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**How visual images of chocolate affect the craving and guilt of female dieters.**

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### **Abstract**

This study asks whether exposure to images of chocolate induces cravings and guilty feelings in females. A further aim was to examine whether these effects are heightened in the case of dieters. The participants, 85 females, saw a series of enticing media images, either of chocolate or of non-food products. Two thirds of the sample were dieting or had dieted in the past; 15% had been on seven or more diets. After viewing the images all participants completed the Attitudes to Chocolate Questionnaire (ACQ) (Benton, Greenfield, & Morgan, 1998). The different conditions affected only those who dieted. Dieters had significantly higher ACQ scores after viewing the chocolate images than the non-dieters. It is suggested that dietary restriction increases desire for forbidden foods, in the form of craving, and may induce negative affect such as guilt, anxiety and depression.

(138 words)

Keywords: chocolate, dieting, dieters, craving, guilt, eating habits

**How visual images of chocolate affect the craving and guilt of female dieters.****Introduction**

At a time when health and diet are under increasing scrutiny, obesity is on the increase. As the media continue to present the thin figure as the ideal (Stice, Schupack-Neuberg, Shaw, & Stein, 1994; Tiggemann & Slater, 2004), the actuality is that over 1 billion adults in the world are overweight, and at least 300 million of those are obese (WHO, 2003). With the adverse effect on health caused by obesity, it is crucial to identify any factors that may contribute to poor dietary habits. Whilst physiological factors, e.g. hormonal changes, may play a role (e.g. Rozin, Levine, & Stoess, 1991) clearly not enough is known about the cognitive and affective basis of food cravings (Harvey, Kemps, & Tiggemann, (2005) and yet this could lead to a better understanding of how unhealthy eating habits develop. Furthermore it has been suggested that some individuals show increased sensitivity and craving in response to external food cues (Schacter, 1971) and this could be as a consequence of dieting (Herman & Polivy, 1975). In this paper we consider whether dieting may increase the craving for food and, paradoxically, lead to over-eating. The study described shows that exposure to visual images of food provokes food cravings and negative affect and that this effect is greater for dieters than non-dieters.

An ideal target food for such research is chocolate, since chocolate is often the subject of a love-hate relationship. Whilst it is loved for its pleasurable taste, scent and texture, it is also disliked by some for its perceived high calorific and sugar content and, as a result, some people make a conscious effort to restrict their consumption of it.

Nonetheless chocolate is consistently identified as one of the most craved foodstuffs (Hill & Heaton-Brown, 1994; Rogers & Smit, 2000). Indeed, comparisons have been made with cravings for alcohol, even though chocolate lacks the addictive properties of alcohol (Baumeister, Heatherton, & Tice, 1994; Rogers & Smit, 2000). Previous research suggests that simply having chocolate within sight can increase desire for it (Painter, Wansink, & Hieggelke, 2002) and that this is associated with feelings of both craving and guilt (Rogers & Smit, 2000). In view of the prevalence of visual images of chocolate and chocolate related food products in women's, food and dieting magazines, in the form of advertisements and recipe related photographs, can such images alone induce these feelings? Thus the focus of this paper is the dynamic relationship between affect and environmental cues on food related behaviour.

Once considered a luxury item, chocolate is now frequently cited as comfort food perhaps because, as Wansink, Cheney et al. (2003) suggest, there is a combination of its "favourable sensory qualities with connotations of gift giving and reward developed from childhood" (p.740). However, chocolate has been found to be a more preferable choice of comfort food to women than to men, and women are more accepting of chocolate as a comfort food than men (Wansink, Cheney, & Chan, 2003). Weingarten & Elston (1991) found that 97% of women and 68% of men experience food cravings, with chocolate being the food craved most often (Hill & Heaton-Brown, 1994; Rozin, Levine, & Stoess, 1991). Moreover, in the Wansink et al. study women reported feeling less healthy after eating comfort foods and after eating chocolate, with 51% women citing a feeling of guilt compared to only 35% of men. So, although chocolate is eaten more for comfort by women, feelings of guilt present an unpleasant side effect for some women. Equally, Lafay et al. (2001) found that the negative

emotions commonly experienced after satisfying a food craving, such as depression, were more frequently reported in women than in men, whilst men more frequently associated cravings with positive emotions, such as relaxation and happiness. Hence, this study will investigate the effects on women only.

