

**Sticks and stones:
The association between
weight discrimination
and mental and physical
wellbeing**

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Presenter Disclosures

Angela Meadows

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

No relationship to disclose

Weight stigma in daily life



- Bullying
- Legal
- Emergency
- Media
- Being 'Fat in Public'

MacCann & Roberts, 2013; Puhl & Heuer, 2009; Puhl et al, 2013a,b;
Rudolph et al, 2009; Schvey et al, 2013; Swami et al, 2010

Review:

- <http://www.yaleruddcenter.org/resources/upload/docs/what/bias/WeightBiasStudy.pdf>

Healthcare:

- <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3492331/>
- <http://www.ncbi.nlm.nih.gov/pubmed/11743063>
- <http://www.ncbi.nlm.nih.gov/pubmed/23171227>
- http://www.yaleruddcenter.org/resources/upload/docs/what/bias/Obesity_Bias_in_Training_Obesity_12.13.pdf
- First do no harm: <http://fathealth.wordpress.com>

News media:

- http://www.yaleruddcenter.org/resources/upload/docs/what/bias/VideoAnalysisOnlineNews_JHC_2.13.pdf
- <http://www.ncbi.nlm.nih.gov/pubmed/23668850>
- http://www.yaleruddcenter.org/resources/upload/docs/what/bias/ObesityStigmaOnlineNews_JHC_5.11.pdf

Employment:

- <http://onlinelibrary.wiley.com/doi/10.1111/j.1744-6570.1999.tb00186.x/abstract>
- <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3549781/>
- <http://www.sciencedirect.com/science/article/pii/S0001879108000912>

Customer service:

- <http://www.ncbi.nlm.nih.gov/pubmed/16737356>

Education:

- <http://www.nature.com/ijo/journal/v37/n1/abs/ijo201247a.html>
- <http://www.ncbi.nlm.nih.gov/pubmed/23784894>

Relationships

- <http://www.ncbi.nlm.nih.gov/pubmed/19466667>
- <http://www.ncbi.nlm.nih.gov/pubmed/16129721>

Legal situations:

- http://www.yaleruddcenter.org/resources/upload/docs/what/bias/Weight_Bias_Courtroom_IJO_1.13.pdf

Bullying:

- http://www.yaleruddcenter.org/resources/upload/docs/what/bias/Bullying_Experiences_of_Weight_Loss_Treatment_Pediatrics_12.12.pdf
- http://www.yaleruddcenter.org/resources/upload/docs/what/bias/VictiminationPeerObservations_JSH_11.11.pdf

Stress and the body

- Stress response associated with hypertension, heart disease, T2DM, hypercholesterolaemia
 - HPA, cortisol and other glucocorticoids
 - Increase risk of obesity, especially visceral obesity
- Social stress has negative impact on health
 - E.g. Perceived racial discrimination or mistreatment associated with increased risk of coronary events, breast cancer, HTN, respiratory illnesses, glucose intolerance, high waist circumference (RR 2–6)

Dohrenwend BP, 2000; Gee et al, 2008; Hatzenbuehler et al, 2013, McEwen, 1998; Meunnig, 2008; Puhl & Heuer, 2010.

Social stress: o/w and o/b women have higher levels of depression.

Social stressors include stigma, discrimination and low SES. Data for African and Asian Americans, Irish, Jewish, Polish, White Italian immigrants: even after controlling for confounding variables eg. bmi and sociodemographic factors.

Stressors activate HPA releasing cortisol and other glucocorticoids. GCs may stimulate appetite and blunt satiety system. Cortisol increases fat retention, esp in abdominal region. Stressors may selectively increase intake of 'comfort foods' over other foods. Serotonin precursors – preferential pathways.

Weight stigma, controlled for age, gender, obesity onset and bmi

BMI vs health. O/w women lose 7x more QALYs than o/w men; Whites begin to experience xs mortality c bmi 30; Blacks c 35.

BMI mortality relationship not sig in Melanesian/Indonesian men/women, Pima Indians, African-American men and women.

