Attachment, eating behaviour and weight loss: A cohort study of patients before and after bariatric surgery

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Submitted for the degree of Doctor of Psychology (Clinical Psychology)

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September 2015
Abstract of Major Research Project

Primary objective: This study assessed the degree of insecure attachment style in a sample of patients undergoing bariatric surgery compared to a normal weight control group. It also investigated the association between attachment style and eating behaviour within the bariatric group pre-surgery and the impact of attachment on weight loss 6 months post-surgery.

Design and method: A cross sectional and cohort quantitative design was used. The bariatric group consisted of 195 patients recruited from a bariatric clinic who were compared with 195 normal weight controls recruited through social media. All participants completed the ECR-R and provided demographic information. The bariatric group also completed measures of control over eating, diet and exercise behaviour, behavioural intentions, and the Power of Food Scale. T-tests and correlations were used for analysis.

Outcome and results: The bariatric group demonstrated significantly higher levels of attachment avoidance and lower levels of attachment anxiety than controls. Significant correlations were found between insecure attachment and hedonic wanting of food, and attachment anxiety was significantly correlated with control over eating. No significant correlations were found between attachment and weight loss at 6 months follow up.

Conclusion: A potentially causal relationship between attachment and obesity is discussed, as well as the implications for clinical psychology in bariatric services.
Acknowledgements

Many people have supported me and contributed to my development throughout the clinical training process. I would like to thank all my placement supervisors, Dr John McMaster, Joanne Morris-Smith, Dr John Burns, Julie Lloyd, and Dr Andrew Mitchell for their knowledge, experience and encouragement throughout my placements. I would like to thank my MRP supervisor, Prof. Jane Ogden for her support and sharing of invaluable knowledge throughout this project. I would also like to thank Dr. Arnedia Hollywood for her informal supervision and reassurance through this process. I also am grateful to the course team for their teaching and feedback throughout my development as a Clinical Psychologist, especially to my Clinical Tutor, Louise Deacon, and Honorary Clinical Tutor, Fiona Goodwin. Finally, I would like to thank my friends and family for their relentless patience and encouragement over the last three years.
<table>
<thead>
<tr>
<th>Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRP empirical paper</td>
<td>5</td>
</tr>
<tr>
<td>MRP empirical paper appendices</td>
<td>63</td>
</tr>
<tr>
<td>MRP proposal</td>
<td>109</td>
</tr>
<tr>
<td>MRP Literature review</td>
<td>127</td>
</tr>
<tr>
<td>Summary of Clinical Experience</td>
<td>177</td>
</tr>
<tr>
<td>Table of Assessments</td>
<td>180</td>
</tr>
</tbody>
</table>
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Abstract

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Keywords: Attachment, bariatric, obesity, eating behaviour, quantitative
Statement of journal choice

This research has been written with the intent of submission to a journal such as Psychology, Health and Medicine using the guidelines for authors (see appendix A). This journal has an international multi-disciplinary audience of psychologists and health care providers, such as doctors and social workers. The journal aims to highlight human factors in health and provides a peer-reviewed forum for issues of psychology and health in practice. It offers a critical forum to examine the wide range of applied health and illness issues and incorporates psychological knowledge, understanding, theory and intervention. The journal aims to reflect and contribute to the recognition of psychosocial issues as they impact health planning and intervention, as well as reflecting on adjustment to and management of health issues. The journal states that it aspires to focus on practical applications of theory, research and experience, providing a bridge between academic knowledge, illness experience, wellbeing and health care practice.
Introduction

The increase of obesity

Eating-related problems have been on the rise in the UK, particularly obesity. Currently, the most common method of measuring obesity is the Body Mass Index (BMI), calculated by dividing a person’s weight measurement in kilograms, by the square of their height in metres. In adults, a BMI of 30kg/m² or above is considered to be obese. In a report published in 2012, the Department of Health estimated that just over a quarter of adults (26% of both men and women) were obese, and 42% of men and 32% of women were overweight according to data collected in 2010. The report estimates that there has been a marked increase in the proportion of the population that are classed as obese in the last twenty years, increasing from 13.2% in 1993 to 26.2% in 2010 for men, and from 16.4% to 26.1% for women. Obesity has been seen as an important public health issue worldwide for the last two decades, and contributes to serious health problems and extensive economic costs (Bray, 2004). The problem of obesity has been explored in terms of its causes and possible treatment. These will now be described with a particular focus on the potential role for attachment style.

Causes of obesity

The cause of obesity is recognised to be multifactorial; encompassing genetics, nutrition, and physical activity (Fishbein, 2001). It is well documented that obesity develops when energy intake exceeds energy expenditure over a prolonged period of time, leading to an accumulation of body fat (Prentice & Jebb, 1995). There is now a greater medical knowledge around energy balance impacts that might help understanding why some individuals may be more prone to developing obesity, and it is agreed that both genetic and
environmental factors contribute. It is widely agreed that the increasing weight of the population is an appropriate biological response to an abnormal environment, characterised by the easy availability of cheap, energy-dense food coupled with a decline in physical activity levels (UK National Auditors Office, 2001).

Research has also addressed the role of the family in the development of both obesity and eating disorders. For example, some studies have highlighted the role of parenting style, and indicate that eating disorders may be linked to family dynamics such as enmeshment and criticism; Johnson, Cohen, Kasen and Brook (2002) highlighted that maladaptive paternal behaviour may play a particularly important role in the development of eating disorders, and that childhood adversities may contribute to greater risk for the development of eating disorders in early adulthood. Other studies have focused on parental control; Brown and Ogden (2004) suggest that a positive parental role model may be helpful for improving a child’s diet, and that those children whose parents indicated a greater use of food as a means to control their child’s behaviour reported higher levels of body dissatisfaction. One area which has received much interest over the past few decades is the role of attachment style on behaviour, with researchers arguing that attachment styles are related to the onset of a number of psychological problems both in childhood and later life, including those relating to eating behaviour.

**Attachment**

Attachment theory, developed by Bowlby (1988), suggests that infants are born with attachment behaviours which aim to seek and maintain proximity to attachment figures. This
seeking is an inborn affect-regulation device, which is designed to protect an individual from physical and psychological threats, and to alleviate distress (Mikulincer, Shaver & Pereg, 2003). Bowlby (1988) claimed that the successful accomplishment of these affect-regulation functions results in a sense of attachment security, in which the individual feels that the world is a safe place, that one can rely on protective others and engage with them, and that one can comfortably explore the environment. Bowlby assumed that attachment style remains active over the entire life span and is demonstrated through thoughts and behaviours related to support seeking throughout that period.

If an individual is seen to have a “secure attachment”, it is intimated that they will have positive expectations about others’ availability, positive views of the self as competent, and that major affect-regulation strategies are organised around these positive beliefs (Mikulincer, Shaver & Pereg, 2003). However, an “insecure attachment” style is formed when significant others are unavailable or unresponsive, or proximity seeking fails to relieve distress. As a result, negative representations of self and others are formed, such as concerns about self-worth, and strategies of affect regulation other than proximity seeking are developed. From these experiences, an individual will develop an attachment style; a pattern of relational expectations, emotions, and behaviours that result from the internalisation of the history of attachment experiences and consequent reliance on a particular strategy of affect regulation (Fraley & Shaver, 2000; Shaver & Mikulincer, 2002). Therefore, attachment style is seen to be one of the major sources of variation in strategies of affect regulation (Mikulincer, Shaver & Pereg, 2003).

The inability to regulate emotion has been linked to attachment style in numerous studies (Brenning, Soenens, Braet, & Bosmans, 2012; Karreman & Vingerhoets, 2012;
Zimmerman, 1999), and has been linked to a number of psychological disorders such as addictions (Padykula & Conklin, 2010), depression and anxiety (Jinyao et al., 2012), and post-traumatic stress disorder (Beniot, Bouthillier, Moss, Rousseau & Brunet, 2010). This inability to regulate emotion has also been demonstrated within eating pathology (Tasca, et al., 2009). This has led to the exploration of attachment in relation to the development and treatment of eating disorders. Previous research has indicated that those with eating disorders experience higher levels of attachment insecurity (Ilting, Tasca, Balfour & Bissada, 2010); if an individual has a limited sense of security, they may utilise food and eating behaviour to regulate distressing emotions. Tasca, Ritchie and Balfour (2011) suggest that a number of individuals with eating disorders do not benefit from conventional treatments, and propose that this is due to factors such as affect intolerance, interpersonal problems and clinical perfectionism. They highlight that these factors are also common within attachment theory. Tasca et al. (2011) go on to suggest that the awareness of an individual’s attachment style enables the patient to have specific treatments with the aim to reduce dropout rates; such as those with high attachment anxiety being offered a psychodynamic approach to focus on interpersonal difficulties (Tasca et al., 2006), rather than a behavioural intervention.

The relationship between attachment and obesity

Despite the links demonstrated between attachment and eating disorders, relatively little research has been conducted in relation to obesity, with much of this taking place within the last six years. There is research in this field that has considered the role of emotional eating and obesity (Chesler, 2012), yet has not explicitly connected emotional eating as being a symptom of an insecure attachment style. It is likely that the marrying of these two research areas would present a richer picture regarding the relationship between attachment and
obesity. Furthermore, articles such as by Chesler (2012) underline the current disconnection between the findings in this area, and its lack of implementation in clinical services. This highlights that this is a relatively new area of research, and is therefore likely to have a number of gaps within the current literature.

The previous research has consisted of both longitudinal and cross-sectional designs, and indicates that there is some stability in the path to obesity between childhood and adulthood (Eriksson, Forsén, Tuomilehto, Osmond & Barker, 2001; Freedman Kettle Khan, Serdula, Dietz, Srinivasan & Berenson, 2005). Much of the limited literature surrounding attachment and obesity has recruited child and adolescent populations. In their study of 8 to 11 year olds, Goossens, Braet, Van Durme, Decaluwe, and Bosmans (2012) concluded that insecure attachment toward the mother predicted increases in dietary restraint, eating, weight, and shape concerns, and an adjusted BMI in the children one year later. An insecure attachment toward the father was predictive of the children’s binge eating episodes. Similarly, a longitudinal study conducted by Anderson, Gooze, Lemeshaw, and Whitaker (2012) focused on maternal-child relationships and onset of adolescent obesity. They concluded poor quality relationships were associated with obesity, but that low maternal sensitivity was a particular risk factor.

However, with the increasing awareness of obesity and interventions being widely publicised (Department of Health, 2012), this pattern of stability between childhood and adult obesity ought to not be assumed, and therefore cross sectional studies that predict a path of obesity should be read with caution. It is possible that the increased uptake of obesity interventions within public health will significantly alter this path in future research data.
Attachment and increased BMI

Within previous literature, the links between attachment and an increased BMI have also have been explored; Cooper and Warren (2011) demonstrated that negative parental discipline was a unique predictor of high BMI scores, and therefore concluded that parenting style may be related to a higher body weight in children. Additionally, Bosmans, Goossens, and Braet (2009) found that attachment to each parent influenced individuals in different ways, with attachment to the mother being linked to weight and shape concerns, and attachment to the father being linked to weight concerns only. Furthermore, a preoccupied and fearful attachment style was correlated with higher shape concerns. The authors highlight the need for attachment style to be taken into consideration when planning treatment for such children. This finding is supported by Stenhammer et al. (2010) who investigated the impact of family stress and attachment style on the BMI of young children. They concluded that insecure attachment to either the father or mother was associated with being overweight, with maternal attachment also being associated with being underweight in the children. Parental stress, particularly maternal stress, was associated with increased BMI. In addition, Wilkinson, Rowe, Bishop & Brunstrom (2010) explored the relationship between BMI, disinhibited eating, and attachment anxiety. They suggest that attachment anxiety may explain differences in BMI through the tendency to engage in disinhibited eating, which would then lead to a higher BMI. Using multiple regression, significant relationships were found between BMI and attachment anxiety, and between disinhibited eating and BMI. In addition, further analysis showed the mediating variable of disinhibited eating to be significant in the relationship between BMI and attachment style.

Several studies have considered the role of emotional eating and how overeating in response to emotional state places an individual at risk of obesity. Rommel, Nandrino,
Ducro, Andrieux, Delecourt, & Antoine (2012) investigated the hypothesis that obese women will have deficits in emotional awareness and therefore use eating to regulate emotion. The results indicated that obese patients have reduced emotional awareness in comparison to the control group, and more often use emotional eating to regulate their emotions. This study also identified a significant relationship between parental attachment and emotional awareness in obese patients. Furthermore, Holland, Dallos and Olver (2011) investigated the relationship between obesity and attachment using qualitative methods, and concluded that complex, conflicted family relationships have influenced the participant’s attachment styles, with a reliance on food as a coping mechanism. The authors highlighted that these individual attachment behaviours need to be considered when planning for BMI interventions.

**Obesity interventions**

Obesity is currently treated through pharmacological agents, low calorie diets, behaviour modification, exercise, and surgery (McTigue, et al., 2003). The majority of obese patients are managed through behavioural inventions, most of which target both physical activity and nutritional behaviours (Sharma, 2012), which may include dietary advice, behavioural skills training, self-monitoring and relapse prevention (Ogden, Clementi & Aylwin, 2006). The National Institution of Clinical Excellence (NICE) recommends that multicomponent behavioural weight management programmes are provided to overweight and obese adults in the UK (NICE, 2014), which are to include interventions for diet, physical activity, and behavioural therapy. However, although behavioural interventions have had some success (Dombrowski et al., 2012; Levin, 2007), a number of studies have suggested that as increasing evidence indicates that obesity is not simply a problem of willpower or self-control but a complex disorder involving appetite regulation and energy metabolism (Lang & Froelicher, 2006). As such behavioural interventions alone may not
always be sufficient. The NICE (2014) review of the multicomponent behavioural weight management programmes currently offered in the UK suggests that although such programmes can result in greater weight loss over a 12 to 18 month period than a control intervention, the effectiveness of these programmes varies widely.

Furthermore, behavioural interventions have also been seen to exacerbate problems of eating control (Ogden, 2003; Ogden, Avenell, & Ellis, 2011) and much research indicates that many patients show weight gain of up to 100% after a five year follow up (Magro et al., 2008). As a result, more patients are being considered for bariatric surgery, and this is currently regarded as the most effective form of obesity management for those with a BMI greater than 40 (NICE, 2009). Patients are should also be considered for bariatric surgery if their BMI is over 35 and there significant health concerns, such as type 2 diabetes or sleep apnoea (NICE, 2009).

**Bariatric surgery**

The most common forms of bariatric surgery included the laparoscopic gastric banding (LAGB) and the laparoscopic Roux-en-Y gastric bypass (Tice, Karliner, Walsh, Peterson & Feldman, 2008). These procedures provide a physical limitation to the amount the patient can eat, and therefore reduce the need for the individual to voluntarily restrict their eating behaviour. Through a systematic review, Bachwald, Avidor and Braunwald (2004) conclude that bariatric surgery can result in a 40kg weight loss and improvements or resolution of symptoms of type 2 diabetes, sleep apnoea, and hypertension. This review stated that the average percentage of excess weight loss ranges between 47.5% and 68.2% for those who undergo various bariatric surgeries. Research also suggests that bariatric surgery has positive results in psychological wellbeing and quality of life, as well as improvements in
eating behaviour and weight loss (De Zwann et al., 2002). However, despite the positive findings regarding weight loss following bariatric surgery, weight recidivism is a significant issue for a percentage of the bariatric population. Despite marked weight loss following bariatric surgery, long-term weight regain and failure of sustained weight loss is seen in a percentage of patients; it is estimated that approximately 10–20% of patients regain a significant portion of their lost weight with long-term follow-up (Sjöström, Lissner, Wedel, & Sjöström, 1999). Research to investigate the reasons for this is increasing; Odem et al. (2010) found that behavioural predictors of post-surgery weight gain included increased food urges, concerns regarding addictive behaviours, decreased well-being, fewer post-operative follow-up visits, and lack of self-monitoring. Müller, Mitchell, Sondag and de Zwaan (2013) suggest that bariatric patients who suffer from psychiatric disorders prior to surgery often show a marked improvement post-operatively, however, the authors state that in some cases this improvement appears to decline over time, and these patients may be at risk for the recurrence or development of further psychiatric symptoms.

Bariatric surgery is evidently the most effective weight-loss treatment for those with a BMI over 40; however, further research is needed in this area to increase the consistency of its success rate. Furthermore, it could be argued that the need for greater prevention strategies in order to halt the increase of the “obesity epidemic” should be taking precedence (WHO, 2000).

Summary

Obesity is increasing within the UK, and is recognised to be caused by the current obesogenic environment though changes in eating behaviour and a reduction in physical activity. However, previous research has indicated that there is also a central role for the
impact of family dynamics on weight gain, with a particular role for attachment. Currently, most patients are managed through behavioural interventions, but the most effective form of treatment at present is through bariatric surgery. However, it has been demonstrated that this is not always effective and results in a large variation in weight loss outcomes.

At present, obese patients receive little in the way of psychological support or treatment; even those undergoing bariatric surgery receive limited psychological intervention pre or post-surgery. When considering the previous research, it is clear that attachment style has an impact on the development and onset of obesity and weight gain, and it would therefore follow that, unless the attachment behaviour is modified, interventions for obesity would be more likely to fail. Therefore, further exploration of additional assessment and treatment methods for those with insecure attachment styles, such individual psychotherapy, need to be considered. In the last decade there has been increasing research that has found strong links between attachment behaviours and the success of treatment of eating disorders, yet little has been done to expand this into the area of obesity. Given that there are such prominent links in attachment with the onset of obesity, it is likely that a stable attachment style will then infiltrate any possible treatment intervention. This may disrupt treatment compliance, motivation, and overall success. Therefore, it would be beneficial to explore this further. In addition, there is a need for further investigation regarding the role of attachment in the UK population, and with the use of clinical sample. The exploration of the impact of attachment with the more severely obese may produce especially interesting findings, in particular with those undergoing more invasive interventions such as bariatric surgery patients. The aim of this study was to explore the role of attachment within the bariatric population, and whether it predicts weight loss following bariatric surgery.
Research questions and hypotheses

Primary research question
Are there differences in attachment style between a bariatric patient group and a normal weight control group?