As food cravings have been found to be strongly associated with negative emotions in women, including stress and boredom (e.g. Rogers & Smit, 2000), it is not surprising that chocolate is widely accepted as a comfort food, as its “consumption evokes a psychologically comfortable and pleasurable state for the person” (Wansink, Cheney, & Chan, 2003, p.739). However, the two emotional responses particularly associated with chocolate are craving and, as mentioned, guilt (Rogers & Smit, 2000). It is the dynamic relationship between negative emotions, including guilt, and food cravings which appears to be important. For example, in terms of healthy eating, chocolate’s high sugar and fat content have earned it the title of a ‘forbidden’ food (Knight & Boland, 1989). It is these ‘forbidden’ foods which dieters try to avoid when losing weight. However, avoidance in itself appears to have an undesired effect as Rogers & Smit (2000) suggest that attempts to resist eating a particular food can, paradoxically, result in cravings. If these cravings are met then negative emotions, such as guilt, can arise. As negative emotions can lead to further craving, so a vicious circle begins. Interestingly, King, Herman, & Polivy (1987) found that chocolate was the only food that both dieters and non dieters felt guilty about eating. Further evidence of the emotional background to food cravings comes from the Lafay et al. study. Only 40% of their sample associated cravings with hunger, suggesting that cravings arise less from food deprivation than from negative affect.

Research into the emotional aspects of cravings has taken diverse routes. For example, studies undertaken by Baumeister, Bratslavsky, Muraven, & Tice (1998) led to their proposal that ego-depletion may be implicated in the emotional element of food cravings. Ego depletion is the notion that ‘active volition’, i.e. willpower, has a limited resource of strength. This could explain how, for example, if a person has a frustrating job or stressful lifestyle that consumes a lot of their active volition, they will be less capable of resisting emotional cravings when they arise. On the other hand, cravings and feelings of guilt form the basis of a questionnaire devised by Benton, Greenfield, & Morgan (1998) in an effort to better understand relationships between people’s beliefs and feelings about chocolate. In their Attitude to Chocolate Questionnaire (ACQ) factor analysis of the original attitude data suggested that attitudes to chocolate comprise three factors: craving, guilt and function. Benton et al.(1998) found that females had significantly higher craving and guilt scores than males, although there was no gender difference between the function scores. They also found that craving strongly influenced the consumption of chocolate, and often, the people who felt most guilty were more likely to report symptoms of bingeing and vomiting.

However, it is not only attitudes towards chocolate and emotional influences on consumption and craving that interest researchers. For example, in studies with other food products, the use of terms such as ‘healthy’ or ‘natural’ on labels or on restaurant menus have been shown to influence perceptions of taste and satiety (Parker & Penfield, 2005; Wansink, van Ittersum, & Painter, 2004). Insofar as chocolate is concerned, Painter et al. (2002) found that visibility and convenience of location prompted an increase in consumption. This suggests that environmental or external cues may also influence cravings and chocolate consumption; therefore a visual image may trigger

cravings. However, crucially, responses to visual images appear to differ for women according to satisfaction with their body image. For example, in a study by Posavac, Posavac, & Posavac (1998) only women who were dissatisfied with their body image had greater weight concerns if they were exposed to beauty pictures rather than neutral pictures. If beauty images provoke a particular reaction only in women with body image dissatisfaction this suggests that there may be cognitive differences between dieters and non-dieters, and that dieters and restrained eaters may differ in their responses to visual images of food when compared to non-dieters.

Research suggests that whilst non-dieters rely on internal cues such as hunger and satiety to regulate their food consumption, dieters have been shown to ignore such cues and, instead, to be more responsive and susceptible to external food cues. The original studies and theorising in this area focused on obese people (Schacter, 1971) and found, for example, that consumption by obese people was affected and increased by time factors (Schacter & Gross, 1968), the sight of food (Herman, Olmsted, & Polivy, 1983) and salience (Ross, 1974). However, in 1975, Herman & Polivy suggested that it was specifically dieters and restrained eaters that were affected in this way, rather than simply obese people. This, too, was borne out by research with evidence of pre-exposure to food resulting in increased salivation (Klajner, Herman, Polivy, & Chabra, 1981) and increased consumption (Rogers & Hill, 1989) in dieters as opposed to non-dieters.

