

Title:

Making concrete construals mindful: A novel approach for developing mindfulness and self-compassion to assist weight loss.

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Abstract

Research on the usefulness of mindfulness and self-compassion for dieting has focused on meditative practices. However, meditation can be difficult to maintain, especially while dieting. Thus, the present research attempted to induce mindfulness and self-compassion by using food diaries that required the participant to either focus on concrete (i.e., how they are eating) construals or abstract (i.e., why they are eating) construals. The concrete construals were expected to increase mindfulness and self-compassion, as well as decrease avoidance and negative thoughts (which would further aid the development of mindfulness and self-compassion). Study 1 found that mindfulness and self-compassion mediated the inverse relationship of avoidance and negative thoughts with weight loss. Study 2 showed that concrete construal diaries increased mindfulness and self-compassion, decreased avoidance and negative thoughts, and supported weight loss significantly more than the abstract construal diaries. Study 3, then, compared the concrete construal diaries with a mindful self-compassionate meditation programme. There was no difference in weight loss at the end of the intervention, but at a three-month follow-up, the diaries performed better at weight maintenance. Thus, the concrete construal diaries may promote mindfulness and self-compassion and potentially promote long-term weight loss.

KEYWORDS: Self-Compassion; Mindfulness; Construal Level Theory; Weight Loss; Cognitive-Behavioural Avoidance; Negative Automatic Thoughts

People often eat automatically (i.e., inattentive of present behaviour) and emotionally (i.e., often eat to avoid or allay negative emotions), and thus, many times overeat (see Blair, Lewis, & Booth, 1990; Cohen & Farley, 2008). Such everyday behaviours have added to the problem of obesity and the associated health problems (e.g., Finucane et al., 2011). To overcome this problem, recent research has established that practicing mindfulness and loving-kindness meditation assists weight loss by increasing awareness of when and why participants are eating (Alberts, Thewissen, & Raes, 2012; Mantzios & Wilson, 2013a; Tapper et al., 2009).

Mindfulness meditation is paying attention in a particular way: “on purpose, in the present moment and non-judgmentally” (Kabat-Zinn, 1990, p. 4), and loving-kindness meditation is a practice to develop attitudes of love, compassion and kindness for oneself and others (e.g., Chödrön, 1996). Loving-kindness meditation was shown to assist in the development of self-compassion (e.g., Davidson, 2007; Shapiro et al., 2005, 2007; Weibel, 2007). However, meditation requires time and practice. Indeed, it requires persistent practice for it to be effective, yet it is not uncommon for participants to cease meditation practice or even to refuse to start (Mantzios & Wilson, 2013a; Miller, Fletcher, & Kabat-Zinn, 1998). Therefore, there is a need to discover alternative methods to gain the benefits of mindfulness and self-compassion, without the discipline required to keep a meditative schedule.

There are two reasons for investigating self-compassion and mindfulness in the present research. First, self-compassion may amplify the effectiveness of mindfulness. Self-compassion is an adaptive way of relating to oneself when considering personal difficulties and failures, and involves three main (overlapping and interactive) components: self-kindness (versus self-judgment), feelings of common humanity (versus isolation), and mindfulness (versus over-identification – see Neff, 2003a, b for review). Accordingly, it could be argued that more self-

kindness and common humanity (or less self-judgment and isolation) may actively foster and promote mindfulness. Similarly, being mindful may allow someone to notice that they are suffering, which enables one to understand that they are not the only ones to suffer, and also assists to take a kinder approach towards oneself. Indeed, recent research indicated that higher scores of self-compassion increased the effectiveness of mindfulness training (Birnie, Speca, & Carlson, 2010) and mediated the relationship between mindfulness and well-being (Hollis-Walker & Colosimo, 2011), as well as mindfulness practice and stress (Shapiro, Astin, Bishop, & Cordova, 2005). Therefore, self-compassion appears to be a vital and essential aspect when exploring the benefits of mindfulness (see Baer, 2010 for review). Second, self-compassion appeared to be a significant element when evaluating the usefulness of mindfulness on weight management. For example, recent research found that the combination of traits of mindfulness and self-compassion, as well as the combination of mindfulness and self-compassion interventions (i.e., mindfulness and loving-kindness meditation), assisted people more than mindfulness alone, or a control condition, in weight management (see Mantzios & Wilson, 2013a; Mantzios, Wilson, Linnell, & Morris, 2013). Therefore, recent research emphasises the role and inclusion of self-compassion within mindfulness research when investigating eating behaviours and weight loss. Compassion is suggested to uniquely stimulate a self-soothing system in the brain that assists affect regulation and redirects attention with feelings of gentleness and kindness (Gilbert, 2005; 2009); a feature that appears to be of additional assistance to people who aim to lose weight. Nevertheless, compassion also requires some form of practice (and usually some meditation), which brings us back to the previously discussed limitations and the need for alternative ways of developing mindfulness and self-compassion.

To find a viable alternative to meditation, two main components were thought to be needed, which are evident in both mindfulness and self-compassion. First, most meditation requires a present-centred awareness (see Brown & Ryan, 2003). It is this present-centred awareness that results in a person accurately monitoring their current behaviour, which is vital for effective weight management (see Wing & Phelan, 2005). Second, lower self-criticism is also a component of mindfulness (e.g., non-judgmental awareness – see Kabat-Zinn, 2006) and self-compassion (i.e., self-kindness vs. self-judgment, self-acceptance – see Neff, 2009). This lower notion of self-criticism (see also Gilbert, 2005) allows failures in regulation to be seen as a part of a learning process, rather than reasons for giving up. These two components are found in social psychology literature, and more specifically, in construal level theory (e.g., Liberman & Trope, 1998; McCrea, Liberman, Trope, & Sherman, 2008; Schmeichel, Vohs, & Duke, 2011).

