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Understanding the role of life events in weight loss and weight gain

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LIFE EVENTS AND WEIGHT CHANGE

Abstract

This study explored the role of life events in triggering both weight loss and weight gain and assessed whether a number of variables differentiated between these two types of weight change. Members of a slimming club (n=538) completed an on line questionnaire concerning two events which had caused either weight loss or weight gain. They then described the event and its impact in terms of a number of variables. The majority of participants could describe a time when a life event had resulted in both weight loss and weight gain including relationship problems, pregnancy, illness and death of someone close. Compared to the weight gain event, the weight loss event was perceived as more positive, less negative, more controllable and more predictable than the weight gain event. Further, in terms of sustaining conditions, the weight loss event was perceived as reducing the choice over food and the function of eating and as increasing the choice over exercise and the function of this behaviour. To conclude, life events are related to weight change and the direction of this change can be explained both by the perceived nature of the event and its impact upon choice and function of eating and exercise.

Key words: weight loss, weight gain, eating, exercise, life events.

Introduction

Obesity has been associated with cardiovascular disease, diabetes, joint trauma, back pain, cancer, hypertension and mortality (eg. Ashton et al, 2001). Research has also examined the relationship between psychological problems and obesity including depression, low self esteem and body dissatisfaction (Bull et al, 1983; Wadden et al, 2006; Rand & McGregor, 1991, Simon et al, 2006). In line with these health risks an increasing number of interventions have been developed to promote weight loss and weight loss maintenance. Evaluation of such interventions indicates that successful weight loss is related to a range of factors including social class and gender, time since onset of unhealthy behavior, previous change attempts, type and intensity of the intervention, the individual's beliefs about the nature of their problem and the degree of support they receive from partners, peers and health professionals (NHS Centre for Reviews and Dissemination, 1997; Finch et al, 2005; Elfhag & Rossner, 2005; Wing & Phelan, 2005). Recent research has also analysed data from the National Weight Control Registry and highlights the importance of a number of behaviours in predicting weight loss maintenance (Wing & Phelan, 2005; Raynor et al, 2005; Gorin et al, 2004; Wing & Hill, 2001).

Research, particularly within health psychology, has also focused on the application of social cognition models. From this perspective research highlights the cognitions relating to behaviour change rather than the behaviours per se and has utilized the Health Belief Model (HBM, Becker & Rosenstock, 1987), and the Theory of Planned Behavior (TPB, Ajzen, 1985; Ajzen & Madden, 1986) to predict behaviors including diet, exercise

and subsequent weight loss (see Conner & Norman, 2005 for a review). In a similar vein, other research has drawn upon the Stages of Change Model (SOC, Prochaska & DiClemente, 1982). This perspective emphasizes behavior change as an ongoing process and describes a series of stages from pre contemplation through to action and maintenance of this action and emphasizes how an individual's beliefs about the costs and benefits of their behavior change across these different stages.

Central to much research on changes in diet and exercise and subsequent weight loss is the emphasis on behavior change as the result of a slow process of cognitive shifts, an accumulation of motivation and the development of behavioral intentions or action plans. For example, social cognition models emphasise behavioural intentions and planning and the work evaluating interventions highlights the impact of repeated attempts at change. Some research, however indicates that behaviour change often occurs in a more dichotomous fashion, and in particular can sometimes follow a specific life event or life crisis. This is not to say that behaviour change is not mediated via cognitions but that the behaviour change is sudden and occurs without conscious planning. For example, Gorin et al (2004) concluded from their analysis that acute medical triggers are good predictors of both long and short term changes in weight, McBride et al (2003) describe the importance of 'teachable moments' and Ogden and Hill (2008) described how weight loss maintenance seemed to be triggered by life events including illness, relationship breakdowns and salient milestones. In a similar vein, Resnicow and Vaughan (2006) drew upon chaos theory to understand behaviour change and argue that cognitive models fail to account for non-linear, quantum influences on human thought and action and for

this reason can only account for so little of the behavioural variance. Likewise, Miller (2004) suggested that decisions to initiate and possibly maintain behaviour change are quantum rather than linear events and argues that such quantum leaps result from a sudden rise of motivation or inspiration that is greater than the sum of its constituent cognitive parts. Miller (2004) outlines two types of quantum change namely that which is brought about by sudden insights and change through mystical epiphanies. Both kinds, he argues, leave an 'indelible impact and often lead to lasting and pervasive change'. In parallel, West and Sohal (2006) and Larabie (2005) report that many smokers quit smoking "cold turkey" without planning and Matzger et al (2004) report that people who sustained long term remission from alcohol, were twice as likely to have done so after experiencing a transformational experience traumatic life event.

