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Misperceptions of weight norms as a risk factor for overweight and underweight status among secondary school students

Jessica Perkins, M.S.
Department of Health Policy
Harvard University, Cambridge, MA

and

H. Wesley Perkins, Ph.D.
Department of Anthropology & Sociology

David W. Craig, Ph.D.
Department of Chemistry

Hobart and William Smith Colleges, Geneva, NY 14456

www.YouthHealthSafety.org www.SocialNormSurveys.org

Presenter Disclosures

Jessica M. Perkins, M.S
H. Wesley Perkins, Ph.D.
David W. Craig, Ph.D.

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Abstract

Overweight, obesity, and underweight are significant health concerns regarding adolescents in the United States. Erroneous perceptions of peer weight norms may be important risk factors for being underweight and overweight. Anonymous surveys were conducted to assess the accuracy of perceived peer weight norms among US youth in grades 6 through 12 from 2004 to 2008 across 8 states (n=33,457). Students reported their personal weight, height, and perceived peer weight by gender. Perceptions of the weight norm for same sex peers in one's grade in the local school cohort are compared to aggregate self-reports of weight for these same sex and grade cohorts in each school. Further, variation in perceptions is compared with personal BMI. Twenty-six percent of males and 21% of females overestimated peer weight norms by more than 5% (22 and 16 pounds on average, respectively). Underestimation occurred for 38% of males and 38% of females (16 and13 pounds on average, respectively). Overestimating peer weight norms was associated with significantly greater risk for being overweight or at risk for overweight for both males and females. Underestimating peer weight norms was significantly associated with greater risk for being underweight or at risk for underweight for males and females. Multilevel regression analysis predicting BMI revealed perceived peer weight norm to be the strongest predictor compared to actual peer weight norms and demographic and environmental factors. Pervasive misperceptions of peer weight norms may contribute to unhealthy weight-related behaviors and help perpetuate the status of overweight or underweight students.

What matters more for adolescents' weight status?

How much peers actually weigh

How much adolescents think peers weigh

Their social milieu / location

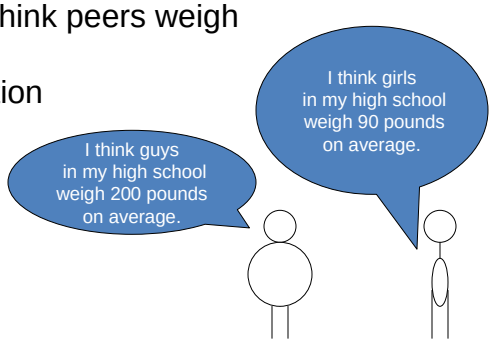


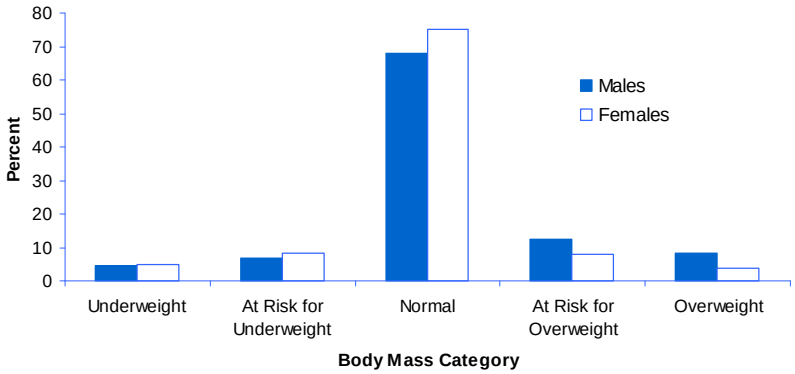
Table 1. Descriptive statistics of student characteristics (n=33,457)

Individual Variables	%	Mean BMI
Gender		
Female	50.6	20.0
Male	48.9	20.8
Age		
9-10 years old	0.1	17.6
11-12 years old	22.0	18.3
13-14 years old	30.1	19.9
15-16 years old	31.3	21.3
17-18 years old	15.9	22.2
19-21 years old	0.2	24.8

Individual Variables	%	Mean BMI
Race/Ethnicity		
White	47.2	20.1
Black	3.1	21.8
Latino/Hispanic	6.4	21.2
Asian	6.0	19.4
Other	7.8	19.6
Behaviors		
School Sport	53.1	20.4
No Participation	46.9	20.5
School clubs/gov't	27.5	20.6
No Participation	72.5	20.3