Construal level theory describes two core mind-sets set on a continuum of abstraction. Concrete construals (or lower levels on this continuum) focus our attention on *how* we carry out behaviour, while abstract construals (or higher levels on this continuum) focus on *why* an action is being performed (Freitas, Gollwitzer, & Trope, 2004). So far, researchers have theorised that abstract construals are conceptually closer to mindfulness (e.g., Ayduk & Kross, 2010). Abstract construals are described often as using a temporal distancing technique, which allows the self to consider the past and future and then act according to goals and personal standards (Fujita, Trope, Liberman, & Levin-Sagi, 2006). However, abstract construals may be unsuitable for developing mindfulness and self-compassion. Specifically, such abstract mind-sets (a) add a deliberate, confrontational, and evaluative perception to the present experience (e.g., Fujita & Roberts, 2010; Fujita et al., 2006) and (b) make observation of the present moment more sporadic. For example, when people evaluate themselves to significant standards and goals – as

in temporal distancing or abstract construals (Fujita, 2008; Fujita et al., 2006) – they are not only centring on the imaginary future, but they also set the scene for identifying personal inadequacies, failures and mistakes, which may be overwhelming and result in negative and mindless rumination, isolation and judgment (Kabat-Zinn, 1990; Neff, 2009; Raes & Williams, 2010). During mindfulness practice, attention is on concrete aspects of the present experience, to eventually enable people to increasingly identify and step back from their abstract or evaluative thoughts (Kabat-Zinn, 1990). Furthermore, self-compassion assists to focus even more closely on concrete aspects of personal suffering (e.g., negative automatic thoughts), rather than everything else (e.g., pleasant or neutral thoughts) that surface in the present moment (see Neff & Germer, 2013). This way, people are more readily available to identify distress, and tolerate such distress by offering kindness and a collective understanding to oneself (see Baer, 2010; Gilbert, 2009; Neff, 2003b; Neff, 2009), without being **distracted** by everything else that co-occurs in the present moment. Therefore, the present research explored the ability of concrete construals to assist in the development of mindfulness and self-compassion.

The two reasons that make abstract construals unsuitable are precisely the same that make concrete construals more suitable for the development of mindfulness and self-compassion. First, concrete construals promote attention to the present behaviour. For example, McCrea et al. (2008) sent participants a questionnaire that activated concrete or abstract construals and were asked to return it by email. Participants in the concrete construal group returned the questionnaire faster, because self-control was assisted by the increased present-focused orientation (see McCrea et al., 2008; see also Schmeichel et al., 2011). Second, as concrete construal focus on the *how* of behaviour, they rarely require further judgement or prompt self-critical attitudes. This is similar to mindfulness and self-compassion, which are associated with

less analysis, judgement, mindlessness, rumination, and isolation (Brown & Ryan, 2003; Kabat-Zinn, 1990; Neff, 2003b; see also Raes, 2010; Raes & Williams, 2010). Therefore, concrete construals could potentially mimic mindfulness (i.e., being attentive and aware of the present moment, non- or at least less-judgmentally), as well as self-compassion, as non-judgment may possibly limit unkind and isolated interpretations of the self, or, in other words, limit the exact opposite of self-compassion (see Neff, 2003a, b).

However, there is one limitation that needs addressing – that is, the procedural nature of concrete construals. Concrete construals can be solely procedural, and thus, tend to completely focus on one part of the present moment without any awareness of other experiences that co-occur (e.g., see Csikszentmihalyi, 1990). Some people may use this technique to avoid or escape negative thoughts, emotions or behaviours that are part of the present experience (e.g., feeling stressed), but are not part of the procedure at hand (e.g., eating). For example, people may mindlessly overeat while concentrating on another task (e.g., reading the paper), or, more relevant to this research, getting absorbed in what one is eating, where the person avoids the possibility of feeling any distress in the moment (i.e., at least until food is accessible or until there is no more room for food – see Heatherton & Baumeister, 1991 for review). Thus, rather than an accepting and tolerant attitude of all the present experiences (especially the experiences that relate to personal suffering), part of the present may be suppressed (Purdon, 1999). This way, the reality of the present moment may be more self-indulging and a hedonic pursuit of pleasure (or avoidance of displeasure). Hayes (2004) referred to such phenomenon as ‘experiential avoidance’. To increase awareness of the present moment, experiential acceptance or exposure (instead of avoidance) is required. Therefore, the present research incorporated

exposure and acceptance of the present moment into the procedural nature of concrete construals to promote mindfulness (henceforth referred to as *mindful concrete construals*).

As previously discussed, avoidance is a practice of keeping away or withdrawing from something undesirable or a source of conflict, and is often used as a coping mechanism (Ottenbreit & Dobson, 2004). Dieters must often avoid urges to eat (and overeat). Paradoxically, suppressing thoughts of food, appetite, or cravings may increase the occurrence and intensity of such urges (e.g., Wegner, Schneider, Carter, & White, 1987), leading to subsequent failure in regulating food intake (Barnes & Tantleff-Dunn, 2010). However, mindfully accepting urges has proven useful in lowering the reoccurrence of such unwanted thoughts and impulses (Alberts, Mulkens, Smeets, & Thewissen, 2010). Thus, the present research explored whether mindfulness and self-compassion – as well as if mindful concrete construals – could assist in reducing cognitive-behavioural avoidance.

Moreover, cognitive-behavioural avoidance is often the avoidance of negative automatic thoughts. Decreasing cognitive-behavioural avoidance may increase the presence of negative automatic thoughts. Avoidance and negative automatic thoughts can be part of a vicious cycle that ends only when there is nothing to avoid or run away from. However, even if there are higher levels of avoidance, the strength of negative automatic thoughts may still increase. Indeed, the paradoxical effects of avoidance have been described in past research (see Wegner et al., 1987 for rebound effect), where one's avoidance adds emphasis on what is to be avoided. Thus, such thoughts can potentially sabotage weight loss efforts, mainly because people are unable to control them (Wegner & Erber, 1992), and because negative automatic thoughts may lead to emotional eating (e.g., Baer, Fisher, & Huss, 2006; Kuehnel & Wadden, 1994), whether they are avoiding or not.

In fact, frequent dieters can be particularly sensitised to such automatic thoughts, as they have become more self-critical and judgemental over past dieting failures, or because they worry about potential dieting failures in the future (Gilbert & Procter, 2006; Leary, 2004). However, self-compassion and mindfulness have been associated with less rumination and thought suppression (see Arch & Craske, 2006; Neff, 2003a; Ramel et al., 2005); thus, supporting the notion that those dieters who score high in self-compassion and mindfulness would not dwell over real or imagined shortcomings, neither would they try to avoid them. The significance of self-compassion, beyond mindfulness, is the centralised focus on personal suffering, where dieters are targeting negative automatic thoughts, and in turn, a main cause of avoidance (see Neff & Germer, 2013 for review on other differences between mindfulness and self-compassion). Thus, developing mindfulness and self-compassion may be particularly challenging for this group, but mindfulness and self-compassion may also be significant benefactors of well-being and weight loss.