Changes in behaviour and subsequent weight loss may therefore occur after a significant life event. Ogden and Hills (2008) carried out a series of qualitative interviews with those who had shown sustained behaviour change as a means to explore the mechanisms behind this process and highlighted the role for a number of sustaining factors namely beliefs about reduced choice, the function of the behaviour and beliefs about the causes and solutions of obesity. In particular, they argued that a life event such as a relationship breakdown, change of job or illness can trigger initial behaviour change. They then further argued that this is translated into sustained behaviour change if the individual believes that the event reduces the individual's choice about when and how much to eat, if it reduces the function and benefits attached to eating and if the individual believes that their weight problem is caused by their behaviour. Further they also emphasised the

process of reinvention and argued that behaviour change may be more likely to be sustained if the individual responds to a life event by reinventing themselves as a healthier and thinner person. This finds reflection in other work on life events and the process of benefit finding (Lechner et al 2003; Tedeschi, Park & Calhoun, 1998) and a shift in self identity (Miller, 2004).

It may however not just be the event in itself that is important but an individual's evaluation of the life event itself which influences whether or not it leads to weight loss. Miller (2004) suggests that common characteristics of epiphanies are distinctiveness (sudden, out of the ordinary, remembered vividly), surprise (uninvited, unique), benevolence (despite its tragic nature it resulted in feelings of joyfulness, being free and exhilarated), and permanence at the level of personality. In parallel, Schwarzer and Schulz (2001) suggests that critical life events can be categorized along a number of dimensions including predictability, controllability, suddenness, normative and strength of impact.

Research therefore shows that behaviour change and subsequent weight loss may relate to a number of demographic and cognitive factors. Much of this research conceptualises behaviour change as the result of a slow process of accumulation and a 'drip drip' effect of new information or cognitive shifts. In contrast, however, some research highlights a more dichotomous approach and indicates that changes in behaviour often follow discrete moments which have been described as life events, life crises, teachable moments or epiphanies. In line with this perspective, the present study aimed to explore the extent to

which life events are related to weight loss and to explore the mechanisms involved in this process. Such life events, however, may not only lead to weight loss but also to weight gain. Therefore the present study aimed to assess which factors differentiate between weight loss and weight gain. In particular, the study aimed to operationalise and test the factors developed by Ogden and Hills (2008) and focused on the role of the meaning of the life event itself and the role of sustaining factors including the reduction of choice, the function of the behaviour and the process of reinvention operationalised as benefit finding.

Method

Design

The study consisted of a within subjects design with dieters being asked to describe and rate one event which had resulted in weight loss and one event which had resulted in weight gain. The order of these two events was counterbalanced throughout the sample to control for order effects. Participants who had never experienced a weight loss event continued to fill in just the weight gain section of the questionnaire.

Participants

Participants were dieters, aged 18 years or over. They were all members of a slimming club and were recruited via an on line advertisement on the clubs' webpage. Of 561 members who replied to the advertisement, 538 gave their consent to participate in the study and completed the online questionnaire (95.9% response rate). The advert for this study remained on the website for 3 weeks.

Measures

The questionnaire consisted of the following sections:

i) Demographics and weight history:

Participants described their age, sex, education level, employment status and ethnicity.

In addition they were asked to report their present weight and height, when being overweight became an issue for them, their lowest and highest weight ever since the age of 18 and whether they were currently on a diet.

ii) Weight change event

Participants were asked to describe two events relating to weight loss and weight gain:

‘Please think of a significant life event which caused you to [lose weight (the most weight you have ever lost)] OR [gain weight (the most weight you have ever gained-excluding weight gained during pregnancy)].

Participants were then asked to describe the event in terms of the following factors.

Rating scales used a 5 point Likert scale ranging from ‘not at all’ (1) to ‘totally’ (5).

Reliability was assessed using Cronbach’s alpha. All alphas for both the weight loss and weight gain items were greater than 0.6.

Weight change: Participants were asked to report how much weight they had lost/gained following this event and for how long this new weight was maintained.

