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Self-Perceived Overweight, Weight Loss Attempts, and Weight Gain: Evidence from Two Large, Longitudinal Cohorts

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Running Head: Perceived overweight, weight loss attempts and weight gain

Abstract

Objective: Self-identification of overweight is associated with a greater desire to lose weight, but also counter-intuitively with increased future weight gain. The present research examined whether weight loss attempts mediate the prospective relation between self-perceived weight status and weight gain across adolescence and young adulthood.

Methods: Data from two longitudinal cohort studies was used. Study 1 tested whether the association between self-perceived weight status and weight gain (from age 10/11-14/15 years) was mediated by weight loss attempts among Australian adolescents. Study 2 focused on young adults based in the US and examined whether attempts at weight loss mediated the relation between self-perceived overweight and weight gain from ages 16 to 28 years.

Results: In Study 1, self-perceived weight status among adolescents was associated with greater weight gain and weight loss attempts mediated 16% of this relation. In Study 2, young adults who perceived their weight status as overweight gained more weight over time and weight loss attempts mediated 27% of this relation.

Conclusions: Adolescents and young adults that identify they are overweight are more likely to gain weight over time and weight loss attempts appear to mediate this effect.

Key Words: Weight misperceptions; weight gain; obesity stigma; body image; dieting

Weight loss attempts mediate the relation between self-perceived overweight and weight gain

Although a person's objective weight status and what they perceive their weight status to be often align, they can also be discordant (Robinson, 2017). For example, several studies show that many adolescents and young adults with overweight and obesity do not identify their weight status as being 'overweight' and instead perceive their weight status as being 'about right' (Andrade, Raffaelli, Teran-Garcia, Jerman, & Garcia, 2012; Jackson, Johnson, Croker, & Wardle, 2015; Maximova et al., 2008). Likewise, some young people whose body weight places them in the 'normal' weight range perceive their weight status as being 'overweight' (Jackson et al., 2015; Park, 2011). Discordance between objective and self-perceived weight status is also observed among older adults (Johnson, Cooke, Croker, & Wardle, 2008; Robinson & Oldham, 2016). The public health relevance of weight perception has received extensive discussion (Robinson, Sutin, Daly & Haynes, 2016). Among individuals with overweight and obesity a failure to identify one's own weight status as being overweight has been argued to be detrimental to weight management efforts (Duncan et al., 2011; Kuchler & Variyam, 2003). In this vein, some intervention approaches aim to ensure that young people with overweight or obesity are made aware of their 'overweight' weight status (Almond, Lee, & Schwartz, 2016).

Because of relevance to public health, understanding the consequences of self-perception of weight status is of importance. A number of studies have shown that both adolescents and adults who self-perceive their weight status as being overweight are more likely to report a desire to lose weight and to be actively attempting weight loss (Lemon, Rosal, Zapka, Borg, & Andersen, 2009; Strauss, 1999; Yaemsiri, Slining, & Agarwal, 2011). Moreover, this finding is observed irrespective of whether a person is objectively

‘overweight’ or their body weight places them in the ‘normal’ weight category (Strauss, 1999). One likely reason why self-perception of overweight is associated with attempted weight loss is because of body image concerns among individuals who self-perceive their body size as being overweight. There is evidence that body dissatisfaction is a motivator for weight loss among young people (Loth, MacLehose, Bucchianeri, Crow, & Neumark-Sztainer, 2014) and individuals who identify their weight status as being overweight are likely to be more dissatisfied with their body size than those who do not (Voelker, Reel, & Greenleaf, 2015). Thus, identifying oneself as being overweight is a likely motivator for weight loss. Although these findings appear to be consistent with the notion that identifying oneself as being overweight may be associated with more effective weight management, recent work examining the relations between self-perceived weight status and future weight gain paints a different picture. Identifying one’s own weight status as being overweight is counter-intuitively predictive of greater weight gain over time among both UK and US adults across the lifespan (Robinson, Hunger, & Daly, 2015). Studies of adolescents and young people have produced similar results. Across these studies, the association between self-perceived overweight and weight gain is observed irrespective of whether a person accurately or inaccurately perceives their weight status as being overweight (Duong & Roberts, 2014; Liechty & Lee, 2014; Sonnevile et al., 2015; Sutin & Terracciano, 2015).