The main aim of this paper was to explore whether mindful concrete construals can become a tool for people who are unable to use traditional methods of cultivating mindfulness and self-compassion. Further, it was expected that concrete construals would increase mindfulness and self-compassion, as well as decrease avoidance and negative thoughts. The present research attempted, initially, to explore the relationship between mindfulness, self-compassion, cognitive-behavioural avoidance, negative automatic thoughts, and weight loss. Findings from the initial study were investigated further in a second study, which attempted to induce mindfulness and self-compassion by using food diaries that required the participant to either focus on mindful concrete or abstract construals. A third study compared the effectiveness

of the mindful concrete construals to a mindful self-compassionate meditation schedule in terms of developing mindfulness and self-compassion, and their usefulness for weight loss.

Study 1:

Exploring the role of Mindfulness, Self-Compassion, Cognitive-behavioural Avoidance and Negative Automatic Thoughts on Weight Loss

Before attempting to induce mindfulness without meditation, it is important to show that being higher in the trait of mindfulness and self-compassion results in better weight management. Thus, this study aimed to explore if higher levels of mindfulness and self-compassion improved weight management and if they did so (at least partially) by reducing cognitive-behavioural avoidance and negative automatic thoughts.

Method

Participants

Two-hundred and forty-three undergraduate students were invited to participate from a University in Greece. The sample consisted of 119 females and 124 males ($n=243$), with a Body Mass Index of $M= 25.62$ ($SD=4.24$) and 123 participants being of average weight (i.e., $BMI<25$) and 120 above average (i.e., $BMI>25$).

Instruments

Participant information form. This form asks for the participants' gender, height and weight and weight after 5 weeks.

Self-compassion Scale (Neff, 2003). The scale calculates the qualities of the self-compassion construct. Responses are ranging from 1 (*almost never*) to 5 (*almost always*). It is a 26-item scale (with overall scores ranging from 26 to 130) and it is composed of six subscales: self-kindness, self-judgment, common humanity, isolation, mindfulness and over-identification (see also Mantzios, Wilson, & Giannou, 2013 for translated scale). Sample items are “When I’m feeling down I tend to obsess and fixate on everything that’s wrong” (i.e., over-identification) and “I try to be understanding and patient toward aspects of my personality I don’t like” (i.e., self-kindness). The present study produced an alpha of .79.

Mindful Attention and Awareness Scale (Brown & Ryan, 2003). The scale is a 15-item, single factor instrument that measures one’s tendency to function on “automatic pilot” without attention to present experience. Responses are ranging from 1 (*almost always*) to 6 (*almost never*) and include, for example, “I forget a person’s name almost as soon as I’ve been told it for the first time” and “I rush through activities without being really attentive to them” (see Mantzios, Wilson, & Giannou, 2013). The overall scores range from 15 to 90 and the present study produced an alpha of .85.

Automatic Thoughts Questionnaire (Hollon & Kendall, 1980). The Automatic Thoughts Questionnaire is a 30-item questionnaire used to assess negative cognition by measuring the cognitive self-statements of an individual. Responses are ranging from 1 (*not at all*) to 5 (*all the time*), with total scores ranging from 30 to 150, and include items such as “I feel so helpless” and “I wish I were somewhere else”. Individuals respond with higher scores indicating increased

occurrences of negative automatic thoughts. The authors reported good internal consistency ($\alpha = .97$). The present study produced an alpha of .87.

Cognitive Behavioral Avoidance Scale (Ottenbreit & Dobson, 2004). The Cognitive-Behavioural Avoidance Scale is a 31-item self-report measure that assesses cognitive/behavioural and social/non-social avoidance. Responses are ranging from 1 (*not at all true for me*) to 5 (*extremely true for me*), with total scores ranging from 31 to 155, and items such as “I quit activities that challenge me too much” and “I avoid making decisions about my future”. Higher scores indicate greater avoidance and the scale has good internal consistency ($\alpha=.91$; Ottenbreit & Dobson, 2004). The present study produced an alpha of .90.

Procedure and Design

Potential participants responded to an advertisement on University grounds, which invited people who were trying to lose weight to participate in this study. Participants who wished to take part were given a questionnaire pack at baseline. After the completion of the questionnaires, two general practitioners (of both genders) took measurements of weight and height and measured their weight again after 5 weeks. The recorded weight difference was used as the variable indicated as Weight Loss. The consent form attained permission to access this data (i.e., the weight measurements) from participants.

Results and Discussion

Initially, this study aimed to explore whether Mindfulness and Self-Compassion would

predict weight loss independently, as well as together, and thus, explore the additional variance of self-compassion. Weight Loss was predicted independently by Mindfulness [adjusted $R^2 = .309$, $F(1, 241) = 109.4$, $p < .001$] and by Self-Compassion [adjusted $R^2 = .181$, $F(1, 241) = 54.5$, $p < .001$], but even more so by combining the two variables [adjusted $R^2 = .355$, $F(2, 240) = 67.7$, $p < .001$]. Indeed, there was a significant difference between Self-Compassion and Mindfulness in predicting Weight Loss ($\Delta R^2 = .05$, $p < .001$). The relationship between Weight Loss with Mindfulness and Self-Compassion was positive, [$\beta = .56$, $p < .001$; $\beta = .43$, $p < .001$, respectively], thus increases in Self-Compassion and/or Mindfulness were associated with Weight Loss.

Next, four mediation analyses were conducted (see Baron & Kenny, 1986 for mediation analysis review), two for each of the predictor variables, Cognitive-Behavioural Avoidance and Negative Automatic Thoughts, on the outcome variable Weight Loss, with Self-compassion and Mindfulness as potential mediators.

