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Assessing Weight Norms, Misperceptions, and Body Mass Index

Comparing the Importance of School Context and Composition versus Individual Perception

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Abstract

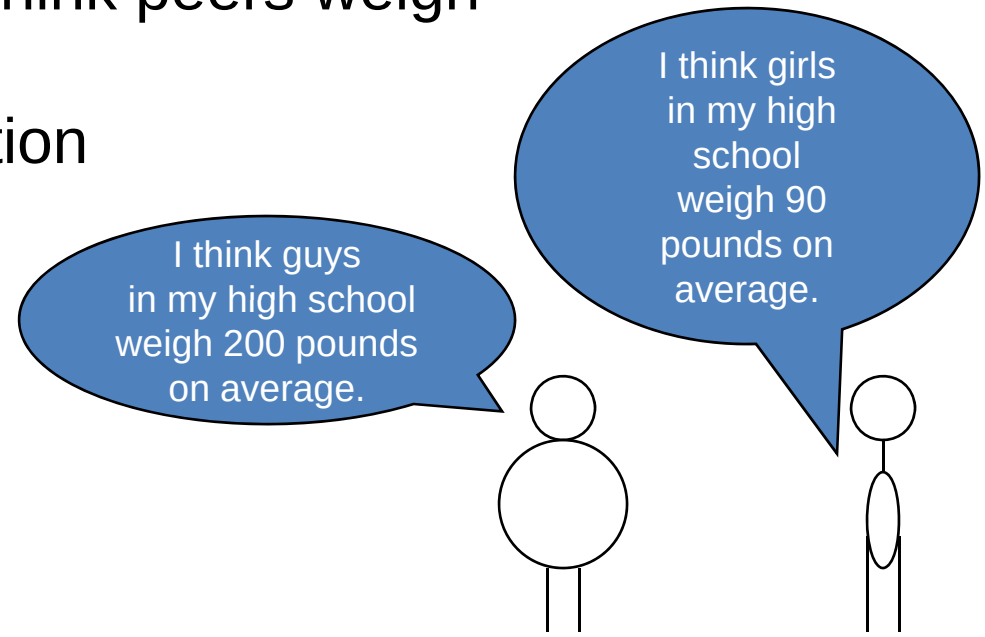
A total of 41,147 secondary students from 54 schools in nine regionally diverse states have been surveyed using an online instrument measuring actual and perceived weight norms between 2004-2008. Measures of perceived weight of both genders in one's own grade, self-assessed weight, and body mass risk are examined. There is a wide discrepancy between actual school norms and students' perceptions of weight norms among males and females in all school contexts. Students who are at risk for overweight conditions and obesity (as well as underweight and very underweight conditions) have the largest misperceptions of the actual norm. Examining variation in weight perceptions by school composition and context is also addressed. Individual perception of weight norms is more strongly associated with an individual's weight status than the actual weight norm in the individual's grade cohort and all other variables considered in the model. Results suggest that reducing adolescents' misperceptions of what is normal is potentially a very important aspect of addressing weight problems among adolescents.

What matters more for adolescents' weight status?