Correlates of weight stigma Actual / Perceived

Health

- Reduced HRQoL
- Mood & anxiety disorders
- Suicidal ideation
- Low self-esteem
- Body dissatisfaction
- Physical ill-health
- May mediate association between BMI and health

Behavioural

- Increased caloric intake
- Binge eating and EDs
- Avoidance of exercise
- Social isolation
- Avoidant coping strategies
- Healthcare utilisation
 - Preventive: reduced
 - Emergent: increased

Gudzune et al, 2013; Hatzenbuehler et al, 2009; Pearl et al, 2014; Puhl et al, 2007; Puhl & Heuer, 2010; Puhl et al, 2013; Rosenthal et al, 2013

Nationally representative survey (n>9000 obese adults) found perceived weight discrimination sig associated with current diagnosis mood & anxiety disorders, and mental health service usage, after control for perceived stress and sociodemographic characteristics (Hatzenbuehler et al Obesity 2009, cited in Puhl, ref 116)

Internalised Weight Stigma

- Accept and believe societal anti-fat attitudes and stereotypes leading to self-devaluation
 - Related to but distinct from self-esteem, body image, anti-fat bias
- Reduced HRQoL, independent predictor of physical and mental health impairment
- Avoidant coping, more maladaptive behaviours, fewer health behaviours

Durso & Latner, 2008; Lillis et al, 2011; Latner et al, 2013; Puhl et al, 2007; Vartanian & Novak, 2011.

Online study: “Life experiences of overweight individuals”

- Online recruitment via social media and forums
 - Diet, weight loss
 - Exercise, health and fitness
 - Plus-size fashion
 - Body image and size acceptance
- ‘Overweight’ adults, 18–69

Older adults excluded as agism seems more salient than weight stigma

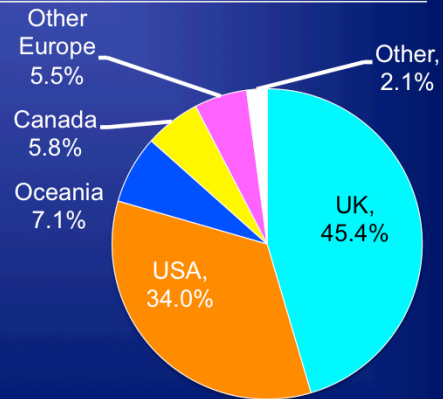
Questionnaires

- Demographics, height and weight, dieting
- Eating behaviour
- Restriction of activities
- Body image and self-esteem
- Experienced and internalised weight stigma

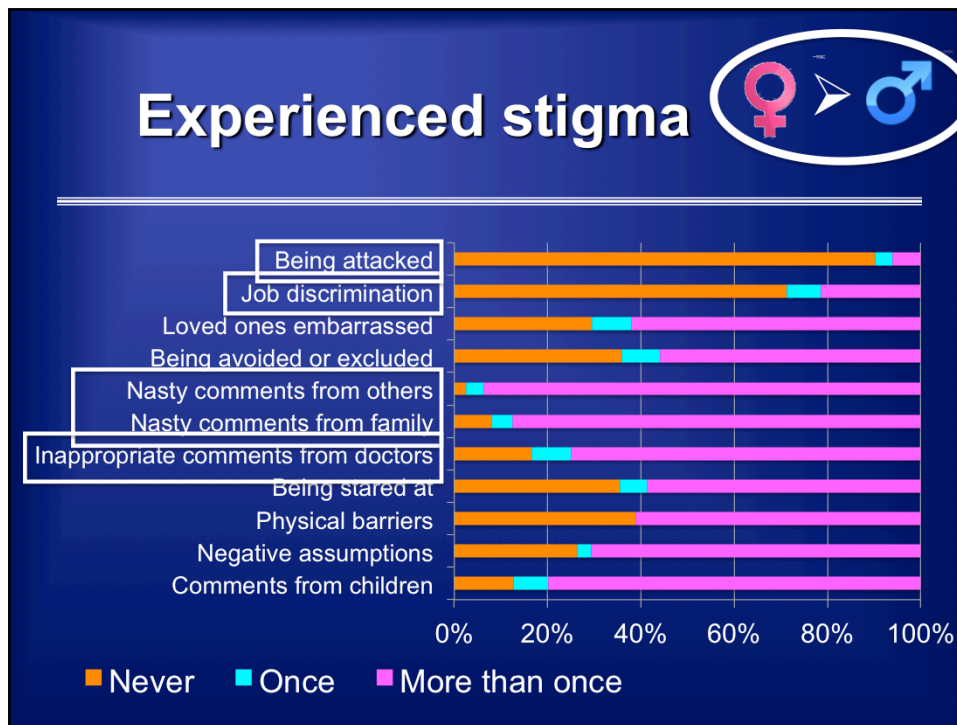
Brown et al, 1990; Cash, 2000; Durso & Latner, 2008;
Myers & Rosen, 1999; Quinn & Crocker, 1999; Robinson & Bacon, 1989;
Rosenberg, 1979; Stice et al, 2000; van Strien et al, 1986