First, Cognitive-Behavioural Avoidance predicted Weight Loss ($\beta = -.035$, $SE = .01$, $p < .001$) and Mindfulness ($\beta = -.27$, $SE = .05$, $p < .001$), Mindfulness predicted Weight Loss ($\beta = .11$, $SE = .01$, $p < .001$), and the relationship between Cognitive-Behavioural Avoidance and Weight Loss was significantly reduced when Mindfulness was included in the model ($\beta = -.006$, $SE = .009$, $p = .48$), $z = -4.85$, $p < .001$ (see Figure 1). Second, Cognitive-Behavioural Avoidance predicted Weight Loss ($\beta = -.035$, $SE = .01$, $p < .001$) and Self-Compassion ($\beta = -.27$, $SE = .04$, $p < .001$), Self-Compassion predicted Weight Loss ($\beta = .09$, $SE = .01$, $p < .001$), and the relationship between Cognitive-Behavioural Avoidance and Weight Loss was significantly reduced when Self-Compassion was included in the model ($\beta = -.01$, $SE = .01$, $p = .29$), $z = -5.40$, $p = .0001$ (see Figure 1). Third, Negative Automatic Thoughts predicted Weight Loss ($\beta = -$

.04, $SE = .01$, $p < .001$) and Mindfulness ($\beta = -.22$, $SE = .05$, $p < .001$), Mindfulness predicted Weight Loss ($\beta = .10$, $SE = .01$, $p < .001$), and the relationship between Negative Automatic Thoughts and Weight Loss was significantly reduced when Mindfulness was included in the model ($\beta = -.02$, $SE = .008$, $p < .01$), $z = -4.02$, $p < .001$ (see Figure 2). Fourth, Negative Automatic Thoughts predicted Weight Loss ($\beta = -.04$, $SE = .01$, $p < .001$) and Self-Compassion ($\beta = -.31$, $SE = .04$, $p < .001$), Self-Compassion predicted Weight Loss ($\beta = .09$, $SE = .01$, $p < .001$), and the relationship between Negative Automatic Thoughts and Weight Loss was significantly reduced when Self-Compassion was included in the model ($\beta = -.02$, $SE = .01$, $p > .05$), $z = -5.87$, $p = .001$ (see Figure 2).

Baron and Kenny (1986) described that when the relationship between predictor and outcome is no longer statistically significant once the mediator is entered into the model, there is an occurrence of full mediation; whereas in a similar context, a reduction in the strength of the association, however, with remaining above zero depicts a partial mediation. Accordingly, the third mediation was partial, while the rest were full mediations.

INSERT FIGURE 1 & 2 HERE

Study 2: Concrete vs. Abstract Construals

The previous study demonstrated that mindfulness and self-compassion may be useful in weight loss; therefore, the present study sought a method of developing mindfulness without meditation. Specifically, this study explored whether mindful concrete construals were as effective in weight loss as mindfulness appeared to be in past research (Mantzios & Wilson, 2013a; Tapper et al., 2009). It is important to note that these mindful concrete construals created

a more experiential mindset (for review, see Hayes, 2004; see also Kabat-Zinn, 1990) rather than being solely procedural as described in construal level theory (e.g., Freitas, Gollwitzer, & Trope, 2004). Further, to ensure they were being used regularly, a food diary was used that promoted frequent concreteness (i.e., at every meal through a diary – compared to the usual single experimental manipulation in construal experiments). This study used present-centred attention and awareness to create an attitude of acceptance or non-judgment (Brown & Ryan, 2004). Some benefits of this diary should also be noticeable in self-compassion (e.g., increase in mindful awareness, ability to recognize suffering, steadily lowering self-judgement and over-identification, etc.). Thus, the present study explored whether these mindful concrete construal diaries increase mindfulness and self-compassion, and in turn, whether they assisted weight loss, compared to abstract construals. Finally, the present study also tried to understand if the mindful concrete construals displayed similar associations to both cognitive-behavioural avoidance and negative automatic thoughts as in past mindfulness research (e.g., Mantzios et al., 2013).

Method

Participants

One-hundred and thirty-six undergraduate students were invited to participate from a University in Greece. Sixty-one students failed to return for the follow-up measurements and three did not fulfil the daily entry requirements of the diary (described in detail below), and were therefore excluded from any further analyses. The final sample consisted of 30 females and 42 males ($n=72$) with a Body Mass Index of $M= 25.55$ ($SD=4.78$) and Age $M= 21.11$ ($SD=3.64$).

Materials

The following measures were used to construct an event based diary and a self-report questionnaire. The order of the measures was randomised. Questionnaires and supporting materials are available by contacting the first author.

Mental Construal Manipulation

The present study manipulated construal levels in a manner that was proven successful in several previous experiments (e.g., Freitas, Gollwitzer, & Trope, 2004; Fujita et al., 2006; Liberman, Trope, McCrea, & Sherman, 2007). In particular, participants spent a few moments prior and during meals considering *how* to eat (concrete construal condition) or *why* to eat the present meal (abstract construal condition). Procedural questions like, ‘How does it smell?’ primed people into a concrete mindset, but with mindful awareness, while purpose oriented questions primed participants into an abstract construal (e.g., ‘why is it important to eat less?’). It should be noted that participants were considering emotions and thoughts that were relevant to the present behaviour of eating. This way, people were present focused with an open awareness instead of being overly immersed in the behaviour. The questions came in a pocket-diary that was used for 5 weeks as an event based account at every meal. The diaries formed a basis for exclusion from the final analyses, whereby participants who did not have at least three entries daily were omitted from the results. Such exclusion protocol was also used for the third study.

Instruments

We used the same scales as in Study 1. The reliabilities for the scales were as follows: $\alpha=.76/.76$ for Self-compassion Scale, $\alpha=.87/.89$ for Mindful Attention Awareness Scale,

$\alpha=.94/.94$ for Automatic thoughts Questionnaire, $\alpha=.89/.90$ for Cognitive-Behavioural Avoidance Scale.

Procedure

Participants for all studies in this paper were recruited through posters and announcements in classrooms, informing students that there would be sessions, which would test possible methods of assisting weight loss. Participants who responded and attended one of those sessions received the questionnaire, were measured in weight and height, and were randomly placed in one of two construal groups. People in both construal conditions received instructions on how to complete the diaries and when to use them.

After five-weeks, participants completed an identical questionnaire and their weight was measured again. Both pre- and post- weight measurements were performed with the help of two medical doctors (1 male, 1 female). Also, diaries were returned to the researchers to evaluate attendance to the diary and possible exclusions, if certain participants neglected to use it.

All studies adhered to the ethical guidelines of the British Psychological Society.