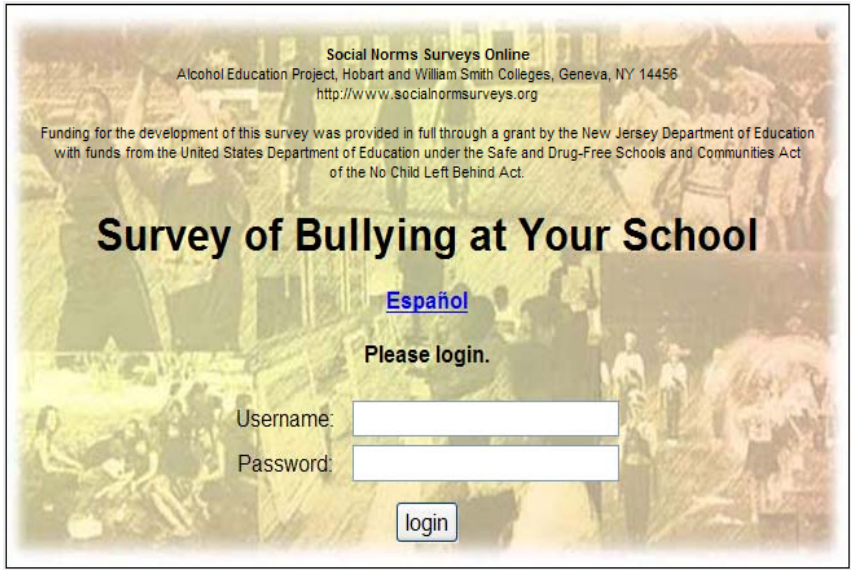
How much peers actually weigh

How much adolescents think peers weigh

Their social milieu / location



Survey Instruments



http://www.socialnormsurveys.org/bullya/

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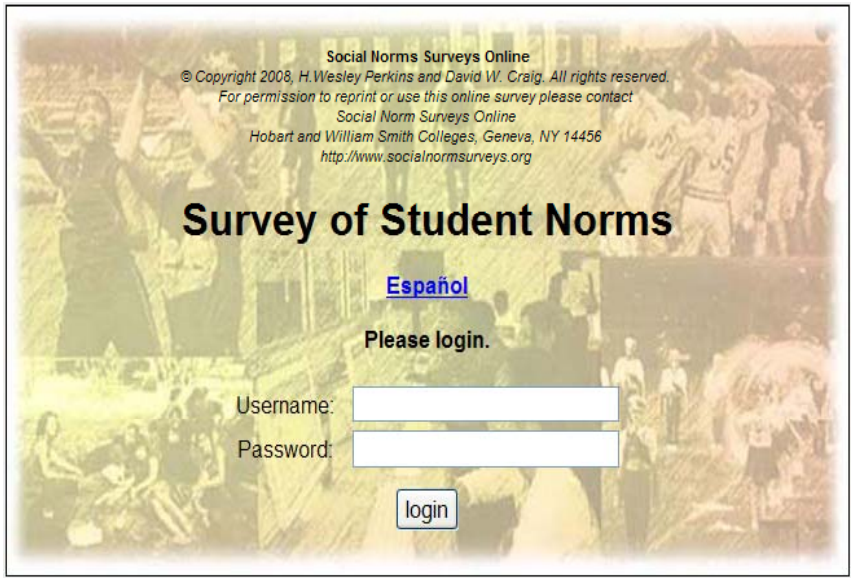


http://www.socialnormsurveys.org/hsf/

Enter test for username and password

Common Body Image Question Items

20. What is your weight and height?

Weight

pounds

Height (enter feet and then inches)

feet

3	4	5	6	7
○	○	◉	○	○

inches

0	1	2	3	4	5	6	7	8	9	10	11
○	○	○	○	○	◉	○	○	○	○	○	○

21. Which best describes what you think of your current weight? *(choose one)*

I am...

- ○ Very underweight
- ○ Somewhat underweight
- ◉ About right
- ○ Somewhat overweight
- ○ Very overweight

22. What would you guess is the most typical (average) weight for boys and girls in your grade? *(just give your best guess for each below)*

Most typical (average) weight for boys in your grade

pounds

Most typical (average) weight for girls in your grade

pounds

Table 1. Descriptive statistics of student characteristics (n=41,147)

Individual Variables	%	Mean BMI
Gender		
Female	48.3	20.4
Male	51.7	21.1
Age		
10 years old	0.4	17.9
11 years old	7.1	18.0
12 years old	12.4	18.7
13 years old	12.4	19.6
14 years old	16.7	20.5
15 years old	17.6	21.3
16 years old	16.0	21.9
17 years old	12.8	22.3
18 years old	4.4	22.9
19 years old	0.2	23.6
20 years old	0.03	26.2
21 years old	0.04	24.0

Individual Variables	%	Mean BMI
Race/Ethnicity		
White	47.5	20.5
Black	4.0	22.5
Latino/Hispanic	6.7	21.7
Asian	7.7	19.7
Other	7.3	20.1
Behaviors		
School Sport	52.2	20.6
No Participation	47.8	20.8
School clubs/gov’t	30.7	20.9
No Participation	69.4	20.6
Engaged in Part-time Work	31.7	21.3
No Engagement	68.3	20.4
Walk to School	4.9	20.9
Ride	69.6	20.6

Table 2. School composition characteristics at respondent's school (n=41,147)

Variable	Mean	S.D.	Min	Max
% students eligible for free school lunch within school	10.9	12.1	0	76.6
% white within school	73.4	19.7	3.3	99.4
School size	1101	456.5	49	1901
% participating in school sport	52.1	10.0	10.0	80.3
% participating in school clubs	30.6	14.4	2.7	68.2

Table 3. Correlation of BMI with school composition characteristics (n=41,147)

School composition characteristics at respondent's school	Correlation with individual BMI
% students eligible for free school lunch within school	.11
% white within school	-.07
School Size	.11
% participating in school sport	.05
% participating in school clubs	.13

Table 4. Descriptive statistics for school contextual characteristics n=54 schools

Variable	%	Mean BMI
School Urbanicity		
City	9.4	21.6
Suburb	62.3	20.5
Town	9.4	21.6
Rural	18.9	20.7
Regional Location		
West	27.8	20.7
East of Colorado	72.8	21.4
School Level		
Upper includes high school grades	37.0	22.6
Lower only middle school and lower grades	63.0	20.0