BMI = Body Mass Index = weight/(height^2)

Figure 1. Weight status of male and females



Weight Status Categories*	Percentile Range
Underweight	Less than the 5th percentile
At risk for underweight	5th percentile to less than 15th percentile
Healthy weight	15th percentile to less than the 85th percentile
At risk of overweight	85th to less than the 95th percentile
Overweight	Equal to or greater than the 95th percentile

*Sources: http://www.cdc.gov/nccdphp/dnpa/bmi/childrens_BMI/about_childrens_BMI.htm ; http://www.bcm.edu/cnrc/bodycomp/bmiz2.html; Brener et al. "The Association between Weight Perception and BMI among High School Students". Obesity Research, 12, 2004

Table 2. School characteristics (n=35)

Variable	Mean	S.D.	Min	Max
% students within school eligible for free school lunch	16.4	19.1	0	80.7
% white within school	69.0	25.2	0.7	99.4
School size	738.9	509.3	49	1863

23 schools East of Colorado and 12 schools in the West

What is weight norm misperception?

Accuracy of perception =
perceived gender/grade/cohort weight norm
MINUS
actual gender/grade/cohort weight norm

Misperception
= incorrect estimation of the actual weight norm for gender-grade-cohort group by more than five percent;

otherwise the student accurately perceived the norm.

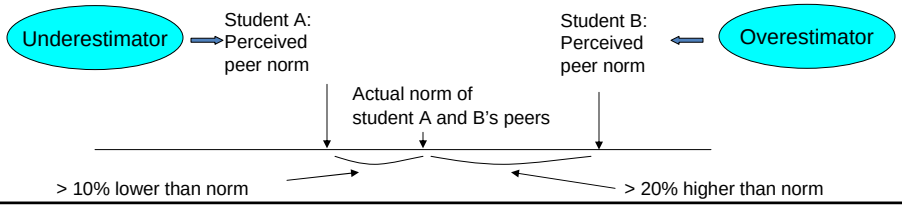


Table 3. Degree of misperception among over-, accurate-, and under-estimators of same-sex peer weight norms in grade by school cohorts.

Misperception by type	Perceived Peer Weight Norm (lb) - Actual Weight Norm (lb)					
	Gender	n	Mean	SD	Min	Max
Overestimates of average same-sex weight in grade	Male	3883	22.3	22.9	4.5	231.9
	Female	3253	16.3	17.2	4.4	277.6
Accurate estimates of average same-sex weight in grade	Male	5605	-0.8	3.9	-8.4	8.1
	Female	6393	-0.4	3.4	-7.0	6.84
Underestimates of average same-sex weight in grade	Male	5710	-16.2	9.6	-4.6	-114.5
	Female	5967	-16.2	9.6	-4.6	-114.5

Figure 2 . Prevalence of underestimation, accurate estimation, and overestimation of same-sex peer weight norm in their grade at their school by gender

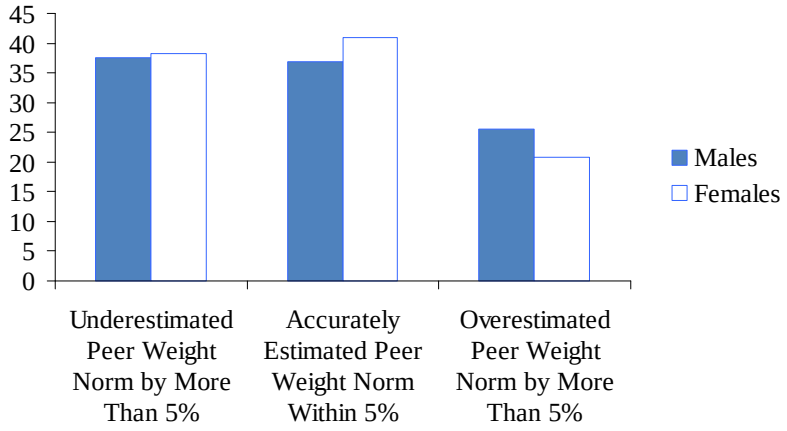


Figure 3. Overweight/underweight risk among males by accuracy of perceived peer body weight norm