Results and Discussion

Preliminary Drop-out analysis

Of the 64 who failed to attend a follow-up session or did not complete the diary, 27 were in the mindful concrete construal group and 34 in the abstract construal group. Analyses were conducted to test significant differences in Intervention Groups, Age, Gender, Body Mass Index (BMI: kg/m^2), Self-compassion, Mindfulness, Negative Automatic Thoughts, and Cognitive-Behavioural Avoidance between those who did participant and those who dropped out. The two groups did not differ in Intervention Group assigned $\chi^2(1) = .30, ns$; Age $F(1, 134) = .82, ns$;

baseline measurements of BMI, $F(1, 134) = .26, ns$; Self-compassion, $F(1, 134) = .13, ns$; Mindfulness, $F(1, 134) = 2.38, ns$; Negative Automatic Thoughts, $F(1, 134) = 1.49, ns$; and Cognitive and Behavioural Avoidance, $F(1, 134) = 1.72, ns$. However, there was a difference in Gender, $\chi^2(1) = 5.03, p < .05$, with more females dropping-out than males (39 vs. 25, correspondingly).

Main Analyses

Participants in the Concrete Construal group lost significantly more weight ($M = 1.33$ kg, $SD = .99$) compared to participants in the Abstract Construal group ($M = .53$ kg, $SD = .85$) ($t(70) = 8.60, p < .001, \eta^2 = .510$).

Next, four 2(Construal Type: Abstract, Concrete) x 2(Time: Pre, Post) ANOVAs with repeated measures on the last factor were conducted on the Self-Compassion, Mindfulness, Cognitive-Behavioural Avoidance, and Negative Automatic Thoughts scales.

With Self-compassion as the dependent variable, there was a significant main effect of Time: $F(1, 70) = 5.44, p = .02, \eta_p^2 = .07$ (see Table 1). There was a non-significant main effect of Construal Type: $F(1, 70) = 2.67, p = .11, \eta_p^2 = .04$ and a significant interaction between Intervention and Construal Type, $F(1, 70) = 63.81, p < .001, \eta_p^2 = .48$. There was also a significant main effect for Mindfulness which also increased over time, Time: $F(1, 70) = 10.62, p < .01, \eta_p^2 = .13$. The main effect of Construal Type was also significant as the Abstract Construal Group scored significantly lower in Mindfulness than the Concrete Construal Group, $F(1, 70) = 20.43, p < .001, \eta_p^2 = .23$. Finally, there was a significant interaction: $F(1, 70) = 130.90, p < .001, \eta_p^2 = .65$, with the Abstract Construal Group decreasing in Mindfulness, and the Concrete Construal Group increasing in Mindfulness over this time period (see Table 1).

With Cognitive-Behavioural Avoidance, there was a non-significant main effect for Time: $F(1, 70) = .11, p = .74, \eta_p^2 < .01$; and Construal Type: $F(1, 70) = 1.89, p = .17, \eta_p^2 = .03$; but there was a significant interaction: $F(1, 70) = 58.73, p < .001, \eta_p^2 = .46$. As seen in Table 1, although the Concrete Construal Group decreased their scores from pre to post, the Abstract Construal Group increased their scores across time.

For the Negative Automatic Thoughts, there was a significant main effect of Time, $F(1, 70) = 6.03, p = .02, \eta_p^2 = .08$; a significant main effect of Construal Type: $F(1, 70) = 4.98, p = .03, \eta_p^2 = .07$; as well as a significant interaction: $F(1, 70) = 69.88, p < .001, \eta_p^2 = .50$. As shown in Table 1, Concrete Construal scores were significantly lower than Abstract Construal scores. Further, Concrete Construal scores decreased over time whereas Abstract Construal scores slightly increased over the same time period.

Results indicated that there was an overall positive effect of the Concrete Construal type, lowering Cognitive-Behavioural Avoidance and Negative Automatic Thoughts and increasing Mindfulness and Self-compassion compared to the Abstract type diary that showed the exact opposite consequence.

INSERT TABLE 1 HERE

Study 3: Concrete and self-compassionate construals vs. Mindfulness and Loving-Kindness Meditation

Considering findings from the previous studies, this study investigated whether mindful concrete construals, with self-compassionate messages to maximise the self-compassionate manipulation (referred to as *mindful self-compassionate construals*) could perform as well as a meditation schedule that was used successfully in recent weight loss research. Specifically, this

meditation schedule (i.e., a mindful self-compassionate intervention that combined mindfulness and loving-kindness meditation) assisted dieters more than mindfulness meditation alone or a control condition (see Mantzios & Wilson, 2013a for review). The present study proposed that mindful self-compassionate construals may perform similar to meditation, while construals may perform better in maintaining mindfulness and self-compassion after the intervention, because it is more automatic and effortless compared to meditation (see Bargh, 1997 for review on automaticity). Accordingly, both construal and meditation interventions were tested for 5 weeks and participants were followed-up 3 months later.

Method

Participants

A sample of 122 Undergraduate Students was invited to participate from a Northern Greek College. Twenty-four students were excluded from the analyses as they quit the meditative practice ($n=11$) or failed to maintain the use of the construal diary ($n=13$). The final sample consisted of 41 females and 57 males ($n=98$) with a mean Body Mass Index of 25.79 ($SD=3.97$) and Age $M=23.30$ ($SD=5.53$).

Materials

Mental Construal Manipulation

Participants spent a few moments prior and during meals considering *how* to eat (concrete construal condition), that is, present oriented and infused with self-compassionate messages [e.g., ‘how important is it for me and all people to eat healthy?’ (Common Humanity)

or ‘How kind are you to yourself now that you eat this meal?’ (Self-Kindness). The questions came in a diary that was used for 5 weeks as an event-based diary for every meal.

Instruction manual and meditation schedule

A protocol was adopted outlining mindfulness and self-compassion meditation (Mantzios & Wilson, 2013a). *Mindfulness meditation* and *mindfulness of walking* were introduced in day one. Day two consisted of *eating meditation*, *desirable food meditation* and *a feeling of hunger mental scale* (e.g., Levine, 2007). In Day three, participants were introduced to a slightly modified meditation that integrated *self-compassion* into the meditation practice already learnt (e.g., Chödrön & Otro, 2001).

Note that similar exclusion protocols were kept for the construal group as in Study two, while for the meditation group participants, who missed more than 3 days, were also excluded.

Instruments

Description of instruments used can be found in Study 1. The reliabilities for the scales were as follows: $\alpha=.75/.88$ for the Self-compassion Scale and $\alpha=.87/.86$ at both instances for Mindful Attention Awareness Scale.