Participants

- N = 379, 88% female
- 71% White
- Mean BMI 36.8
 - SD 8.9, range 25.0–76.2
- Mean age 37.6 years
- Educated
 - 69% at least UG degree
 - 37% higher degree
- Employment
 - 57% white collar, 19% education, 7% unemployed



N=431 started; 88% completion rate



Interpersonal discrimination and prejudice very high: unpleasant comments from family members, friends and co-workers, or from total strangers

Over 80% in healthcare setting

Over ¼ had experienced job discrimination due to weight

Around 10% had been attacked (over 6% more than once)

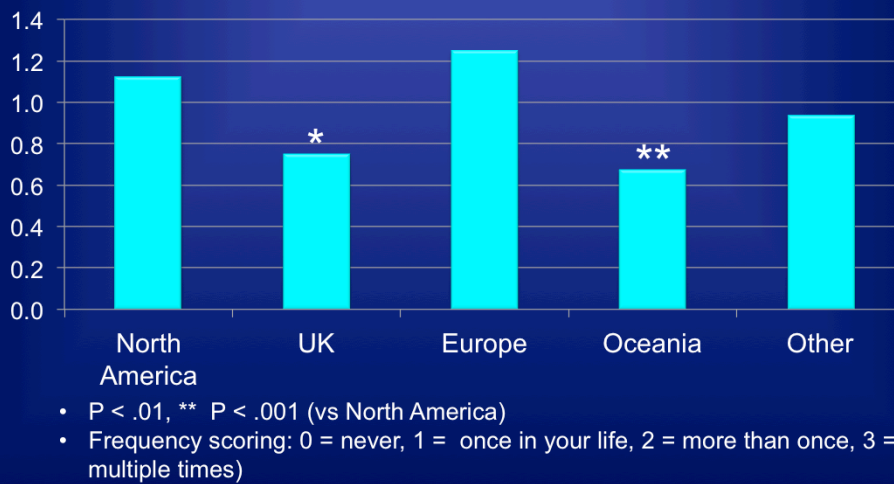
Consistent with previous findings.

Women experienced significantly more stigma on all scales except assault, even after controlling for BMI.

Nasty comments from others include drive by shoutings, strangers asking personal questions or suggesting diets or fashion tips.

Stared at includes pointing, laughing, photographing etc.

Frequency of experienced stigma by region



SSI scoring (modified by Puhl et al) 0=Never, 1=Once, 2=More than once, 3=Many times.

Significance from Tukey HSD tests following significant ANOVA.

Types of stigma: North America vs UK

- North American participants reported significantly higher frequency of all types of stigma experience except being physically attacked
- However both anti-fat attitudes in general and internalised weight stigma were significantly higher in the UK (note, 'OW/OB' sample).