Primary hypothesis
The bariatric patient group will display higher levels of attachment insecurity than the normal weight control group.

Secondary research question
Is there an association between attachment style and beliefs about food or eating behaviour?

Secondary hypothesis
Insecure attachment will be associated with more pathological beliefs about food, and unhealthy eating behaviours.

Additional research question
What is the role of attachment in predicting weight loss at six months post-surgery within the bariatric group?

Additional research hypothesis
Those patients with higher levels of insecure attachment will achieve less weight loss at six months post-operatively.
Method

Design

The study involved both a cross sectional and cohort quantitative design and was embedded within a large randomised controlled trial.

Participants

The study was based within a teaching hospital in the South East of England. This service offers a NHS based bariatric service for obese patients with a BMI of over 40. Patients were recruited into the study from the bariatric clinic if they consented to taking part in the study, were aged 18 or over, had attended the bariatric clinic for a pre-assessment appointment; had been accepted for surgery by the bariatric team, and if they had their funding for surgery agreed (for example, by the Primary Care Trust). Those who had not yet had their funding confirmed were not recruited into the study.

Participants were recruited from the hospital over a 14 month period; in total, 212 patients were invited to participate. Of those asked, 195 participants completed the baseline measures, and 133 patients had surgery completed by the end of the 14 month period. Of these 133, 80 patients had surgery 6 months before the completion of this project and were therefore suitable for inclusion at follow up, and 30 of these returned follow up data of their current weight.

For comparison, a control group of 195 normal weight (BMI of 18-30) individuals were asked to complete a measure of attachment and provide demographic information such as age, gender, weight and height. These participants were recruited using an opportunistic
sampling method through the use of social media. The online questionnaire recruited 360 participants for the control group; these responses were screened and 195 participants were selected based on the need to be matched as closely as possible to those in the bariatric group in relation to age and sex.

**Measures**

The following measures were taken at baseline and can be found in appendix B:

**Demographics**: The participant’s weight and height (to compute BMI) were obtained in the clinic during their pre-assessment appointment. This appointment usually occurred between two and six weeks pre-operatively. This provided the baseline measurement, and was followed up post-operatively at 6 months. Baseline measures of age, sex, ethnicity, and type of surgery were also taken.

**Attachment**: This was assessed using the Experiences in Close Relationships-Revised (ECR-R) Questionnaire (Fraley, Waller & Brennan, 2000). The ECR-R is a 36 item measure, which is a revised version of Brennan, Clark, and Shaver's (1998) Experiences in Close Relationships (ECR) questionnaire. The ECR-R is designed to assess individual differences with respect to attachment-related anxiety (i.e., the extent to which people are insecure vs. secure about the extent to which their partner's availability and responsiveness) and attachment-related avoidance (i.e., the extent to which people are uncomfortable being close to others vs. secure depending on others). It is comprised of 36 items, to which respondents answer on a 7-point scale ranging from 1 “strongly disagree” to 7 “strongly agree”. The commonly cited estimate of internal consistency reliability tends to be 0.90 or higher for ECR-R scale (Sibley, Fischer & Lui, 2004). This study found a cronbach’s alpha of 0.93 for the anxiety scale (18 items), and 0.86 for the attachment scale (18 items).
Beliefs about food: This was assessed in terms of hedonic wanting of food. Hedonic wanting was measured using the power of food scale (PFS) established by Lowe, Butryn, and Didie (2009). The measure comprises 15 items with a five point response ranging from 1 “Don’t agree at all” to 5 “strongly agree”. A high score indicates a greater motivation draw and increased wanting of food to cues in the environment, potentially influencing subsequent eating behaviour. The scale proposes to contain 3 factors; food available, food present and food tasted. This measure was found to have a cronbach’s alpha of 0.94.

Diet and eating behaviour: This was assessed using measures of snack and meals intake that have been used extensively in previous research, such as in Brown, Ogden, Gibson and Vogege (2008). This measure aims to identify the frequency of consumption of particular foods, ranging from “Never” to “More than 3 times a day”. The cronbach’s alpha of this measure is reported to range from .048 to 0.71 (Brown et. al., 2006). For the purpose of this study, only items reflecting the consumption of healthy snacking (8 items) and unhealthy snacking (9 items) were used, as well as methods of healthy food preparation (4 items) and unhealthy food preparation methods (4 items). These items were found to have a cronbach’s alpha of 0.62 for healthy snacking, 0.80 for unhealthy snacking, 0.61 for healthy food preparation, and 0.58 for unhealthy food preparation.

Control over eating: An existing measure of overt control and food preferences used by Ogden, Reynolds and Smith (2006) was included to reflect the ability to control snacking and meal time consumption. It presents a likert scale of 1 to 5, with 1 representing “not at all” to 5 representing “totally”. It has been demonstrated to have a cronbach’s alpha of 0.77-0.80 (Ogden, Reynolds and Smith, 2006). Only items directly related to control over eating, rather
than food preferences were used for this study; these 11 items were found to have a cronbach’s alpha of 0.78.

**Behavioural Intentions:** Patient’s intentions to change their behaviour in the next month were measured using a five point likert scale, ranging from “strongly disagree” to “strongly agree”, and included questions such as “I intend to eat healthier” and “I intend to be more active”. The questionnaire measured three intentions; to diet, lose weight, and exercise.

**Follow up**

Participants were asked to report their weight at three and six months post-surgery.

**Procedure**

The participants were sent an information sheet (appendix C) and consent form (appendix D) two weeks prior to them attending their booked pre-assessment appointment, which was usually two weeks before surgery. On arrival at the hospital, the participants were met by one of the two researchers, who explained the study, obtained consent, and presented the questionnaire pack. The participants were asked to complete the questionnaires during their time at the clinic; most were required to attend a number of appointments over approximately two hours. They then returned the questionnaires to the researcher, and continued with their intervention.

The participants were asked to provide an email address on completion of the questionnaire pack. They were then be contacted via email or letter three and six months after their operation, and asked to report their current weight.
The control group were recruited through social media, using posts on Facebook to provide a link to the Qualtrics website. The questionnaire can be found in appendix E. These online responses were then downloaded and incorporated into the data set.

**Power calculation and data analysis**

All data analysis was conducted using IBM SPSS for Windows, version 22. To calculate differences in attachment, t-tests were conducted to determine the differences in means of the anxiety and avoidance scales of the ECR-R. Correlations were used to explore the interaction of attachment anxiety and attachment avoidance with food preferences, behavioural intentions, control over eating and hedonic wanting of food.

Power calculations were calculated using G*Power software (Faul, Erdfelder, Lang & Buchner, 2007). G*Power enables a priori power analysis to be conducted to determine the required sample size. To determine difference in the means of the attachment between the control and bariatric groups, t-tests will be conducted. To conduct a 2 tailed t-test, with the criterion alpha set at 0.05, a desired effect size of \( d = 0.5 \), and power set at 0.95, G*Power calculated a minimum required sample size of 105 participants per group.

No previous research has directly explored the relationship between attachment and bariatric surgery, several related studies have looked at attachment style and either weight loss or gain. However, it was expected that attachment style would have a small to moderate effect on participant’s response to surgery. It was estimated that with alpha set at 95% and beta set at 0.80, G*Power calculated the study would need 82 participants for a significant effect.
Ethical considerations

All ethical considerations were addressed as per the BPS Code of Ethics and Conduct (2009). Due to the non-invasive nature of this study, the ethical considerations are minimal. The main ethical consideration was the use of the patient’s time whilst they are awaiting a surgical procedure, and their ability to provide informed consent given potential levels of stress. This was avoided by asking the patient’s to participate prior to their surgery date, and by providing detailed information about the study. The participants in this study would not receive any immediate benefit from taking part in the study, as additional psychological support was unable to be offered, however, it is hoped that the results of the study may provide evidence for this to be increased for future patients.

Informed consent was gathered from each participant and an information sheet was provided to allow participants to be assured of confidentiality and data protection. The participants were reassured that their provision of treatment would not be altered on the basis of the results of their data, and that the data is for research purposes only. The storage of data will be in accordance with the Data Protection Act (1984).

All participants were provided with the contact details of the lead researcher of the larger RCT, should they wish to withdraw their data at any time. The participants were advised to seek support from their GP or the bariatric team that they are engaged with should any additional questions or concerns arise as a result of completing the measures.

No conflicts of interest have been foreseen. Due to this study being incorporated into a previous study being conducted by Dr. Amelia Hollywood and Prof. Jane Ogden, NHS
ethical approval had been obtained (appendix F). The wider project has been approved by the University of Surrey ethics committee (appendix G).
Results

Data Analysis

All data was analysed using the IBM SPSS version 22 statistics package. The data was screened for normality (see appendix H) and was found to be normally distributed. The following statistical tests were conducted.

1. Participant profile characteristics for the bariatric and control groups were described using descriptive statistics. The differences in profile characteristics between the bariatric and control groups were compared using t-tests and chi square analyses.

2. The bariatric and control groups were compared on their attachment anxiety and attachment avoidance ratings using t-tests.

3. The association between the bariatric patient’s attachment ratings and baseline eating behaviours was explored using correlations.

4. The profile characteristics of the responders and non-responders at the six month post-surgery follow up time were explored using t-tests and chi square analyses.

5. The role of attachment in predicting weight loss six months after surgery was also explored using correlations.

1. Participant profiles and comparison of groups

The bariatric group consisted of 195 patients. The characteristics of the bariatric group are provided in table 1. The results showed that the majority were female, white, and had a range
of educational background. Differences between the bariatrics and control groups are shown in Table 2. The control group consisted of 42 males and 153 females, with an age range of 18 to 70, and a mean age of 38.33 (SD = 11.04). In comparison, the bariatric group consisted of 41 males and 154 females, with an age range of 21 to 68, and a mean age of 43.52 (SD = 11.93).
Table 1.

Profile characteristics of the bariatric patient group (n=195)

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<td>White</td>
<td>149</td>
<td>76.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>10</td>
<td>5.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>17</td>
<td>8.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>194</td>
<td>99.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than</td>
<td>4</td>
<td>2.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>secondary</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td>58</td>
<td>29.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>school</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional</td>
<td>71</td>
<td>36.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certificate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree</td>
<td>46</td>
<td>23.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher degree</td>
<td>15</td>
<td>7.7%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No significant differences were found for sex or age but significant differences were found in the BMI of each group as expected. The mean BMI of the control group based on
self-report weight and height was 24.48 (SD = 2.9) with a range of 17.92 to 30.12, in comparison with the mean bariatric group which was 45.69 (SD = 7.26), with a range of 30.35 to 71.91.

Table 2.
Differences in participant profiles between control group and bariatric group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control (n=195)</th>
<th>Bariatric (n=195)</th>
<th>χ² or t</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>M = 42 F = 153</td>
<td>M = 41 F = 154</td>
<td>χ² (1) = 0.015</td>
<td>0.90</td>
</tr>
<tr>
<td>Age</td>
<td>38.33 (11.04)</td>
<td>43.52 (11.93)</td>
<td>t (388) = -4.46</td>
<td>0.18</td>
</tr>
<tr>
<td>BMI</td>
<td>24.48 (2.9)</td>
<td>45.69 (7.26)</td>
<td>t (368) = 37.59</td>
<td>0.00</td>
</tr>
</tbody>
</table>

2. Differences in attachment style between the bariatric group and control group

An independent samples t-test was used to compare the means of both self-reported attachment anxiety between the bariatric group and control group, and self-reported attachment avoidance between the two groups. Both calculations indicated significant differences in the reported attachment behaviours between the bariatric group and the control group. The bariatric group reported lower levels of attachment anxiety than the control group, with a mean score of 2.81 (SD = 0.88), which was found to be statistically lower than the control groups mean score of 3.27 (SD = 1.65) on the anxiety rating (t (361.4) = 4.44, p = 0.00). However, the bariatric group had significantly higher levels of attachment avoidance (t (338.1) = -7.57, p = 0.00) with a mean attachment avoidance score of 3.96 (SD = 0.53), in comparison to the control group who reported a mean score of 3.45 (SD = 0.79).
3. Correlations between attachment style and eating behaviour within the bariatric group

Associations between attachment avoidance and attachment anxiety and eating behaviour were explored using a two-tailed Pearson’s correlation (see table 3).

i) Attachment anxiety: The results that show that attachment anxiety was significantly negatively correlated with reported control over eating and hedonic wanting of food as indicated by the Power of Food Scale. This indicates that higher levels of attachment anxiety are related to an increased wanting of food. Attachment anxiety was not significantly associated with other eating behaviours or food preferences, nor was it related to a patient’s intentions to lose weight, diet or exercise.

ii) Attachment avoidance: Correlations were also conducted to assess the relationship between attachment avoidance and eating behaviour. The results showed a significant positive correlation between attachment avoidance and the Power of Food Scale ratings indicating that higher levels of attachment avoidance are related to an increased wanting of food. No other correlations between attachment avoidance and eating behaviours were identified.

Table 3.

Correlations between attachment anxiety, attachment avoidance and eating behaviours within the bariatric group (n=195)

<table>
<thead>
<tr>
<th>Eating behaviour</th>
<th>Anxiety</th>
<th>Avoidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy snacking</td>
<td>r (193) = 0.060</td>
<td>r (193) = -0.028</td>
</tr>
<tr>
<td></td>
<td>p = 0.404</td>
<td>p = 0.693</td>
</tr>
<tr>
<td>------------------------------</td>
<td>----------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Unhealthy snacking</td>
<td>r (193) = 0.018</td>
<td>r (193) = -0.045</td>
</tr>
<tr>
<td></td>
<td>p = 0.808</td>
<td>p = 0.534</td>
</tr>
<tr>
<td>Healthy food preparation</td>
<td>r (193) = -0.009</td>
<td>r (193) = -0.136</td>
</tr>
<tr>
<td></td>
<td>p = 0.903</td>
<td>p = 0.903</td>
</tr>
<tr>
<td>Unhealthy food preparation</td>
<td>r (193) = -0.009</td>
<td>r (193) = -0.136</td>
</tr>
<tr>
<td></td>
<td>p = 0.903</td>
<td>p = 0.058</td>
</tr>
<tr>
<td>Healthy food preparation</td>
<td>r (193) = 0.038</td>
<td>r (193) = 0.031</td>
</tr>
<tr>
<td></td>
<td>p = 0.601</td>
<td>p = 0.664</td>
</tr>
<tr>
<td>Intention to diet</td>
<td>r (193) = -0.059</td>
<td>r (193) = -0.26</td>
</tr>
<tr>
<td></td>
<td>p = 0.411</td>
<td>p = 0.719</td>
</tr>
<tr>
<td>Intention to lose weight</td>
<td>r (193) = -0.061</td>
<td>r (193) = -0.054</td>
</tr>
<tr>
<td></td>
<td>p = 0.394</td>
<td>p = 0.456</td>
</tr>
<tr>
<td>Intention to exercise</td>
<td>r (193) = 0.011</td>
<td>r (193) = 0.015</td>
</tr>
<tr>
<td></td>
<td>p = 0.884</td>
<td>p = 0.236</td>
</tr>
<tr>
<td>Control over eating</td>
<td>r (193) = -0.159</td>
<td>r (193) = -0.135</td>
</tr>
<tr>
<td></td>
<td>p = 0.026*</td>
<td>p = 0.060</td>
</tr>
<tr>
<td>Hedonic wanting</td>
<td>r (193) = 0.248</td>
<td>r (193) = 0.218</td>
</tr>
<tr>
<td></td>
<td>p = 0.000***</td>
<td>p = 0.002**</td>
</tr>
</tbody>
</table>

*p<0.05, **p<0.01, ***p<0.001

4. Comparisons between responders and non-responders at follow up

Of the 195 participants that completed the baseline measures, 133 patients had surgery completed by the end of the 14 month period. Of these 133, 80 patients had their surgery completed six months before the completion of this project and were therefore suitable for inclusion at follow up. However, only 50 provided their weight by three months
and only 30 provided their weight by six month follow up. Due to this low response rate at the six month time point, a number of chi square analyses and t-tests were conducted to detect any differences in the responders and non-responders. Table 4 describes the differences between these groups; no significant differences were identified in the patient’s sex, baseline BMI, or ethnicity. However, a t-test showed a significant difference in the patient’s age, with those who responded to the follow up being significantly older than those who did not. Furthermore, significant differences were shown in attachment avoidance rating between those who responded to the follow up request and those who did not respond, with those who did respond reporting lower levels of attachment avoidance. In addition, the difference between the two groups reported attachment anxiety is close to reaching significance.
Table 4.

