

Perceived Weight and Bullying Victimization in Boys and Girls

Felicia R. Carey, MPH

Michael & Susan Dell Center for Healthy Living

University of Texas School of Public Health, Austin Regional Campus



Presenter Disclosures

Felicia R. Carey

- 1) The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

No relationships to disclose

Background

Self-perceived weight, rather than objective weight, may confer separate and added risks of increasing adolescent vulnerability to bullying victimization

- General dissatisfaction with one's own body image^{1,2}
- Inaccurate perceptions of one's own weight status³
- Obese adolescents who accurately perceive themselves as being overweight⁴
 - All associated with increased bullying victimization

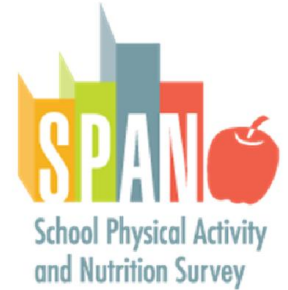
Gaps in current literature

- When perceived weight and objective weight are considered jointly, results are inconsistent⁵⁻⁷
- Lack of research in U.S. based populations

The Current Study

- In this study, we investigated perceived and objective weight and self-reported bullying victimization among a statewide survey of school-aged children in Texas
 - **Hypothesis 1:** Perceived under- or over-weight would be associated with increased bullying victimization, even after taking objective weight status into account.
 - **Hypothesis 2:** Gender would modify the associations between perceived weight and bullying victimization.

The School Physical Activity and Nutrition (SPAN) Project



- Texas-wide child obesity surveillance program of public school children in 2009-2011
- Implemented by the University of Texas School of Public Health
- Questionnaires collected self-reported bullying victimization, self-reported weight perceptions, and objectively measured body mass index (BMI)
- 6716 children from the 8th and 11th grade level of the SPAN project

Survey Items

- Perceived weight
 - “Compared to other students in your grade who are as tall as you, do you think you weigh: Too much, The right amount, Too little (or not enough)?”
- BMI
 - Age and sex adjusted percentiles as per CDC standards
- Bullying victimization
 - “Over the last 6 months, how often have you been bullied at school?”
 - 5 point scale of increasing frequency
 - Dichotomized → 2 or 3 times a month or more frequently labeled as bullying victims

Analyses

- Other covariates: gender, grade level, ethnicity, and economic status
- Main effects logistic regression models
 1. Unadjusted -- Perceived weight on bullying victimization
 2. Adjusted for BMI only
 3. Fully adjusted for all covariates
 4. Predicted probabilities of bullying victimization at each level of perceived and objective weight
- Logistic regression models for gender interactions with perceived weight
 1. Unadjusted
 2. Adjusted for BMI only
 3. Fully adjusted for all covariates
 4. Predicted probabilities of bullying victimization at each level of perceived weight by gender interaction

Table 1. Demographics among the total sample, SPAN 2009-2011 (N=6716)

Characteristic		Total ^a
Gender	Boy	50.9%
	Girl	49.1%
Grade	8th	53.3%
	11th	46.7%
Ethnicity	White	39.8%
	Black	14.6%
	Hispanic	45.6%
Economic Status ^b	Lowest Tertile	36.8%
	Middle Tertile	38.2%
	Highest Tertile	25.0%
Victim of Bullying	Yes	10.8%
	No	89.2%
BMI Status	Normal weight	62.0%
	Overweight	15.7%
	Obese	22.3%

a. All percentages presented are based on survey weights.

b. Economic status is based on school level data, not individual.

