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Understanding successful behaviour change: the role of intentions, attitudes to the target and motivations and the example of diet.

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Abstract

Although many attempts to change health behaviour fail, some individuals do show successful behaviour change. This study assessed the role of behavioural intentions, motivations and attitudes to the target in explaining successful changes in diet with a particular focus on positive and negative intentions and positive and negative attitudes. Participants (n=282) completed a questionnaire describing a recent change in eating behaviour (becoming a vegetarian, cutting out a food group, eating fewer calories), their intentions, their attitudes to the food being avoided, a range of motivations and their degree of success. The results showed that the three behaviour change groups differed in terms of their cognitions with those trying to eat fewer calories reporting less success in changing their behaviour. Successful vegetarianism was associated with a lower positive attitude; successfully cutting out a food group was related to ethical motivations, a lower positive attitude and greater positive and negative intentions, and reducing calorie intake was associated with greater positive intentions and a lower positive attitude. Therefore, success was associated with different cognitions depending upon the type of change being made, although cognitions such as 'I will eat more vegetables' and 'I no longer find high fat foods palatable' were consistently most predictive of success. Suggestions for the development of more effective interventions to change health behaviours are made.

Introduction

Most people attempt to change an aspect of their health behaviour at some time whether it be to stop smoking, drink less alcohol, exercise more often, or practice safer sex. For some, these intentions are translated in successful behaviour change. For many, however, such intentions never result in actual behaviour change or may do so only in the short term. Eating behaviour is especially difficult to change particularly when this change involves weight loss related dieting. Although some studies indicate that dieters may successfully reduce their energy intake (1,2), other studies have found that dieters rarely reduce energy intake enough to be successful at weight loss (3-10). Research exploring the links between dieting and eating has been developed within the framework of restraint theory and was based upon an early study by Herman and Mack (3). Restraint theory explored the impact of imposing cognitive restraint on eating and showed that paradoxically trying to eat less can result in overeating. Subsequent studies have explored the conditions under which overeating eating occurs and has highlighted a role for factors such as smoking abstinence (4), food cues (5), cognitive shifts (6) and lowered mood (7). In addition, reviews of the success of weight loss interventions illustrate that, although the percentage of people who initially lose weight has recently increased a large majority of them regain this weight on 5 year follow up evaluations (8,9,10). Therefore, the majority of dieters find it difficult to change their eating behaviour. Nevertheless, a small minority do succeed in sustaining weight loss after 5 years. Similarly, successful changes in eating behaviour can also be found in populations other than dieters including vegetarians, those who chose to fast at specific times of the year and those who avoid specific foods for religious reasons. What factors therefore predict successful changes in eating behaviour? Some research has addressed the correlates

of successful dieting and has pointed to a role for previous dieting history, the intensity and length of any intervention and the individual's beliefs about the causes and consequences of obesity (eg. 10, 11). However, other research findings point to a potential role for cognitions which may explain successful changes in eating behaviour beyond that shown by the minority of dieters. In particular, research in health and social psychology has drawn upon social cognition models such as the Theory of Planned Behaviour (TPB, 12) and Protection Motivation Theory (PMT, 13) and highlights a role for behavioural intentions, attitudes and motivations.

First, in terms of behavioural intentions, research has consistently shown that the intention to perform a behaviour can be translated into actual behaviour. For example, research indicates that the intention to use condoms predicts condom use, that the intention to exercise correlates with this behaviour and the intention to attend for cervical or breast screening practices predicts actual attendance (eg. 14,15,16). In terms of eating behaviour, research has also shown that the intention to eat healthily is a successful predictor of subsequent behaviour (eg. 17). Therefore the cognition 'I intend to...' seems to translate into 'I did'. Sutton (18) carried out an analysis of the association between behavioural intentions and behaviour across a series of studies and concluded that intentions generally predict between 19-38% of the actual variance in behaviour. This suggests that behavioural intentions may be useful predictors of successful dietary change. In direct contrast to the social cognition literature, however, research drawing upon restraint theory as a means of understanding eating behaviour implicitly indicates that the intention to under eat does not predict actual under eating but has the paradoxical effect of being associated with overeating. For example, studies show that dieters who make an intention to eat less or to eat more