Differences between responders and non-responders at six month follow up

<table>
<thead>
<tr>
<th>Variable</th>
<th>Non-responders (n=165)</th>
<th>Responders (n=30)</th>
<th>$\chi^2$ or t</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>M = 33 F= 132</td>
<td>M = 8 F= 22</td>
<td>$\chi^2$ (1)= 0.679</td>
<td>0.41</td>
</tr>
<tr>
<td>Age</td>
<td>39.53 (12.93)</td>
<td>44.24 (11.63)</td>
<td>t (193) = 2.01</td>
<td>0.05*</td>
</tr>
<tr>
<td>BMI</td>
<td>45.68 (7.43)</td>
<td>45.73 (6.43)</td>
<td>t (173)= -0.03</td>
<td>0.98</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>2.10 (0.66)</td>
<td>2.30 (0.88)</td>
<td>$\chi^2$ (3)= 3.18</td>
<td>0.37</td>
</tr>
<tr>
<td>Education</td>
<td>3.02 (0.68)</td>
<td>3.23 (0.86)</td>
<td>$\chi^2$ (4)= 6.03</td>
<td>0.18</td>
</tr>
<tr>
<td>Attachment</td>
<td>2.86 (0.89)</td>
<td>2.53 (0.77)</td>
<td>t (44.24) = 2.11</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Anxiety

<table>
<thead>
<tr>
<th>Attachment Avoidance</th>
<th>Non-responders (n=165)</th>
<th>Responders (n=30)</th>
<th>$\chi^2$ or t</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachment</td>
<td>3.99 (0.52)</td>
<td>3.79 (0.52)</td>
<td>t (40.45) = 2.02</td>
<td>0.05*</td>
</tr>
<tr>
<td>Avoidance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05, **p<0.01, ***p<0.001

5. Correlations between attachment style and weight loss post-surgery

Correlations were conducted to determine the relationship between attachment anxiety and avoidance with the bariatric patient’s reported weight loss at both three and six months after their surgery. At three months post-surgery, the bariatric patients had lost an average of 28.28kg (SD = 19.95); by six months post-operatively, this had increased to an average weight loss of 32.61kg (SD = 9.34). Table 5 details the level of reported weight loss and BMI at three and six months post-operatively.
Table 5.

Average reported weight loss post-surgery

<table>
<thead>
<tr>
<th>Variable</th>
<th>3 months post-surgery (n=50)</th>
<th>6 months post-surgery (n=30)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Weight loss (kg)</td>
<td>28.28 (19.95)</td>
<td>32.61 (9.34)</td>
</tr>
<tr>
<td>BMI</td>
<td>38.01 (7.40)</td>
<td>34.44 (5.93)</td>
</tr>
</tbody>
</table>

Using a two-tailed Pearson’s correlation, ratings on both attachment scales were not shown to be significantly correlated with weight loss at either time point. Table 6 demonstrates these non-significant results. However, these correlation analyses for predicting weight loss at six month post-surgery, these correlations would only reach power of 0.202 based on a post-hoc G*Power calculation with $r = 0.3$. These results are therefore underpowered.

Table 6.

Correlations between attachment ratings and weight loss post-surgery

<table>
<thead>
<tr>
<th>Attachment scale</th>
<th>Weight loss at 3 months</th>
<th>Weight loss at 6 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>$r (48) = -0.184$</td>
<td>$r (28) = 0.277$</td>
</tr>
<tr>
<td></td>
<td>$p = 0.200$</td>
<td>$p = 0.139$</td>
</tr>
<tr>
<td>Avoidance</td>
<td>$r (48) = 0.063$</td>
<td>$r (28) = 0.233$</td>
</tr>
<tr>
<td></td>
<td>$p = 0.666$</td>
<td>$p = 0.216$</td>
</tr>
</tbody>
</table>
Discussion

The aim of the present study was to explore differences in attachment style between patients undergoing bariatric surgery versus a control group, and to assess associations between attachment and eating behaviour within the bariatric sample. Further, the study aimed to explore the impact of attachment styles on weight loss following bariatric surgery.

Attachment style

The results of this study indicated that the bariatric sample reported more insecure attachment behaviours in terms of higher attachment avoidance compared to the control group. Significant differences in attachment style were found in both avoidance behaviours and anxiety behaviours between the bariatric group and the control group. In particular, the bariatric group indicated significantly higher avoidant attachment behaviours than the control group, whereas they showed lower levels of attachment anxiety than the control group. This would suggest that a large proportion of the bariatric participants would fit into the “dismissing-avoidant” category as defined by Fraley, Waller and Brennan (2000), which is characterised by a pattern of high avoidance and low anxiety attachment behaviours. Diagram 1 shows the interaction of anxious and avoidant attachment patterns.

Diagram 1. Dimensions of attachment defined by Fraley, Waller and Brennan (2000)
In contrast to the findings of this study, previous research has identified higher levels of attachment anxiety in an obese population rather than attachment avoidance (Wilkinson, Rowe, Bishop & Brunstrom, 2010). However, within the obesity literature, few studies actually separate out the interaction of anxious attachment styles and avoidant attachment styles; much of the literature reduces attachment patterns to be either “insecure” or “secure” and concludes that attachment insecurity is related to risk of obesity. The data from the current study would suggest that the interaction of attachment style and obesity is perhaps more complex. Within the eating disorder literature, an avoidant attachment style is deemed to be more prevalent (Latzer Hochdorf, Bachar & Canetti, 2002; Ramaciotti, Sorbello, Pazzagli, Vismara, Manconr & Pallanti, 2001) than an anxious attachment style, however, this is usually seen in relation to restrictive disorders such as anorexia nervosa. This is supported by a recent meta-analysis of attachment and eating disorders conducted by Tasca and Balfour (2014); they conclude that a number of previous studies have identified higher
levels of attachment avoidance within individuals with a range of eating disorders, however, they also present a similar difficulty; few studies have identified the prevalence of a specific insecure attachment category and therefore it is difficult to draw comparisons with previous research.

**Attachment style and eating behaviour**

The study also explored the relationship between attachment styles and eating behaviour within the bariatric sample. The findings indicated that higher levels of attachment anxiety were shown to be predictive of less reported control over eating, as measured by the questionnaire items that elicited an individual’s beliefs about food. This would suggest that attachment anxiety may reduce the ability and success of controlling eating behaviours. This supports the previous research that indicates that obese patients are likely to use food and eating behaviours to regulate their emotions (Rommel et al., 2012) due to attachment insecurity.

Several studies have highlighted the role of emotional eating and binge eating in response to negative emotions (Masheb & Grillo, 2006). Previous research has indicated that those who binge and purge, for example in those with bulimia nervosa, tend to display emotional dysregulation in line with higher attachment anxiety (Tasca & Balfour, 2014) and may engage in uncontrolled eating as a result. In contrast, those who restrict their eating, such as within anorexia nervosa, tend to demonstrate higher levels of avoidant attachment due to a downplaying of affect. Those with higher levels of attachment avoidance often have a dismissing view of the importance of relationships, particularly close relationships. Often, those with higher levels of avoidance can minimise the impact of emotional events and may experience the negative emotions being suppressed (Mukulincer & Shaver, 2012). In
addition, they may experience difficulties in expressing their emotions and forming close relationships with others. As a result, individuals with this attachment pattern may use other means to regulate their emotion, such as though food and eating behaviour (Tasca et al, 2009; Holland, Dallos & Olver, 2011), rather than using strategies such as accessing social and emotional support.

The indication that higher levels of insecure attachment through anxiety behaviours may lead to a decreased sense of control over eating would suggest that, following bariatric surgery, patients with higher levels of anxious attachment may be less likely to modify their control over their eating, if this influence is not addressed. It has previously been suggested that eating disordered behaviour before surgery leads to weight regain post-operatively (Fischer et al., 2007), and that one- to two-thirds of bariatric patients reported vomiting due to difficulty adhering to the dietary guidelines following surgery. Mitchell et al. (2015) concluded that patients with disorders such as binge eating disorder are at risk of the continuation of such difficulties post-surgery, and that this should be addressed pre-operatively. Although a number of studies have examined the interaction of eating disordered behaviour and negative emotion in patients having weight loss surgery (Fischer et al., 2007; Wallfish, 2004), these studies have not linked emotional eating as a method of emotional regulation to attachment style.

Both higher levels of attachment anxiety and attachment avoidance were predictive of increased hedonic wanting of food, as measured by the Power of Food Scale (PFS). A high score on the PFS indicates greater motivational draw and increased wanting of food in response to cues in the environment, which is thought to then influence eating behaviour. The scale proposes to contain three factors: food available, food present, and food tasted. This
correlation is hypothesised to be due to those with higher attachment avoidance and anxiety finding it more challenging to regulate their emotions, and therefore finding it harder to control urges, such as resisting food when presented to them.

This key finding is of particular interest owing to this specific client group of obese patients awaiting bariatric surgery. This surgery requires significant life alterations in order for it to be both successful and safe; the patient’s stomach and digestive organs are physically altered in order to restrict their food intake. If, as shown, attachment style has an influence on the motivational draw and increased wanting of food, it would follow that a patient is more likely to struggle with resisting this wanting of food, if the underlying factors and influences, such as emotional regulation difficulties owing to insecure attachments, are not addressed.

Further correlations demonstrated that attachment style was not shown to significantly impact an individual’s choice of food, or their method of food preparation. However, these scales were shown to have low alpha levels, which suggests that they may not be a reliable measure of eating behaviours. It was also not shown to significantly impact the bariatric group’s intentions to improve their diet, lose weight, or exercise more. However, this would not have been expected given that these patients were asked these questions within a bariatric clinic whilst awaiting a weight-loss surgical procedure; each of these subscales achieved a mean score of at least four, with one indicating no intention and five indicating a strong intention.

**Attachment style, weight loss and follow up**

Correlations between attachment anxiety and avoidance and weight loss at three and six months post-surgery were non-significant, however these calculations were shown to be
underpowered. Only 30 patients participated at the six month follow up, owing to large participant dropout rates and a limited number of operations being completed during the allocated time frame. As a result, this study did not have the statistical power to identify whether attachment style is associated with weight loss six months post-surgery.

However, it has previously been indicated that due to the inevitable ill health following major surgery (Bachwald, 2002), bariatric patients show a similar level of weight loss in this first phase post-surgery. Previous research has indicated that individual differences in weight loss and weight regain do not emerge until at least one year post-surgery; reputable journals such as Obesity Surgery or the International Journal of Obesity will not accept articles that use weight loss as an outcome before one year post-surgery. Due to the scope and time frame of this project, it was not possible to collect this data 12 months post-operatively, however it is recommended that this is explored further with a larger sample size and longer follow up period.

However, this study did identify significant differences in attachment style between those who did continue their participation in the research. Those who provided follow up data had significantly lower attachment avoidance scores, and differences in attachment anxiety were also close to significant differences, indicating lower levels of attachment anxiety. It is possible that those who present with higher attachment avoidance may become distressed when required to report their eating behaviours and weight loss post-surgery, and therefore suppress this experience and emotion by dropping out of the study. Although there are likely to be a number of reasons for why participants chose to drop out of a research study, attachment style may have implications for treatment compliance post-surgery; previous research has demonstrated that higher levels of avoidance is associated with increased risks of dropping
out of treatment for eating disorders (Tasca et al., 2009). It would be interesting for further research to explore the impact of attachment on compliance with dietary and exercise regimes following surgery within the bariatric population.

In summary, the findings of this study indicate that avoidant attachment behaviours are higher in those undergoing bariatric surgery, whilst anxious attachment behaviours are lower than in the control group. This may well be a causal relationship to obesity, given that the results show an association between attachment style and eating behaviours which may lead to obesity and weight gain. It is likely that an individual’s inability to feel in control of their eating may be a result of unsuccessful attempts to regulate their negative emotions; the use of insecure attachment behaviours such as a reluctance to seek social support to manage these emotions may lead to overeating in order to avoid these emotions. It is therefore possible that attachment style could also impact successful weight loss following surgery. Although this study did not find this association between attachment and weight loss to be significant, these results were shown to be underpowered.

Limitations of the study

This study has a number of limitations. Due to a Serious Untoward Incident (SUI) in the early stages of data collection, a number of operations were cancelled resulting in a lower number of participants being recruited. Due to the time restraints of the Major Research Project and PsychD programme, little could be done to increase the sample pool due to this being a highly specialised NHS client group. However, a large number of patients were recruited into the study, with 212 patients consenting to take part, and 195 participants providing data at the baseline time point. Despite this initial large sample, the follow up response rate was much lower than expected. A higher than expected number of operations
were cancelled, most likely due to necessary increased precautions following the Serious Untoward Incident. This resulted in a maximum of 80 participants receiving surgery and therefore being available for follow up. Of these, only 50 and 30 responded to the request to complete the questionnaires at the second and third time points respectively. Due to these participants being NHS patients from a wide geographical area, little could be done to increase this response rate.

The use of questionnaires

It is important to note that the measures of eating behaviour and attachment were based on self-report assessments rather than interviews. Due to the questions being administered within the bariatric clinic in-between appointments with health professionals, it is possible that the participants felt an element of expectation to report healthier behaviours. It is conceivable that demand characteristics may have been present in the completion of the questionnaires; the questionnaire pack was administered by two females, both in the ‘normal’ BMI weight range. It is widely noted that there is a great deal of shame surrounding obesity (Conradt, Dierk, Schlumberger, Rauh, Hebebrand, & Rief, 2008), and an awareness of who would view the participant’s responses may have influenced the responses. For example, participants may have underreported the frequency of eating fattening or unhealthy foods, in fear of judgment from the researchers. Furthermore, this may also have influenced responses at both the three and six month follow-up; participants may feel a sense of obligation to demonstrate changes in their food and exercise habits following surgery. The requirement that these follow up questionnaires were completed from the participants home, either online or returned by post, may have enabled the clients to overestimate their perceived level of change. However, it is also possible that this anonymity and lack of presence of the
researcher may have enabled the participants to be more honest if they were struggling with their post-surgery regime.

Furthermore, it is possible that due to the attachment measure being placed at the end of the questionnaire pack, participants may have become disinterested or bored. It is possible that the participants may have been more contemplative if they had completed the attachment measure first, and provided more thought through answers. Also, as the participants completed the questionnaire pack whilst waiting for their various appointments, it is possible that by the time they reached the end of the questionnaire pack, they had finished their appointments and were rushing to finish the measures.

In terms of measuring attachment, self-report measures in general have been criticised for being passive, as attachment theory states that attachment behaviours need to be activated, often by stressful situations (Mikulincer & Shaver, 2003). In addition, Ravitz, Maunder, Hunter, Sthankiya, and Lancee (2010) highlight that self-report measures focus on the views that individuals currently hold about themselves and others, and therefore may not detected a stable attachment style.

Measuring attachment

The difficulty in accurately measuring an individual’s attachment style has been documented in the literature. There is an assumption that attachment style remains relatively stable over time (Mikulincer & Shaver, 2003), however, the display of symptoms linked to attachment style is likely to fluctuate throughout the lifespan, such as during times of stress and through older age (Van Assche, Luyten, Bruffaerts, Persoons, van de Ven, & Vandenbulcke, 2013). Therefore, cross-sectional research may not be an inaccurate
representation of the relationship over the lifespan, and provide an inaccurate picture of the interactions between attachment and other constructs. Due to this, the use of the ECR-R measure could be seen as a limitation of the current study; it would have been preferable to use the more reputable measure of the Adult Attachment Interview (Ravitz, Mаunder, Hunter, Sthамиkiya, and Lancee, 2010). However, due to the need for training and the time needed to conduct such in-depth, personal interviews, this was not possible for this project. However, if this had been conducted, stronger links between attachment and the outcome of surgery may have been found, as difficulties in attachments and relationships may have been identified in the interview which the ECR-R is not sensitive enough to detect.

The variability within previous research highlights the difference in preference for attachment measures. Ravitz et al. (2010) conducted a review of the measurement of attachment over the last 25 years, and concluded that the Adult Attachment Interview (George, Kaplan, and Main, 1985) is still considered to be the gold standard in the measures of attachment, but due to the need for training, time and resources to administered it, less time consuming self-report measures have been developed. Ravitz et al. identified 29 different measures of attachment, and highlighted the need for the consideration of what relationship the focus (for example, romantic partner or parents) and what attachment constructs, dimensions, or categories are of specific interest.

In addition to this, a number of researchers have contested the ability to categorise individuals into Ainsworth’s (1978) previously identified three organized patterns of attachment (secure, avoidant, and anxious/ambivalent) through self-report measures. Therefore, several authors have broken the type-descriptions into agree-disagree items, factor-analyised the items, and turned them into continuous scales of attachment avoidance and anxiety (Bartholomew, 1990). Measures such as Brennan, Clark, and Shaver's (1998)
Experiences in Close Relationships (ECR) questionnaire, and the revised version by Fraley, Waller and Brennan (2000) which was used in this study, plot an individual’s attachment traits on these anxiety and avoidance dimensions, as opposed to placing them within a category. However, measures such as the Attachment History Questionnaire offer a composite score of attachment. As a result, drawing comparisons between these different approaches to measuring attachment and discussing these findings in the light of other research should be carried out with caution.

Co-morbidity

This study did not include a measure of mood or any measures of psychopathology. Previous research has highlighted the impact of co-morbid disorders such as anxiety, depression, and eating disorders within obesity studies. For example, D’Argenio, Mazzi, Pecchioli, Lorenzo, Siracusano and Troisi (2009) explored the link between obesity and childhood physical or sexual abuse in their cross sectional study, concluding that the severity of early trauma was a significant predictor of adult obesity. Furthermore, Mayer, Muris, Meesters and Zimmerman –van Beuningen (2009) concluded that attachment and social anxiety had an indirect relationship to BMI and eating problems, whereas depression and self-esteem had a direct relationship to eating behaviour.