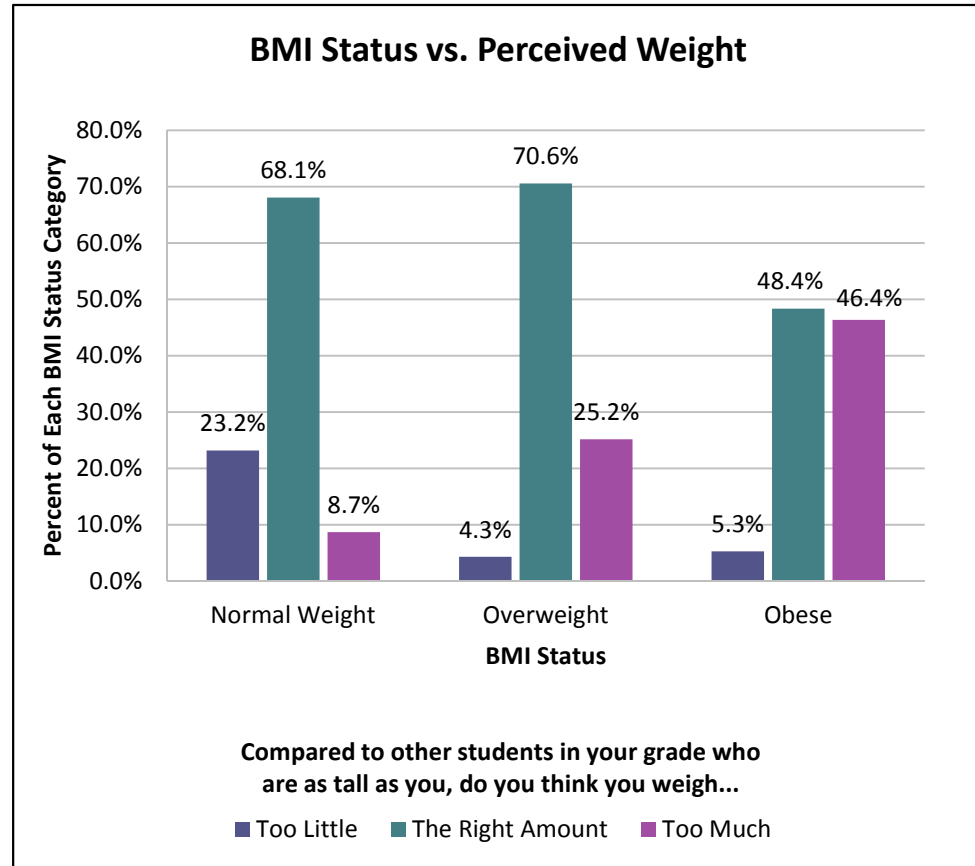


Figure 1: Weight perceptions among students belonging to each BMI status category

Table 2. Logistic Regression of Bullying Victimization vs. Perceived Weight, Unadjusted and Adjusted Models

Variable		Model I ^a			Model II ^b			Model III ^c		
		OR	95% CI	P-value	OR	95% CI	P-value	OR	95% CI	P-value
Perceived weight	Too little	2.81	1.18-6.69	0.020	3.09	1.24-7.70	0.016	3.19	1.33-7.62	0.010
	The Right Amount ^d	1.00			1.00			1.00		
	Too Much	2.51	1.05-6.04	0.040	2.01	0.81-4.97	0.131	2.33	1.07-5.08	0.033

a. Unadjusted for other covariates; b. Adjusted for BMI status; c. Adjusted for all covariates (BMI status, gender, grade, ethnicity, and economic status); d. Referent category

- Other covariates

- BMI was not significantly associated with bullying victimization in any model
- Economic status was not significantly associated with bullying victimization
- Gender, grade, and Hispanic ethnicity were significantly associated with bullying victimization