The Big Question

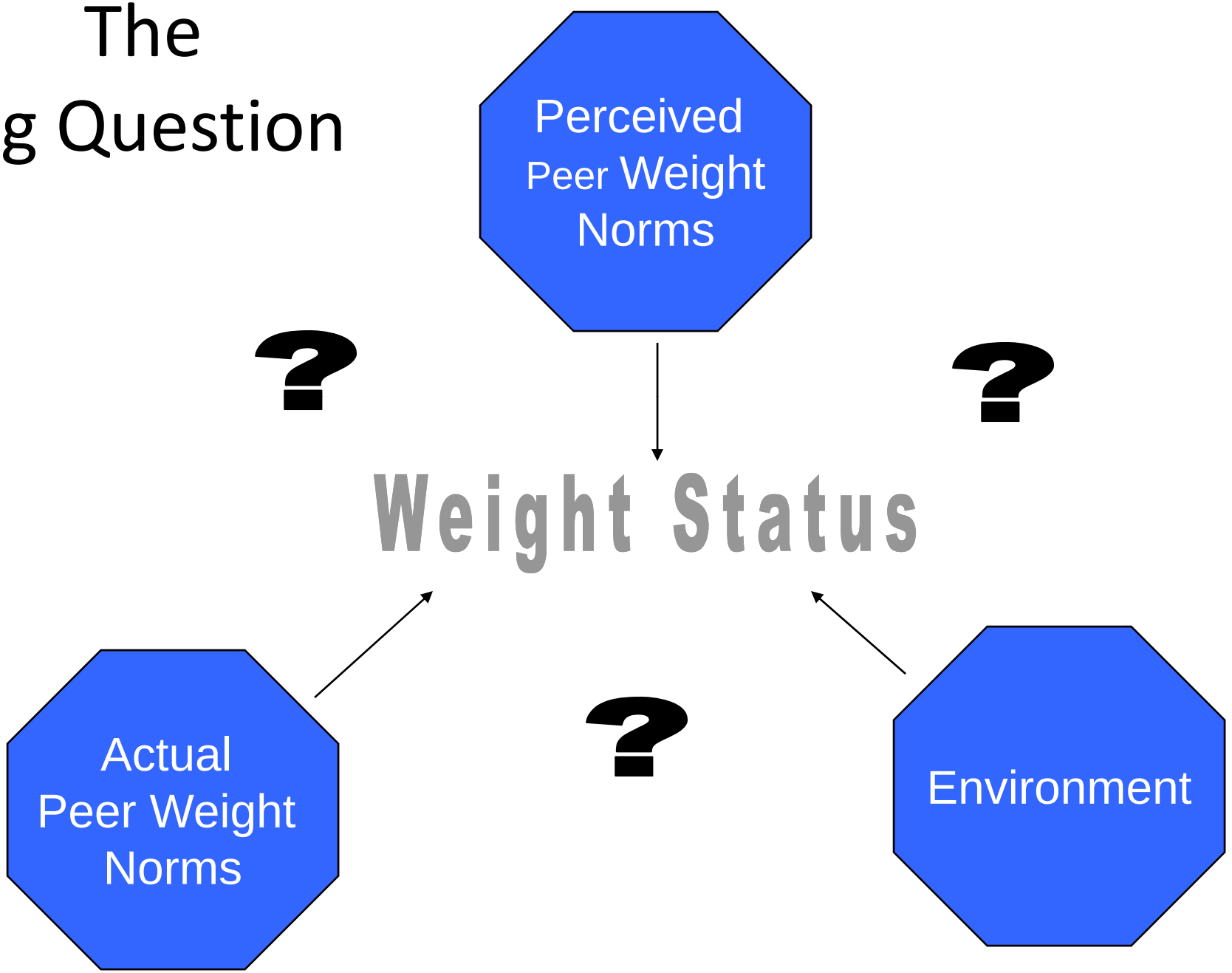
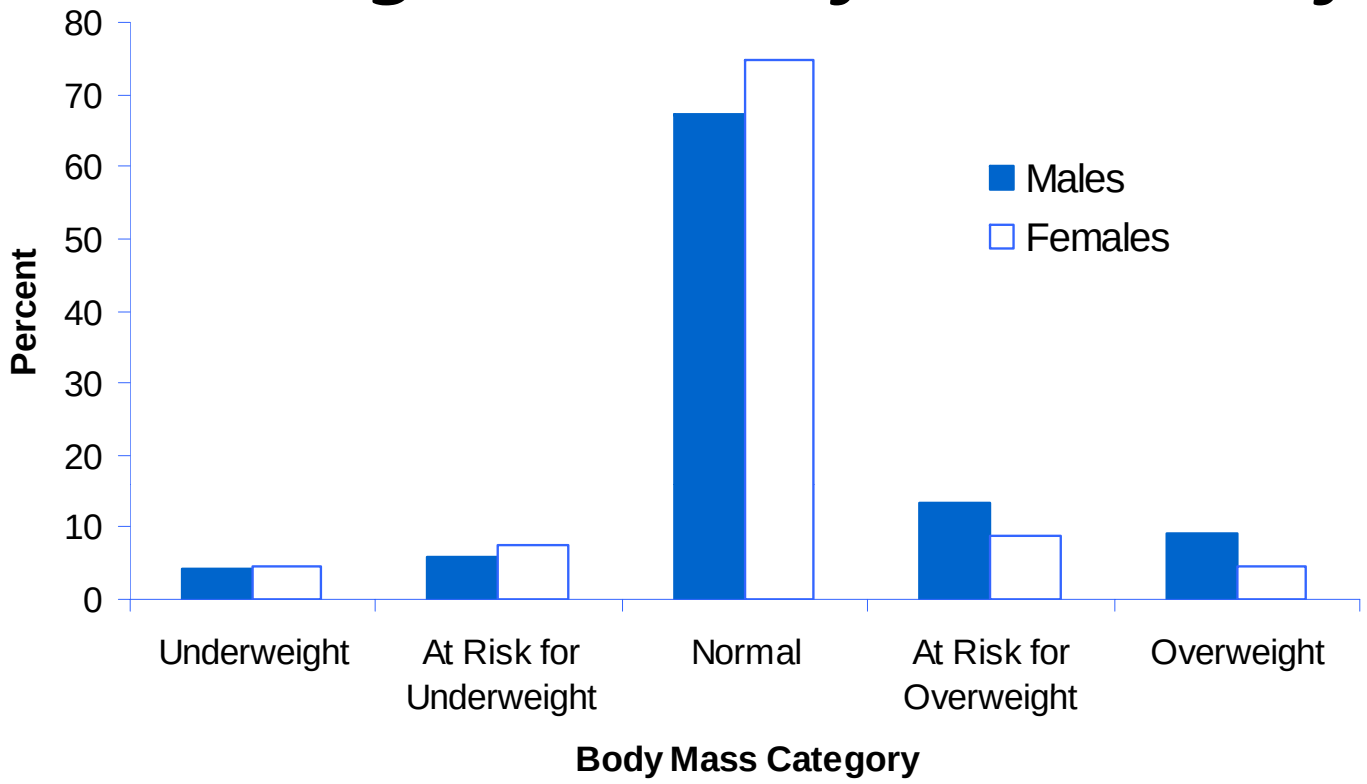