The interaction of these psychopathologies with attachment style and the development of obesity should be considered, as it is a limitation of much of the previous literature and the current study. It has been previously demonstrated that obese individuals often suffer with co-morbid disorders such as depression and eating disorders including binge-eating disorder and bulimia nervosa, and such disorders have also been explored in relation to attachment. However, due to this high percentage of co-morbidity, it is understandable why this is often not separated or used as exclusion criteria, due to it resulting in a significantly smaller sample.
pool. In addition, there is the ethical difficulties managing the depressive symptoms once they are acknowledged (Keiswetter et al, 2010), particularly within a non-clinical sample.

**Implications for clinical psychology**

This study demonstrates that the frequency of an insecure attachment style is higher in this particular morbidly obese population when compared to the general population. This is in line with previous research; a large meta-analysis of over 10,000 Adult Attachment Interviews (Bakermans-Kranenburg and van Ijzendoorn, 2009) concluded that within a non-clinical adult population, 58% of people demonstrated a secure attachment style, 23% were dismissing (avoidant), and 19% were preoccupied (anxious). In comparison, a clinical sample showed an over-representation of insecure attachment styles.

Given the high psychiatric comorbidity in this patient group (Keiswetter et al., 2010; Cooper & Warren, 2009), most bariatric surgery settings require a preoperative psychiatric assessment in order to identify potential psychosocial factors that may negatively impact post-surgery weight loss, and to evaluate the patient’s appropriateness for bariatric surgery (Ritz, 2006; Aarts, Hinnen, Gerdes, Acherman & Brandjes, 2014). This assessment is usually conducted within the bariatric clinic, using face to face interviews and questionnaires. Although psychological disorders or distress is not a necessarily a contraindication for bariatric surgery, there can be psychological reasons for denying clearance for surgery; for example the presence of acute or inadequately managed mental illness such as psychotic symptoms, active substance abuse, bulimia nervosa, untreated depression or suicidal ideations (Bauchowitz et al., 2005; Walfish, Vance, & Fabricatore, 2007).
This is not to say that an insecure attachment style should be also be a contraindication for bariatric surgery, rather, it may be useful to recommend that patients receive additional psychological support whilst they transition to a healthier lifestyle and implement their diet and exercise changes. It has been hypothesised that the insecure attachment behaviours that are displayed by those who are obese, such as overeating and binge eating are related to the inability to regulate emotions (Holland, Dallos Olver, 2011; Wilkinson, Rowe, Bishop & Brunstrom, 2010). This is thought to be due to the lack of an internal secure base, and therefore this is located externally through the consumption of food. Through the necessary reduction of such eating behaviours as a result of their bariatric surgery, such as the need to follow a liquid diet post-surgery, this also removes the current attachment behaviours which are used to regulate emotions. As a result, an individual may lose their primary coping strategy for managing stress and challenging emotions. This is likely to leave a patient feeling overwhelmed and unable to cope. Therefore, it is necessary to replace the maladaptive emotional regulation strategies, such as overeating, with strategies that are more in line with a secure attachment, such as seeking social support.

Previous research has indicated that an individual’s attachment style can shift over a period of time (Howard, 2011), often either as result of a positive relationship or through a psychological intervention such as long term psychotherapy. It is unrealistic to suggest that the NHS provides this type of intervention to those having bariatric surgery; it is beyond the scope of the time limited therapies currently offered to NHS patients to anticipate a marked change in attachment style. However, the expanding provision of Improving Access to Psychological Therapies (IAPT) programme does make psychological therapy more accessible for the general population. In recent years, IAPT has expanding from offering short term Cognitive Behavioural Therapy (CBT) to now including Interpersonal Therapy
(IPT), and systemic therapies such as family and couple therapy. In addition, therapies with a psychodynamic origin such as Cognitive Analytic Therapy are also available in some settings; this therapy addresses the reciprocal roles that individuals often engage in, and can increase awareness of the relational patterns present in a client’s life (The Association for Cognitive Analytic Therapy). It is likely that engagement with therapy may be enough to begin to shift these relational patterns, and potentially lessen a number of insecure attachment behaviours. Previous research suggests that, regardless of the model of therapy used, the therapeutic alliance between a therapist and client is the most significant predictor of a positive therapeutic outcome (Rosenzweig, 1937; Shedler, 2010). This is thought to be due to the reparative value of the therapeutic relationship; the experience of having a consistent, containing relationship with a therapist can then expand out into wider social relationships. It is therefore possible that a range of psychological therapies may impact an individual’s attachment style.

This study indicates that an individual’s attachment style may have an impact on their compliance with bariatric surgery outcomes. Therefore, it may be beneficial for bariatric services to consider an individual’s attachment style in their psychological assessment for a patient’s psychological ability to cope with the demands of the lifestyle changes that are imperative following bariatric surgery. This study also has implications for theory and research; additional research would be beneficial to explore the longer term interaction of attachment and weight loss following bariatric surgery. Research with the capacity for a longer follow up time and larger post-surgery sample may produce interesting results to further explore the impact of attachment style on weight loss post-surgery. Furthermore, it would be of interest to investigate the relationship between attachment style and the ability to
exercise control over eating, to assess how this differs between normal weight and obese individuals.

**Conclusion**

In conclusion, this study indicates that levels of avoidant attachment style are higher in those who are obese and undergoing bariatric surgery. In contrast, levels of anxious attachment style are lower in the obese population than individuals with a normal range BMI. This research suggests that there may well be a causal relationship between attachment and obesity. Further, the results also showed a significant association between attachment style and eating behaviours which may lead to obesity and weight gain. Accordingly, it is argued that avoidant attachment may cause overeating as a means to regulating emotion, which in turn causes weight gain. It could also be argued that this would impede weight loss following bariatric surgery; however, this was not found in the present study, possibly due to a problem with power. The findings of this study have clinical implications for the potential need for therapeutic intervention for bariatric patients as part of their procedure; considering the impact of an individual’s attachment style on their eating behaviour and supporting them to modify their attachment behaviours may result in a more successful weight loss outcome post-surgery.
References


Benoit, M., Bouthillier, D., Moss, E., Rousseau, C., & Brunet, A. (2010). Emotion regulation strategies as mediators of the association between level of attachment security and PTSD.


MRP Empirical Paper Appendices

Appendix A. Guidelines for authors
Appendix B. Questionnaire pack for bariatric participants
Appendix C. Information sheet for bariatric participants
Appendix D. Consent form for bariatric participants
Appendix E. Qualtrics questionnaire for control participants
Appendix F. Confirmation of NHS favourable ethical opinion
Appendix G. Confirmation of University of Surrey favourable ethical opinion
Appendix H. Normality of data
Appendix A. Guidelines for authors
Advice to authors on preparing a manuscript

NB: Please follow any specific instructions for authors provided by the Editor of the journal.

Font: Times New Roman, 12 point. Use margins of at least 2.5 cm (1 inch). Further details of how to insert special characters, accents and diacritics are available here.

Title: Use bold for your article title, with an initial capital letter for any proper nouns.

Authors' names: Give the names of all contributing authors on the title page exactly as you wish them to appear in the published article.

Affiliations: List the affiliation of each author (department, university, city, country).

Correspondence details: Please provide an institutional email address for the corresponding author. Full postal details are also needed by the publisher, but will not necessarily be published.

Anonymity for peer review: Ensure your identity and that of your co-authors is not revealed in the text of your article or in your manuscript files when submitting the manuscript for review. Advice on anonymizing your manuscript is available here.

Abstract: Indicate the abstract paragraph with a heading or by reducing the font size. Advice on writing abstracts is available here.

Keywords: Please provide five to six keywords to help readers find your article. Advice on selecting suitable keywords is available here.

Headings: Please indicate the level of the section headings in your article:

- First-level headings (e.g. Introduction, Conclusion) should be in bold, with an initial capital letter for any proper nouns.
- Second-level headings should be in bold italics, with an initial capital letter for any proper nouns.
- Third-level headings should be in italics, with an initial capital letter for any proper nouns.
- Fourth level headings should also be in italics, at the beginning of a paragraph. The text follows immediately after a full stop (full point) or other punctuation mark.

Tables and figures: Indicate in the text where the tables and figures should appear, for example by inserting [Table 1 below here]. The actual tables and figures should be supplied either at the end of the text or in a separate file as requested by the Editor. Ensure you have permission to use any figures you are reproducing from another source. Advice on artwork is available here. Advice on tables is available here.

Running heads and received dates are not required when submitting a manuscript for review.

If your article is accepted for publication, it will be copy-edited and typeset in the correct style for the journal.

If you have any queries, please contact us at authorqueries@tandf.co.uk, mentioning the full title of the journal you are interested in, or see our Author Services homepage.
Appendix B. Questionnaire pack for bariatric participants

(Please note – questions used for this MRP are highlighted in yellow. Additional questions were required for the wider RCT).
Confidential Questionnaire

Standard questionnaire

Baseline

The impact of an investment based intervention in bariatric patients.

Version number: 1

18-6-13

Participant number:

Investigators: xxxxxxxxxxx.

Contact details:

Dr. XXXXXXXXXXX
School of Psychology
University of Surrey
Guildford. GU2 7XH
01483 xxxxxxxx
xxxxxxxxxxx@surrey.ac.uk
We are interested in your experiences of undergoing bariatric (obesity) surgery. We would be grateful if you could answer the following questions as honestly as possible. All answers will be treated with the strictest confidence. Please remember that there are no right or wrong answers we are only interested in your views.

Please answer ALL questions

Section 1: The first questions are about you.

Are you: □ Male □ Female

How old are you? ____________ (years)

Which of the following best describes you: □ Black □ Asian
□ White □ Other

Are you: □ Living Alone □ Co-habiting (living with a partner/family/friends)

How tall are you? _______________ (specify metres or feet and inches)

What is your current weight? ________________ (specify kg, lb or stone)

Level of Education: a) less than Secondary school □
                    b) Secondary school □
                    c) Professional certificate (e.g. NVQ) □
                    d) Degree □
                    e) Higher degree □

Do you work? □ Full time □ Part time □ I am a full time parent □ I am not working at the moment □

What type of surgery are you having? ________________________________________

(Eg Gastric band, RYGB, Sleeve)

Section 2: The following questions are about your diet, exercise and health over the PAST WEEK.

These questions are about activities you might do during a typical day. Over the PAST WEEK has your health limited these activities? If so how much?

<table>
<thead>
<tr>
<th>Activity</th>
<th>No, not limited at all</th>
<th>Yes, limited a little</th>
<th>Yes, limited a lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vigorous activities such as running, lifting heavy objects, participating in strenuous sports</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Moderate activities such as moving a table, pushing a vacuum cleaner, bowling or playing golf</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Lifting or carrying groceries</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Climbing several flights of stairs</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Activity</td>
<td>No, not limited at all</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>------------------------</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Climbing one flight of stairs</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Bending kneeling or stooping</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Walking more than a mile</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Walking half a mile</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Walking 100 yards</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Bathing and dressing yourself</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Over the **PAST WEEK** how often have you done the following:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Never</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Very Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watched television</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Please, estimate how many hours of television you have watched in the past week  hrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Used the computer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sat reading a book, newspaper or magazine</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taken exercise</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Please, estimate how many hours of active exercise you have done in the past week hrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walked rather than used transport</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Used stairs rather than lifts</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The following questions are about your diet over the **PAST WEEK**:

<table>
<thead>
<tr>
<th>In the past week, how often did you have a serving of the following snacks in between your breakfast, lunchtime and evening meals? (Serving = normal portion for an adult) Please mark one box only for each snack</th>
<th>Never or less than once a month</th>
<th>Less than once a week</th>
<th>Once a week</th>
<th>2-4 days a week</th>
<th>5-6 days a week</th>
<th>Once a day, every day</th>
<th>2-3 times a day, every day</th>
<th>More than 3 times a day, every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>In between meals I snack on....</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fresh fruit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dried fruit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruit juice (not including squashes)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugared squash/still soft drinks (not including fruit juice)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Sugared fizzy drinks</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Whole, semi or skimmed milk</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Sausages, pies or burgers</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Rice cakes or bread sticks</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Chips</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raw vegetables and salad</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potato Crisps (Walkers...)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Savoury snacks (Twiglets, Wotsits...)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Nuts or seeds</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Toast or bread</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Cheese</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Ice cream</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Yoghurt</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
### In between meals I snack on:

| Cakes and other sweet pastries | | | | | |
| Sweet biscuits | | | | | |
| Cereal bars | | | | | |
| Chocolate confectionery (choc. bars...) | | | | | |
| Sugared confectionery (sweets...) | | | | | |

### On average, how often do you have a serving of the following food? Please mark one box only for each food:

<table>
<thead>
<tr>
<th>Never or less than once a month</th>
<th>Less than once a week</th>
<th>Once a week</th>
<th>2-4 days a week</th>
<th>5-6 days a week</th>
<th>Once a day, every day</th>
<th>2-3 times a day, every day</th>
<th>More than 3 times a day, every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foods deep fry in oil/fat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boiled foods</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steamed foods</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry fried foods</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooked meals at home</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Processed foods</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ready meals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Takeaways</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please answer the following questions for how you have felt about your health over the PAST WEEK:

### How would you rate your health? (Please circle)

<table>
<thead>
<tr>
<th>Worst possible</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Best possible</th>
</tr>
</thead>
</table>

### Would you say your health is? (Please circle)

| poor | Fair | good | very good | excellent |

### Section 3: Feelings towards food and eating

The following questions are about you and your thoughts and feelings towards food and eating. Please tick the box that best describes how you have been feeling over the PAST WEEK.

### To what extent have you felt the following in the PAST WEEK?

<table>
<thead>
<tr>
<th>Not at all</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Totally</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In control of your eating</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. That you should eat healthy foods</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>No.</td>
<td>Statement</td>
<td>Not at all</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>------</td>
<td>---------------------------------------------------------------------------</td>
<td>------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>3.</td>
<td>That it is necessary to eat regularly</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>A desire to go out and do new things</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td><strong>That you can manage your eating</strong></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td>That food is a very important part of who you are</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7.</td>
<td><strong>A fear of overeating</strong></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8.</td>
<td>That on the whole you are satisfied with yourself</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9.</td>
<td><strong>A desire to overeat</strong></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10.</td>
<td>Lively</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11.</td>
<td><strong>That you can control what you eat</strong></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Preoccupied with food</strong></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>13.</td>
<td>You are able to do things as well as most people</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>14.</td>
<td>That food is a central part of your life</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>15.</td>
<td>That you must avoid certain foods</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>16.</td>
<td><strong>That you want to binge</strong></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>17.</td>
<td>That you eat frequently throughout the day</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>18.</td>
<td>That you eat small amounts</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>19.</td>
<td>That you must choose your food carefully</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>20.</td>
<td>That you take a positive attitude towards yourself</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>21.</td>
<td>That you have lots of energy</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>22.</td>
<td>That you want to eat low fat foods</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>23.</td>
<td>That you can limit what you eat yourself and not just rely on your stomach</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>24.</td>
<td><strong>That you are controlling what you eat yourself</strong></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>25.</td>
<td>That you want to eat fruit and vegetables</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>26.</td>
<td><strong>That your body is controlling your eating behaviour not your mind</strong></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>27.</td>
<td>That you want to eat healthy foods</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>28.</td>
<td>That you want to eat sweet foods</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>29.</td>
<td>That you want to eat chocolate</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>30.</td>
<td>That you want to eat cakes</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>31.</td>
<td><strong>That you mind is controlling what you eat not your stomach</strong></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>32.</td>
<td>That you want to eat fried foods</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>33.</td>
<td>That you want to eat fatty foods</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>34.</td>
<td><strong>That your eating is being controlled by your stomach</strong></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>35.</td>
<td>That you want to eat foods high in fat</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>36.</td>
<td>A sense of great hunger</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>37.</td>
<td>That your stomach is controlling what you eat</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>38.</td>
<td>A feeling that you are always hungry</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>39.</td>
<td>That you will never feel properly full</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>40.</td>
<td>Overfull after you have eaten</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>41.</td>
<td>Nauseated after you have eaten</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>42.</td>
<td>The need to be sick after eating</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>43.</td>
<td>Pleasure after eating</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>44.</td>
<td>Content after you have eaten</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>45.</td>
<td>Satisfied after eating</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Please circle the extent to which you agree that the following items describe you over the **PAST WEEK**.

<table>
<thead>
<tr>
<th></th>
<th>don’t agree at all</th>
<th>agree a little</th>
<th>agree somewhat</th>
<th>agree</th>
<th>strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I find myself thinking about food even when I’m not physically hungry.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. I get more pleasure from eating than I do from almost anything else.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. If I see or smell a food I like, I get a powerful urge to have some.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. When I’m around a fattening food I love, it’s hard to stop myself from at least tasting it.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. It’s scary to think of the power that food has over me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. When I know a delicious food is available, I can’t help myself from thinking about having some.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. I love the taste of certain foods so much that I can’t avoid eating them even if they’re bad for me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. Just before I taste a favourite food, I feel intense anticipation.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. When I eat delicious food I focus a lot on how good it tastes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. Sometimes, when I’m doing everyday activities, I get an urge to eat “out of the blue” (for no apparent reason).</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. I think I enjoy eating a lot more than most other people.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. Hearing someone describe a great meal makes me really want to have something to eat.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. It seems like I have food on my mind a lot.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. It’s very important to me that the foods I eat are as delicious as possible.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. Before I eat a favourite food my mouth tends to flood with saliva.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Section 4: In the following section we are looking at your food preferences. Using the scale provided please indicate how much you Like or Dislike the food. Use the scales to help indicate your attitudes towards the food, keep in mind this is your opinion and there are no good, bad or indifferent responses. An honest expression of your personal preferences will help. Please think about your preferences in the PAST WEEK.