Further evidence of differences in cognition by dieters and non-dieters comes from studies into the effects of visualisation. Research indicates that the interaction between dieting and food visualisation may have a singularly powerful effect on the development of food cravings. Thus, visualising favourite foods for restrained eaters

and dieters, but not for non-dieters, has been found both to impair performance on a reaction time task (Green, Rogers, & Elliman, 2000), providing support for the ego-depletion hypothesis, and to increase craving intensity for that food (Harvey, Kemps, & Tiggemann, 2005). In neither of the above studies did the effect occur when participants were asked to imagine their favourite holiday. Furthermore Harvey et al. (2005) also found that completing a non food related imagery task after the food imagery task, reduced craving intensity. As a result they suggest that “mental imagery may be a central feature of naturalistic food craving” (p.50).

As food visualisation has successfully demonstrated an effect on food craving intensity, is it possible then that simply exposing participants to visual images of foods could intensify their craving or guilt? Specifically for women, this may be particularly strong when exposed to images of chocolate. Moreover, those who have dieted at some point in their life may be more affected by seeing photographs of chocolate (e.g. Harvey, Kemps, & Tiggemann, 2005; e.g. Posavac, Posavac, & Posavac, 1998). The aim, therefore, of this study was to explore whether visual images of chocolate, compared to non food related images, increased feelings of craving and/or guilt in women as measured by Benton et al’s (1998) Attitude to Chocolate Questionnaire. Furthermore, it was expected that any influence would be greater for dieters than non-dieters.

## **Method**

### *Design*

The study was a between subjects design. The independent variable was the type of pictures observed; either chocolate (chocolate condition), or non-food related advertisements (control condition). The main dependent variables were: a total attitude to chocolate score, a craving score and a guilt score from the Attitude to Chocolate Questionnaire (ACQ) (Benton, Greenfield, & Morgan, 1998). Whilst the craving and guilt scales were found to be orthogonal dimensions during development of the original measure, findings in the original study suggest that the combination of high craving and high guilt are implicated in eating disorders and restrained eating, hence the decision to sum these scores to provide a total attitude to chocolate score. Participants were classified as dieters or non-dieters.

### *Participants*

The participants were 85 females. A convenience sampling method was used, where participants were recruited via a sign-up poster displayed at a University inviting female students or staff to volunteer. The age groups of the participants ranged from 16-20 to 51+ with the modal age range being 16-20 years of age. Fifty seven (67%) of participants had been on a diet at some point in their life (2 values missing) and 14 were currently dieting. The mean Body Mass Index (BMI) of the participants was 23.47 (range = 18.11-35.04). Forty-three participants were assigned to the chocolate condition and 42 to the control condition of the study.

### *Materials*

Two questionnaires were used in this study: a demographic questionnaire and the Attitude to Chocolate Questionnaire (Benton, Greenfield, & Morgan, 1998). In view of a re-evaluation of the ACQ by Cramer & Hartleib (2001) in which the stability

of function factor was not supported, only items relating to craving and guilt were used in this study.

The demographic questionnaire consisted of 5 sections and covered personal information, reading preferences of magazines, food habits and preferences, exercise and dieting.

The Attitude to Chocolate Questionnaire (Benton, Greenfield, & Morgan, 1998) comprised 20 statements about chocolate. Ten were a measurement of craving and ten were a measurement of guilt. These scores combined gave a total attitude to chocolate score. The measurement was taken in the form of the 5 point Likert scale where strongly disagree = 1 point and strongly agree = 5 points, with the other points distributed accordingly.

Two display folders were assembled, one containing 10 pictures of chocolate products, e.g. a photograph accompanying a recipe, and one containing 10 pictures of non-food related advertisements. As Michener & Rozin (1994) identified the aroma of chocolate as an important factor in chocolate craving, perfume was selected for the non-food related advertisements as it was a non foodstuff, it represented an item likely to be desired by the participants and it appealed to the senses, notably the olfactory sense. The non-food related advertisement needed to be something that was comparable. All 20 items in the folders were taken directly from magazines and were not altered in any way. The items were all 'large' sized pictures (i.e. bigger than half an A4 sheet) and were presented on the right-hand side of the display book with a white sheet of A4 paper on the left-hand side.

### *Procedure*

Participants were tested individually in a study cubicle. After completing the demographic questionnaire they were then given a display folder of pictures. According to the condition to which they had been assigned, the folder contained either images of chocolate or the control images (non-food). The experimenter verbally informed the participants they had two minutes to look at the pictures and that they could leaf through them as many times as they wished, but that they must look at each picture as it would be important for the next stage of the study. After viewing the pictures, participants were then given and asked to complete the Attitude to Chocolate Questionnaire. At each stage the participants were left to complete their questionnaires or tasks alone. At the end of the study, the participant was verbally thanked for their participation and debriefed as to the true nature of the study.