*Table 5. Conforming to perceived or actual norms: descriptive stats of variables under scrutiny**

Actual Peer Weight Norm (across school cohorts)	Gender	Mean	Std. Dev.	Min	Max
Average weight in grade within school cohort	Male	138.0	24.3	94.9	169.0
	Female	119.5	21.8	60.0	245.0
Perceived Peer Weight Norm - Actual Weight Norm = Misperception by type (across respondents)					
Over-misperception of average weight in grade	Male	21.0	19.7	4.5	186.9
	Female	15.8	16.2	4.4	278.2
Under-misperception of average weight in grade	Male	-16.0	8.9	-4.6	-115.0
	Female	-13.2	6.7	-4.6	-75.2

*Data includes only schools with 50% response rates or greater

Figure 1. Weight status of males 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

Figure 2 . Accuracy of students' perceptions of same-sex peer weight norm in their grade at their school by gender

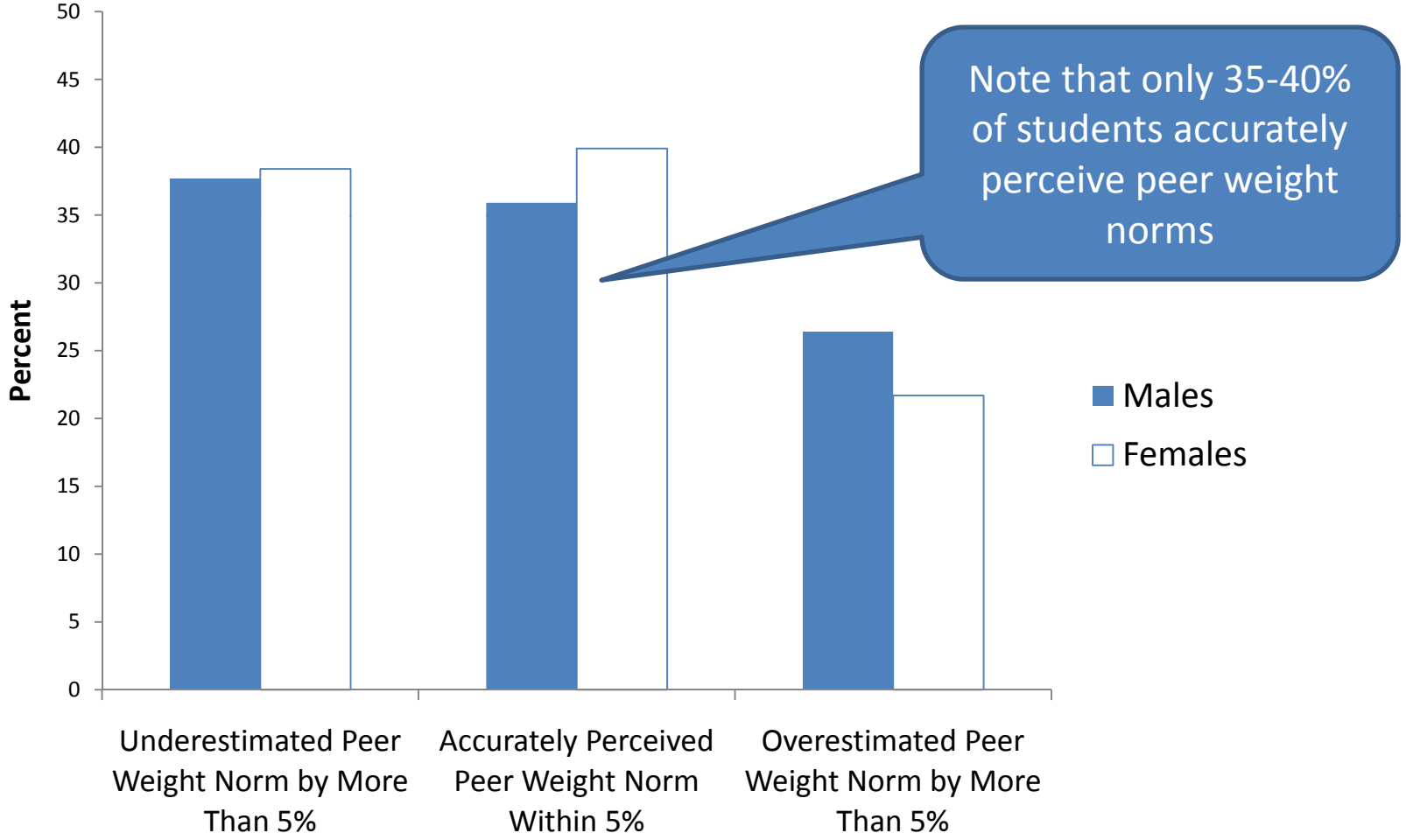
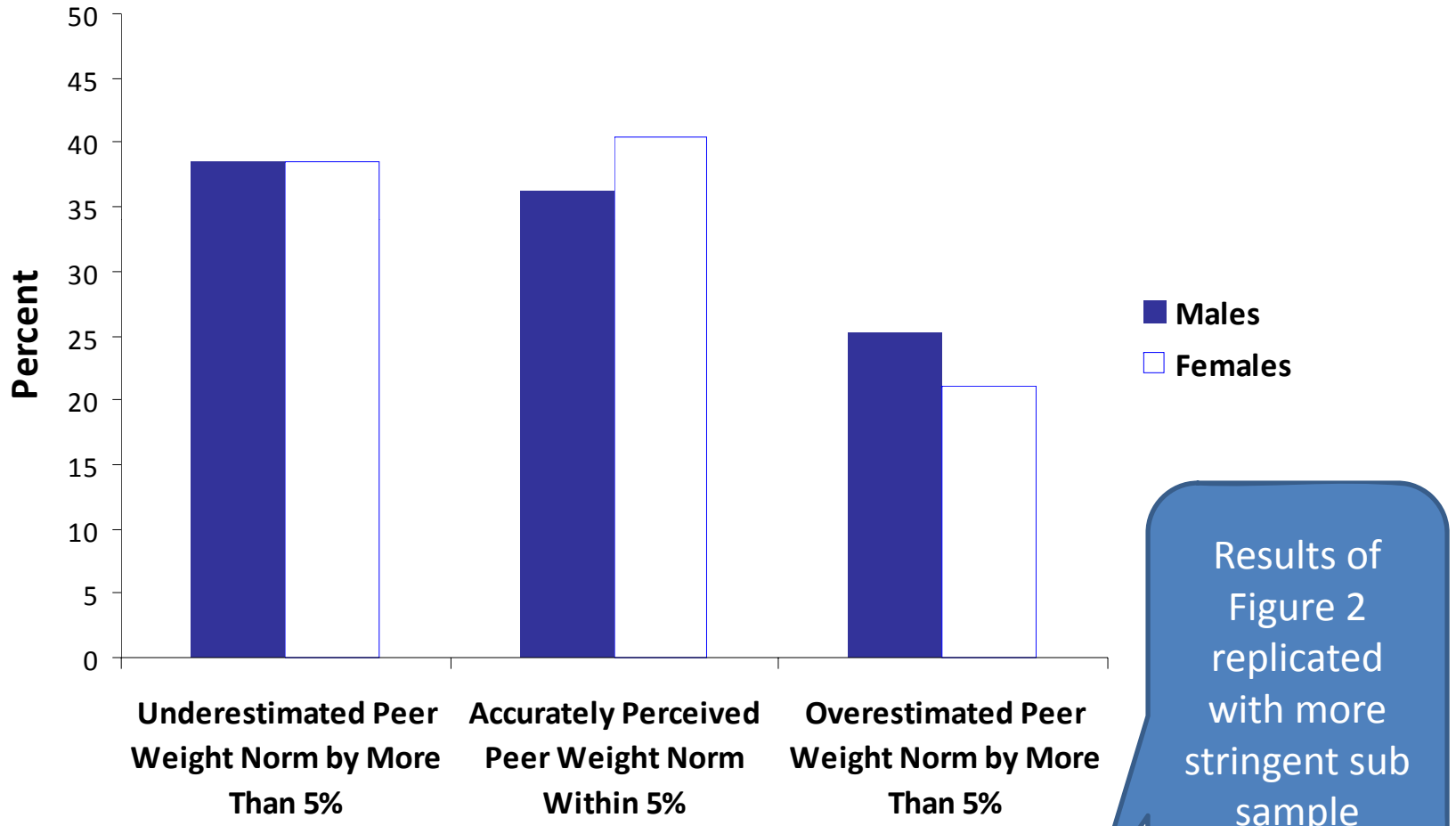