Predicted Probability of Bullying Victimization by Perceived Weight

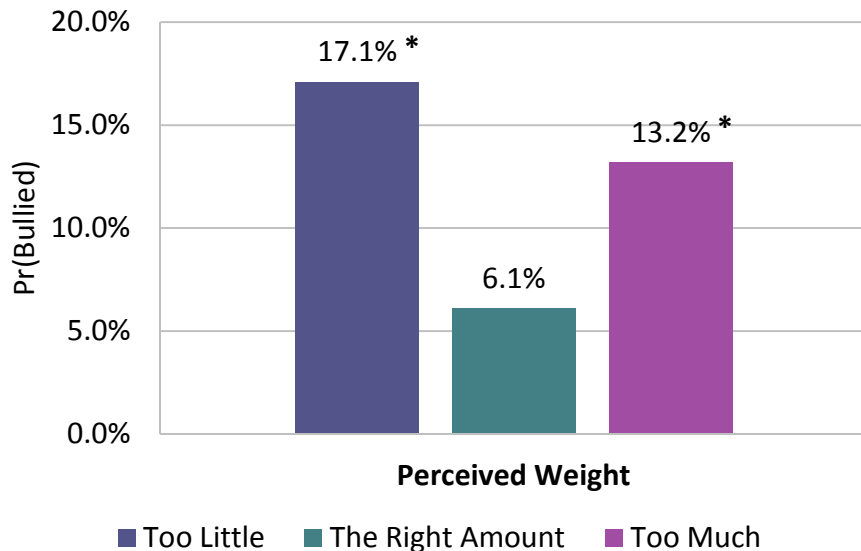


Figure 2: The predicted probability of being a victim of bullying by perceived weight, fully adjusted model

* $p < 0.05$

Predicted Probability of Bullying Victimization by Objective Weight

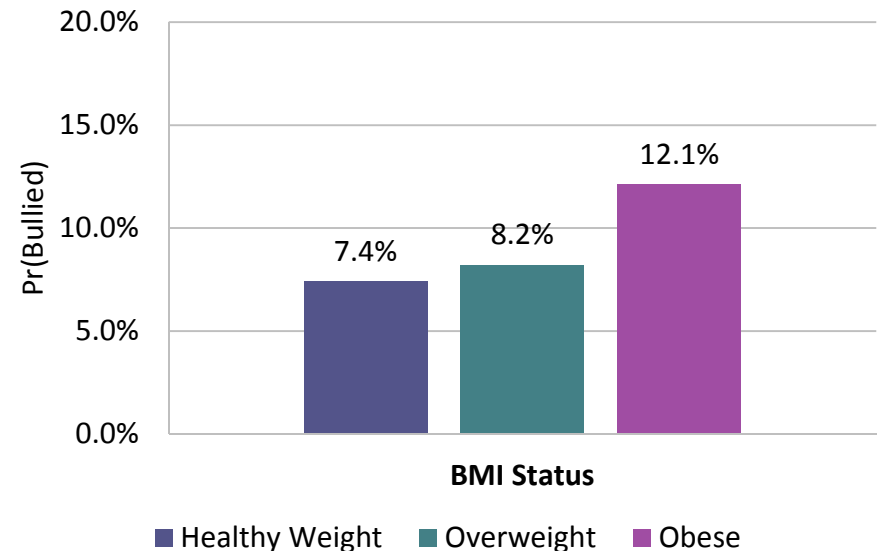


Figure 3: The predicted probability of being a victim of bullying by objective weight, fully adjusted model

Reference category contrasts

- Perceived Weight

- Too Little vs. The Right Amount: $p = 0.02$
- Too Much vs. The Right Amount: $p = 0.03$

- Objective Weight

- Overweight vs. Healthy Weight: $p = 0.72$
- Obese vs. Healthy Weight: $p = 0.34$

