.33			0.027
Race	33.50	10.57	0.236	3.17	0.002
Gender	93.64	42.08	0.164	2.23	0.027
Behavioral Intentions	-8.78	4.16	-0.155	-2.11	0.036

## Conclusions

- As childhood obesity increases, so does the need for innovative and effective theory based interventions that can target modifiable risk factors
- Our results support that snacking is a major part of children's daily caloric intake.
  - Children consumed on average 312 Calories/day

## Conclusions

- TPB appears to be a **useful and robust** theory for targeting snack food consumption among children.
  - Intentions were strongly predicted by attitudes, perceived control, and subjective norms ( $r^2 = 0.48$ )
  - Calorically dense snack foods were **negatively** predicted by intentions, gender and race ( $r^2 = 0.09$ )
  - Fruit and vegetable snack foods were **positively** predicted by intentions, and race ( $r^2 = 0.09$ )
- Future health promoting interventions should consider utilizing this theory

## Limitations

- The validity/reliability was measured and mostly adequate
  - However some subscales did not meet the requirements Cronbach  $\alpha$  and test-retest reliability measures.
- Convenience sample (sampling bias)
- One-day dietary recall was used to measure snack food consumption
- Instrument was self-report (measurement bias)