## Results

The results are presented in two sections. The first section presents the demographic findings of the participants' magazine preferences, food preferences, dieting and exercise habits. The second section presents the ACQ scores and scores on the sub-scales of craving and guilt. Data in this section are analysed by condition and according to whether the participant is a dieter or non-dieter.

### *Demographic and classifying variables*

*Magazine reading habits and preferences:* This question was included to obtain a measure of participants' general exposure to the types of media images presented in the study. Twenty-six per cent of participants never or rarely read magazines, 41% read them sometimes and 33% read them often or always. The type of magazines read

varied, e.g. fashion, women's, health, etc., and the mean number of types read was 3.88. 'Women's' magazines were the most regularly read with 29% of women stating that they read them.

*Food preferences and eating habits:* Eighty-three per cent of participants nominated savoury items as their favourite food, whilst 11% preferred sweet items and 5% showed no preference. One participant failed to respond. Chocolate was the most frequently reported comfort food with 51% of respondents stating it as their preferred comfort food. The second most frequently reported comfort food was crisps (12%).

The healthiness of the participants' diets was assessed by the frequency with which they ate the recommended five portions of fruit and vegetables daily. Twenty-four per cent never or rarely ate five portions of fruit and vegetables per day, 40% ate them sometimes and 36% always ate them.

Only 6% of participants reported eating chocolate rarely. Thirty-four per cent ate chocolate sometimes whilst 59% often or always consumed it. During a week 49% ate chocolate one to four times per week, 31% ate it four to seven times and 15% consumed chocolate on more than seven occasions. Five per cent did not consume any chocolate.

*Exercise:* Fifteen per cent of participants reported not exercising, whilst 67% said that they took exercise on one to four occasions in a week, 14% said they exercised on four to seven occasions and one per cent exercised on 7 or more occasions.

*Dieting:* In response to questions about dieting habits, 67% (n = 57) of participants had, at some point, been on a diet, 31% (n = 26) had never dieted and 2 participants failed to respond to this question. Of the dieters, 68% stated that they had tried between one and four diets, 16% had tried between four and seven diets and 15%

had tried seven or more diets. The participants were positive about the effects of the diets in that 90% felt that they had been successful. Forty per cent of dieters had dieted within the previous year, whilst 58% had dieted more than a year previously. Of the 57 dieters in the sample, 14 (25%) were dieting at the time of the study.

*Total attitude to chocolate, craving and guilt scores: effect of condition*

The two experimental conditions of the study were the chocolate (n = 43) and control conditions (n = 42). After viewing either the chocolate pictures or the non-food related pictures, the participants were asked to complete the attitude to chocolate questionnaire which consisted of 20 statements. Ten of the statements measured guilt and ten measured craving. The maximum possible score for craving was 50 and the minimum possible score was 10; this was also true for guilt (see scoring information on the Likert scale in the materials section). A total attitude to chocolate score was calculated for each participant which was the sum of the guilt score and the craving score. This had a maximum possible score of 100 and a minimum possible score of 20.

The mean total attitude to chocolate scores were analysed as a function of condition. In the chocolate condition (n = 43) the mean total attitude to chocolate was  $M = 57.6$  ( $SD = 13.45$ ), and in the control condition (n = 42),  $M = 56.74$  ( $SD = 10.86$ ). An independent samples t-test revealed that there was no significant difference between the scores,  $t(83) = .33$ ,  $p > .05$ . Similar analyses were carried out for the two sub-scales, craving and guilt, as a function of condition but no significant differences were found.

*Total attitude to chocolate scores: effect of condition on dieters and non-dieters:*

From the demographic questionnaire, dieters and non-dieters were identified. Of the 83 that responded to the diet question, 57 had been on a diet at some point in their



or both, the data from the two subscales of the total attitude to chocolate scale were analysed separately.