The tendency for self-perceived overweight to be associated reliably with both increased efforts to lose weight in the short-term and greater weight gain in the long-term may seem paradoxical. However, weight loss efforts may, in part, explain why self-perceived weight status is associated with increased weight gain over time. Although individuals who perceived their weight status to be heavier may be motivated to lose weight, long-term weight loss is very difficult to achieve (Jeffery et al., 2000) and could be associated with ‘yo-yo’ dieting (Mann et al., 2007). In addition, although attempts at weight loss could act as a

proxy, rather than being a cause of weight gain (Lowe, 2015), evidence suggests that attempts at weight loss through dieting may be associated with increased weight gain (Neumark-Sztainer, Wall, Story, & Standish, 2012; Pietilainen, Saarni, Kaprio, & Rissanen, 2012). This line of reasoning may be particularly relevant when considering body weight perceptions and weight control practices among young people. Adolescence and young adulthood are life periods in which concerns about social acceptance are especially important (Steinberg & Morris, 2001). Thus, the social stigma attached to feeling overweight may compromise self-regulation and make weight loss particularly difficult to achieve among young people that self-identify as being overweight (Hunger, Major, Blodorn, & Miller, 2015; Tomiyama, 2014). Thus, efforts to lose weight may in part explain why adolescents and young adults who self-identify as being ‘overweight’ gain more weight over time than those who do not self-identify as being overweight.

The present research examined whether weight loss attempts mediate the prospective relation between self-perception of weight status and weight gain across adolescence and young adulthood. It was hypothesised that a heavier self-perceived weight status would be associated with a higher likelihood of attempting weight loss in the future and that these attempts at weight loss would be predictive of increased weight gain over time. To address this question data was drawn from two longitudinal cohort studies in Australia and the US, as this allowed an examination of both the replicability of results and the generalizability of findings in two cultural contexts and across adolescence into young adulthood.

Study 1

Method

Participants and procedure. Participants were drawn from the older (K) cohort of the Longitudinal Study of Australian Children (LSAC, 2015). Families in the older cohort were

recruited into the study when study children were four years old. Families undergo a comprehensive assessment every two years. Study children were included in the present study if they completed the Wave 4 assessment at age 10-11 when self-perceived weight was assessed, the Wave 5 assessment at age 12-13 when weight loss attempts were assessed, and had measured height and weight available at the Wave 4 (baseline concurrent with self-perceived weight assessment) and Wave 6 (age 14-15, the most recent available wave) assessments. A total of 2,978 study children had data available to be included in the analysis. Of the 3,935 study children who had baseline data available at ages 10-11, 357 did not have information on attempted weight loss at ages 12-13, and another 600 did not have information on BMI at ages 14-15 and thus could not be included in the analysis. Participants included in the analytic sample were less likely to be indigenous, speak a language other than English in the home, were from more educated backgrounds, and had a lower BMI z-score than those who had baseline data but not follow-up data ($ps <.01$). There was no difference in study child age or gender or in perceived weight levels.

Inverse probability weights were used to test the influence of selection bias due to non-random attrition on the study results (e.g. bias introduced if heavier or more disadvantaged individuals were less likely to be retained in the sample). The probability of inclusion was calculated for each participant using the results of a logistic regression where perceived weight and all covariates predicted the likelihood of retention/non-missing data at follow-up. The weighting variable was generated by taking the inverse of the predicted probability of retention for each participant. This inverse probability weighting variable was then applied to analyses of those with follow-up data in order to account for baseline differences in each of the study predictors between participants retained in the analysis and those who dropped out of the study. Re-weighting the analyses to adjust for selection bias did not alter the main pattern of results identified and therefore the unweighted results are

reported. Because analyses in both Study 1 and 2 used existing publicly available data and both ethical approval and participant consent were obtained when the data were originally collected, formal ethical approval of the present analyses was deemed unnecessary.