Compare UK and US because largest sample sizes. UK N=172, North America N=151, Others quite small (N=8 to 27)

Actual values for each variable available on unused slide at end of presentation

Partial correlations (controlling for BMI)

Partial correlations (BMI)	IWS	SSI	AFA	Dieting	Self-esteem	Appearance evaluation	REACT-Exercise	REACT-Eating	Gender	Education	BMI
IWS		.200***	.466***	-.354***	-.685***	-.793***	.498***	.457***	NS	-.197***	NS
SSI			NS	NS	-.242***	-.155**	.238***	.252***	.261***	NS	.561***

- No significant correlation with age, employment
- Nominal variable coding: Dieting (1=WL dieting, 2=Watching, 3=Not dieting); Gender (0=male, 1=female); Education (1=low to 6=high)

IWS=Internalised weight stigma, SSI=Stigmatising Situations Inventory, AFA=Anti-fat Attitudes, REACT=Restriction of activities.

- IWS correlated with all outcomes except gender and BMI. However, SSI correlated strongly with both.
- IWS increased likelihood of dieting even controlling for BMI. SSI less likely to be dieting but became non-significant after controlling for BMI. So if heavy, SSI leads to decreased dieting.
- Both IWS and SSI associated with worse psychological and behavioural outcomes, but effect size bigger for SSI.
- Both associated with DEBQ subscales, but higher for IWS.
- Only IWS associated with binge eating frequency, after controlling for dieting and BMI.
- SSI associated with BED diagnosis ($r=.104^*$), controlling for BMI ($r=.113^*$), but controlling for BMI and dieting behaviour $p=.057$.

Partial correlations (controlling for BMI & dieting)

Partial correlations (BMI, Dieting)	DEBQ- Restraint	DEBQ- External	DEBQ- Emotional	BE6	BE3	BED	EDDS Total
IWS	.253***	.380***	.484***	.387***	.378***	NS	.658***
SSI	.151**	.114*	.155**	NS	NS	0.101	.237***

- Nominal variable coding: BED (1=Yes, 0=No)
- No significant correlation with BN, BED diagnosis

DEBQ=Dutch Eating Behaviour Questionnaire, BE3/6=Binge eating in previous 3/6 months, BED=Binge Eating Disorder (DSM-V), EDDS=Eating Disorders Diagnostic Survey.

- IWS correlated with all outcomes except gender and BMI. However, SSI correlated strongly with both.
- IWS increased likelihood of dieting even controlling for BMI. SSI less likely to be dieting but became non-significant after controlling for BMI. So if heavy, SSI leads to decreased dieting.
- Both IWS and SSI associated with worse psychological and behavioural outcomes, but effect size bigger for SSI.
- EDDS cut off 16.5 distinguished clinical from healthy controls. Average in this sample was 24.
- Both associated with DEBQ subscales, but higher for IWS.
- Only IWS associated with binge eating frequency, after controlling for dieting and BMI.
- SSI associated with BED diagnosis ($r=.104^*$), controlling for BMI ($r=.113^*$), but controlling for BMI and dieting behaviour $p=.057$.

Regression models

(*Include age, gender, and BMI as covariates)

	Internalised Stigma	Experienced Stigma	Full Model* R ²
Self-Esteem	✓	✓	.51
Appearance Evaluation	✓	-	.64
Exercise in public	✓	✓	.31
Eating in public	✓	✓	.29