*Craving scores as a function of diet and condition*

The mean craving score for dieters was  $M = 30.6$  ( $SD = 7.53$ ) and for non-dieters  $M = 30.73$  ( $SD = 6.48$ ). When assessed by condition the dieters had a mean craving score  $M = 31.18$  ( $SD = 8.52$ ) in the chocolate condition and  $M = 30.03$  ( $SD = 6.51$ ) in the control condition. The non-dieters had a mean of  $M = 28.38$  ( $SD = 8.13$ ) in the chocolate condition and  $M = 33.08$  ( $SD = 3.09$ ) in the control condition. In a two way ANOVA with diet and condition as factors no main effects of either were found,  $F(1,79) = .005$ ,  $p > .05$  and  $F(1,79) = 1.09$ ,  $p > .05$  respectively. Nor was there any interaction between the two,  $F(1, 79) = 2.96$ ,  $p > .05$ . Therefore dieting does not appear to change one's craving for chocolate, nor is it affected by visual images.

*Guilt scores as a function of diet and condition*

The mean guilt score for dieters was  $M = 28.74$  ( $SD = 8.48$ ) and for non-dieters  $M = 21.27$  ( $SD = 5.55$ ). In the chocolate condition the mean for dieters was  $M = 30.11$  ( $SD = 8.74$ ) and  $M = 27.41$  ( $SD = 8.16$ ) in the control condition. For non-dieters the mean for the chocolate condition was  $M = 20.23$  ( $SD = 4.4$ ) and  $M = 22.31$  ( $SD = 6.52$ ) in the control condition. In a two way between groups ANOVA, there was a main effect of diet,  $F(1,79) = 16.95$ ,  $p < .001$ . However there was no main effect of condition,  $F(1,79) = .03$ ,  $p > .05$ , nor was there any interaction between diet and condition,  $F(1, 79) = 1.72$ ,  $p > .05$ . Thus, dieters experience more guilt in relation to chocolate when compared to non-dieters. However, this is not affected by seeing visual images of chocolate.

## Discussion

The aim of this study was to investigate whether exposure to visual images of chocolate, as found in printed media, influenced women's attitudes to chocolate in the form of increased cravings and feelings of guilt. Further, the findings were analysed to establish whether the effects differed according to whether the participants were dieters or non-dieters. However, a wealth of data about eating and exercise habits was obtained from the demographic questionnaire and this merits discussion first.

Chocolate was popular with very nearly all participants and was the most frequently reported comfort food with just over half the participants nominating it as such. Moreover, it was decidedly more popular than the government recommended consumption of fruit and vegetables, with 59% eating chocolate "often to always" compared to only 36% "often to always" eating five portions of fruit and vegetables on a daily basis. Exercise fared slightly better with around two-thirds of the participants taking part in one to four sessions per week. Nonetheless, fifteen per cent reported taking no exercise in a week and only 14% reported taking exercise 4-7 times a week, which suggests that the tendency for two-thirds exercising one to four sessions per week may be nearer one to two sessions rather than four.

It was surprising that even though the mean BMI of the women participating was well into the normal range, just over two thirds of the women in this study had been on a diet at some point in their life. Of these 31% had tried four or more diets and this includes 15% who had been on seven or more diets. In view of the young modal age of the participants (16-20 years) this is disquieting and, perhaps, a cause for concern.

Furthermore, despite 90% saying that dieting works, it is clear from the use of multiple diets that the effects, in terms of weight loss, were not long lasting.

As the aim was to examine whether visual images from magazines were likely to influence attitudes it was valuable to note that very nearly three-quarters of participants were regular readers of the magazines which contain the types of image tested in this study. In terms of the manipulation in this study, i.e. exposure to chocolate or non-food pictures, exposure to visual images of chocolate did not affect the total ACQ scores for all women. In common with a number of other studies (Green, Rogers, & Elliman, 2000; Harvey, Kemps, & Tiggemann, 2005), it was only those participants who had dieted at some point in their life that were affected. For these women only, their scores on the ACQ increased after exposure to images of chocolate but not to images of non-food products.

One sub-scale of the ACQ examines how guilty the person feels when they think about chocolate. King et al. (1987) had found that both dieters and non-dieters experienced guilty feelings about chocolate. However, our study found that the dieters had greater feelings of guilt about chocolate than the non-dieters, and this was irrespective of whether they had seen photographs of it or not. This supports the idea that dieters experience more guilt than non dieters, as the 'forbidden' food label suggests (Knight & Boland, 1989), and suggests that dieters are experiencing the negative affect brought about by dietary control which, as indicated, promotes craving. Indeed in this study, rather than effects on craving and guilt individually, it was the combined scores that differed between the dieters and the non-dieters in the two conditions, suggesting that negative affect and craving are closely linked. Dieting, then, appears to make a difference to how people perceive food, in this particular instance

chocolate. Instead of helping people to eat more healthily and to cut down on products, which are bad for their health, the negative affect induced by dieting appears to have the opposite effect in that it can increase their desire for the very foods they are trying to avoid.