Measures

Perceived weight. Children self-reported on their health and well-being through Audio Computer Assisted Self-Interview Software (ACASI). The use of ACASI allowed children to respond privately to questions directly on a computer without fear of being overheard. At age 10-11, children reported on their perception of their own body size with a 7-body version of the Contour Drawing Rating Scale (Thompson & Gray, 1995). Seven body sizes in ascending order were shown to children, and the children were asked ‘which picture looks most like your body shape?’ Participants selected one of the seven figures; higher numbers indicated a larger perceived body size.

Weight loss attempts. At age 12-13, through ACASI, children were asked to “pick the answer that shows what you are trying to do about your weight now.” Response options were lose weight, gain weight, stay the same weight, and I am not trying to do anything about my weight. Study children who chose “lose weight” were classified as attempting weight loss; this group was compared against the other three response options.

Study child BMI. Trained staff measured the weight and height of the study children at each assessment. Children were instructed to wear light clothing. Weight was measured with a bathroom glass scale to the nearest 50 grams. Height was measured with a portable stadiometer to the nearest 0.1cm. Growth charts from the Centers for Disease Control and Prevention (CDC) (Must & Anderson, 0000) were used to convert the measurements into age and sex specific BMI-Z scores at each assessment.

Covariates. Demographic factors associated with child weight were included as covariates: sex and age of the child, child ethnicity (indigenous versus not indigenous),

household language use (language other than English spoken in the home versus English spoken in the home), mother's education, and baseline child BMI-Z score.

Analytic strategy. The first aim was to establish whether perceived weight at baseline predicted weight gain from baseline to follow-up. Specifically, the relation between perceived weight at baseline and BMI-Z scores at follow-up was tested in a model adjusting for baseline BMI-Z scores and potential confounds described above using OLS regression analysis. Next, mediation analysis was employed to test whether weight gain attributable to participants' weight perceptions could be explained by weight loss attempts. To demonstrate successful mediation an association must exist (total effect; path *c*) between the independent variable (perceived weight) and the dependent variable (weight gain); an association must be present between the independent variable and the mediator (subsequent weight loss attempts; path *a*); and a link must exist between the mediator and the dependent variable (i.e. weight loss attempts predict increased weight gain over the period of the study; path *b*). Having established that the preconditions for mediation were present, the *khb* command in STATA Version 13 (Karlson, Holm, & Breen, 2012; Kohler, Karlson, & Holm, 2011) was then used to establish the significance levels of the indirect effect (*ab*). This method is appropriate for decomposing the total effect of perceived overweight into a direct effect and an indirect pathway through weight loss attempts and also estimating the proportion of the total effect explained by the indirect path. This approach was used because the dichotomous nature of our weight loss mediator variables can present problems for the standard product of coefficients approach.

Table 1

Participants' Characteristics in Study 1 (N = 2,978)

Characteristic	Statistic
Perceived weight ^a	$M = 3.86, SD = .87$
Age (years)	
Baseline	$M = 10.31, SD = .46$
Follow-up	$M = 14.40, SD = .49$
Sex (% female)	48.69
Indigenous (%)	1.81
Language other than English (%)	7.15
Language unknown (%)	2.25
Mother's Education ^b	$M = 5.37, SD = .97$
Body mass index (kg/m ²) z-score	
Baseline	$M = .31, SD = 1.01$
Follow-up	$M = .35, SD = 1.09$
Weight loss attempt (%)	33.58

^a Participant's indicated which of seven figures most resembled their body shape; higher numbers indicated a larger perceived body size.

^b Mother's education was scored on a scale from 1 (Never attended school) to 6 (Year 12 or equivalent).

Results

Descriptive statistics for all study variables are shown in Table 1. At the age 10-11 baseline assessment, participants, on average perceived their bodies to be close to the middle figure of the seven bodies of the Contour Drawing Rating Scale ($M=3.86$, $SD=.87$). A total of 33.6% of the sample reported that they were trying to lose weight at the age 12-13 assessment. As expected, adolescents who reported attempting weight loss perceived themselves as heavier than adolescents who were not attempting weight loss ($M = 4.28$ [$SD = .84$] versus $M = 3.65$ [$SD=. 81$], $p < .01$).