healthily may end up eating less healthily and overeating (3,5). This approach finds reflection in the work of Wegner and colleagues who describe the ‘theory of ironic processes of mental control’ (19) and suggest that attempting not to think about something can have the opposite effect to that which is desired. Further, it is similar to the work describing different types of goals and the differential effect of goals and anti goals (20). It may not, therefore, be behavioural intentions per se which predict successful dietary change but the direction of this intention. Most research exploring intentions and health behaviours focuses on positive intentions such as ‘I intend to use a condom’ and ‘I intend to exercise’ whereas eating research implicitly focuses on negative intentions such as ‘I intend not to eat food high in calorie’. In line with this the present study aimed to explore the impact of the type and direction of behavioural intention of successful changes in eating behaviour and to examine whether positive and negative intentions differentially impact upon the success of behaviour change.

Second, research shows a role for motivational factors. For example, a study examining the motivations behind the choice to adopt a vegetarian diet found a role for moral, health, gustatory and ecological factors (21). Similarly, Mooney and Wahlbourn (22) investigated reasons for food rejection by college students and reported that students who avoided meat placed more importance on ethical factors. Furst et al (23) also explored what motivations influenced food choice and found a role for issues of availability and cost and Steptoe and Pollard (24) used the ‘food choice questionnaire’ to explore the factors that motivate food selection and reported a role for familiarity with a food and convenience. Changes in diet are, therefore, the result of a range of motivations. Further, it would seem that successful food avoidance shown in line with religious rules or by vegetarians is motivated by

different factors by the attempted food avoidance shown by dieters. However, research to date has been descriptive in its focus and has not explored whether some forms of motivation are more predictive of success than others. So as to lend clarity to this issue, the present study examined a range of motivational factors and their association with successful dietary change.

Finally, social cognition models such as the TPB and PMT (12, 13) also include a role for attitudes which are defined as ‘a function of a person’s salient beliefs, which represent perceived consequences of the behaviour’ (25). These are usually operationalised by asking an individual to rate a particular behaviour using differentials such as ‘unpleasant / pleasant’. However, such attitudes are generally directed at the behaviour per se such as ‘dieting is effective’ and ‘dieting is pleasant’ (eg. 26) rather than at the target of the behaviour. Attitudes to the target have been described by Eagley and Chaiken (27) and would seem to be particularly pertinent in the area of eating behaviour as different foods are embedded with different meanings and can generate both positive and negative responses. Examples of this would include an individual’s attitudes to cigarettes (for the person intending to stop smoking) or attitudes to meat by the person intending to become a vegetarian. However, to date although research has incorporated attitudes in social cognitive model based research of behaviour, such research has focused on attitudes towards the behaviour rather than to the object. Furthermore, no research has explored the direction of attitude neither has it examined the impact of the direction of attitude on successful changes in eating behaviour. This would seem to be particularly relevant given that some forms of dietary change such as vegetarianism may be accompanied by negative attitudes to the target (‘I will avoid meat and I find it disgusting’) whereas

others may involve positive attitudes to the target ('I will eat low fat foods but I still prefer high fat alternatives').

In summary, research suggests that whilst some attempts to change behaviour are successful many are not. Further, some types of changes in eating behaviour seem to be more consistently associated with success than others. The literature exploring behaviour change has drawn upon restraint theory and social cognition models and has highlighted a role for a range of cognitions. In particular, research points to a role for behavioural intentions in explaining this variability but has treated this construct as unidimensional neglecting the potential for a differential effect of the positive and negative versions of this variable. Further, the literature has also pointed to a role for attitudes but has focused on attitudes to the behaviour rather than attitudes to the target which would seem to be particularly pertinent to a behaviour such as eating which is concerned with a target so embedded with meaning. Finally, whilst previous research has explored the type of motivations linked with food choice, the relationship between different type of motivation and success remains unexplored. The present study therefore aimed to assess differences in cognitions between different types of changes in eating behaviour. In addition, the study aimed to assess the relative impact of the positive and negative versions of both intentions and attitudes to the target and a range of motivations in predicting the degree of success in actual behaviour change. In particular, given that dieting seems to generally involve negative intentions, positive attitudes to the target and weight and health related motivations, it was predicted that the use of such cognitions would help to explain why dieting is a universally unsuccessful form of behaviour change.