<table>
<thead>
<tr>
<th></th>
<th>Extremely Dislike</th>
<th>Very Much Dislike</th>
<th>Moderately Dislike</th>
<th>Slightly Dislike</th>
<th>Neither Like nor Dislike</th>
<th>Slightly Like</th>
<th>Moderately Like</th>
<th>Very Much Like</th>
<th>Extremely Like</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chips (French fries)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pasta in tomato sauce</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Chocolate</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jelly</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cheese</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ice Cream</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steamed Vegetables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruit Salad</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
How much do you agree with the following statement in the next month I intend to... (Please circle)

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lose Weight</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Eat healthier</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Be more active</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Reduce my BMI</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Eat fewer calories</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Do more exercise</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Reduce my body weight</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Eat less food</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Move more</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Section 5: The statements below concern how you feel in emotionally intimate relationships. We are interested in how you generally experience relationships, not just in what is happening in a current relationship. Respond to each statement by circling a number to indicate how much you agree or disagree with the statement.

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Slightly disagree</th>
<th>Neither Agree/Disagree</th>
<th>Slightly agree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 I'm afraid that I will lose a person's love.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>2 I often worry that people will not want to stay with me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>3 I often worry that others don't really love me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>4 I worry that others won't care about me as much as I care about them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>5 I often wish that others' feelings for me were as strong as my feelings for him or her.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>6 I worry a lot about my relationships.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>7 When my partner is out of sight, I worry that he or she might become interested in someone else</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>8 When I show my feelings for others, I'm afraid they will not feel the same about me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>9 I rarely worry about others leaving me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Question</td>
<td>Strongly disagree</td>
<td>Disagree</td>
<td>Slightly disagree</td>
<td>Neither Agree/Disagree</td>
<td>Slightly agree</td>
<td>Agree</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>10 My romantic partner makes me doubt myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>11 I do not often worry about being abandoned.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>12 I find that others don't want to get as close as I would like.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>13 Sometimes romantic partners change their feelings about me for no apparent reason</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>14 My desire to be very close sometimes scares people away.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>15 I'm afraid that once a person gets to know me, he or she won't like who I really am</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>16 It makes me mad that I don't get the affection and support I need from others.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>17 I worry that I won't measure up to other people.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>18 My partner only seems to notice me when I'm angry.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>19 I prefer not to show a person how I feel deep down.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>20 I feel comfortable sharing my private thoughts and feelings with others</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>21 I find it difficult to allow myself to depend on others.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Question</td>
<td>Strongly disagree</td>
<td>Disagree</td>
<td>Slightly disagree</td>
<td>Neither Agree/Disagree</td>
<td>Slightly agree</td>
<td>Agree</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>22 I am very comfortable being close to others.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>23 I don't feel comfortable opening up to others.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>24 I prefer not to be too close to others.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>25 I get uncomfortable when a person wants to be very close.</td>
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Please provide further contact details for us to send you future information on this study.

Email address: ____________________________________________

Also would you like to take part in a short telephone interview, at a later date, to discuss your experiences further?

No ☐ Yes: ☐ If yes please write your telephone number:

___________________________________________

Thank you for your help with this study.
Appendix C. Information sheet for bariatric participants
Title of Project: The impact of an investment based intervention in bariatric patients.

We would like to invite you to take part in our research study. Before you decide we would like you to understand why the research is being done and what it would involve for you. Please take time to read the following information carefully. One of our team will go through the information sheet with you at your next clinic appointment and will answer any questions you have. Talk to others about the study if you wish. (Part 1 tells you the purpose of this study and what will happen to you if you take part. Part 2 gives you more detailed information about the conduct of the study). Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

Part 1

What is the purpose of the study?
The purpose of this study is to explore whether providing a brief investment based intervention both before and after surgery is beneficial to the patient.

Why have I been invited?
You have been invited to take part because you have been approved for bariatric surgery at XXXX. You have been invited to take part along with 400 other patients at the clinic, some of whom are waiting to have surgery and some of whom have had surgery already.

Do I have to take part?
It is up to you to decide to join the study. We will describe the study in this information sheet and we will go through this information sheet at your next clinic appointment. If you agree to take part, we will then ask you to sign a consent form at the clinic. You are free to withdraw at any time, without giving a reason. This would not affect the standard of care you receive.

What will happen to me if I take part?
Sometimes we don’t know which way of treating patients is best. To find out, we need to compare different treatments. We put people into groups and give each group a different treatment. However this will not affect the type of surgery you are having, it is just an additional questionnaire that will differ between the groups. The results are compared to see if one is better. To try to make sure the groups are the same to start with, each patient is put into a group by chance [randomly]. You have a 50/50 chance of getting the intervention questionnaire or not.

Taking part in this research will involve you being randomly allocated to either receive the standard questionnaire, or to receive the extra intervention questions that will last about an extra 10 minutes, which will take place alongside standard appointments at the clinic or by post.

If you will be receiving the standard care package (group 1) you will just have to complete a questionnaire that will take 15 mins to complete. If you are waiting for your surgery date you will complete this at 4 time points which will be when you come to the clinic for the pre-operative tests, when you attend for a 3 month follow up appointment along with at 6 and 12 months which you will receive by post. If you have already had surgery you will receive this at your 12 month follow up appointment and at 12 months follow up [24 months postop].

If you are allocated to receive the intervention (group 2) then you will receive the extra questions, which take 10 minutes, at your pre-operative appointment and then at the standard 3 and 6 month follow up appointment if you are waiting for your surgery date, or at your 12 months post-operative appointment only if you have already had your surgery. You will also be asked to complete the standard questionnaire, which takes 15 minutes at the same time points as group 1.
Furthermore at 12 months after recruitment, 40 patients will be asked to take part in an interview either by telephone or face-to-face, which will take around 30 minutes. The interview will be about their experiences, which will be recorded for transcription purposes only. The interview tapes will be destroyed after they have been transcribed and that all quotations used in the reports will be anonymised.

Your first involvement will be when you attend the bariatric clinic for your pre-operative tests or 12 month post-operative appointment and your final involvement will be at 12 months after recruitment. Therefore the duration of your involvement will be roughly 1 year.

What will I have to do?
When you attend your next appointment at the bariatric clinic, if you wish to participate you will need to sign a consent form. You will then be allocated to one of the two groups. Additionally you may be asked to take part in an interview at 12 months after recruitment.

What is the procedure that is being tested?
The investment based intervention encourages patients to consider their personal investment in having weight loss surgery, through a simple series of questions with the aim of improving weight loss by follow up. There are 16 questions at each time point, which have a response option from 1 (not at all) to 5 (very much), which explore your experiences of bariatric surgery at that time point.

What are the possible disadvantages and risks of taking part?
The disadvantage of taking part is the time taken to take part.

What are the possible benefits of taking part?
The benefit of taking part in this research is the opportunity to reflect upon the process of having surgery. In addition, the information we get from this study may help improve the treatment of people having bariatric surgery in the future.

What happens when the research study stops?
When the study finishes you will receive no further questionnaires. You can receive a summary of the results of the study if you wish. Also once the study is complete your personal details will be destroyed and the results will only be reported so that the patients are not identifiable.

What if there is a problem?
Any complaint about the way you have been dealt with during the study or any possible harm you might suffer will be addressed. The detailed information on this is given in Part 2.

Will my taking part in the study be kept confidential?
Yes. We will follow ethical and legal practice and all information about you will be handled in confidence. Your GP will be notified if you agree to take part in this research. The details are included in Part 2.

If the information in Part 1 has interested you and you are considering participation, please read the additional information in Part 2 before making any decision.

Part 2

What will happen if I don’t want to carry on with the study?
If you withdraw from the study, we will destroy all your contact details, but we will need to use the data collected up to your withdrawal.

What if there is a problem?
If you have a concern about any aspect of this study, you should ask to speak to the researchers who will do their best to answer your questions (Dr. Amelia Hollywood 01483 686883). If you remain unhappy and wish to
complain formally, you can do this through the NHS Complaints Procedure. Details can be obtained from the hospital.

In the event that something goes wrong and you are harmed during the research and this is due to someone’s negligence then you may have grounds for a legal action for compensation against (University College London Hospitals NHS Foundation Trust) but you may have to pay your legal costs. The normal National Health Service complaints mechanisms will still be available to you (if appropriate).

**Will my taking part in this study be kept confidential?**
All information which is collected about you during the course of the research will be kept strictly confidential, and any information about you which leaves the hospital or university will have your name and address removed so that you cannot be recognised.

**Involvement of the General Practitioner/Family doctor (GP)**
Your GP (or other health care practitioner) will be notified if you agree to take part in this research.

**What will happen to the results of the research study?**
The broad scientific results of a trial will be available at the study website once the study is complete. You will be given this information at the end of the study and if you wish to receive a hard copy of the results, this will also be available. The results of the research will also be published in academic journals and at conferences. You will not be identified in any report/publication and any direct quotes from the interviews will be anonymised.

**Who is organising and funding the research?**
The Research for Patient Benefit Programme, which is part of the National Institute for Health Research, is funding this research.

**Who has reviewed the study?**
All research in the NHS is looked at by an independent group of people, called a Research Ethics Committee, to protect your interests. This study has been reviewed and given favourable opinion by XXXXXXXXXXXX Research Ethics Committee.

You will be given a copy of the information sheet and a signed consent form to keep.

**Further information and contact details**
For further information please contact Dr XXXXXXXXXXXX (xxx@surrey.ac.uk) or 0XXXX XXXXX with regard to general information about the research, specific information about this research project, advice as to whether you should participate and if you are unhappy with the study.
Appendix D. Consent form for bariatric participants
CONSENT FORM

Title of Project: The impact of an investment based intervention in bariatric patients.

1. I confirm that I have read and understand the information sheet dated 15/14 (version 3) for the above study. I have had the opportunity to consider the information, ask questions and have had those answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected.

3. I understand that relevant sections of my medical notes and data collected during the study may be looked at by individuals from University of Surrey, from regulatory authorities or from the NHS Trust, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records.

4. I understand any direct quotes from the interviews will be kept anonymous.

5. I agree to my GP being informed of my participation in the study.

6. I agree to take part in the above study.

7. I give permission to be contacted, once the study has finished, with the study results (OPTIONAL).

Name of Patient: ____________________________ Date: ____________________________ Signature: ____________________________

Name of Person taking consent: ____________________________ Date: ____________________________ Signature: ____________________________

When completed, 1 for participant, 1 for researcher site file, (original) to be kept in medical notes.
Appendix E. Qualtrics questionnaire for control participants
Thank you for considering taking part in my research.

I am conducting research into young people's experience of online communication in romantic relationships. As part of this research, I am asking you to take part in an online survey about your experiences of online communication in romantic relationships.

The survey will take approximately 10-15 minutes to complete and will involve answering questions about your experiences of online communication in romantic relationships. Your responses will be kept anonymous and will be used for research purposes only. This research is being conducted by the research team at the University of Surrey, and your participation is voluntary.

If you are willing to participate, you will be asked to provide your email address so that you can receive the survey. Please note that your email address will not be included in any analysis of the data.

Thank you for your participation.

Please complete the following survey.

Thank you for completing the survey.
Qualtrics Online questionnaire content

Experiences in Close relationships

Thank you for considering taking part in my research. I am currently completing my PsychD doctorate, and am conducting research into how people experience close relationships and whether this is related to their current weight. Should you choose to participate, you will be asked a few questions about yourself, and then asked to complete 36 questions about how you feel in close relationships. You will not be contacted for any follow up questions. All responses are anonymous and confidential, so they cannot be traced back to any particular individual. By completing this questionnaire, you are consenting for your responses to be used in my PsychD research, and understand that your participation is completely voluntary, and you are entitled to withdraw at any time. For any further information, please contact a.nancarrow@surrey.ac.uk Thank you for your participation. First, please complete the following four questions.

Q1 Please indicate your gender.
   ☐ Male (1)
   ☐ Female (2)
   ☐ Prefer not to state (3)

Q2 Please enter your age.

Q3 Please enter your current weight.

Q4 Please enter your height.

Thank you.

Please now complete the following questions. These statements concern how you feel in emotionally intimate relationships. I am interested in how you generally experience relationships, not just in what is happening in a current relationship. Please respond to each question by clicking an option to indicate how much you agree or disagree with the statement.

Q1 I’m afraid that I will lose a person’s love.
   ☐ Strongly Disagree (1)
   ☐ Disagree (2)
   ☐ Slightly Disagree (3)
   ☐ Neither Agree/Disagree (4)
   ☐ Slightly Agree (5)
   ☐ Agree (6)
   ☐ Strongly Agree (7)
Q2 I often worry that people will not want to stay with me.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)

Q3 I often worry that others don’t really love me.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)

Q4 I worry that others won’t care about me as much as I care about them.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)

Q5 I often wish that others’ feelings for me were as strong as my feelings for him or her.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)

Q6 I worry a lot about my relationships.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)
Q7 When my partner is out of sight, I worry that he or she might become interested in someone else.
☑ Strongly Disagree (1)
☑ Disagree (2)
☑ Slightly Disagree (3)
☑ Neither Agree/Disagree (4)
☑ Slightly Agree (5)
☑ Agree (6)
☑ Strongly Agree (7)

Q8 When I show my feelings for others, I'm afraid they will not feel the same about me.
☑ Strongly Disagree (1)
☑ Disagree (2)
☑ Slightly Disagree (3)
☑ Neither Agree/Disagree (4)
☑ Slightly Agree (5)
☑ Agree (6)
☑ Strongly Agree (7)

Q9 I rarely worry about others leaving me.
☑ Strongly Disagree (1)
☑ Disagree (2)
☑ Slightly Disagree (3)
☑ Neither Agree/Disagree (4)
☑ Slightly Agree (5)
☑ Agree (6)
☑ Strongly Agree (7)

Q10 My romantic partner makes me doubt myself.
☑ Strongly Disagree (1)
☑ Disagree (2)
☑ Slightly Disagree (3)
☑ Neither Agree/Disagree (4)
☑ Slightly Agree (5)
☑ Agree (6)
☑ Strongly Agree (7)

Q11 I do not often worry about being abandoned.
☑ Strongly Disagree (1)
☑ Disagree (2)
☑ Slightly Disagree (3)
☑ Neither Agree/Disagree (4)
☑ Slightly Agree (5)
☑ Agree (6)
☑ Strongly Agree (7)
Q12 I find that others don’t want to get as close as I would like.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)

Q13 Sometimes romantic partners change their feelings about me for no apparent reason.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)

Q14 My desire to be very close sometimes scares people away.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)

Q15 I’m afraid that once a person gets to know me, he or she won’t like who I really am.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)

Q16 It makes me mad that I don’t get the affection and support I need from others.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)
Q17 I worry that I won't measure up to other people.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)

Q18 My partner only seems to notice me when I'm angry.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)

Q19 I prefer not to show a person how I feel deep down.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)

Q20 I feel comfortable sharing my private thoughts and feelings with others.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)

Q21 I find it difficult to allow myself to depend on others.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)
Q22 I am very comfortable being close to others.
   □ Strongly Disagree (1)
   □ Disagree (2)
   □ Slightly Disagree (3)
   □ Neither Agree/Disagree (4)
   □ Slightly Agree (5)
   □ Agree (6)
   □ Strongly Agree (7)

Q23 I don't feel comfortable opening up to others.
   □ Strongly Disagree (1)
   □ Disagree (2)
   □ Slightly Disagree (3)
   □ Neither Agree/Disagree (4)
   □ Slightly Agree (5)
   □ Agree (6)
   □ Strongly Agree (7)

Q24 I prefer not to be too close to others.
   □ Strongly Disagree (1)
   □ Disagree (2)
   □ Slightly Disagree (3)
   □ Neither Agree/Disagree (4)
   □ Slightly Agree (5)
   □ Agree (6)
   □ Strongly Agree (7)

Q25 I get uncomfortable when a person wants to be very close.
   □ Strongly Disagree (1)
   □ Disagree (2)
   □ Slightly Disagree (3)
   □ Neither Agree/Disagree (4)
   □ Slightly Agree (5)
   □ Agree (6)
   □ Strongly Agree (7)

Q26 I find it relatively easy to get close to others.
   □ Strongly Disagree (1)
   □ Disagree (2)
   □ Slightly Disagree (3)
   □ Neither Agree/Disagree (4)
   □ Slightly Agree (5)
   □ Agree (6)
   □ Strongly Agree (7)
Q27 It's not difficult for me to get close to others.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)

Q28 I usually discuss my problems and concerns with others.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)

Q29 It helps to turn to others in times of need.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)

Q30 I tell my partner just about everything.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)

Q31 I talk things over with others close to me.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)
Q32 I am nervous when people get too close to me.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)

Q33 I feel comfortable depending on others.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)

Q34 I find it easy to depend on others.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)

Q35 It's easy for me to be affectionate with other people.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)
Q36 Others close to me really understand me and my needs.
- Strongly Disagree (1)
- Disagree (2)
- Slightly Disagree (3)
- Neither Agree/Disagree (4)
- Slightly Agree (5)
- Agree (6)
- Strongly Agree (7)

Thank you for participating in this research. Any questions, please email me at a.nancarrow@surrey.ac.uk
Appendix F. Confirmation of NHS favourable ethical opinion
15 July 2013

Professor J Ogden
Professor in Health Psychology
Department of Psychology
University of Surrey
Guildford
GU2 7XH

Dear Professor Ogden

Study title: The Impact of an Investment Based Intervention on weight-loss and beliefs about food in patients post bariatric surgery.

REC reference: 13/LO/1056

IRAS project ID: 125012

Thank you for your emails of 09 July 2013, responding to the Proportionate Review Sub-Committee’s request for changes to the documentation for the above study.

The revised documentation has been reviewed and approved by the sub-committee.