Procedure

Participants responded to an advertisement on University grounds about participating in a study that could assist them if they were trying to lose weight. Participants did not receive any nutritional help or weight loss advice and were advised to diet the same way they did in the past.

Participants were given the questionnaires, subsequently were measured in weight and height, and were placed in the Construal Group or the Meditation Group. Participants in the Construal Group received instructions on how to complete and when to use the diaries.

The Meditation Group participated in a three day introduction to Mindfulness and Loving-Kindness Meditation and were asked to practice at least 3 times a day (early morning, lunch time and in the afternoon) with the counsellor at a specified area on campus, at set times, and to return after 5 weeks to record any weight differences. A daily-log was kept to record attendance and help with exclusion due to non-attendance.

After 5 weeks, participants' weight was measured, as well as Mindfulness and Self-compassion scores. Participants responded at a 3-month follow-up weight check, to see whether construals revealed any differences in weight regain compared to the meditation group. All measurements were taken from two general practitioners (i.e., 1 male and 1 female) in all three instances of weight measurements. Also, diaries were returned to the researcher to evaluate attendance to the diary and possible exclusions if participants neglected to use it.

Results and Discussion

Preliminary Drop-out analyses

A drop-out analysis was conducted to test significant differences in Intervention Groups, Age, Gender, Body Mass Index (BMI), Self-compassion and Mindfulness between participants and drop-outs. The analysis showed that drop-outs and those who participated did not differ in Intervention Groups assigned $\chi^2(1) = .21, ns$; baseline measurements such as Age $F(1, 120) = .81, ns$; BMI, $F(1, 120) = .82, ns$; Self-compassion, $F(1, 120) = .92, ns$; and Mindfulness, $F(1, 120) = 1.18, ns$. However, again there was a difference in Gender, $\chi^2(1) = 8.49, p < .01$, with more females dropping-out than males (18 vs. 6, correspondingly).

Main Analyses

Two 2(Group Type: Meditation, Construal) x 2(Time: Pre, Post) ANOVAs with repeated measures on the Time was conducted on the Self-compassion and Mindfulness.

For Self-compassion, there was a significant main effect of Time: $F(1, 96) = 21.57, p < .001$, with both groups increasing in Self-compassion over the time period (see Table 2).

However, there was a non-significant main effect of Group Type: $F(1, 96) = .34, p = .56$. There was also a non-significant interaction between Time and Group Type, $F(1, 96) = 3.03, p = .09$.

For Mindfulness, there was a significant main effect of Time: $F(1, 96) = 292.19, p < .001$ with both groups again increasing over time in their Mindfulness scores (see Table 2). There was also a significant main effect of Group Type, $F(1, 96) = 4.93, p = .03$, with the Meditation Group scoring significantly high both pre- and post- Time than the Construal Group. However, a non-significant interaction was found between Time and Group Type, $F(1, 96) = .20, p = .66$. Results indicated that both Times produced similar outcomes when it came to increasing Mindfulness and Self-Compassion.

INSERT TABLE 2 HERE

Additionally, another 2(Group Type: Meditation, Construal) x 2(Time: Post, Follow-up) ANOVA with repeated measures on the Time was conducted on weight loss. A significant main effect of Time was found: $F(1, 96) = 288.83, p < .001$ from post to follow-up measurements (see Table 3). However, there was a non-significant main effect of Group Type, $F(1, 96) = .71, p = .40$, with the Meditation Group producing similar weight loss to the Construal Group. Last, a significant interaction between Time and Group Type was observed, $F(1, 96) = 54.04, p < .001$.

As shown in Table 3, whilst the two groups did not differ in weight loss post-intervention, by the follow-up period, the Construal Group had lost more weight (that is, regained less weight) than the Meditation Group.

INSERT TABLE 3 HERE

General Discussion

The present research explicitly explored in three studies: (a) if mindfulness and self-compassion predict weight loss and whether they mediate the effect of cognitive-behavioural avoidance and negative automatic thoughts on weight loss; (b) whether mindful concrete construals can increase mindfulness and self-compassion and decrease cognitive-behavioural avoidance and negative automatic thoughts; and (c) if mindful self-compassionate construals assist weight loss and maintenance; all of which will be reviewed in turn.

First, results showed that mindfulness and self-compassion positively predict weight loss, while negative automatic thoughts and cognitive-behavioural avoidance inversely predict weight loss. Further, results revealed mindfulness and self-compassion mediating the relationship between negative automatic thoughts, as well as cognitive-behavioural avoidance and weight loss. Findings are consistent with recent research that demonstrated a similar relationship between mindfulness, self-compassion, and negative automatic thoughts (Mantzios et al., 2013). This study also offers possible explanations as to how other mindfulness-based interventions may have assisted people who were trying to lose weight in past research (e.g., Tapper et al., 2009). Furthermore, self-compassion appeared of greater support in aiding weight maintenance (Mantzios et al., 2013); while this study found that mindfulness may be of greater value for weight loss. Future research should explore differences between weight loss and maintenance in

relation to mindfulness and self-compassion. These preliminary findings highlight the need to explore both mindfulness and self-compassion to successfully help people manage their weight.

Second, results indicated that mindful concrete construals increased mindfulness and self-compassion, while abstract construals reduced them. Moreover, participants who were primed concretely showed a decrease in cognitive-behavioural avoidance and negative automatic thoughts. This was consistent with the findings in Study 1 and past research that suggested mindfulness and self-compassion to be associated to adaptive functioning and well-being (Brown & Ryan, 2003; Levesque & Brown, 2007; Mantzios & Wilson, 2013a; Neff, 2003b).

Furthermore, mindful concrete construals contributed towards greater weight loss compared to abstract construals. Results contradict past findings (e.g., Fujita, 2008) as mindful concrete construals appeared to perform better than abstract construals in self-regulating behaviour. However, mindful concrete construals have not been compared in previous research. The lesser weight loss observed in the abstract construal group may be explained through the reported increase in cognitive-behavioural avoidance and negative automatic thoughts. As already mentioned, abstract construals link influential future aspects (that give purpose and drive) with present behaviour, which may add evaluative and self-punitive perceptions to the present experience (e.g., Fujita & Roberts, 2010; Fujita, et al., 2006). These may easily lead to further avoidance, as dieters are confronted with failures and inadequacies, including judging themselves (e.g., ‘you are such a loser, stop thinking of the cookies’) and their behaviours (e.g., ‘you had your cookie, but now you need to go hungry to make up for your failure’). Suffering becomes the likely result in the present moment. Thus, abstract construals may resemble a more uncompassionate and mindless self. Future research should attempt a deeper exploration of negative, self-punitive and self-critical thoughts and explore the interaction between avoidance

and thoughts that may be disruptive of effective dieting. This way, a new method of making abstract construals more constructive (e.g., more self-compassionate) may be a better way of tolerating the distress that comes with dieting behaviour, and eventually, lead to more effective dieting.