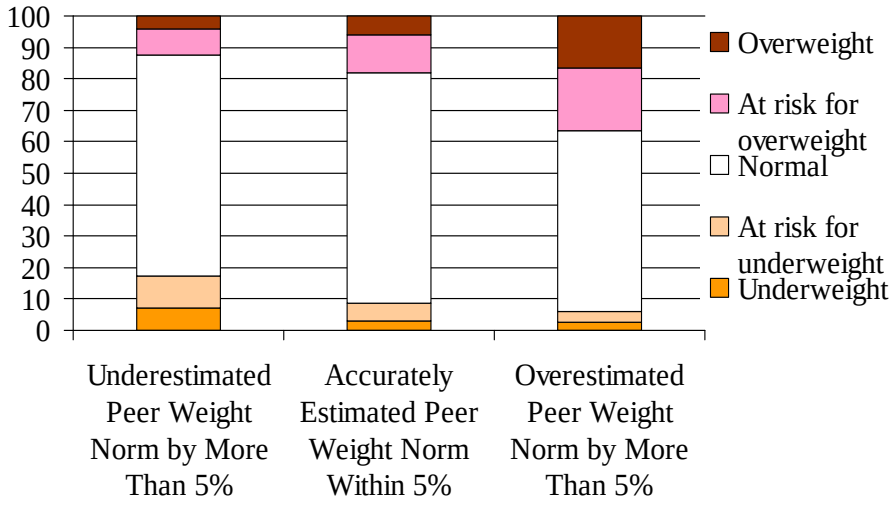
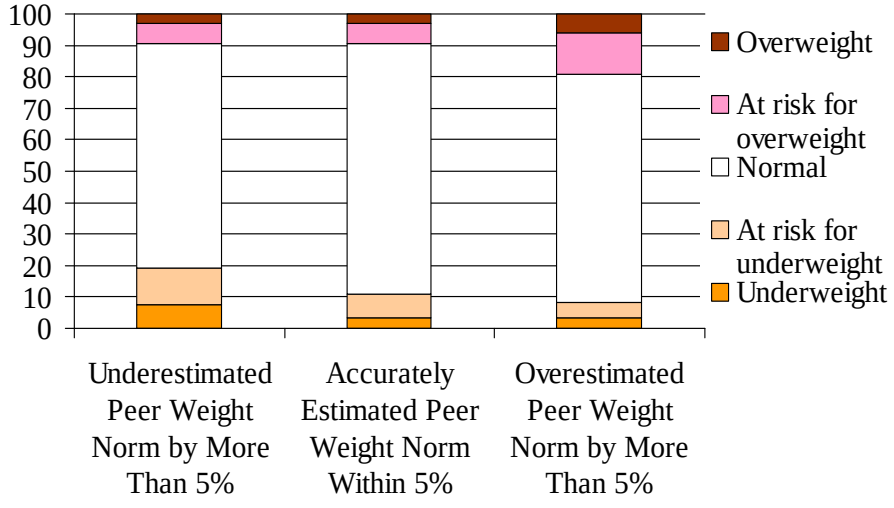


Figure 4. Overweight/underweight risk among females by accuracy of perceived peer body weight norm