We plan to publish your research summary wording for the above study on the NRES website, together with your contact details, unless you expressly withhold permission to do so. Publication will be no earlier than three months from the date of this favourable opinion letter. Should you wish to provide a substitute contact point, require further information, or wish to withhold permission to publish, please contact the Co-ordinator Dr [redacted].

nrescommittee [redacted]

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised.

Ethical review of research sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see “Conditions of the favourable opinion” below).
Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission (R&D approval) should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements.

Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at http://www.rdforum.nhs.uk.

Where a NHS organisation’s role in the study is limited to identifying and referring potential participants to research sites (“participant identification centre”), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of approvals from host organisations.

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

You should notify the REC in writing once all conditions have been met (except for site approvals from host organisations) and provide copies of any revised documentation with updated version numbers. The REC will acknowledge receipt and provide a final list of the approved documentation for the study, which can be made available to host organisations to facilitate their permission for the study. Failure to provide the final versions to the REC may cause delay in obtaining permissions.

Approved documents

The documents reviewed and approved by the Committee are:

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<td>21 June 2013</td>
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<tr>
<td>Covering Letter</td>
<td></td>
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Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Reporting requirements

The attached document “After ethical review — guidance for researchers” gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and Investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

Feedback

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

Further information is available at National Research Ethics Service website > After Review

Please quote this number on all correspondence

We are pleased to welcome researchers and R & D staff at our NRES committee members’ training days – see details at http://www.hra.nhs.uk/hra-training/

With the Committee’s best wishes for the success of this project.

Yours sincerely,

Chair

Email: mrescommittee

Enclosures: “After ethical review — guidance for researchers”

Copy to: Dr [Name] — University of Surrey

A Research Ethics Committee established by the Health Research Authority
Foundation Trust

Mr Michael Chenery – University of Surrey
Appendix G. Confirmation of University of Surrey favourable ethical opinion
Ethics Committee

Dr Aneila Hollywood
School of psychology
FA. S

12 February 2014

Dear Dr Hollywood

The impact of an investment based intervention in hodgkin's patients
RC/2014/21/FAHS fast-track

On behalf of the Ethics Committee, I am pleased to confirm a favourable ethical opinion for
the above research on the basis described in the submitted protocol and supporting
documentation.

Date of confirmation of ethical opinion: 12 February 2014

The list of documents reviewed and approved by the Committee under its Fast Track
procedure is as follows:

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This opinion is given on the understanding that you will comply with the University's Ethical
Guidelines for Teaching and Research.

The Committee should be notified of any amendments to the protocol, any adverse reactions
suffered by research participants, and if the study is terminated earlier than expected by
reasons. Please be advised that the Ethics Committee is able to withdraw research to ensure
that researchers are abiding by the University's requirements and guidelines.

You are advised to note that a further submission to the Ethics Committee will be required in
the event that the study is not completed within five years of the above date.

Ongoing favourable ethical opinion from the NHSS is subject to supplying Annual Progress
Reports and a Declaration of the End of Study to the NHSS REC which gave the favourable
ethical opinion. A copy should be sent to the University Ethics Committee also. The form is available to download here http://www.provost.ncl.ac.uk/applications/registration-redock.

Yours sincerely

Ms Susan Francis, Research Governance Administrator, Research & Enterprise Support Administrator, University Ethics Committee
Appendix H. Normality of data
Normality of data

An exploratory data analysis was conducted to determine if the attachment score distributions for each group were normally distributed. Due to the large sample size, this was done by visually examining histograms and examining the values of skewness and kurtosis. (Field, 2007).

Normality statistics for the control group

A review of the control group data of attachment avoidance scores for skewness (0.384) and kurtosis (-0.480) revealed a slight positive skew. However, as examination of z-scores revealed none of these values exceeded the upper threshold of 3.29 for kurtosis (Field, 2007), it was deemed to be a normal distribution. A histogram (graph 1) suggested that normality was reasonable.

Through examining the data of anxiety attachment scores, statistics for skewness (0.277) and kurtosis (-0.476) suggested that normality was a reasonable assumption. The histogram (graph 2) suggests a normal distribution.
Graph 1.

Histogram of the control group attachment avoidance data
Graph 2.

Histogram of the control group attachment anxiety data
Normality statistics for the bariatric group

A review of the bariatric group data of attachment avoidance scores for skewness (0.073) and kurtosis (-0.132) suggested a normal distribution. A histogram (graph 3) also suggested that normality was reasonable.

Through examining the data of anxiety attachment scores for the bariatric group, statistics for skewness (0.263) and kurtosis (-0.491) suggested that normality was a reasonable assumption. The histogram (graph 4) suggests a normal distribution.
Graph 3.

Histogram of the bariatric group attachment avoidance data
Graph 4.

Histogram of the bariatric group attachment anxiety data
Major Research Project Proposal

What is the relationship between weight loss after obesity surgery and attachment?

URN: 6065609

Word Count: 2,998
Background and Theoretical Rationale

Obesity has been seen as an important public health issue worldwide for the last two decades, and contributes to serious health problems and extensive economic costs (Bray, 2004). The most common method of measuring obesity is the Body Mass Index (BMI), with a BMI of 30kg/m2 or above being considered to be obese. In 2012, the Department of Health estimated that just over a quarter of adults (26%) were obese.

The cause of obesity is recognised to be multifactorial; encompassing genetics, nutrition, and physical activity (Fishbein, 2001). It is widely agreed that the increasing weight of the population is an appropriate biological response to an abnormal environment, characterised by easy availability of cheap, energy dense food coupled with a decline in physical activity levels (UK National Auditors Office, 2001). The majority of obese patients are managed through behavioural inventions, including dietary advice, behavioural skills training, self-monitoring and relapse prevention (Ogden, Clementi & Aylwin, 2006). However, increasing evidence suggests that obesity is not simply a problem of will power or self-control but a complex disorder (Lang & Froelicher, 2006). As a result, more patients are being considered for bariatric surgery, and this remains to be recommended by the National Institute for Clinical Excellence (NICE, 2009). Research also suggests that bariatric surgery has positive results in psychological wellbeing and quality of life, as well as improvements in eating behaviour and weight loss (De Zwann, Lancaster, Mitchell, Howell, Morson & Roerig 2002).

Research has recently focused on the role of the family in the development of obesity. Some studies have highlighted the role of parenting style, and suggest that maladaptive parental behaviour may play an important role in the development of eating disorders and obesity (Johnson, Cohen, Kasen and Brook, 2002; Carper, Fischer and Birch, 2000; Brown and Ogden, 2004). One area which has received much interest over the past few decades is
the role of attachment, suggesting that that attachment styles are related to the onset of a number of psychological problems both in childhood and later life, including those relating to eating behaviour.

Attachment theory, developed by Bowlby (1988), suggests that infants are born with attachment behaviours, which aim to seek and maintain proximity to attachment figures. This seeking is an inborn affect-regulation device, which is designed to protect an individual from physical and psychological threats, and to alleviate distress (Mikulincer, Shaver & Peres, 2003). Bowlby (1988) assumed that attachment style remains active over the life span, and is demonstrated through thoughts and behaviours related to support seeking. If an individual is seen to have a “secure attachment”, it is assumed that they will have positive expectations about others’ availability and positive views of the self as competent, and major affect-regulation strategies are organised around these positive beliefs (Mikulincer, Shaver & Peres, 2003). However, an “insecure attachment” style is formed when significant others are unavailable or unresponsive, or proximity seeking fails to relieve distress. As a result, negative representations of self and others are formed, such as concerns about self-worth, and strategies of affect regulation other than proximity seeking are developed.

The inability to regulate emotion has been linked to attachment style in numerous studies (Brenning, Soenens, Braet, & Bosmans, 2012; Karreman & Vingerhoets, 2012; Zimmerman, 1999), and has also been associated with eating pathology (Tasca, et al., 2009). Research has indicated that those with eating disorders experience higher levels of attachment insecurity (Illing, Tasca, Balfour & Bissada, 2010), and in are likely to have poorer treatment outcomes. The links between attachment and obesity have also have been explored, however, little research has addressed the possibility that attachment style may also impact how an individual reacts to obesity onset or treatment.
Several studies infer that the parent-child relationship influences eating pathology within investigations of attachment and eating pathology and weight (Goossens, Braet, Van Durme, Decaluwé, & Bosmans, 2012; Bosmans, Goossens & Braet, 2009; Anderson, Gooze, Lemeshow & Whitaker, 2011). These studies all concluded poor quality relationships were associated with obesity, but that low maternal sensitively was a particular risk factor. Stenhammer et al. (2010) likewise concluded that insecure attachment to either the father or mother was associated with being overweight, with maternal attachment also being associated with underweight in the children. Furthermore, parental stress, particularly maternal stress, was associated with increased BMI. Cooper and Warren (2011) also demonstrated that negative parental discipline was a unique predictor of BMI, and determined that parenting style is related to a higher body weight in children.

Within an adult population, Rommel, Nandrino, Ducro, Andricux, Delecourt and Antoine (2012) suggest that obese patients have reduced emotional awareness in comparison to the control group, will more often use emotional eating to regulate their emotions, and that there was a significant relationship between parental attachment and emotional awareness. This was supported by the findings of Henandez-Hons and Woolley (2011) and Wilkinson, Rowe, Bishop & Brunstrom (2010), who also concluded that there are clinical benefits to addressing emotional eating in obese women from an attachment perspective, as attachment anxiety may explain differences in BMI through the tendency to engage in disinhibited eating, which would then lead to a higher BMI.

Research therefore indicates that obesity is on the increase and has a number of serious psychological and physical consequences. The cause of obesity is multi factorial with studies highlighting the role of genetics, environment and behaviour. One area that has
received some recent interest is the role of attachment with research indicating that poor attachment maybe related to eating pathology and onset and progression of obesity. To date however, no research has addressed the role of attachment in the effectiveness of obesity treatment, and given that attachment style has an impact on the development and onset of obesity and weight gain, and it would therefore follow that, unless the attachment behaviour is modified, interventions for obesity would be likely to fail.

At present the most effective form of obesity management is bariatric surgery which is available to those in the UK with a BMI over 40 (or 35 with comorbidities). However, although more effective than traditional behavioural interventions, many people who have bariatric surgery do not show the desired level of weight gain or regain any weight lost. One possible reason for this variability is their attachment style, which if this has contributed to the development of their weight problem may well undermine attempts at weight loss post surgery if it has not been addressed. To date this possibility has not been explored. Ogden, Avenell and Ellis (2010) demonstrated that the mind/body relationship is currently largely ignored by surgery, and concluded that the battle of handing over control to a surgical mechanism rather than relying on the self was central to a successful surgical outcome. They highlighted the need for change in both the participants eating behaviours, but also the need to engage the mind and cognitive processes in order to assure a successful intervention.

In line with this, the present study aimed to explore the role of attachment is explaining weight loss post bariatric surgery in obese patients. In addition, given the existing evidence for the as role of attachment style in the onset of obesity the study also aimed to explore the association between attachment styles and key beliefs about food and behaviours relating for eating and activity.
Primary research Question

Is attachment style related to motivation and compliance with treatment in bariatric patients post-surgery?

Secondary research question

Is attachment styles related to factors associated with the onset of obesity particularly beliefs about food and eating and exercise?

Main Hypotheses

Insecure attachment style will predict poorer treatment compliance and lower levels of control of eating behaviour.

Secondary hypothesis

Insecure attachment will be associated with more pathological beliefs about food and unhealthy eating behaviours and low levels of activity.

Method

Participants

The study will be based with the University College Hospital, London. The service offers a NHS based bariatric service for obese patients with a BMI of over 40. Patients will be recruited if they have been approved for surgery and had the date set for their operation. Patients will be included if the consent to taking part in the study, are aged 18 or over, have attended the bariatric clinic in London, have been accepted for surgery and have their funding agreed (e.g. by the PCT). Those who have not yet had their funding confirmed will not be recruited into the study. The patients will be recruited from the UCH clinic, and will be sent out information and consent forms prior to an appointment at the clinic. During their appointment, they will be asked to complete a battery of measures.
Although previous research has not directly explored this relationship, several related studies have looked at attachment style and either weight loss or gain. It is expected that attachment style would have a small to moderate effect in response to surgery. We would estimate that with alpha set at 95% and beta set at 80%, the study would need 150 participants for a significant effect. It is estimated that 80% of those asked would consent, and the approximately 60% of those who participate will be available for follow up. Therefore, in order to achieve these numbers, we would need to invite 250 participants to take part in the study.

**Design**

The research will be a cross sectional, quantitative study using a repeated measures design.

**Measures**

**BMI and weight:** The participant’s weight will be obtained in the clinic two weeks pre-operatively to provide the baseline measurement. This will be followed up postoperatively at 6 months. Baseline measures of age, sex, ethnicity, and type of surgery will also be taken.

**Attachment:** This will be assessed using the Experiences in Close Relationships-Revised (ECR-R) Questionnaire (Fraley et. al, 2000). The ECR-R is an 18 item is a revised version of Brennan, Clark, and Shaver’s (1998) Experiences in Close Relationships (ECR) questionnaire. The ECR-R is designed to assess individual differences with respect to attachment-related anxiety (i.e., the extent to which people are insecure vs. secure about the extent to which their partner’s availability and responsiveness) and attachment-related avoidance (i.e., the extent to which people are uncomfortable being close to others vs. secure depending on others). It is comprised of 18 items, to which respondents answer on a 7-point scale ranging from 1 “strongly disagree” to 7 “strongly agree”. The commonly cited estimate
of internal consistency reliability tends to be 0.90 or higher for ECR-R scale (Sibley, Fischer & Lui, 2004).

**Beliefs about food:** This will be assessed in terms of hedonic wanting and liking. Hedonic wanting will be measured using the power of food scale (PFS) established by Cappelleri et al. (2009). The measure comprises 15 items with a 5 point response ranging from 1 “Don’t agree at all” to 5 “strongly agree”. A high score indicates a greater motivation to draw and increased wanting of food to cues in the environment, potentially influencing subsequent eating behaviour. The scale proposes to contain 3 factors; food available, food present and food tasted.

The hedonic liking construct relates to food palatability preference as is examined using written and visual representations of food types. Food items are divided into four groupings replicating examples suggested by Lowe et al. (2009). Participants will be asked to express their preference for the food type by rating the items on a 9 point likert scale, ranging from 1 “extremely dislike” to 9 “extremely like”.

**Diet and exercise behaviour:** This will be assessed using measures of snack and meals intake that have been used extensively in previous research, such as in Brown, Ogden, Gibson and Vogeie (2006). This measure aims to identify the frequency of consumption of particular foods, ranging from “Never” to “More than 3 times a day”. The cronbach’s alpha of this measure ranges from .048 to 0.71.

In addition, an existing measure of overt control used by Ogden, Reynolds and Smith (2006) will be included to reflect the ability to control snacking and meal time consumption. It
presents a likert scale of 1 to 5, with 1 representing “not at all” to 5 representing “totally”. It has been demonstrated to have a cronbach’s alpha of 0.77-0.80.

**Behavioural Intentions:** Patient’s intentions to change their behaviour in the next month will be measured using at 5 point likert scale, ranging from “strongly disagree” to “strongly agree”, and will include questions such as “I intend to eat healthier” and “I intend to be more active”.

**Procedure**

A colleague based at the UCH is currently conducting a study with patients undergoing bariatric surgery. The participants involved in the approved study will be asked if they are willing to complete an additional measure (the ECR-R) for use in the current study. If they consent, they will be provided with information and consent forms before their pre-operative appointment which usually two weeks before surgery. On arrival at the UCH, the participants will see the researcher, who will explain the study, obtain consent, and present the questionnaire pack. If this is not possible the reception staff at the clinic have agreed to hand out and collect in the questionnaire packs, which will have a detailed information sheet to explain the study to obtain informed consent. The participants will then return the questionnaires to the researcher or reception staff, and continue with their intervention.

The participants will be asked to provide an email address on completion of the questionnaire pack. They will then be contacted via email or letter 6 months after their operation, and asked to complete the measures again using an online version.

**Ethical considerations**
All ethical considerations will be addressed as per the BPS Code of Ethics and Conduct (2009). Due to the non-invasive nature of this study, the ethical considerations are minimal. The main ethical consideration is the use of the patient’s time whilst they are awaiting a surgical procedure, and their ability to provide informed consent given potential levels of stress. This will be avoided by asking the patient’s to participate prior to their surgery date, and by providing detailed information about the study. The participants in this study will not receive any immediate benefit from taking part in the study, as additional psychological support is unable to be offered currently, however, it is hoped that the results of the study may provide evidence for this to be increased for future patients.

Informed consent will be gathered from each participant and an information sheet will be provided to allow participants to be assured of confidentiality and data protection. The participants will be reassured that their provision of treatment will not be altered on the basis of the results of their data, and that the data is for research purposes only. The storage of data will be in accordance with the Data Protection Act (1984).

It is possible that the patient’s may become distressed by completing the ECR-R, however, this is unlikely due to the passive nature of self-report measures. The participants will be advised to seek support from their GP or the bariatric team that they are engaged with should any additional questions or concerns arise as a result of completing the measures.

No conflicts of interest have been foreseen in this initial stage. Due to this study being incorporated into a previous study being conducted by Dr. Amelia Hollywood and Prof. Jane Ogden, further NHS ethical approval would not be required. However, the proposal would need to be approved by the University ethics committee.