*Figure 2a . Accuracy of students' perceptions of same-sex peer weight norm in their grade at their school by gender**



Results of Figure 2 replicated with more stringent sub sample

*Data includes only schools with 50% response rates or greater

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

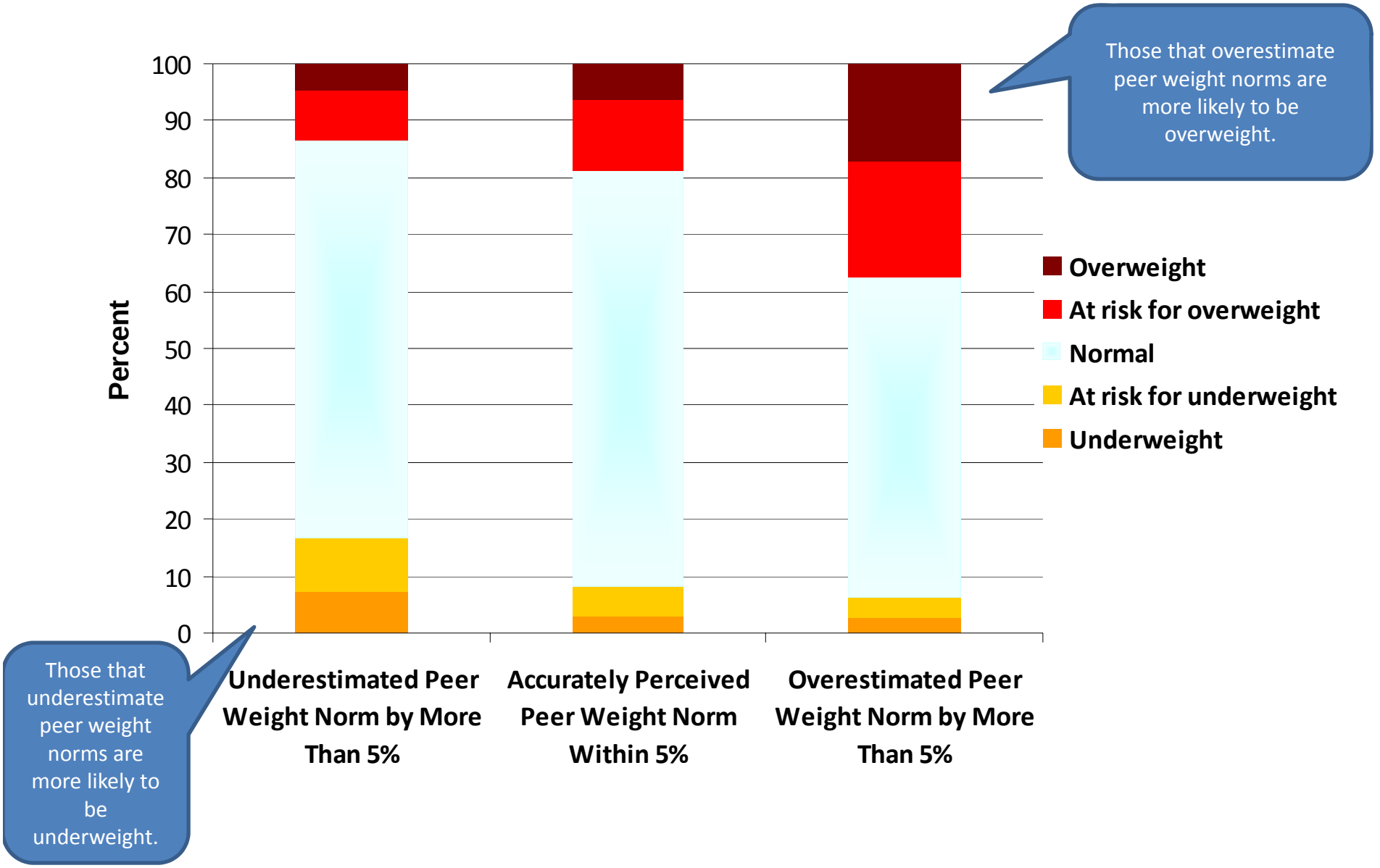


Figure 4. Overweight/underweight risk among females by accuracy of perceived peer body weight norm