Nature of the event: Participants were asked to rate the perceived nature of the event for the following constructs which were derived from the existing literature on categorising life events (Miller, 2004; Schwarzer & Schulz, 2001): **i) Positive** (3 items: positive, happy, exciting); **Negative** (3 items: sad, miserable, negative); **Predictable** (3 items: expected, predicted, planned for); **Controllable** (3 items: controlled by you, managed by you, decided by you); **Salient** (3 items: had a big impact on you, important, central to your life); **Overload** (3 items: at a time when life was easy, at a time when you were already under stress, the final straw). These items were derived from the research on life events and stress and how they may relate to behaviour change. Higher scores reflected that the event was deemed as more predictable, more controllable, more salient and indicated greater overload.

Choice: Participants also rated whether the event influenced the degree of choice they had over eating and exercise which was derived from previous research on sustaining factors following a life event (Ogden & Hills, 2008): **Eating:** (3 items: made eating more difficult, made food less available, made food less accessible); **Exercise:** (3 items: made being active more hard, made exercise more difficult, made it harder to be active).

Functionality: Participants also rated whether the event influenced how functional food and exercise were for them: **Eating:** (3 items: made eating less sociable, made eating less pleasurable, made eating less of a comfort); **Exercise:** (3 items: made exercise less enjoyable, made exercise less sociable, made being active less pleasurable).

Choice and functional scales were derived from Ogden and Hill's (2008) study of the role of life events on behaviour change. Higher scores indicated that the event limited choice over eating and exercise and made eating and exercise less functional.

Benefit finding: Participants were also asked to rate whether they had found benefit in the event the benefit scale originally designed for patients with breast cancer (Tomich and Helgeson, 2004; Carver and Antoni, 2004). This scale involves 10 items with a higher score reflecting greater benefit finding and asks questions which are relevant to a number of possible life events.

Procedure

The study was approved by the University Ethics Committee and by the Slimming Club. An online advertisement, information sheet and consent form and questionnaire were developed and placed online. Consent to participate led participants to complete either one of the questionnaires in random order.

Data analysis

The results were analysed in the following ways: to describe participants' demographics and weight history data and to assess the types of events that resulted in either weight loss or weight gain using descriptive statistics; to assess differences between these events in terms of the nature of the event, choice, functionality and benefit finding using repeated measures ANOVA with event (weight loss vs weight gain) as the between subject factor.

Results

1. Participants' demographic and weight history details.

Participants' demographic and weight history details are shown in table 1.

-insert table 1 about here -

The sample was mainly white women with a mean age of 39 years and had been educated up to school level. In terms of their weight history the large majority were currently trying to lose weight, had been overweight since their early 20's and had a BMI that would place them in the obese range.

2. Weight loss and weight gain events

Weight change and weight maintenance characteristics for the two events are shown in table 2.

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The results show that 73.9% of participants described an event resulting in weight loss and 85.4% described an event resulting in weight gain. The weight loss event resulted in weight loss of 37.6 lbs which was maintained for a mean of about 2 years. The weight gain event resulted in a gain of 42 lbs which was maintained for a mean of 4 and a half years.

3. Types of events relating to weight loss and weight gain

The kinds of events associated with weight loss and weight gain were coded and counted. For the ‘weight gain event’ participants were asked to consider an event other than weight gain during pregnancy. However, many participants described in detail how they had gained excess weight during pregnancy and that their weight gain had continued after pregnancy. These were therefore included in the analysis as it was deemed weight change beyond the normal physiological weight gain attributed to having a child. The 10 most commonly reported types of events for weight loss and weight gain are shown in Table 3.

-insert table 3 about here –

The results show that the most common events resulting in weight loss were relationship problems, pregnancy, special event and own illness whereas the most common events leading to weight gain were pregnancy, feeling comfortable in a relationship, death of someone close and relationship problem. Several events resulted in both weight loss and weight gain including relationship problem, pregnancy, death of someone close, illness and going to University.

3) Differences between weight loss and weight gain events

The results were then analysed to explore differences in the nature of the event, choice, function and benefit finding between the events which led to either weight loss or weight gain. The results are shown in table 4. Only those participants who described both types of events are included in this within subjects analysis (n=407).

-insert table 4 about here -

The results showed that the event that resulted in weight loss was described as more positive, less negative, more controllable and more predictable than the event resulting in weight gain. No difference was found for salience or overload. Further, the event which resulted in weight loss was described as reducing choice over food but increasing choice over exercise and as reducing the function of eating and increasing the function of exercise. No difference was found for benefit finding.