Name of Ethics Committee: The Faculty of Arts and Human Sciences, University of Surrey

**Proposed Data Analysis**
Following collection of the baseline measures all data will be entered into SPSS. On collection of the 6 month follow up data, this will be entered into the database. The data will be checked for a skewed distribution using graphical descriptive statistics, and further numerical descriptive statistics such as the mean BMI and weight reduction, standard deviation and variation will be explored. The data will then be analysed in the following ways:

1. To explore the role of baseline attachment styles in predicting weight loss at follow up using multiple regression.

2. To explore the associations between attachment styles at baseline and baseline measures of beliefs about food, eating behaviour and exercise behaviour using correlation analysis.

**Service User and Carer Consultation / Involvement**

The Service User and Carer committee will be consulted prior to data collection to confirm the measures and information sheets provided are understandable. In addition, service user representation was present at the MRP proposal presentations to ensure that no harm to the participants was anticipated at this early stage.

**Feasibility Issues**

The main obstacle to completing this study would be recruiting enough participants. The estimated number of bariatric operations completed per year at the chosen service is approximately 400. However, this is dependent on availability of the surgeons and referral rates. It is possible that I will not be able to recruit the required number in the expected time frame. In the event of this, it is possible to investigate extending the research to an additional site. My supervisor, Prof. Ogden, has suggested the possibility of applying for ethical
approval to conduct the research at St. Richard’s Hospital in Chichester, in addition to UCH, to ensure the required data is collected.

There is a possibility that participants will not complete the follow up questionnaires, however, we have accounted for a significant dropout rate. In addition, I intend to obtain contact details for each participant during the initial data collection to prevent this. Each participant will be asked if they would be prepared to participate in a possible follow up interview to explore their experiences further. This will provide the opportunity to conduct qualitative analysis should it be needed.

**Dissemination strategy**

Dissemination to the wider audience is anticipated to occur from August of 2015, and will be achieved by submitting the research to a journal where there has been recent interest in obesity. Presentations at relevant conferences will also be considered.

**Study Timeline**

Please also see gant chart in appendices.

Trainee:  
Signature:  
Date:
References


Literature Review:

What is the relationship between obesity and attachment?

URN: 6065609
Maximum Word Count: 8000
Word Count: 7991
Journal Statement

This literature review is written with the intent of submission to a journal such as the Health Psychology review. This journal has been a pioneering publication in the field of health psychology; it was the first review journal in this area. It is an internationally respected forum which contributes to the advancement of health psychology, and aims to strengthen the relationship to the field of psychology as a whole.

Health Psychology Review publishes theoretical and conceptual work, as well as meta-analytic and systematic reviews. It favours theory-based reviews, and those reviews that connect the field of health psychology with other disciplines, such as biology and sociology. The journal also welcomes articles that consider the cross-cultural relevance of concepts and theories.
Abstract

It is well documented that obesity is an increasing problem in the UK. Several theories have attempted to explain this increase, including a focusing on the environment and changes in eating behaviour and physical activity. One area that has recently been applied to obesity onset is attachment theory, which suggests that within eating pathology, an insecure attachment style leads to difficulties with emotional regulation, which is then managed with disturbed eating behaviours, in terms of both over and under eating.

This review evaluates the current literature surrounding attachment style and the onset of obesity. Relevant articles were located through searches of computerised databases, including PsycINFO, Scopus, and Web of Knowledge. Twelve studies were identified from the search, all of which indicated a link between attachment and obesity onset. The results indicate that attachment style is associated with obesity onset using longitudinal and cross sectional designs in children, adults, and adolescents. The results demonstrate that an insecure attachment style, particularly a preoccupied attachment, is more predictive of obesity than a secure attachment style.

However, due to the limited articles, a range of sample ages needed to be compared, ranging from toddlers to adults. Future research should expand the research base, and focus on the psychological mechanisms that are involved in attachment behaviours and the associations with obesity. Furthermore, the impact of attachment style on obesity interventions should be considered.
1. Introduction

1.1. The prevalence of eating problems

Eating-related problems have been on the rise in the UK, particularly in terms of the increase of obesity. Currently, the most common method of measuring obesity is the Body Mass Index (BMI), calculated by dividing a person’s weight measurement in kilograms, by the square of their height in metres. In adults, a BMI of 30kg/m2 or above is considered to be obese. In a report published in 2012, the Department of Health estimated that just over a quarter of adults (26% of both men and women) were obese, and 42% of men and 32% of women were overweight (BMI of 25kg/m2) according to data collected in 2010. The report estimates that there has been a marked increase in the proportion of the population that are classed as obese in the last 2 decades, increasing from 13.2% in 1993 to 26.2% in 2010 for men, and from 16.4% to 26.1% for women. Obesity has been seen as an important public health issue worldwide for the last two decades, and contributes to serious health problems and extensive economic costs (Bray, 2004).

In addition, eating disorders are also becoming more prevalent in the UK. The Eating Disorders Association suggest that 1.6 million people in the UK are affected by an eating disorder, of which around 11% are male. However, more recent research from the NHS information centre showed that up to 6.4% of adults displayed signs of an eating disorder (Adult Psychiatric Morbidity Survey, 2007). Many theories have suggested why obesity and eating disorders are becoming so prevalent in the UK.

1.2. Causes of eating problems

The cause of obesity is well recognised to be multifactorial; encompassing genetics, nutrition, and physical activity (Fishbein, 2001). It is well documented that obesity develops
when energy intake exceeds energy expenditure over a prolonged period of time, leading to
an accumulation of body fat (Prentice & Jebb, 1995). There is now a greater knowledge of
energy balance that might help understanding why some individuals may be more prone to
developing obesity, and it is agreed that both genetic and environmental factors contribute to
the development of obesity. There has been recent identification of rare single gene defects
that cause severe early onset obesity; however, as obesity has been increasing rapidly
throughout the world in the last two decades, it seems unlikely that this change has a genetic
basis (Wilding, 2001). It is widely agreed that the increasing weight of the population is an
appropriate biological response to an abnormal environment, characterised by easy
availability of cheap, energy dense food coupled with a decline in physical activity levels

With reference to eating disorders, it has been suggested that a number of causes are
likely, including sociocultural factors such as the media and peer influences, which lead to
negative affect, low self-esteem, and body dissatisfaction (Polivy & Herman, 2002). Research
has also addressed the role of the family in the development of both obesity and eating
disorders. For example, some studies have highlighted the role of parenting style, and
indicate eating disorders may be linked to family dynamics such as enmeshment and
criticism; Johnson, Cohen, Kasen and Brook (2002) highlighted that maladaptive paternal
behaviour may play a particularly important role in the development of eating disorders, and
that childhood adversities may contribute to greater risk for the development of eating
disorders in early adulthood. Other studies have focused on parental control; Brown and
Ogden (2004) suggest that a positive parental role model may helpful for improving a child’s
diet, and that those children whose parents indicated a greater use of food as a means to
control their child’s behaviour reported higher levels of body dissatisfaction. In addition,
Carper, Fischer and Birch (2000) concluded that pressure in child feeding is associated with
the emergence of dietary restraint and disinhibition among young girls. One area which has received much interest over the past few decades is the role of attachment style, with researchers arguing that attachment styles are related to the onset of a number of psychological problems both in childhood and later life, including those relating to eating behaviour.

1.3. Attachment

Attachment theory, developed by Bowlby (1988), suggests that infants are born with attachment behaviours, which aim to seek and maintain proximity to attachment figures. This seeking is an inborn affect-regulation device, which is designed to protect an individual from physical and psychological threats, and to alleviate distress (Mikulincer, Shaver & Pereg, 2003). Bowlby (1988) claimed that the successful accomplishment of these affect-regulation functions results in a sense of attachment security, in which the individual feels that the world is a safe place, that one can rely on protective others, engage with them, and that one can explore the environment. Bowlby assumed that it is attachment style remains active over the entire life span, and is demonstrated through thoughts and behaviours related to support seeking.

If an individual is seen to have a “secure attachment” style, it is assumed that they will have positive expectations about others’ availability and positive views of the self as competent, and major affect-regulation strategies are organized around these positive beliefs (Mikulincer, Shaver & Pereg, 2003). However, an “insecure attachment” style is formed when significant others are unavailable or unresponsive, or proximity seeking fails to relieve distress. As a result, negative representations of self and others are formed, such as concerns about self-worth, and strategies of affect regulation other than proximity seeking are developed. From these experiences, an individual will develop an attachment style; a pattern
of relational expectations, emotions, and behaviour that results from the internalization of the history of attachment experiences and consequent reliance on a particular strategy of affect regulation (Fraley & Shaver, 2000; Shaver & Mikulincer, 2002). Therefore, attachment style is seen to be one of the major sources of variation in strategies of affect regulation (Mikulincer, Shaver & Pereg, 2003).

The inability to regulate emotion has been linked to attachment style in numerous studies (Brenning, Soenens, Bract, & Bosmans, 2012; Karreman & Vingerhoets, 2012; Zimmerman, 1999), and has been linked to a number of psychological disorders such as addictions (Padykula & Conklin, 2010), depression and anxiety (Jinyao et al., 2012), and posttraumatic stress disorder (Beniot, Bouthillier, Moss, Rousseau & Brunet, 2010). This inability to regulate emotion has also been demonstrated within eating pathology (Tasca, et al., 2009). This has led to the exploration of attachment style in relation to the development and treatment of eating disorders. In a recent review by Tasca, Ritchie and Balfour (2011), they suggest that a number of individuals with eating disorders do not benefit from conventional treatments, and suggested that this is due to factors such as affect intolerance, interpersonal problems, and clinical perfectionism, and highlight that these are also common within attachment theory. Previous research has indicated that those with eating disorders experience higher levels of attachment insecurity (Illing, Tasca, Balfour & Bissada, 2010), and in addition are likely to have poor treatment outcomes. Tasca et al. (2011) go on to suggest that the awareness of an individual’s attachment style enables the patient to have specific treatments with the aim to reduce dropout rates; such as those with high attachment anxiety being offered a psychodynamic approach to focus on interpersonal difficulties (Tasca et al., 2006).
Within previous literature, the links between attachment style and obesity have also have been explored, particularly in relation to the impact on Binge Eating Disorder symptoms. However, little research has addressed the possibility that attachment style may also impact how an individual reacts to obesity onset or invention.

1.4. Obesity interventions

Obesity is currently treated through pharmacological agents, low calorie diets, behaviour modification, exercise, and surgery (McTigue, Harris, Hemphill, et al., 2003). The majority of obese patients are managed through behavioural inventions, most of which target both physical activity and nutrition behaviours, (Sharma, 2007), which may include dietary advice, behavioural skills training, self-monitoring and relapse prevention (Ogden, Clementi & Aylwin, 2006). However, although behavioural interventions have had some success (Dombrowski, et al, 2012, Levin, 2007), a number of studies have suggested that as increasing evidence suggests that obesity is not simply a problem of will power or self-control but a complex disorder involving appetite regulation and energy metabolism (Lang & Froelicher, 2006), which is associated with a variety of comorbid conditions, behaviour interventions are not always sufficient. Furthermore, behavioural interventions may also been seen to exacerbate problems of eating control (Odgen, 2003). Some research has indicated that levels of weight loss reduces over five years through these programmes, to the point where no weight loss has been maintained (Magro et al, 2008). As a result, more patients are being considered for bariatric surgery, and this remains to be recommended by the National Institute for Clinical Excellence (NICE, 2009). The most common forms of bariatric surgery included the laparoscopic gastric banding (LAGB) and the laparoscopic Roux-en-Y gastric bypass (Tice, Karliner, Walsh, Peterson & Feldman, 2008). Through a systematic review, Bachwald, Avidor and Braunwald (2004) conclude that bariatric surgery can result in a 40kg weight loss and improvements or resolution of symptoms of type 2 diabetes, sleep apnoea,
and hypertension. Research also suggests that bariatric surgery has positive results in psychological wellbeing and quality of life, as well as improvements in eating behaviour and weight loss (De Zwaan et al., 2002).

It is clear that there are increasingly mixed views regarding the most effective treatments for obesity, and further research is needed in this area. Furthermore, it could be argued that the need for greater prevention strategies in order to halt the increase of the "obesity epidemic" should be taking precedence (WHO, 2000).

To date, little research appears to have been conducted to investigate the role of attachment style in the development of obesity, which may establish a future need for the consideration of attachment style within both obesity prevention and intervention. To undertake a review of the entire area of links between attachment style and obesity is beyond the scope of this paper, therefore, this literature review will explore the previous research surrounding the impact of attachment style on the development of obesity, with a view to exploring future directions for intervention.
2. Method

The search aimed to identify any previous literature that hypothesised a link between attachment style and obesity onset. A computerised search of all the literature for relevant articles published up until January of 2013 was performed using the databases PsycINFO, Web of Knowledge, and Scopus. The following search strategy was used:

obes* AND attach* AND “body mass index” AND onset.

The terms were searched for using the titles and abstracts of articles. No date or language restrictions were applied, but the search results were restricted to journal articles. Furthermore, the areas of research were then restricted to psychology, psychiatry and behavioural sciences due to the large volume of medical and dentistry articles produced.

Diagram 1 illustrates the search strategy. The search produced 58 results, 15 of which were duplicate articles. The results were then screened by title, and 24 abstracts were read to establish whether they would be appropriate for inclusion, with 20 papers then being read in full. Of these 20, 11 were selected for inclusion in the literature review, with those articles focusing on eating disorders or the treatment of obesity being excluded. A further article was found through the University’s Summon search engine and was included in the final selection of papers, totalling 12 articles.
Diagram 1. The search strategy and process (Adapted from Moher, Liberati, Tetzlaff & Altman, 2009).

Identification

Records identified through database searching (n = 58)

Additional records identified through other sources (n = 1)

Records after duplicates removed (n = 43)

Screening

Records after screening (n = 24)

Records excluded through title screening (n = 19)

Eligibility

Records excluded through abstract screening (n = 4)

Full-text articles assessed for eligibility (n = 20)

Studies included in qualitative synthesis (n = 12)

Full-text articles excluded,
- 6 related to eating disorders
- 2 related to specific medical conditions
3. Results

The results are structured by dividing the studies into groups; those using a cross-sectional design and those using a longitudinal design to address the impact of attachment style on obesity onset. Ten of the twelve papers involved a cross-sectional design, therefore this group were then divided into age groups of adult, adolescent and child participants, as the implications of these studies will vary depending on the life stage of each participant group.

Table 1 presents an overview of the results; the designs and methods that were used in the chosen studies. The findings, strengths and limitations are discussed in table 2. The strengths and limitations provided are the opinion of the reviewer, and more detail will be provided throughout the text.
Table 1.

Summary Table of Included Papers

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Study</th>
<th>Design</th>
<th>Sample</th>
<th>Outcome measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult 19-60 years</td>
<td>D'Argenio, Mazzi, Pecchioli, Lorenzo, Siracusano and Troisi (2009)</td>
<td>Cross sectional, 3 groups</td>
<td>- 200 participants, recruited from the community and outpatient services - Clinical sample</td>
<td>- Structured clinical interview of DSM IV axis 1 &amp; the Schedule for Interviewing for DSM IV Personality Disorders. - Early Traumatic Life Events Interview - The Relationship Questionnaire - BMI</td>
</tr>
<tr>
<td>Adult 19-60 years</td>
<td>Cooper &amp; Warren (2009)</td>
<td>Cross sectional</td>
<td>- 145 women recruited from university - Non clinical sample</td>
<td>- Hospital Anxiety and Depression Scale - Eating Attitude Test-26 - Attachment History Questionnaire - BMI</td>
</tr>
<tr>
<td>Adult 19-60 years</td>
<td>Wilkinson, Rowe, Bishop and Brunstrom (2010)</td>
<td>Cross sectional</td>
<td>- 200 participants recruited from university - Non clinical sample</td>
<td>- Experiences in Close Relationships (36 items) - Disinhibition Scale - BMI</td>
</tr>
<tr>
<td>Adult 19-60 years</td>
<td>Rommel, Nandrino, Ducro,</td>
<td>Cross sectional</td>
<td>- 94 participants recruited from outpatient clinic, 56 control participants from</td>
<td>- Dutch Emotional Behaviour Questionnaire</td>
</tr>
<tr>
<td>Study</td>
<td>Authors</td>
<td>Age</td>
<td>Design</td>
<td>Sample Size</td>
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<tr>
<td>Adult</td>
<td>Hernandez-Hons &amp; Wolloy, 2012</td>
<td>18-60</td>
<td>Cross sectional</td>
<td>8 women recruited through craigslist.com and university Clinical Sample</td>
</tr>
<tr>
<td>Adolescents</td>
<td>Mayer, Muris, Meesters, (2009)</td>
<td>16-20</td>
<td>Cross sectional</td>
<td>301 females through a school Non clinical sample</td>
</tr>
<tr>
<td>Adolescents</td>
<td>Bosmans, Goossens, Braet (2009)</td>
<td>10-17</td>
<td>Cross sectional</td>
<td>39 males and females, recruited from inpatient obesity treatment Clinical sample</td>
</tr>
<tr>
<td>Adolescents</td>
<td>Holland, Dallos and Olver</td>
<td></td>
<td>Cross sectional</td>
<td>8 females recruited from weight management</td>
</tr>
<tr>
<td>Age</td>
<td>Study Details</td>
<td>Measures</td>
<td></td>
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<td>-------------------------------------------------------------------------------</td>
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<tr>
<td>13-16 years</td>
<td>Stenhamnar, Olsson, Bahmanyar, Hulting, Wettergren, Edlund and Montgomery (2010)</td>
<td>- 873 families recruited through government registers</td>
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<td></td>
<td></td>
<td>- Non clinical sample</td>
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<td></td>
<td></td>
<td>- Demographic information</td>
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<td></td>
<td></td>
<td>- The Swedish Parenthood Stress Questionnaire</td>
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<td></td>
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<td>- The Relationship Questionnaire</td>
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<td></td>
<td></td>
<td>- BMI</td>
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<tr>
<td>3 years old</td>
<td>Goossens, Braet, Van Durme, Decaluwe, and Bosmans (2012)</td>
<td>- 601 male and female children recruited through elementary schools</td>
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<tr>
<td>8-11 years</td>
<td></td>
<td>- Children’s Eating Disorder Examination Questionnaire (Dutch adaptation)</td>
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<td>- The Security Scale</td>
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<td></td>
<td></td>
<td>- BMI</td>
<td></td>
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</tr>
<tr>
<td>Adolescent</td>
<td>Anderson, Gooze, Lerneshaw, and Whitaker (2012)</td>
<td>- 977 children recruited from birth through hospitals</td>
<td></td>
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</tr>
<tr>
<td>15 months - 15 years</td>
<td></td>
<td>- Non clinical sample</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>- Video tapes of child-parent interaction</td>
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<td></td>
<td></td>
<td>- The strange situation scenario</td>
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<td></td>
<td></td>
<td>- The Attachment Q-Sort</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>- BMI at 15 years old</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult</td>
<td>Hintsanen, Jokela, Pulkkki-Räback, Viikari</td>
<td>- 1,570 men and women participating in</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>- Waist:hip ratio</td>
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<tr>
<td></td>
<td></td>
<td>- The Relationship</td>
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</tbody>
</table>

- BMI
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<thead>
<tr>
<th>and</th>
<th>Young Finns study</th>
<th>Questionnaire</th>
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</thead>
<tbody>
<tr>
<td>Keltikangas-</td>
<td></td>
<td></td>
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<tr>
<td>Järvinen (2010)</td>
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</tbody>
</table>
Table 2.