Method

Design

The study used an anonymous, cross sectional questionnaire survey examining a recent episode of attempted change in eating behaviour.

Participants

Questionnaires (n=350) were given out to undergraduate students at two universities through lectures. Completed questionnaires were received from 282 (response rate = 80.5%).

Measures

Participants were asked to describe a recent change in eating behaviour and then to complete questions describing behavioural intentions, attitudes to the target, motivations and success which were rated on a 5 point Likert scale ranging from 'not at all' to 'totally'. Reliability was assessed using Cronbach's alphas for each scale within each behaviour change group.

Change in eating behaviour

Participants were asked to 'think about a time recently that you decided to change what you eat' and to identify if it was one the following: following a vegetarian diet, cutting out on a particular food group or food, eating fewer calories. These were selected as they represented changes in eating behaviour which were expected to be present in the population being studied. In addition, they reflected types of behaviour change which were hypothesised to range from successful (becoming a vegetarian) to less successful (eating fewer calories). They were then asked to go to the section

relating to this behaviour and to rate a series of statements describing behaviour intentions.

Behaviour intentions

Participants were asked to rate 6 statements describing 3 positive and 3 negative intentions which were specific to their type of behaviour change. Positive intention statements included “I would eat more vegetables” for the vegetarian’s section, ‘I would eat more low calorie foods’ for the fewer calorie section and ‘I will eat more foods from other food groups’ for the cutting out a food section. Negative intention statements included ‘I will not eat meat’ for the vegetarian’s section, ‘I will not eat sweet foods’ for the fewer calories section and ‘I will not purchase food from this food group’ for the cutting out a food group section. These items were summated to compute a total negative intention score and a total positive intention score. All alphas for negative intention were >0.7 . The alphas for positive intention for those becoming a vegetarian and those trying to eat fewer calories were all greater than 0.5. However, the alpha for positive intention for those cutting out a food group was 0.04. On removing one item the correlation between the remaining two items was 0.4. Therefore, for positive intentions for those cutting out a food group a two item scale was used.

Attitudes to the target

Participants were asked to rate the ‘foods you were trying to avoid’ using a series of 4 positive adjectives (pleasant, desirable, appetising, tasty) and 4 negative adjectives (disgusting, sickening, horrible, revolting). These were summated to create a total

positive attitude score and a total negative attitude score. The alphas for positive and negative attitudes for all three groups were >0.9 .

Motivations

Participants were asked 'to what extent was your decision to make this change motivated by the following reasons' and then rated the following motivations: taste, religion, weight, finance, ethics, health, and availability.

Success

Finally participants were asked to rate their success at food avoidance using three items 'I was successful at making this change in my behaviour', 'I was able to stick to my decision to change' and 'I kept breaking my rules' using a 5 point Likert scale ranging from 'totally disagree' to 'totally agree'. These were summated to create a total success score. The alphas for the three groups were all >0.9 .

Higher scores reflected higher intentions (positive and negative), stronger attitudes (positive and negative), a greater endorsement of the motivation and greater success.

Participants also described their age, sex and ethnicity (white / Black / Asian / other).

Results

The data were analysed to describe the participants' profile characteristics and type of change in eating behaviour and to explore differences in intentions, attitude and motivations between the different types of dietary change. The results were then analysed to assess the role of positive and negative behavioural intentions, positive

and negative attitudes and a range of motivations in predicting successful dietary change using Multiple Regression analysis within each type of dietary change. A blocked method of entry was used to enable the impact of motivations (block 1), intentions (block 2) and attitudes (block 3) to be assessed separately.

1. Profile characteristics

Participants' profile characteristics are shown in table 1.

-insert table 1 about here-

The majority of participants were women and Caucasian although a large minority described themselves as Asian. The most common form of dietary change was an attempt to eat fewer calories.

2. Difference between different types of dietary change

The means (and SDs) for the different types of dietary change are shown in table 2.