Consistent with previous research on older adolescents and adults, self-perceived weight was associated with greater weight gain: study children who perceived themselves as heavier tended to gain more weight between age 10-11 and 14-15 than study children who perceived themselves as lighter ($b = 0.06$, $SE = 0.02$, $t(2969) = 2.92$, $p < .01$), as shown in Table 2. Self-perceived weight at age 10-11 was also associated with currently trying to lose weight at age 12-13 ($OR = 1.31$, $95\% CI = [1.15, 1.49]$, $p < .001$), and currently trying to lose weight at age 12-13 was associated with greater weight gain by age 14-15 ($b = 0.16$, $SE = 0.03$, $t(2968) = 4.81$, $p < .001$).

Formal mediation analysis confirmed that weight loss attempts at age 12-13 mediated, in part, the association between a higher self-perceived weight at age 10-11 and weight gain between 10-11 and 14-15 (indirect effect of weight loss attempts = 0.01, $95\% CI = [0.004, 0.015]$, $p < .001$). This indirect effect accounted for 16% of the total effect.

Table 2.

Results for Study 1: Weight Loss Attempts as Mediators of the Effect of Perceived Weight on Weight Gain over 4 years in Study 1 (LSAC; N = 2,978)

	Point Estimate	SE	95% CI Lower ; Upper	Effect ratio
Path a				
Perceived weight -> weight loss attempts	1.31***	0.09	[1.15 ; 1.49]	
Path b				
Weight loss attempts -> weight gain	0.16***	0.03	[0.10 ; 0.23]	
Path c				
Perceived weight -> weight gain	0.06**	0.02	[0.02 ; 0.10]	
Path c'				
Perceived overweight -> weight gain	0.05*	0.02	[0.01 ; 0.09]	
Indirect effect (ab)				
Via weight loss attempts	0.01***	0.003	[0.004 ; 0.015]	0.16

Note: The effect ratio is the indirect effect/c.

* $p < .05$. ** $p < .01$. *** $p < .001$.

In Study 1 self-perceived weight status was associated with increased weight gain and weight loss attempts mediated this relation. A limitation of Study 1 was that the measure of self-perceived weight status only permitted an examination of the association between a heavier perceived weight status and weight gain; the nature of the measure did not allow for dichotomous categorization of participants as identifying (vs. not) as being ‘overweight’. Study 2 addressed this and investigated whether similar findings were observed when weight gain was examined across adolescence into young adulthood in a different cultural context.

Study 2

Method

Participants and procedure. In this study, data from the National Longitudinal Study of Adolescent Health was used (Add Health) (Harris et al., 2009), a nationally representative, longitudinal survey of adolescents in grades 7-12 at initial recruitment in the school year 1994-1995 (Wave 1). Data were drawn from the public-use Add Health dataset comprised of a randomly selected sample of half of the core study sample and half of the African-American oversample. The analysis included participants who took part in Wave 2 (1996; the first wave where height and weight were measured by trained interviewers), Wave 3 (2001–2002), and Wave 4 (2008–2009) with complete data on baseline covariates (including education drawn from Wave 3) and the three main study variables: perceived weight, weight loss attempts, and BMI at baseline and follow-up. Of the 4,743 participants with available baseline data, 1,518 were excluded from the present analysis due to missing information on weight loss attempts in Wave 3 (N = 983), on educational attainment (N = 3), and on BMI at follow-up (N = 532). Those included in the current analysis were more likely to be female ($p < .001$), non-Hispanic ($p < .001$), non-Black ($p < .001$), younger at baseline ($p < .01$), and to perceive themselves as overweight ($p < .05$) compared with participants missing follow-up

data. As in study 1 weighting the analyses to account for attrition bias did not alter the main pattern of results, so the unweighted analyses are reported. The study sample (N = 3,225) was comprised of 1,440 (44.7%) men and 1,785 (55.3%) women who were, on average 16.47 years old (SD = 1.59) at baseline and 28.43 years old (SD = 1.61) at follow-up.