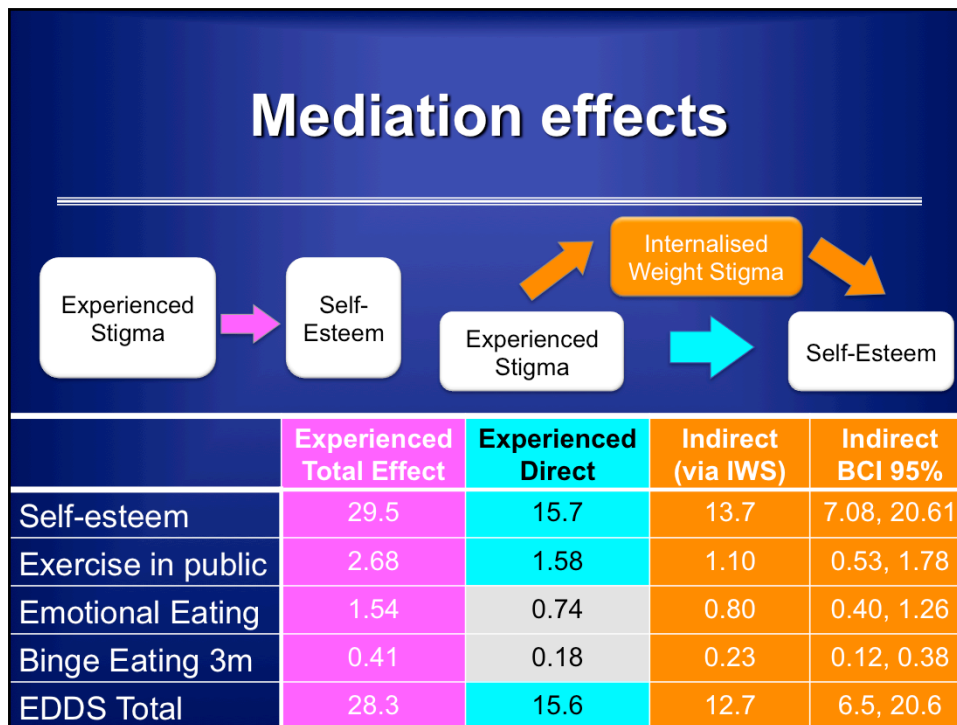
Despite lack of moderation effect, 43% of participants were more affected in terms of exercise than eating. 13% eating. Rest, no difference.

Regression models

(*Include age, gender, BMI, and dieting as covariates)

	Internalised	Experienced	Full model* R ²
Restraint	✓	-	.42
External Eating	✓	✓	.19
Emotional Eating	✓	-	.28
Binge Eating 3m	✓	-	.19
Binge Eating 6m	✓	-	.21
EDDS Total	✓	✓	.53

- Coefficients: Internalised >> experienced stigma
- Internalised stigma more important in driving disordered eating



Not in chart: Eating in public, appearance eval (Exp stigma NS), Restraint (NS), External, BE6 (NS).

All unstandardised coefficient, so measured in original outcome scale. Scoring: REACT (0=Never to 4=Always); RSE (0 to 3, Max 30), DEBQ (1=Never to 5=Very Often), App Eval (1=strongly disagree, 5=strongly agree), BE6 (days per week), BE3 (times per week)

Total effect is effect of predictor on outcome WITHOUT mediator in model (c path). Direct effect is effect WITH mediator in model (c'). If mediation is present, this will be less than the total effect, i.e. some of the effect is explained by the mediator. If c' not = 0, then partial mediation occurs. If c' = 0 that is complete mediation (rare). Indirect effect = total-direct. Also = a x b path coefficients.

All highly statistically significant unless otherwise stated.

Outcomes where no significant effect with SSI found in moderation regression equations, direct effect becomes non-significant when internalisation included in model:

- App Eval: direct effect (i.e. taking internalisation into account) .038, $p=.882$
- Restraint $B=.489$ ($p=.102$)
- Emotional $B=.741$ ($p=.064$)
- BE3 $B=.184$ ($p=.204$)
- BE6 $B=.191$ ($p=.125$)

Summary: Internalised vs Experienced stigma

- Internalised stigma crosses gender, BMI boundaries
- Only small correlation between experienced and internalised stigma
 - Experienced stigma common but not ubiquitous
 - Internalised stigma from fat-shaming environment?
- Internalised stigma significant driver of negative outcomes and mediates relationships with experienced stigma

Don't need to have people throw things at you out of cars in order to hate yourself for being fat.