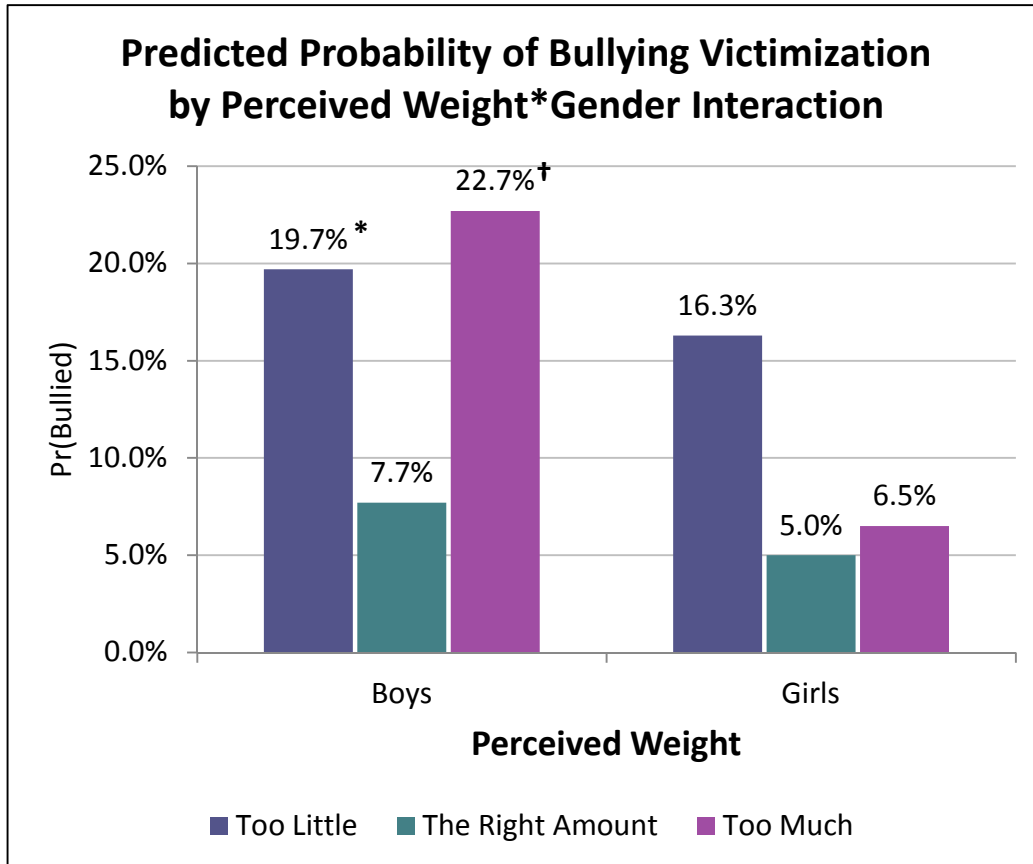


Figure 4: Predicted probabilities of being a victim of bullying by perceived weight x gender interaction categories, fully adjusted model

†p<0.10; *p<0.05

Logistic Regression of Bullying Victimization vs. Perceived Weight and Gender Interactions

- Perceived weight was significantly associated with bullying victimization **among boys only**
 - Boys with low perceived weight had significantly increased odds of being a bullying victim in all 3 models
 - Boys with high perceived weight had a strong trend for increased odds of bullying victimization in unadjusted and fully adjusted models
- Other covariates
 - BMI was not significantly associated with bullying victimization in any model
 - Grade and Hispanic ethnicity were significantly associated with bullying victimization

Reference category contrasts

- Boys
 - Too Little vs. The Right Amount: p=0.02
 - Too Much vs. The Right Amount: p=0.07
- Girls
 - Too Little vs. The Right Amount: p=0.19
 - Too Much vs. The Right Amount: p=0.38

Summary of the findings

- Students perceive themselves as being in a lower weight category than the objective weight category they belong to
- Perceived weight has a stronger association with bullying victimization than objective weight does
 - Both perceiving oneself as weighing too little or too much
- Gender interactions revealed that perceived weight was significantly associated with bullying victimization in boys but not girls
 - Specifically those who perceive themselves as weighing too little

Strengths

- Survey items were adapted from reliable and valid measures
- Objectively measured height and weight
- Large, probability based sample of ethnically diverse adolescent populations within Texas

Limitations

- Single, self-reported survey item assessing bullying victimization
- Item assessing perceived weight does not gauge adolescents' actual dissatisfaction with perceived body weight
- Causal inferences cannot be made because of cross-sectional data

Conclusion

- Perceived weight may play a greater role in predicting bullying victimization among adolescents than objective weight.
 - Especially in the case of boys who perceive themselves as weighing too little.
- Implications
 - Inform school-based prevention and intervention by further defining adolescent populations that may be more vulnerable to victimization by their peers
 - More research is needed to build an appropriate evidence base and further intervention efforts in this area

Thank you!