Measures

Perceived weight. Weight self-perception was assessed in Wave 2 using participants' response to the item "*How do you think of yourself in terms of weight?*". Participants selected one of the following response options: 1 = very underweight, 2 = slightly underweight, 3 = about the right weight, 4 = slightly overweight, 5 = very overweight. Participants selecting "slightly overweight" or "very overweight" were categorized as perceiving themselves as overweight. The remaining participants (i.e. those selecting "very underweight", "slightly underweight", or "about the right weight") were contrasted with this group.

Weight loss attempts. As part of Wave 3 of Add Health participants responded to the question "*What are you currently doing about your weight? Are you trying to lose weight, gain weight or bulk up, or stay the same weight – or are you not trying to do anything about your weight?*". Those who selected "lose weight" were classified as attempting weight loss and this group was contrasted with the remainder of the sample who had no current weight loss intentions.

Weight gain. Trained interviewers assessed height and weight at baseline and follow-up which were used to calculate BMI (kg/m²) at both time-points.

Table 3.

Participants' Characteristics in Study 2 (N = 3,225)

Characteristic	Statistic
Perception of self as overweight (%)	32.81
Age (years)	
Baseline	$M = 16.47, SD = 1.59$
Follow-up	$M = 28.43, SD = 1.61$
Sex (% female)	55.34
Ethnicity (%)	
Hispanic	10.41
Black	22.29
Asian	3.44
Native American	2.11
Other	0.78
White	60.96
Education ^a	$M = 13.14, SD = 1.92$
Body mass index (kg/m ²)	
Baseline	$M = 23.14, SD = 5.09$
Follow-up	$M = 29.07, SD = 7.50$
Weight loss attempt (%)	34.45

^aEducation was scored on a scale from 6 (6th grade) to 22 (5 or more years of graduate school) and indicates the highest level of education achieved at the Wave 3 assessment.

Analytical Strategy. The same strategy described in Study 1 above was used to test whether weight loss attempts mediated the relation between whether the participant perceived him- or herself as overweight at baseline and BMI at follow-up in a model that adjusted for baseline BMI and potential confounds: age, sex, race, and education.

Results

Of the 3,225 participants, at baseline 32.8% indicated they perceived themselves as being overweight, whereas the remaining 67.2% of the sample did not, as shown in Table 3. Across the full sample 34.5% reported that they were attempting weight loss in the intervening period between baseline and follow-up. As expected, the proportion of participants attempting weight loss was markedly increased among those who perceived themselves as overweight compared to those who did not (57.1% vs. 23.4%, $p < .001$).

Perceiving oneself as overweight (vs. not) was associated with increased weight gain between baseline and follow-up ($b = 1.18$, $SE = 0.23$, $t(3214) = 5.02$, $p < .001$), in a model adjusted for initial BMI levels and covariates (Table 4). Further, those who perceived themselves as overweight at baseline were more likely than other participants to subsequently engage in weight loss attempts in a fully adjusted model (OR = 1.84, 95% CI = [1.50, 2.24], $p < .001$). As anticipated, engaging in weight loss attempts was associated with increased weight gain over the course of the study ($b = 2.22$, $SE = 0.20$, $t(3213) = 10.89$, $p < .001$). Finally, including weight loss attempts in a model examining the link between perceiving oneself as overweight and weight gain diminished the strength of this association (model without weight loss attempts – $b = 1.18$, $SE = 0.23$, $t(3214) = 5.02$, $p < .001$; model with weight loss attempts – $b = 0.86$, $SE = 0.23$, $t(3213) = 3.71$, $p < .001$). Formal mediation analysis confirmed that weight loss attempts mediated the association between self-perceived

overweight and weight gain (indirect effect of weight loss attempts = 0.32, 95% CI = [0.21, 0.43], $p < .001$) and showed that this indirect effect accounted for 27% of the total effect.

Table 4.