Why should dieters be affected in this way? This study complements previous research which has suggested that body image and dieting are closely linked to cravings and negative affect (Harvey, Kemps, & Tiggemann, 2005; Posavac, Posavac, & Posavac, 1998). Whilst there appears to be evidence for the dynamic effect of negative affect and food cravings, there may also be some value in considering how body image, dieting, visual images and emotions relate to the ego depletion notion described in the introduction to this study (Baumeister, Bratslavsky, Muraven, & Tice, 1998). Certainly, these factors, if important to a person, i.e. a dieter, may well use up resources leading to less willpower and, as a result, increase cravings.

However, this study also supports the idea that dieters are more susceptible to the visual salience of chocolate (Green, Rogers, & Elliman, 2000; Harvey, Kemps, & Tiggemann, 2005). Indeed, it lends weight to the caution by Wansink et al (2004) that it is important to be aware of people's perceptions of a particular food before testing for the effects of manipulation, e.g. 'healthy' labelling. This study identifies dieters as a very specific sample as the heightened visual salience of food for dieters is attributable to their over-sensitivity to external cues (Baumeister, Heatherton, & Tice, 1994). By imposing dietary restraint, dieters appear to move the focus of their attention to food away from the normal internal cue of hunger to external cues, such as the sight and smell of food (Klajner, Herman, Polivy, & Chabra, 1981; Rogers & Hill, 1989). As a result, the external cues become more salient and dieters appear to be far more

responsive to them than non-dieters. If, as in the Wansink et al.(2004) study manipulating labels can influence taste perception and, as in this study, a simple static image was found to promote cravings and feelings of guilt in female dieters, then future research could explore this further and consider whether the presence of other food cues, such as in television advertisements or pictorial restaurant menus, increase these feelings even further. Moreover, in view of the specific nature and strength of craving for chocolate as identified by Hill & Heaton-Brown (1994) and suggested by Rogers & Smit (2000), future studies could be used to investigate to what extent the findings from this study can be generalised to include other foodstuffs, both sweet and savoury.

The implications of the findings from this study are numerous. Although it can be argued that only dieters were affected, it must be noted that over two-thirds of the participants were dieters. Taking this into account together with the finding that nearly three-quarters of participants are regular magazine readers, a bigger picture begins to develop. If two-thirds of the female population have dieted at some point in their life and three-quarters of the female population are exposed to images that produce this effect, then the consequences may be more severe than first expected. Such severity was reported by Stice, Schupack-Neuberg, Shaw, & Stein (1994) who found a relationship between amount of media exposure and eating disorder symptomology. This prompts the thought that perhaps the media, be it women's magazines or television, should adopt a more responsible role in attempting to tackle the obesity and eating disorder problems that exist and which are continuing to increase.

Taking an even broader view, the findings presented here add to a growing body of evidence which can only indicate that dieting, *per se*, is counter-productive. Far from reducing the desire to consume 'forbidden' foods, the very act of dieting appears to

increase cravings for such food. This provokes feelings of guilt and negative emotions which, in turn, provoke cravings, thus creating a vicious circle. Furthermore, 'slimming' magazines perpetuate the problems by including photographs of the very items dieters are trying to avoid. Instead of thinking in terms of 'dieting' in the future, a more positive and pro-active approach to healthy eating, and weight loss if necessary, should be taken. For, as this study shows, dietary restriction is counter productive and leads only to an increase in desire for that which is forbidden.

(5155 words)

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Table 1. Mean scores on the Attitude to Chocolate Questionnaire by condition and scale

Scale	Diet		No Diet	
	Chocolate (n = 28)	Control (n = 29)	Chocolate (n = 13)	Control (n = 13)
<b>Craving</b>	31.18 (8.52)	30.03 (6.52)	28.38 (8.13)	33.08 (3.09)
<b>Guilt<sup>†</sup></b>	30.11 (8.74)	27.41 (8.15)	20.23 (4.40)	22.31 (6.52)
<b>Total<sup>††</sup></b>	61.29 (13.04)	57.34 (12.17)	48.62 (9.64)	55.38 (7.37)

<sup>†</sup> significant main effect of diet,  $p < .001$

<sup>††</sup> significant main effect of diet,  $p < .01$ ;

<sup>††</sup> significant interaction between diet and condition,  $p < .05$ .