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The three groups were comparable in terms of positive and negative intentions and motivations relating to finance, religion and availability. Trying to consume fewer calories was associated with greater motivation relating to health and weight and trying to become a vegetarian was associated with greater negative attitudes, lower positive attitudes and higher motivations relating to taste and ethical issues. Trying to eat fewer calories resulted in a lower level of success than the other two types of behaviour change.

3. The best predictors of successful dietary change.

The results were analysed to explore the best predictors of successful behaviour change within each behaviour change group using Multiple Regression analysis.

i) Predicting successfully becoming a vegetarian.

Due to the smaller sample size within this group ($n=39$) initial univariate correlations were carried out to assess which variables could be entered into the Multiple Regression analysis. The results showed that motivations relating to health ($r=-0.44$) and ethics ($r=0.4$), positive attitudes ($r=-0.59$) and negative attitudes ($r=0.36$) were significantly correlated with success and were therefore entered into the Multiple Regression analysis ($P_s<0.05$). The remaining motivations and positive and negative intentions were not entered into the analysis. The results from this analysis showed that a positive attitude significantly predicted success ($B=-0.51$, $p=0.005$) accounting for 39% of the variance. Health motivation ($B=-0.24$, $p=0.143$), ethical motivation ($B=0.16$, $p=0.32$) and negative attitude ($B=-0.05$, $p=0.76$) were unrelated to success. Successful behaviour change for becoming a vegetarian was associated with lower ratings of the foods to be avoided as ‘pleasant’, ‘tasty’, ‘desirable’ and ‘appetising’.

ii) Predicting successfully cutting out a food group. (see table 3)

The best predictors for cutting out a food group were a higher ethical motivation, greater positive and negative intentions and a lower positive attitude towards the food being avoided. Success at cutting out a food group was therefore associated with an ethical motivation, cognitions such as ‘I will eat more foods from other food groups’ and ‘I will not purchase foods from this food group’ and lower beliefs that the foods being avoided were ‘tasty’ or ‘pleasant’.

iii) Predicting successful calorie reduction (see table 4).

Successfully eating fewer calories was associated with higher positive intentions and a lower positive attitude to the foods being avoided. Therefore greater endorsement of beliefs such as ‘I will only eat foods that are low in calories’ and less beliefs that high calories foods are ‘tasty’ or ‘pleasant’ were predictive of success.

Discussion

The present study aimed to assess differences between different types of changes in eating behaviour and to evaluate the best predictors of successful behaviour change with a focus on behavioural intentions, attitude to the target and motivations.

However, there are some problems with the study that need to be addressed. First, the study was cross sectional in design. It is therefore possible that rather than predicting changes in behaviour the cognitions identified are post hoc justifications of behaviour change. But, why different types of change should generate different types of justification is an interesting question in itself. Future research should employ a prospective design to clarify issues of causality. Second, participants were asked to select the behaviour themselves and it is possible that they chose the one which resulted in most success which could shift the results in a socially desirable direction. The study however, was anonymous and participants did not have to complete the questionnaire if they did not wish to, nor if they felt they hadn’t changed their behaviour. Pressure to answer in a particular way was therefore kept to a minimum. The results however do provide some insights into which cognitions are related to which type of change in eating behaviour.

The study focused on three types of changes in eating behaviour, namely becoming a vegetarian, cutting out a food group and eating fewer calories. The results showed

that eating fewer calories was associated with motivations relating to weight and health and that becoming a vegetarian was associated with ethical and taste related motivations, a lower positive attitude and a greater negative attitude for the foods being avoided. In addition, eating fewer calories was associated with lower success than the other two groups. Previous research suggests that dieting is often unsuccessful resulting in weight maintenance or weight gain, failed under eating and actual overeating (3,7,10). The present study suggests that this lack of success may be due to the kinds of cognitions associated with this behaviour.