Results for Study 2: Weight Loss Attempts as Mediators of the Effect of Perceived Overweight on Weight Gain over 12 years in Study 2 (Add Health; N = 3,225)

	Point Estimate	SE	95% CI Lower ; Upper	Effect ratio
Path a				
Perceived overweight -> weight loss attempts	1.84***	0.19	[1.50 ; 2.24]	
Path b				
Weight loss attempts -> weight gain	2.22***	0.20	[1.83 ; 2.63]	
Path c				
Perceived overweight -> weight gain	1.18***	0.23	[0.72 ; 1.65]	
Path c'				
Perceived overweight -> weight gain	0.86**	0.23	[0.41 ; 1.32]	
Indirect effect (ab)				
Via weight loss attempts	0.32***	0.06	[0.21 ; 0.43]	0.27

Note: The effect ratio is the indirect effect/c.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Sensitivity Analyses

Whether the main findings were observed when male and female participants were examined separately in isolation, as well in participants that were objectively classed as having an overweight/obese weight status at baseline and those below this weight was examined. For male participants, both Study 1 (22.2%) and Study 2 (14.1%) indicated that weight loss attempts significantly mediated the relation between self-perceived weight status and weight gain. The same mediation results were observed when focusing on females in Study 1 (10.9%) and Study 2 (42.9%). Multiple-group path analysis showed that the gender difference in the magnitude of the indirect effect of weight loss attempts was not statistically significant in Study 1 (male – female difference: $b = 0.005$, $SE = 0.006$, $p = 0.34$) or Study 2 (male – female difference: $b = -0.17$, $SE = 0.12$, $p = 0.15$).

Among participants that were of overweight/obese status in Study 1 there was no evidence for a significant mediation effect. In Study 2 (10.1%) weight loss attempts did mediate the relation between self-perceived weight status and weight gain for this group. For participants with a BMI below the overweight/obese level in Study 1 (28.9%) and in Study 2 (42.8%) weight loss attempts significantly mediated the relation between self-perceived weight status and weight gain. Multiple-group path analysis revealed that the size of the indirect effect of weight loss attempts did not differ significantly between those of overweight/obese status and those with BMI levels below this range in Study 1 (overweight/obese status – $BMI \leq 25 \text{ kg/m}^2$ difference: $b = -0.007$, $SE = 0.005$, $p = 0.15$) or Study 2 (overweight/obese status – $BMI \leq 25 \text{ kg/m}^2$ difference: $b = -0.19$, $SE = 0.12$, $p = 0.09$).

To summarize, in all but one of the eight subgroup analyses there was evidence for an indirect effect of weight loss attempts and we did not find statistically significant gender or weight status related differences in the magnitude of the indirect effects identified.

General Discussion

Across two studies adolescents and young adults who perceived their weight status to be heavier were more likely to attempt weight loss in the future and these weight loss attempts predicted an increase in weight gain over time. These results shed light on previous observations that self-perception of overweight is associated with a greater motivation and efforts to lose weight (Yaemsiri et al., 2011) but paradoxically also with increased weight gain (Robinson et al., 2015). These findings indicate that perceiving one's own weight status as being 'overweight' may increase the likelihood that a young person attempts weight loss and it is these weight loss attempts that appear key in explaining why self-perceived overweight predicts an elevated weight gain trajectory over time.

In both studies weight loss attempts mediated the relation between self-perceived weight status and weight gain, but only partially so. This suggests that there are likely to be other pathways that explain why self-perceived weight status is associated with weight gain. For example, experimental work indicates that young adults made to feel 'overweight' consume more high calorie snack food (Incollingo Rodriguez, Heldreth, & Tomiyama, 2016). Moreover, a fear of negative evaluation because of one's weight status could result in avoidance of physical activity (Atlantis, Barnes, & Ball, 2008; Seacat & Mickelson, 2009). The stress attached to self-identifying as being part of a stigmatised social group may also be harmful to psychological well-being (Atlantis & Ball, 2008) and this could impede weight management. The association between self-perception of overweight and weight gain may be in part explained by body image. For example, dissatisfaction with one's body size has been shown to be a predictor of weight gain among young people (Loth, Watts, van den Berg, & Neumark-Sztainer, 2015) and it is likely that body dissatisfaction is relatively high among individuals who identify that they are overweight (Voelker, Reel, & Greenleaf, 2015). There is also evidence that self-perceived overweight is associated with unhealthy dieting practises

that could ‘backfire’ and promote weight gain (Hadland, Austin, Goodenow, & Calzo, 2014; Sonnevile, Thurston, Milliren, Gooding, & Richmond, 2016).