Discussion

The present study aimed to explore the impact of life events on weight loss and weight gain and to assess the extent to which the perceived nature of the event and a number of sustaining conditions differentiate between these two types of weight change.

The results showed that the large majority of participants were able to describe a time when a life event had resulted in either weight loss or weight gain. Although much research describes behaviour change as the end point of a slow process of cognitive shifts (eg. Conner and Norman, 2005), the results from the present study indicate that changes in weight related behaviours also occur in a more dichotomous way following specific life changes. This provides support for previous research which has highlighted the role of discrete moments which have been labeled in a range of ways including life events, life crises or epiphanies (eg. Ogden and Hills, 2008; Resnicow and Vaughan, 2006; Miller, 2004). In addition, the results indicate that life events can lead to changes in behaviour resulting in either weight loss or weight gain. The results from the present study also provide insights into the kinds of events and highlight a role for events such as

pregnancy, relationship breakdown, illness and death of someone close. This also provides larger scale quantitative support for the kinds of events described in previous qualitative research (Ogden and Hills, 2008). However, many of these events occurred across both types of weight change indicating that it is not the event per se that results in behaviour change but the ways in which this event is interpreted and reacted to by the individual concerned. Thus, the same event could result in weight gain for one person and weight loss in another or for the same person at a different time.

To further explore this possibility the present study also examined differences in the perceived nature of the event and a number of sustaining factors between the events described as resulting in weight loss and those resulting in weight gain. In terms of the nature of the event, this analysis showed that compared to the weight gain event, the weight loss event was perceived as more positive, less negative, more controllable and more predictable than the weight gain event. No differences were found for either salience or overload. Previous research has highlighted ways in which life events can be classified (Miller, 2004; Schwarzer & Schulz, 2001). The results from this study indicate that these dimensions differentiate between those events which result in weight gain and those that result in weight loss. Further, in terms of sustaining conditions, the weight loss event was perceived as reducing both the choice over food and the function of eating and as increasing the choice over exercise and the function of this behaviour.

Previous qualitative research exploring behaviour change highlighted how these sustaining conditions influence whether initial behaviour change following a life event is translated into sustained behaviour change (Ogden and Hills, 2008). The results from

the present study provide quantitative support for these conditions and suggest that they also differentiate between different types of behaviour change.

There are some problems with the present study, however, that need to be considered.

Firstly, the study relies upon retrospective data and involves asking individuals to describe how an event in the past influenced their behaviour. Such data is clearly open to recall bias and social desirability. This may be particularly the case for events relating to episodes of weight change as changes in weight are not neutral phenomena. In particular, whilst an episode of weight loss would be generally welcomed and regarded as a move towards a more socially acceptable body shape within a society that values thinness, an episode of weight gain would generally be conceptualized as a more negative event. Such values could in turn influence how the individual remembers the impact of the event and their assessment of it. Further such social judgements could encourage the individual to search for a means to legitimize their weight gain and a life event could in fact serve this function. Therefore the evaluations of the life events and the recall of the life events themselves may reflect how life events influence weight change. However, they may also be part of how people develop narratives to make sense of ways in which their weight fluctuates over time. Secondly the study was conducted on a large group of dieters who were members of a slimming club and monitored the club's web page. Such people may not be representative of dieters in general as they are obviously highly committed not only to losing weight but also to the approach of this particular club. Given these caveats, however, the present study provides some quantitative support for the role of life events in weight change and also enables a preliminary distinction

between those events and the impact of the those events which are related to either weight loss or weight gain.

To conclude, the results from the present study indicate that weight change is often precipitated by a specific life event including relationship breakdowns, illness, pregnancy or death of a loved one. In addition, the results illustrate that whilst the same type of event can result weight loss for some people, for the same people at other times or for different people it can result in weight gain. The meaning of the event is therefore important. In line with this, the results indicate that those events resulting in weight loss were perceived as more positive, less negative, more controllable and more predictable than the weight gain event and as reducing both the choice over food and the function of eating and in contrast increasing the choice over exercise and the function of this behaviour. These results provide support both for the link between life events and weight change and for a number of sustaining conditions. Further, they illustrate that behaviour change may not always be the consequence of a slow process of cognitive shifts, plans and the accumulation of motivation but can sometimes occur in a more dramatic and dichotomous fashion.