To explore this further, the results were then analysed to assess the best predictors of successful changes in eating behaviour within each behaviour change group. For becoming a vegetarian, successful behaviour change was associated with lower ratings of the positive attributes of the food being avoided. For cutting out a food group the best predictors of success were an ethical motivation, both positive and negative intentions and a lower positive attitude, whilst successfully eating fewer calories was predicted by higher positive intentions and a lower positive attitude. Previous research has highlighted that attempts to change eating behaviour are related to a range of motivations including ethics, availability, weight and health (21,22,23). These findings support this variability in motivations and suggest that different motivations are associated with different forms of successful behaviour outcomes. Previous research also suggests a role for behavioural intentions but has tended to treat this construct as unidimensional in nature and has not assessed the possibility of a differential impact from either positive or negative intentions (eg. 15) The results from this study support the importance of assessing both positive and negative behavioural intentions for better predictions of successful outcomes. Further they

indicate that positive rather than negative intentions may be more predictive of success. This is line with Wegner's work on ironic processes of control (19) and reflects the concepts of goals and anti goals described within the literature on self regulation (20). Whilst cutting out a food group was related to stronger intentions regardless of their direction, successfully eating fewer calories required stronger positive intentions. Finally most previous research has also highlighted a role for attitudes but has emphasised attitudes to the behaviour rather than the target of that behaviour (eg. 12). The results from the present study suggest that attitudes to the target are related to the degree of success and that the absence of a positive attitude is consistently most related to outcome.

In summary, successful changes in three types of eating behaviour are related to different types of cognitions. However, an ethical motivation, positive rather than negative intentions and the absence of a positive attitude to the target all emerge as factors most likely to predict success. Accordingly, cognitions such as 'eating meat is unethical', 'I will eat more vegetables' and 'I no longer find high fat foods palatable' are more predictive of success than motivations relating to other factors such as health and weight, negative intentions which involve avoiding foods ('I will not eat sweet foods') and liking the food which is to be avoided ('I still like sweet foods').

These results have implications for both research and practice. In terms of research, the results suggest that neither intentions nor attitudes to the target are unidimensional constructs making it worthwhile to differentiate between the positive and negative versions of these variables and that attitudes to the target rather than just attitudes to

the behaviour are predictive of outcome. It is possible that the moderate associations between intentions and behaviour described in the literature (18) may be due to either the absence of a measure of the different types of intention or the ability of the two opposing types of intention to cancel each other out. The results may also explain the apparent contradiction between the social cognition literature which suggests that intentions are predictive of behaviour and the literature based upon restraint theory which suggests that intentions to under eat may paradoxically result in overeating. The social cognition literature may report a positive association between intentions and behaviour because it primarily focuses on positive intentions. In contrast, restraint literature may report a negative association between intentions and behaviour because its focus is on dieting which is implicitly associated with negative intentions.

In terms of practice, the results from this study have implications for the development of effective behaviour change interventions. At present many interventions designed to improve health related behaviours such as diet, smoking and drinking encourage the avoidance of these behaviours. Such approaches emphasise health as a motivator for behaviour change and encourage individuals to develop negative intentions (eg 'I will not eat fatty foods' and 'I will not smoke') whilst leaving them with a positive attitude for these objects of their behaviour ('I like fatty foods', 'I like cigarettes'). The results from the present study suggest that such an approach is unlikely to result in actual behaviour change as it promotes the cognitions which are linked with failure. However, if an intervention could encourage individuals to be motivated by factors other than health (such as ethics), to focus on what they intend to do rather than what they are going to avoid and to develop a dislike for the object to be avoided than perhaps such an approach would be more predictive of positive outcomes. Further,

such interventions could be facilitated by social and structural changes designed to promote healthier lifestyles. For example, changes in social norms towards seeing unhealthy behaviours such as smoking and an unhealthy diet as unattractive and socially unacceptable may reduce an individual's positive attitudes to the unhealthy behaviours. Furthermore, the provision of more easily accessible healthy foods and banning smoking in public areas make may positive intentions easier both to make and adhere to. Intending 'to do' a healthy behaviour and 'not liking' the unhealthy behaviour seem to be the key to success. Such an approach should be incorporated into behaviour change interventions which could be complimented by social and policy changes designed to provide a better environment in which a decision to be healthier can be more easily translated into actual healthier behaviour.