The design of the present studies prohibits causal inferences. Although it seems reasonable to assume that self-identifying one’s own weight status as being overweight promotes motivations and efforts to lose weight, there is debate about the causal role that dieting and attempted weight loss have on weight gain. One viewpoint is that dieting or attempts at weight loss may actually play a causal role in weight gain (Dulloo & Montani, 2015; Polivy & Herman, 1987) and the present observational findings align with this contention. However, individuals who attempt weight loss may have a predisposition towards weight gain and weight loss attempts therefore act as a proxy for weight gain, rather than a cause (Lowe, 2015). Moreover, dieting is likely to be beneficial for some individuals and it is likely that how weight loss is attempted is important in predicting whether or not weight loss or weight gain occurs (Johnson, Pratt, & Wardle, 2012). The measures available in the present studies were not fine grained enough to be able to examine this question adequately, but further work addressing this question would be valuable. For example, among young people we presume that ‘unhealthy’ weight control methods may promote disordered eating patterns and will therefore be counterproductive to weight in the long-term (Neumark-Sztainer et al., 2012), whereas well informed and correctly supervised changes to diet and physical activity would have a more beneficial effect.

Further work examining the causal role that perceptions of weight status have on health relevant behaviour would also be informative. There is a small amount of experimental work indicating that informing young adults that they are ‘overweight’ may be damaging to self-esteem (Essayli, Murakami, Wilson, & Latner, 2016; Ogden & Evans, 1996) and a recent

quasi experimental study found that informing young females (but not males) that they were overweight was associated with a small increase in weight gain over time (Almond et al., 2016). Although there are theoretical reasons to posit why and how self-perception of overweight may be detrimental to self-regulation and weight management, further evidence is needed to address these questions. One proposition with some empirical support is that awareness of stigma surrounding overweight/obesity may wear down self-control and promote over-eating among individuals who self-identify as being overweight (Major, Hunger, Bunyan, & Miller, 2014; Schvey, Puhl, & Brownell, 2011).

The longitudinal design and replication of results across two different cultural contexts are both strengths of the present research. The present studies focused on adolescence and young adulthood. It would now be informative to investigate whether the same pattern of results would be observed among older participants. For example, it is plausible that because adolescence and young adulthood is a life period in which concerns about social acceptance are likely to be salient, this may result in self-identifying as being overweight being particularly distressing. Likewise, adolescents may be less knowledgeable about healthy weight control practices and therefore attempt weight loss in different ways to older adults. A further limitation of the present work was that due to data available we were unable to examine whether similar patterns of results are observed across different ethnic groups, so further work will be better suited to address this. A limitation of Study 1 was that the measure of self-perceived weight status (body figure scale) did not allow for dichotomous categorization of participants as identifying (vs. not) as being 'overweight'. This may account for why a smaller mediation effect was observed in Study 1 than in Study 2 (in which the measure used did allow for dichotomous categorization).

These limitations aside, the public health relevance of the present research warrants consideration. Individuals failing to identify that they are overweight has been assumed to be detrimental to weight management efforts and fewer individuals with overweight and obesity are correctly identifying their weight status since the emergence of the ‘obesity crisis’ (Johnson et al., 2008) and therefore less likely to attempt weight loss (Snook et al., 2017). Failures by healthcare professionals to notify their patients with overweight or obesity of their weight status or encourage weight loss attempts have also been identified as a cause for concern (Perrin, Skinner, & Steiner, 2012). Examination of the effectiveness of public health approaches that result in young people self-identifying as being overweight is therefore warranted. The association between self-perception of overweight and weight gain is a delicate issue for public health intervention. Given the adverse consequences of overweight and obesity and health benefits of weight loss (Hamman et al., 2006), motivating individuals to want to lose weight is of importance and self-perceiving oneself as being overweight is a likely motivator for weight loss. Therefore, removing the stigma attached to overweight and obesity and ensuring individuals have the appropriate support required for long-term weight loss may be ways to ensure that accurate self-perception of overweight can motivate healthy behavior change.

Contributions

All authors were responsible for the study design. Daly and Sutin were responsible for the analysis of the studies reported. All authors drafted and approved the final version of the manuscript.

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