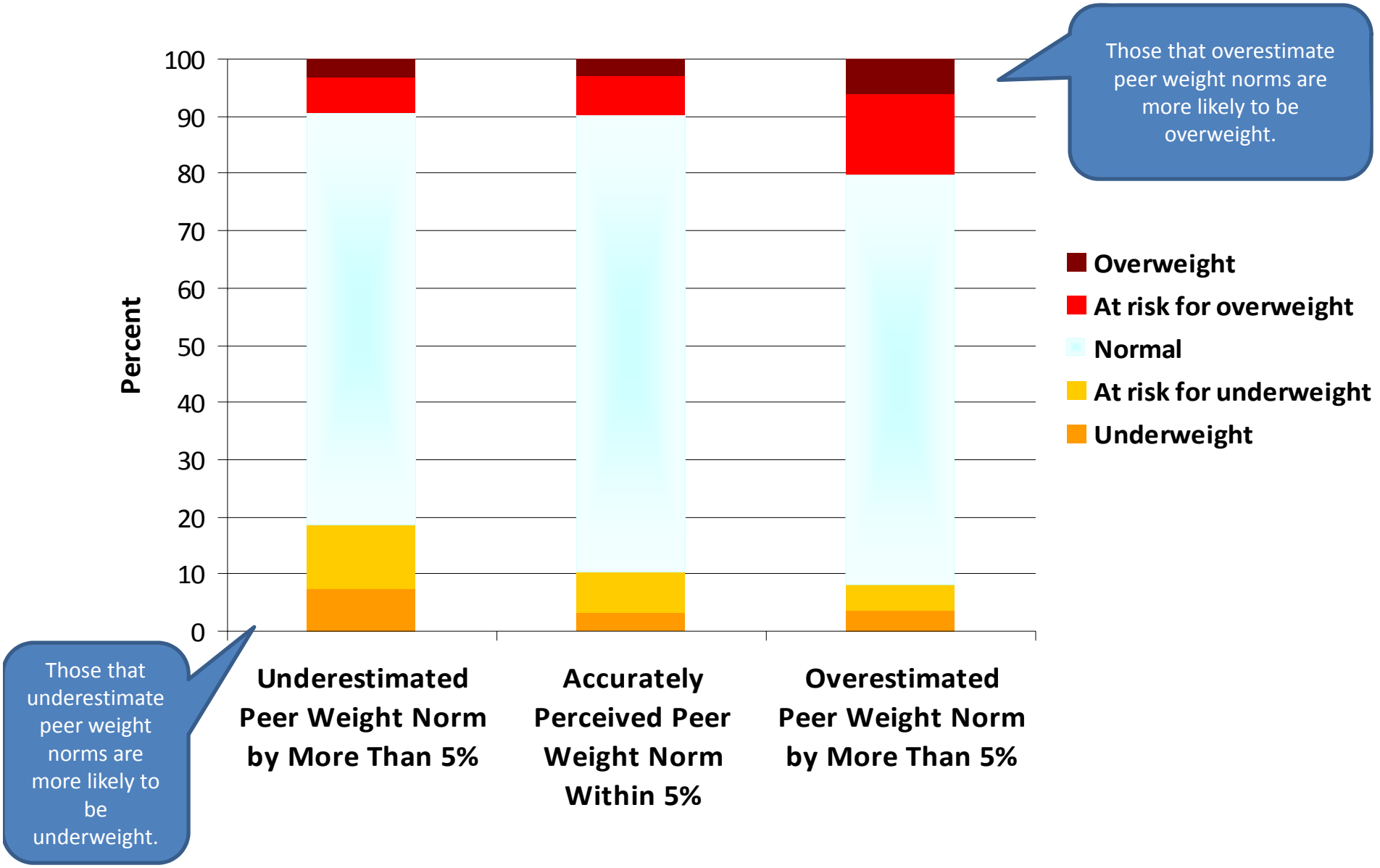


Table 6. Standardized regression coefficients predicting BMI percentile

Independent Variables	Males (N = 12,619)	Females (N = 12,725)
Perceived same-sex body weight norm in grade	.44 **	.32 **
Actual same-sex body weight norm in grade (mean)	.07 *	.25 **
Age (years)	-.33 **	-.26 **
Race (Asian)	.01 ns	-.03 **
Race (Black vs. White)	.03 **	.05 **
Race (Hispanic or Latino vs. White)	.07 **	.07 **
Race (Other vs. White)	.02 ns	.01 ns
Race (Missing vs. White)	-.01 ns	.01 ns
Participation in school club or student government	-.02 ns	-.02 ns
Participation in athletics	-.01 ns	-.05 **
Eligible for free school lunch	.06 **	.07 **
US Region (Western vs other regions)	-.12 **	-.09 **

Perceived weight norm is the strongest predictor of BMI percentile for both males and females

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

The larger the coefficient the more important the variable

Table 7. Unstandardized regression coefficients predicting BMI percentile

Independent Variables	Males (N = 12,619)	Females (N = 12,725)
Perceived same-sex body weight norm in grade	.40 **	.40 **
Actual same-sex body weight norm in grade (mean)	.09 *	.31 **
Age (years)	-4.77 **	-3.72 **
Race (Asian)	1.01 ns	-4.09 **
Race (Black vs. White)	5.32 **	8.72 **
Race (Hispanic or Latino vs. White)	8.30 **	8.47 **
Race (Other vs. White)	1.65 ns	.48 ns
Race (Missing vs. White)	-.44 ns	.72 ns
Participation in school club or student government	-1.13 ns	-.95 ns
Participation in athletics	-.38 ns	-2.96 **
Eligible for free school lunch	.15 **	.17 **
US Region (Western vs other regions)	-6.78 **	-4.94 **

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

Hypothetical Adolescents

MELISSA

- 14 year old, Black Female in the west
- No sports, but participates in school clubs
- 25% of the student body are eligible for FSL
- Average weight for her grade cohort is 1 standard deviation greater than typical (142 pounds)

Accurately perceived
average grade weight

BMI percentile:
77th
Healthy weight

Over perceived
average grade weight
by 15 pounds