- Questions? Comments?
 - felicia.r.carey@uth.tmc.edu
- Acknowledgements
 - Co-authors: Anna V. Wilkinson, Nalini Ranjit, Dorothy Mandell, & Deanna M. Hoelscher
 - This research is supported by funding from the Michael & Susan Dell Foundation to the Michael & Susan Dell Center for Healthy Living and contributions from The University of Texas School of Public Health. The SPAN Project was conducted by researchers at the University of Texas School of Public Health, with funding from the Texas Department of Health.



References

1. Farrow CV, Fox CL. Gender differences in the relationships between bullying at school and unhealthy eating and shape-related attitudes and behaviours. *Br J Educ Psychol*. 2011;81(3):409-420.
2. Rech RR, Halpern R, Tedesco A, Santos DF. Prevalence and characteristics of victims and perpetrators of bullying. *J Pediatr*. 2013;89(2):164-170.
3. Jiang Y, Kempner M, Loucks EB. Weight misperception and health risk behaviors in youth: the 2011 US YRBS. *Am J Health Behav*. 2014;38(5):765-780.
4. Lenhart CM, Daly BP, Eichen DM. Is accuracy of weight perception associated with health risk behaviors in a diverse sample of obese adolescents? *J Sch Nurs*. 2011;27(6):416-423.
5. Reulbach U, Ladewig EL, Nixon E, O'Moore M, Williams J, O'Dowd T. Weight, body image and bullying in 9-year-old children. *J Paediatr Child Health*. 2013;49(4):E288-E293.
6. Wilson ML, Viswanathan B, Rousson V, Bovet P. Weight status, body image and bullying among adolescents in the seychelles. *Int J Environ Res Public Health*. 2013;10(5):1763-1774.
7. Brixval CS, Rayce SL, Rasmussen M, Holstein BE, Due P. Overweight, body image and bullying--an epidemiological study of 11- to 15-years olds. *Eur J Public Health*. 2012;22(1):126-130.

Supplementary Slides

- Table 1. Demographics among the total sample and by perceived weight
- Table 2. Logistic Regression of Bullying Victimization vs. Perceived Weight, Unadjusted and Adjusted Models
- Table 3. Logistic Regression of Bullying Victimization vs. Perceived Weight and Gender Interactions, Unadjusted and Adjusted Models

Table 1. Demographics among the total sample and by perceived weight, SPAN 2009-2011 (N=6716)

Characteristic		Total ^a	By Perceived Weight		
			Too Little	The Right Amount	Too Much
Gender	Boy	50.9%***	18.9%	65.1%	16.0%
	Girl	49.1%	13.3%	62.7%	24.0%
Grade	8th	53.3%*	16.0%	60.7%	23.3%
	11th	46.7%	16.4%	67.8%	15.8%
Ethnicity	White	39.8%*	16.4%	65.8%	17.8%
	Black	14.6%	16.1%	70.6%	13.3%
	Hispanic	45.6%	16.0%	60.1%	23.9%
Economic Status^b	Lowest Tertile	36.8%*	18.6%	59.8%	21.6%
	Middle Tertile	38.2%	13.1%	70.9%	16.0%
	Highest Tertile	25.0%	16.9%	60.3%	22.8%
Victim of Bullying	Yes	10.8%*	26.8%	42.8%	30.3%
	No	89.2%	14.8%	66.5%	18.8%
BMI Status	Normal weight	62.0%***	23.2%	68.1%	8.7%
	Overweight	15.7%	4.3%	70.6%	25.2%
	Obese	22.3%	5.2%	48.4%	46.4%

a. All percentages presented are based on survey weights.

b. Economic status is based on school level data, not individual.