Third, this study investigated whether a mindful self-compassionate construal diary performed similarly well to a successful mindful self-compassionate meditation programme for weight loss. The goal was to use construals to enable one to be mindful and compassionate without the ‘musts’ and ‘shoulds’ that make experiences (including meditation and dieting) every so often intolerable and judgemental (e.g., ‘I should meditate before lunch’ or ‘I need to meditate to see positive results’). Keeping a mindful concrete construal diary may have activated relevant mental representations in a subtle, unnoticeable fashion, whereby, the unaware, unintended effects of this activation are observed at a later stage (see Bargh & Chartrand, 2000). Such obligations or commitments can be set off by relevant external stimuli without the person’s purpose to act that way or awareness of their conduct (see Dijksterhuis, Chartrand, & Aarts, 2007). In other words, participants were aware that they completed a food diary, but may have been unaware that this diary primed them to be more mindful and self-compassionate. Results indicated that the construal group worked in a similar fashion to the meditation practice, increasing mindfulness, self-compassion, and weight loss over time. Findings are consistent with recent research that observed participants in a mindful self-compassionate meditation programme losing significantly more weight than control participants (see Mantzios & Wilson, 2013a). However, the present study may also suggest that construals appear to be a gentler, less exhausting method to cultivate mindfulness and self-compassion in comparison to meditation, which in turn, assisted weight maintenance. Indeed, the 3-month follow-up revealed that the

diary group regained significantly less weight compared to the meditation group. Overall, results could suggest that mindful concrete construals were more effortless than meditation and could, therefore, have been more easily maintained; but such a case was not explored in the present study and remains a question for future research. Despite our efforts in following participants' progress, this study could have benefited from extending the follow-up periods.

Another issue that did arise throughout the present research was the number of participants who did not complete each study. Each study tended to demand a lot of work from participants, which may have been difficult for some people to persist. This has also been an issue with meditation research, especially with participants new to meditation (Mantzios & Wilson, 2013a; Miller et al., 1998). However, whether the drop-out was strictly related to construal interventions or dieting, or the combinations of both, remains a question for future research. Another future direction could be to investigate adherence to such construal diary with people who maintain their weight, which is less demanding than losing weight. Finally, the attrition rate of female participants is noteworthy. Although there may be many reasons for this, there are two aspects that may help explain it. First, this loss of female participants may have been the outcome of having a male researcher on-site and actively involved, as well as a male meditation counsellor. Weight loss is a sensitive issue for many people, and at times, sharing personal information with the opposite sex may be more difficult than sharing with a same sex researcher/counsellor. Whether female participants required further help from a female researcher/counsellor and felt too embarrassed or uncomfortable to ask the male researcher remains a question for future research. Second, there may have been cultural factors that disadvantaged female participants to maintain participation. In particular, traditionally females are expected to focus on others and not themselves, which may have worked against maintaining

participation. As the research was based in a university, one might not expect such traditional values to be present, however, it is interesting to note that more males volunteered to take part in each study, which is unusual. Again, further research is needed to clarify this. Overall, it may be that the present findings would be more robust if larger sample sizes had been obtained.

Moreover, the use of students in the studies may have affected the results. Most students are committed to an abstract mind-set, where their present behaviour is regulated according to future goals (e.g., pass the exams, earn a degree, etc.). If this assumption is true, then the effect of mindful concrete construals may have been stronger (but also more conflicting), than a sample of retirees that are more interested in enjoying their family each moment or focus on the activity of the day. Therefore, caution should be used when interpreting the results, and future research should include other samples that may put forward results that are more representative of the population.

Furthermore, although adhering to the diary intervention may have been easier; requiring participants to complete diaries with every meal still requires self-discipline and conscious effort. Future research might use less invasive construal methods (such as messages on food packaging, placemats, plates, commercials, phone apps etc.) instead of diaries.

Also, the lack of a control group in the third study should be addressed. As it stands, there is no clear indication whether a simple dieting group would have performed similarly to the meditation or construal intervention. Then again, a recent longitudinal study indicated that the same meditation protocol assisted participants to lose more weight than a control group (see Mantzios & Wilson, 2013a). Future research should address this limitation and possibly use a controlled food environment (e.g., a boarding school or a secluded military base) or a similar diet plan to attain more accurate results on effects of psychological interventions.

A final limitation worth mentioning is the lack of manipulation check or pre-test to assess whether concrete diaries accurately influenced construal levels. This limitation leaves room for other theories and interpretations to emerge and explain the positive results achieved by participants in these studies. For example, counteractive control theory (Trope & Fishbach, 2000) suggests that exposure to temptations may involuntarily trigger goal-directed behaviour via mindsets that activate the long-term goal. In fact, exposure to temptations directs towards superior goal importance and intentions, as well as enhanced goal-directed behaviour; hence, assisting successful self-regulation and successful weight management (see Kroese, Evers, & De Ridder, 2009; see also Mantzios & Wilson, 2013b). Also, exposing oneself to the present moment is a leading concept in mindfulness and self-compassion literature (Gilbert, 2009; Kabat-Zinn, 2006; Neff, 2003a), and show another theoretical overlap that may lead to supplementary future research. Without exposing oneself to the present moment, dieters fail to address the importance of dealing with their eating behaviour right here, right now; but also fail to notice when the time is right to take a more compassionate approach, especially when feeling distressed over resisting palatable foods, or, even when failing to do so successfully (see Adams & Leary, 2007).

To conclude, the present results are significant for both health behaviour modification and applied social psychology research. Results showed weight loss being more effectively managed by concrete construals that are more mindful and self-compassionate, rather than by abstract construals that are more mindless and uncompassionate towards the self. Another significant finding is that there are other means to develop mindfulness and self-compassion apart from the traditional meditation practice, which opens the door to other methods that may be highly important for people who are not able, willing or ready to meditate.