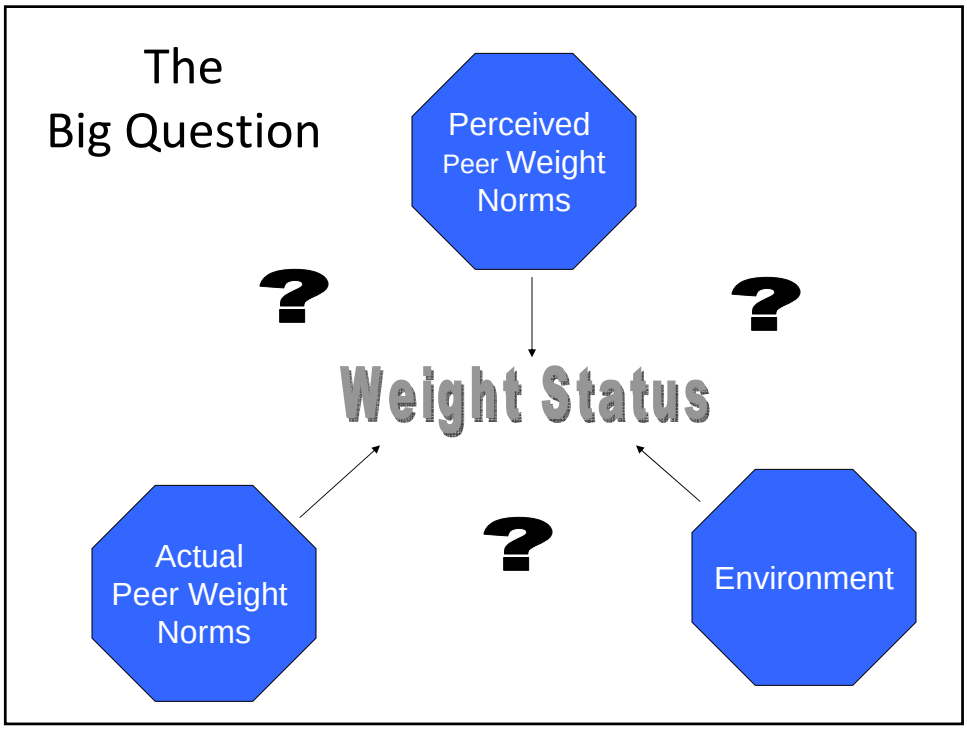


Table 5. Standardized regression coefficients predicting BMI

Independent Variables	**Males (n = 14,398)**	**Females (n = 14,570)**
	β	*β*
Intercept	0.03 n.s.	0.09 n.s.
Perceived same-sex body weight norm in grade	0.44 ***	0.27 ***
Actual same-sex body weight norm in grade (mean)	-0.09 ***	0.04 *
Age (continuous years)	0.16 ***	0.15 ***
Black (vs. White)	0.04 ***	0.06 ***
Hispanic or Latino (vs. White)	0.08 ***	0.08 ***
Asian (vs. White)	0.02 **	-0.02 **
Other (vs. White)	0.02 *	0.02 *
Missing (vs. White)	0.0006 n.s.	0.01 n.s.
Participation in athletics	-0.03 ***	-0.06 ***
Participation in school club or student government	-0.01 n.s.	-0.01 n.s.
Percent of students eligible for free school lunch	0.04 n.s.	0.05 **
Percentage of student body that is White	-0.01 n.s.	0.0002 n.s.
Western/Mountain (vs. Midwest/Northeast)	-0.08 **	-0.07 *
Total population of school	-0.05 *	-0.00006 n.s.

* Coefficient is significant at p < .05; **p < .01; ***p<.001. ns Coefficient is not significant (p > .05).

Table 6. Unstandardized regression coefficients predicting BMI

Independent Variables	**Males (n = 14,398)**	**Females (n = 14,570)**
	B	*B*
Intercept	11.32 n.s.	9.44 n.s.
Perceived same-sex body weight norm in grade	0.06 ***	0.05 ***
Actual same-sex body weight norm in grade (mean)	-0.02 ***	0.01 ***
Age (continuous years)	0.33 ***	0.29 ***
Black (vs. White)	0.82 ***	1.53 ***
Hispanic or Latino (vs. White)	1.28 ***	1.14 ***
Asian (vs. White)	0.37 **	-0.32 **
Other (vs. White)	0.23 *	0.22 *
Missing (vs. White)	0.006 n.s.	0.08 n.s.
Participation in athletics	-0.25 ***	-0.43 ***
Participation in school club or student government	-0.10 n.s.	-0.1 n.s.
Percent of students eligible for free school lunch	0.01 n.s.	0.02 **
Percentage of student body that is White	-0.002 n.s.	0.00007 n.s.
Western/Mountain (vs. Midwest/Northeast)	-0.62 **	-0.49 *
Total population of school	-0.0004 *	-0.0002 n.s.

* Coefficient is significant at p < .05; **p < .01; ***p<.001. ns Coefficient is not significant (p > .05).

Implications

- How can we reduce weight misperception?!

Over/Under perceive peer weight norm → *Accurately perceive* peer weight norm

?

Over/Underweight → Healthy weight!!

Future Research

- Personalized feedback to broad range of students
- What creates misperceptions
  - False consensus
  - Distorted images
  - Close friends at extreme ends of weight spectrum
- Misperceptions about weight-related behaviors
  - Food and beverage consumption
  - Physical activity
  - Beauty norms