*P-value for Pearson's chi-square is <0.05

**P-value for Pearson's chi-square is <0.01

***P-value for Pearson's chi-square is <0.001

Table 2. Logistic Regression of Bullying Victimization vs. Perceived Weight, Unadjusted and Adjusted Models

Variable		Model I ^a			Model II ^b			Model III ^c		
		OR	95% CI	P-value	OR	95% CI	P-value	OR	95% CI	P-value
Perceived weight	Too little	2.81	1.18-6.69	0.020	3.09	1.24-7.70	0.016	3.19	1.33-7.62	0.010
	The Right Amount ^d	1.00			1.00			1.00		
	Too Much	2.51	1.05-6.04	0.040	2.01	0.81-4.97	0.131	2.33	1.07-5.08	0.033
BMI Status	Normal Weight ^d				1.00			1.00		
	Overweight				1.14	0.70-1.87	0.599	1.12	0.61-2.03	0.722
	Obese				1.83	0.70-4.75	0.214	1.71	0.63-4.61	0.290
Gender	Boy ^d							1.00		
	Girl							0.51	0.36-0.72	<0.001
Grade	8th ^d							1.00		
	11 th							0.48	0.26-0.89	0.020
Ethnicity	White ^d							1.00		
	Black							0.72	0.40-1.30	0.271
	Hispanic							0.39	0.19-0.78	0.008
Economic Status	Lowest Tertile ^d							1.00		
	Middle Tertile							1.59	0.78-3.25	0.200
	Highest Tertile							1.49	0.80-2.80	0.212

a. Unadjusted for other covariates

b. Adjusted for BMI status

c. Adjusted for all covariates (BMI status, gender, grade, ethnicity, and economic status)

d. Referent category

Table 3. Logistic Regression of Bullying Victimization vs. Perceived Weight and Gender Interactions, Unadjusted and Adjusted Models

Variable		Model I ^a			Model II ^b			Model III ^c		
		OR	95% CI	P-value	OR	95% CI	P-value	OR	95% CI	P-value
Perceived weight	Too little	2.54	1.10-5.88	0.030	2.73	1.23-6.02	0.014	2.93	1.36-6.32	0.006
	The Right Amount ^d	1.00			1.00			1.00		
	Too Much	4.30	1.26-14.70	0.210	3.51	0.88-14.00	0.075	3.50	1.04-11.78	0.043
Gender	Boy ^d	1.00			1.00			1.00		
	Girl	0.62	0.32-1.21	0.159	0.64	0.35-1.15	0.133	0.62	0.35-1.11	0.109
Perceived Weight#Gender	Too Little#Boys ^e	--		*	--		*	--		*
	Too Much#Boys	--		†	--			--		†
	Too Little#Girls	1.24	0.34-4.51	0.738	1.21	0.35-4.18	0.759	1.27	0.33-4.91	0.728
	Too Much#Girls	0.32	0.09-1.18	0.087	0.35	0.10-1.30	0.116	0.38	0.11-1.36	0.135
BMI Status	Normal Weight ^d				--			1.00		
	Overweight				1.10	0.69-1.76	0.688	1.11	0.64-1.92	0.723
	Obese				1.48	0.57-3.87	0.416	1.57	0.58-4.27	0.377
Grade	8th ^d							1.00		
	11 th							0.49	0.27-0.88	0.018
Ethnicity	White ^d							1.00		
	Black							0.75	0.41-1.37	0.346
	Hispanic							0.39	0.19-0.80	0.010
Economic Status	Lowest Tertile ^d							1.00		
	Middle Tertile							1.61	0.80-3.24	0.184
	Highest Tertile							1.51	0.80-2.86	0.200

a. Interaction between Perceived Weight and Gender, unadjusted for other covariates
b. Interaction between Perceived Weight and Gender, adjusted for BMI status
c. Interaction between Perceived Weight and Gender, adjusted for all covariates (BMI status, grade, ethnicity, and economic status)
d. Referent category
e. Referent category for perceived weight*gender is “The Right Amount” and “Boys”
†P-value for Perceived Weight vs. Referent by gender <0.10
*P-value for Perceived Weight vs. Referent by gender <0.05