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Table 1

Means and Standard Deviations for Concrete Construal group (n=36) and Abstract Construal group (n=36), pre- and post- intervention.

		Mean (SD)	
	Measures	Pre	Post
Concrete	NATQ	52.06 (15.56)	46.92 (14.77)
	CBAS	67.94 (19.62)	64.86 (20.04)
	MAAS	65.72 (10.90)	67.36 (10.29)
	SCS	93.03 (14.58)	94.14 (13.55)
Abstract	NATQ	58.17 (21.99)	60.97 (23.31)
	CBAS	70.89 (17.11)	74.25 (19.58)
	MAAS	54.78 (13.61)	51.83 (14.51)
	SCS	89.94 (9.52)	87.92 (9.95)

Note: NATQ=Negative Automatic Thought Questionnaire, CBAS= Cognitive-Behavioural Avoidance Scale, MAAS= Mindful Attention and Awareness Scale, SCS= Self-compassion Scale.

Table 2

T-Test means and Standard Deviations for Self-Compassionate Construal group (n=48) and Meditation group (n=50), pre- and post-intervention.

		Mean (SD)	
Measures		Pre	Post
Construal	SCS	85.15 (13.31)	87.38 (16.85)
	MAAS	54.08 (13.17)	57.79 (12.53)
Meditation	SCS	85.56 (13.21)	90.46 (17.32)
	MAAS	59.80 (12.52)	63.32 (12.10)

Note: MAAS= Mindful Attention and Awareness Scale, SCS= Self-compassion Scale.

Table 3

Means and Standard Deviations of weight lost (in kg) for Self-Compassionate Construal group (n=48) and Meditation group (n=50), post-intervention and follow-up measurements.

Groups	Mean (SD)	
	Post	Follow
Construal	3.90 (1.43)	3.33 (1.58)
Meditation	4.06 (1.49)	2.64 (1.79)

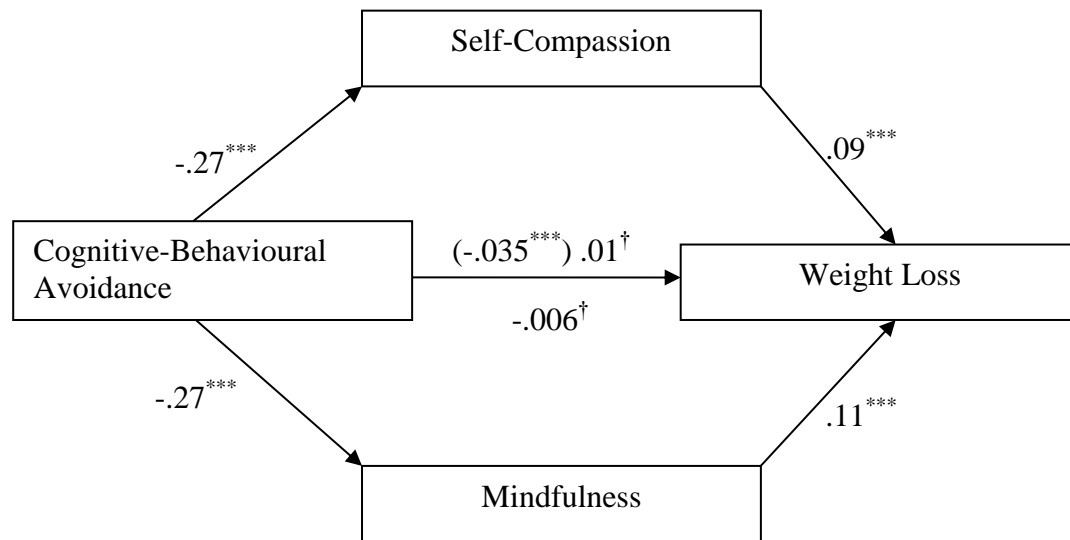


Figure 1. Model of relationships among Cognitive-behavioural Avoidance, Weight Loss, Self-compassion and Mindfulness.

Values presented are standardized regression coefficients. The value in parenthesis represents the coefficient for the direct path.

$^{\dagger}p > .05$; $^{***}p < .001$

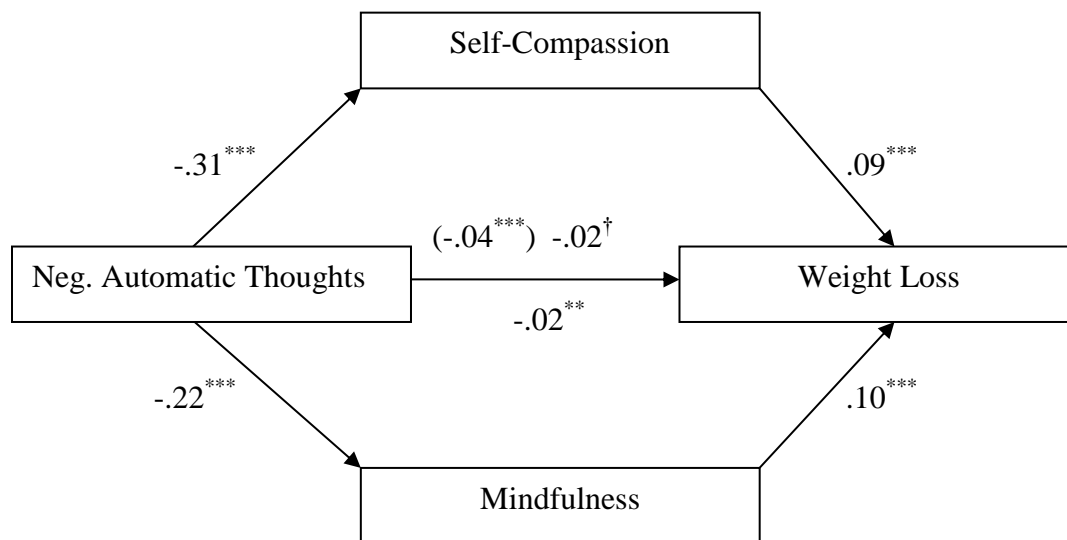


Figure 2. Model of relationships among Negative Automatic Thoughts, Weight Loss, Self-compassion and Mindfulness.

Values presented are standardized regression coefficients. The value in the parenthesis represents the coefficient for the direct path.

$^{\dagger}p > .05$; $^{**}p < .01$; $^{***}p < .001$