(typical over-perception in her grade)

BMI percentile:
86th
At risk for overweight

Hypothetical Adolescents

VICTORIA

- 18 year old, Asian Female in the west
- Plays sports and participates in school clubs
- 1% of the student body are eligible for FSL
- Average weight for her grade cohort is 2 standard deviation lower than typical (116 pounds)

Accurately perceived
average grade weight

BMI percentile:
26th
Healthy weight

Under perceived
average grade weight
by 30 pounds
(2.5 std. dev. more than typical under-perception in her grade)

BMI percentile:
14th
At risk for underweight

Hypothetical Adolescents

DIEGO

- 12 year old, Hispanic Male in the west
- No sports or school clubs
- 75% of the student body are eligible for FSL
- Average weight for his grade cohort of males is 2 standard deviations greater than typical (146 pounds)

Accurately perceived
average grade weight

BMI percentile:
85th
At risk for overweight

Over perceived
average grade weight
by 16 pounds
(Typical over-perception in his grade)

BMI percentile:
95th
Overweight

Hypothetical Adolescents

KRISTY

- 13 year old, White Female in the east
- No sports or clubs
- 16% of the student body are eligible for FSL
- Average weight for her grade cohort is 1 standard deviation greater than typical (125 pounds)

Accurately perceived
average grade weight

Over perceived
average grade weight
by 48 pounds
(2 std. dev. more than typical over-perception in her grade)

BMI percentile:
67th
Healthy weight

BMI percentile:
86th
At risk for overweight

Hypothetical Adolescents

MIKE

- 17 year old, Black Male in the east
- Plays sports, but no school clubs
- 30% of the student body are eligible for FSL
- Average weight for his grade cohort is typical (164 pounds)

Accurately perceived
average grade weight

BMI percentile:
70th
Healthy weight

Over perceived
average grade weight
by 57 pounds
(2.0 std. dev. more than typical over-perception in his grade)

BMI percentile:
96th
Overweight

Implications

- How can we reduce weight misperception?!

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

?

Over/Underweight  Healthy weight!!