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Table 1: Participants' demographics

	n/%	Mean	SD	Range
Age (yrs)		39	10.59	18-71
Sex	M = 13 (2.3%) F = 534 (93.2%)			
Ethnicity	White = 539 (94.1%) Black = 5 (0.8%) Asian = 2 (0.3%) Other = 1 (0.2%)			
Education	GCE = 191 (33.3%) A-Lev = 135 (23.6%) BSc = 96 (16.8%) MSc = 38 (6.6%) PhD =10 (1.7%) Other = 77 (13.4%)			
Present Weight (lbs)		189.06	40.28	117-347
BMI		31.6	6.5	18-63.5
Heighest Weight (lbs)		211.3	48.37	125-392
Lowest Weight (lbs)		142.7 (lbs)	30.0	89-252
Age first tried to lose weight (yrs)		22.7	9	16-52
Currently Trying	Yes = 521 (96.8%) No=17(3.2%)			
Occupation	Full Time=309(54.9%) Pt=124 (22%) Unemploy=19 (3.4%) Other = 86 (15.3%)			

Table 2: Degree of weight loss / weight gain following life events

Variables	Weight Loss (n=429;73.9%)	Weight Gain (n=456; 85.4%)
Amount of weight (lbs)	Mean = 37.6 lbs SD= 23 Range = 7-182 (lbs)	Mean = 41.6 lbs SD = 24 lbs Range = 8-210
Maintenance of weight change (months)	Mean = 23.6 months Or $\approx$ 2 yrs. SD = 81 months Range = 1-120	Mean = 50.4 months Or $\approx$ 4.5 yrs. SD = 54 months Range = 1-360

Table 3: Events relating to weight loss and weight gain in rank order

Weight loss		Weight gain	
Relationship problem	N=78 (18.9%)	Pregnancy	N=107 (23.5%)
Pregnancy	N=71 (17.1%)	Feeling comfortable in relationship	N=65 (14.3%)
Special event (eg. wedding, birthday)	N=55 (13.3%)	Death of someone close	N=11 (50%)
Own illness	N=42 (10.2%)	Relationship problem	N=50 (11%)
Death of someone close	N=22 (5.3%)	Stress	N=29 (6.4%)
Reaching certain age	N=15 (3.6%)	Disability after injury	N=20 (4.4%)
Seeing picture of self	N=13 (3.1%)	Illness	N=17 (3.7%)
Travelling	N=11 (3.1%)	Giving up smoking	N=16 (3.5%)
Falling in love	N=11 (2.7%)	Depression	N=15 (3.3%)
University	N=8 (1.9%)	University	N=14 (3.1%)

Table 4: Differences in perceived nature of the event and sustaining conditions for weight loss and weight gain events

Variables	Weight Loss (n= 407)	Weight Gain (n=407)	t	P	Effect Size
Perceived nature of the event					
Positive	Mean = 3.16 SD = 1.58	Mean = 2.55 SD = 1.61	5.207	.0001 **	.3 (medium)
Controllable	Mean = 3.20 SD = 1.56	Mean = 2.52 SD = 1.41	6.557	.0001**	.3 (medium)
Negative	Mean = 2.39 SD = 1.54	Mean = 3.07 SD = 1.60	-5.949	.0001**	.3 (medium)
Predictable	Mean = 2.81 SD =1.40	Mean = 2.50 SD = 1.35	3.245	.001*	.16 (small)
Salient	Mean = 4.03 SD = 1.06	Mean = 4.14 SD = 1.03	-1.827	.068 ns	.1 (small)
Overload	Mean = 2.59 SD = 0.81	Mean = 2.65 SD = 0.90	-1.083	.279 ns	.1 (small)
Sustaining Conditions					
Less Food Choice	Mean = 2.12 SD = 1.14	Mean = 1.67 SD = 0.95	6.592	.0001**	.3 (medium)
Less Food Benefits	Mean = 2.48 SD = 1.29	Mean = 1.85 SD = 1.04	8.101	.0001**	.3 (medium)
Less Exercise Choice	Mean = 2.18 SD = 1.39	Mean = 3.42 SD = 1.37	-13.245	.0001**	.3 (medium)
Less Exercise Benefits	Mean = 2.12 SD = 1.33	Mean = 3.18 SD = 1.40	-11.589	.0001**	.3 (medium)
Benefit Finding	Mean = 3.00 SD = 1.04	Mean = 2.92 SD = 1.10	1.386	.166 ns	.1 (small)