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Table 1: Profile characteristics

Variable		N	%	Mean	SD	Range
Age		182		25.26	9.92	16-66yrs
Sex	Male	77	27.3			
	Female	204	72.3			
Ethnicity	White	150	53.2			
	Black	20	7.1			
	Asian	83	29.4			
	Other	28	9.9			
Type of change	Vegetarian	39	13.8			
	Cut out a food group	90	31.9			
	Eat fewer calories	153	54.3			

Table 2: Differences according to type of dietary change (Means and SDs)

Variable	Vegetarian (N=39)	Cut out a food group (N=90)	Eat fewer calories (N=153)	F
Intentions				
Positive intentions	3.41 $\pm$ 0.83	3.45 $\pm$ 1.11	3.28 $\pm$ 0.89	.38
Negative intentions	3.65 $\pm$ 1.09	3.54 $\pm$ 1.19	3.41 $\pm$ 0.95	1.04
Attitude				
Positive attitude	2.79 $\pm$ 1.4	3.60 $\pm$ 1.07	3.62 $\pm$ 1.08	8.70**
Negative attitude	2.47 $\pm$ 1.41	1.65 $\pm$ 1.02	1.86 $\pm$ 1.14	6.96**
Motivations				
Financial motivation	1.44 $\pm$ 0.99	1.32 $\pm$ 0.7	1.44 $\pm$ 0.85	1.02
Taste motivation	2.31 $\pm$ 1.55	1.63 $\pm$ 1.05	1.58 $\pm$ 0.93	7.14**
Religious motivation	1.67 $\pm$ 1.35	1.41 $\pm$ 1.09	1.25 $\pm$ 0.7	2.64
Weight motivation	2.17 $\pm$ 1.67	3.13 $\pm$ 1.56	4.01 $\pm$ 1.26	30.78**
Health motivation	2.97 $\pm$ 1.67	3.84 $\pm$ 1.41	4.22 $\pm$ 0.98	14.09**
Availability motivation	1.53 $\pm$ 1.0	1.41 $\pm$ 0.85	1.69 $\pm$ 1.04	1.3
Ethical motivation	3.17 $\pm$ 1.65	1.66 $\pm$ 1.35	1.4 $\pm$ 0.84	35.25**
Success	3.71 $\pm$ 1.44	3.35 $\pm$ 1.19	3.16 $\pm$ 1.27	3.51*

* p<.05, **p<.001,

Table 3: Predicting successful cutting out a food group (n=90)

Block	Variable	Stand. Beta	Adj. R2	F change
1	Financial motivation	-.20		
	Taste motivation	.19		
	Religious motivation	.17		
	Weight motivation	-.24*		
	Health motivation	-.14		
	Availability motivation	-.02		
	Ethical motivation	.27*	.27	5.20** *
2	Financial motivation	-.20		
	Taste motivation	.19		
	Religious motivation	.19		
	Weight motivation	-.27*		
	Health motivation	-.16		
	Availability motivation	.02		
	Ethical motivation	.26*		
	Positive intentions	.28**		
	Negative intentions	.22*	.36	5.9**
3	Financial motivation	-.19		
	Taste motivation	.13		
	Religious motivation	.20		
	Weight motivation	-.19		
	Health motivation	-.12		
	Availability motivation	.03		
	Ethical motivation	.33**		
	Positive intentions	.24**		
	Negative intentions	.19*		
	Positive attitude	-.23*		
	Negative attitude	-.01	.38	5.5*

* p<.05, ** p<.01, ***p<.001

Table 4: Predicting successful calorie reduction (n=153)

Block	Variable	Stand. Beta	Adj. R2	F change
1	Financial motivation	.05		
	Taste motivation	.12		
	Religious motivation	-.04		
	Weight motivation	.00		
	Health motivation	.00		
	Availability motivation	-.09		
	Ethical motivation	.02	-.04	.31
2	Financial motivation	.07		
	Taste motivation	.10		
	Religious motivation	-.03		
	Weight motivation	-.03		
	Health motivation	-.00		
	Availability motivation	-.09		
	Ethical motivation	-.00		
	Positive intentions	.35**		
	Negative intentions	.08	.11	11.98* **
3	Financial motivation	.05		
	Taste motivation	.00		
	Religious motivation	-.04		
	Weight motivation	.04		
	Health motivation	.03		
	Availability motivation	-.07		
	Ethical motivation	.05		
	Positive intentions	.31***		
	Negative intentions	.03		
	Positive attitude	-.32**		
	Negative attitude	.12	.26	14.25* **

* p<.05, ** p<.01, ***p<.001