Implications

- Targeting anti-fat bias not very successful
- Target internalisation?
 - Victim blaming?
 - May be partially protective
 - Mostly qualitative and anecdotal data
- Develop intervention and test effect on health and health behaviours

Weight Stigma Conference

Sign up for updates at:
stigmaconference.com

Email: axm583@bham.ac.uk

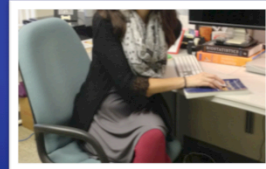
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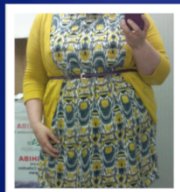
Suzanne Higgs, PhD



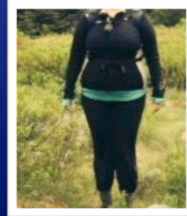
Andrea Bomback, PhD



Janelle Messenger, PhD



Natalie Ingraham, MPH



Catherine Womack, PhD

Regional distribution of sample (text)

- UK 45.4%
- USA 34.0%
- Canada 5.8%
- Oceania 7.1%
- Other Europe 5.5%
- Other 2.1%

Frequency of experienced stigma by region (text)

- Across all 11 domains measured by the Stigmatising Situations Inventory, North America and Europe reported the highest levels of stigma
 - 1.1 and 1.2 on a scale from 0=Never to 3=Multiple times
 - UK and Oceania averaged score of 0.7

Results:

Experienced stigma (text)

- Women experienced more than men
- Over 90% received nasty comments from friends, family, colleagues, strangers
- Over 80% experienced stigma in healthcare settings
- Over one-quarter in employment settings
- Being stared at, physical barriers common
- 10% physically attacked, 6% more than once

Results: Partial Correlations: Experienced Stigma (text)

- Not correlated with age, employment, dieting, or anti-fat attitudes
- Strong correlation with BMI, $r = .56$ and gender, $r = .26$ (both $p < .001$)
- Controlling for BMI, negatively correlated with self-esteem, appearance evaluation, avoidance of exercising and eating in public

Results: Partial Correlations: Internalised Stigma (text)

- Not correlated with BMI or gender
- Strong correlation with all other measures in expected directions; all correlations stronger than for experienced stigma
- Only moderate correlation between experienced and internalised weight stigma ($r = .20, p < .001$)

Results: Partial Correlations: Eating Behaviour (text)

- Experienced and internalised weight stigma both significantly correlated with restrained, external and emotional eating, and symptom scores on the Eating Disorders Diagnostic Scale. Correlations larger for internalised.
- Binge eating behaviour only correlated with internalised stigma

Results: Regression Models (text)

- Regression model included age, gender, and BMI as covariates.
- Internalised and experienced stigma were significant predictors of restriction of public activities (R-squared exercise .31, eating) and self-esteem (R-squared .51)
- Experienced stigma not significant predictor appearance evaluation but model R-squared = .64

Regression Models – eating behaviours (text)

- Regression model included age, gender, BMI, and dieting as covariates.
- Internalised stigma was significant predictors of all outcomes. Experience stigma significant predictor of external eating and EDDS symptom score.
- Total model R-squared (from top to bottom):
Restrained .42, External .19, Emotional .28, Binge Eating in previous 3 months .19, 6 months .21, EDDS symptom scores .53

Results:

Mediation effects (text)

- Total effects of experienced stigma on all outcomes at least partially mediated via internalised weight stigma
- After controlling for internalised stigma, direct effects of experienced stigma on appearance evaluation, dietary restraint, emotional eating, and binge eating became non-significant.

UNUSED SLIDE

Types of Stigma Experience: North America vs UK

	North America	UK	<i>p</i>
Nasty comments from family	1.107	0.852	.006
Loved ones embarrassed	0.984	0.727	.020
Nasty comments from children	1.383	1.067	.010
Nasty comments from others	1.305	0.849	< .001
Being excluded	1.195	0.864	.021
People making assumptions	1.526	0.991	< .001
Being stared/pointed at	0.870	0.501	< .001
Inappropriate comments from doctors	1.471	0.988	< .001
Employment settings	0.459	0.187	< .001
Physical barriers	0.956	0.471	< .001

UK N=172, North America N=151, Others quite small (N=8 to 27)

Post hoc Tukey's HSD after significant ANOVA

No differences in frequency of physical attacks between regions.