Outcomes, Strengths and Limitations of the Included Studies.

<table>
<thead>
<tr>
<th>Study</th>
<th>Outcome/Conclusions</th>
<th>Strengths</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>D'Argenio et al., 2009</td>
<td>- Those who experience more severe trauma during the first 15 years were more likely to be obese when attachment style and psychiatric diagnosis were taken into account.</td>
<td>- Identified trauma to be linked to obesity, irrespective of diagnoses.</td>
<td>- Participants not generalisable to all that are overweight or obese; may only be applicable to surgery candidates.</td>
</tr>
<tr>
<td></td>
<td>- Strong association found between anxious attachment and obesity.</td>
<td>- Use of interviews rather than self-report measures to identify trauma of trauma may be inaccurate.</td>
<td>- Retrospective accounts - Cross sectional – raises questions regarding causality. - Unable to infer if anxious attachment is cause of disordered eating; difficult to separate anxious attachment from trauma.</td>
</tr>
<tr>
<td>Cooper &amp; Warren, 2009</td>
<td>- Parenting style is related to higher BMI; negative parental discipline predicted variance in BMI.</td>
<td>- Takes anxiety, depression and eating disorders into account.</td>
<td>- Use of self-report measures only. - Only included women - Not clinical sample, only 20% reported to be obese. - AHQ not well tested measure.</td>
</tr>
<tr>
<td></td>
<td>- Attachment history may be important to consider in the contribution to the prevention and treatment</td>
<td>- Conclusive results - Raises questions for further research.</td>
<td></td>
</tr>
</tbody>
</table>
of obesity.
- Mood mediates the
relationship between
attachment style and BMI.

<table>
<thead>
<tr>
<th>Wilkinson et al., 2010</th>
<th>Attachment anxiety was related to disinhibited eating, and predicts BMI.</th>
<th>Implications for treatment.</th>
<th>Self report measures used.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Disinhibited eaters engage in external affect regulation.</td>
<td>Large sample size.</td>
<td>Questions regarding causality.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rommel et al., 2012</th>
<th>Obese women exhibited deficits in emotional awareness and used emotional eating more than controls.</th>
<th>Use of performance based measures.</th>
<th>Only included women.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Parental overprotection negatively influenced obese participant’s emotional awareness, and positively influenced emotional eating.</td>
<td>Implications for treatment of obesity.</td>
<td>Use of self-report measures</td>
</tr>
<tr>
<td></td>
<td>Has relevance to the study of attachment, as identified link between parental bonding (and likely attachment style) and emotional eating.</td>
<td>Has relevance to the study of attachment, as identified link between parental bonding (and likely attachment style) and emotional eating.</td>
<td>Did not control for anxiety, depression or eating disorders.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hernandez-Hons &amp; Wolloy, 2012</th>
<th>Identified through IPA a number of themes that link attachment-related influences with emotional eating.</th>
<th>Identifies clinical need for examining obesity and emotional eating from an attachment perspective.</th>
<th>Qualitative study, therefore results are not generalisable.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Identified links between insecure attachment and addiction and emotional eating.</td>
<td>Used structured criteria for IPA coding.</td>
<td>Categorisation of attachment insecurity; authors did not use standardised methods.</td>
</tr>
<tr>
<td></td>
<td>Use of clinical sample.</td>
<td>Study only used female</td>
<td>Study only used female</td>
</tr>
<tr>
<td>Study</td>
<td>Findings</td>
<td>Methodology/Notes</td>
<td></td>
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<tr>
<td>------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Mayer et al., 2009</td>
<td>- Concluded that eating problems were related to insecure attachments,</td>
<td>- Conclusions were correlative, therefore cannot infer causality.</td>
<td></td>
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<tr>
<td></td>
<td>although this was an indirect relationship.</td>
<td></td>
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<tr>
<td></td>
<td>- Used a range of measures, and considered variables such as depression,</td>
<td>- Use of non-clinical sample.</td>
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</tr>
<tr>
<td></td>
<td>social phobia and self-esteem.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Use of self-report measures</td>
<td></td>
</tr>
<tr>
<td>Bosmans et al., 2009</td>
<td>- Concluded that attachment to mother was linked to weight and shape</td>
<td>- Cross sectional design cannot infer causality.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>concerns, and attachment to father was linked to weight concern only.</td>
<td>- Generalises “eating problems”; does not distinguish between eating disorders and</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>obesity, despite using clinical sample.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- A more insecure attachment style was linked to heightened concerns</td>
<td></td>
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<tr>
<td></td>
<td>regarding weight.</td>
<td></td>
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<tr>
<td></td>
<td>- Identified influence of parents in the development of eating problems.</td>
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<tr>
<td>Holland et al., 2011</td>
<td>- Participants used food to cope with difficult emotions and experiences.</td>
<td>- Qualitative study, therefore results are not generalisable.</td>
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<tr>
<td></td>
<td>- Emotional eating appeared to be embedded</td>
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<tr>
<td></td>
<td></td>
<td>- Only used female participants.</td>
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</tr>
<tr>
<td></td>
<td>- Used standardised measure (CAI) to characterise attachment behaviour</td>
<td></td>
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</tbody>
</table>
within experiences of early relationships and linked with insecure attachment.

- Included BYI to assess for variables of anxiety and depression.
- Has clinical implications for the use of family therapy when considering the treatment of obesity.

<table>
<thead>
<tr>
<th>Stenhammar et al., 2010</th>
<th>- Family stress was associated with children being over or underweight.</th>
<th>- Large sample size</th>
<th>- “Family stress” was measured through subjective parental stress; this may impact children differently.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Attachment style was linked to an increased BMI, but not independently of family stress.</td>
<td>- Reliable measures of attachment</td>
<td>- Use of non-clinical sample; 20% were overweight.</td>
</tr>
<tr>
<td></td>
<td>- Associations between family stress and attachment were more pronounced in overweight children than underweight.</td>
<td>- Identified different attachments to each parent.</td>
<td>- Authors identified possible self-selection bias through participants, e.g. if the child was overweight or of concern, parent’s more likely to engage in the study.</td>
</tr>
<tr>
<td></td>
<td>- Insecure attachment to either parent is linked to suboptimal BMI.</td>
<td></td>
<td>- Young age to assess risk for onset of obesity.</td>
</tr>
<tr>
<td>Goossens et al., 2012</td>
<td>- Concluded that</td>
<td>- Distinguished between</td>
<td>- RQ is primarily used for assessing adult attachment.</td>
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<td></td>
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</table>

- Noted higher attrition
<table>
<thead>
<tr>
<th>Study</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anderson et al., 2012</td>
<td>- Poor quality maternal relationships were associated with higher levels of adolescent obesity. - Use of two measures of attachment rather than questionnaires. - Large sample size. - Longitudinal study with extensive follow up. - Discusses implications for prevention of obesity.</td>
</tr>
<tr>
<td>Hintsanen et al., 2010</td>
<td>- Concluded that a higher waist-hip ratio were associated with a more fearful attachment style. - Large sample size. - Longitudinal study with substantial follow up. - Accounted for variation in education and measures of attachment.</td>
</tr>
</tbody>
</table>

- Attachment style is linked to eating pathology.
- Insecure attachment to mother was associated with dietary restraint and eating, weight and shape concerns, whereas insecure attachment to the father was linked to binge eating behaviours.
- Insecure attachment was correlated with increased BMI at 1 year follow up. - Considers clinical implications of findings.
that BMI has a negative relationship status.

impact on psychological functioning.

- Identified gender differences.

- Measures BMI at several time points.
3.1. Longitudinal Studies

Hintsanen et al. (2010) conducted a longitudinal study to assess the associations between attachment style and BMI and waist-hip ratio. The participants were involved in a Cardiovascular Risk study, and complete further attachment measures in adulthood. BMI was collected at two separate points, and the attachment measure completed at between ages 24-39 years old. The authors concluded that a preoccupied attachment style was associated with a higher BMI, and that a higher BMI might have negative associations with psychological functioning as well as physical health. They go on to suggest that the results imply that physical appearance might also be associated with attachment style. This paper is written with the conclusions that the direction of causality that a higher BMI negatively influence attachment style, whereas much of the wider research suggests attachment style influences BMI, due to it being viewed as stable throughout the lifespan (Bowlby, 1988). Despite this being a longitudinal study, it is still not possible to infer causality in this paper, as attachment style was only measured once in adulthood. The use of waist-hip ratio as well as BMI makes this study more methodologically sound, and the authors were able to infer that these measurements in youth were predictive of those in adulthood. Although many studies are critiqued for using a female only sample, this study could be criticised for using both; the authors acknowledge that waist-hip ratio is not comparable between men and women.

In comparison, Goossens et al. (2012) included both genders, which added to their study due to the use of BMI only. Goossens et al. were able to infer that the parent-child relationship influences eating pathology in their investigation of attachment style and eating pathology and weight gain in 8-11 year olds, following them up one year later. The authors concluded that insecure attachment toward the mother predicted increases in dietary restraint, eating, weight, and shape concerns, and adjusted BMI in the children one year later, whereas
an insecure attachment toward father was predictive of the children’s binge eating episodes. The main limitation of this study is the length of follow up, it would have been interesting to observe the development of eating pathology through later adolescence. The study had a high dropout rate, and the authors identified those who dropped out to have more disturbed eating pathology; this may skew the results.

A final longitudinal study included in this review is that by Anderson et al. (2011), who focused on maternal-child relationships and onset of adolescent obesity. Along with Goossens et al. and Hintasen et al., they were able to recruit a large sample of 977 children. One strength of this study was the measurement of attachment style being concluded as the result of observations of the children at 15, 24 and 36 months, and a long follow up of the children at age 15 years where their BMI was recorded. They concluded poor quality relationships was associated with obesity, but that low maternal sensitivity was a particular risk factor. This highlights weaknesses in the other studies, such as that by Goossens et al.; many studies conclude that attachment style is linked to BMI, but does not identify the underlying psychological mechanisms involved, such as emotional regulation.

3.2 Cross Sectional Studies

3.2.1 Children

Three studies included in this review investigated obesity and attachment style with children, with one of these being cross sectional. Stenhammer et al. (2010) conducted a two stage cross sectional design study to investigate the impact of family stress and attachment style on the BMI of young children aged three years old. The authors approached all parents of children born in a six month period, and the BMI of the participants were collected at 6 months, 18 months and 3 years. They concluded that insecure attachment to either the father
or mother was associated with being overweight, with maternal attachment also being associated with underweight in the children. Furthermore, parental stress, particularly maternal stress, was associated with increased BMI. In terms of the limitations of this study, the authors acknowledge the difficulty of using a questionnaire to measure this, and the problems with self-report measures. It has previously been suggested that the use of self-reports may be affected by a number of social and subjective processes (Marks & Yardely, 2004) that need to be considered when interpreting such results. Furthermore, it is possible that there is a selection bias present in this sample; the authors identified a higher number of overweight children included in the sample than would be representative to the population, and the authors acknowledge that those parents who may be worried about their child’s weight are more likely to participate. In addition, measuring BMI at 3 years old may not be predictive of adult obesity; further longitudinal research is needed in this area.

3.2.2. Adults

Five studies used adult samples to investigate the relationship between obesity and attachment style. D’Argenio et al. (2009) explored the link between obesity and childhood physical or sexual abuse in their cross sectional study. They hypothesised that the mediating mechanism of psychological dysfunction leads to obesity in adulthood. They interviewed all participants on their early life experiences, and rated their levels of trauma using the Early Traumatic Life Events interview structure. The prevalence of the traumatic events was then calculated for all three groups, and compared with levels of obesity. The authors measured their participant’s attachment styles using the Relationship Questionnaire, which then plots attachment style in 2 dimensions; anxious and avoidant, and used binary logistic regression to identify predictors of adult obesity. They concluded that severity of early trauma was a significant predictor of adult obesity, and an anxious attachment style also predicted the
prevalence of adult obesity. They concluded that having a psychiatric diagnosis did not fully explain the link between early trauma and obesity.

The use of three intervention groups, including a control group makes this study one of the more methodologically robust designs in this review. However, it is possible that there may be issues of disclosure within this study; enquiring about traumatic life events through a one-off interview may prevent participants disclosing such personal details.

Rommel et al. (2012) investigated the hypothesis that obese women will have deficits in emotional awareness and therefore use emotional eating to regulate emotion, and also explored the impact of parental bonding on levels of emotional awareness. The results indicated that obese patients have reduced emotional awareness in comparison to the control group, and more often use emotional eating to regulate their emotions. They concluded that emotional awareness was a significant and positive indicator of emotional eating in the obese group. They also found a significant relationship between parental attachment style and emotional awareness in obese patients. However, the use of self-report questionnaires regarding emotional eating may not produce consistent results; it is possible that participants under report incidences of emotional eating, or may not wish to disclose such behaviours.

Cooper and Warren (2011) conducted a study to investigate whether attachment history predicts variance in body mass index (BMI). The authors considered the mediating variables of anxiety, depression and eating disorders and their potential impact on BMI, and controlled for this. They demonstrated that negative parental discipline was a unique predictor of BMI, and therefore concluded that parenting style is related to a higher body weight in children. There are a number of limitations to this study; it is not a clinical sample, and only 17.2% of the participants were deemed to be overweight or obese. Furthermore, the reliability of the Attachment History Questionnaire could be questioned, as the authors acknowledge that it is a relatively untested measure in the previous literature.
Their findings support the theory that attachment style may be linked to obesity, but also highlighted the mediating role of mood. They suggest that mood may influence recall bias, and lead to the attachment being recalled in a negative way.

This consideration of self-reporting and also the impact of mood on attachment recall can also be applied to Henandez-Hons and Woolley’s (2011) paper. They conducted a qualitative study to investigate the link between emotional eating and attachment processes. They identified ten key themes in this relationship, which included “relationship history”, “emotional eating a reminiscent of ambivalent and anxious attachment” and “addiction as coping mechanisms for insecure attachment”. The authors conclude that there are clinical benefits to addressing emotional eating in obese women from an attachment perspective. However, due to the nature of the qualitative method, these results would not be generalisable and the subjective interpretation that is required when using Interpersonal Phenomenological Analysis may impact the results. Furthermore, the authors acknowledge the homogeneity of the sample’s demographics, and highlight that this may also impede the generalisability of the results.

Wilkinson, Rowe, Bishop & Brunstrom (2010) explored the relationship between BMI, disinhibited eating, and attachment anxiety. They suggest that attachment anxiety may explain differences in BMI through the tendency to engage in disinhibited eating, which would then lead to a higher BMI. Using multiple regression, significant relationships were found between BMI and attachment anxiety, and between disinhibited eating and BMI. In addition, further analysis showed the mediating variable of disinhibited eating to be significant in the relationship between BMI and attachment style.
The critique of this study can also be applied to Cooper and Warren’s (2011) paper; due to the participants being recruited from a local university, the mean ages of these two samples is between 20-25 years old. Previous research (such as Ward, Ramey and Treasure, 2000) has indicated that attachment style changes through the adult lifespan, and this point will be explored further within the discussion section. In addition, Cooper and Warren’s sample consisted of only women; therefore it may not be generalisable to the general populations, or to any male populations. Both Hernandez-Hons and Woolley (2011) and Rommel et al. (2012) used female samples, and therefore the impact of gender on this relationship cannot be explored in these papers.

D’Argenio et al. (2009) and Rommel et al. (2012) both used clinically obese samples recruited through treatment clinics, whereas Hernandez-Hons and Woolley (2011) used a clinically obese sample that were not necessary engaged in treatment. Therefore it is difficult to generalise these results to non-clinical samples such as those used by Wilkinson et al. (2010) and Copper and Warren (2011). Also, by using a cross sectional designs, none of these studies are able to infer causality. However, this research is able to identify a relationship between attachment style and BMI which would be beneficial in exploring further with additional research, and opens up a number of other questions for clinical practice.

3.2.3. Adolescents

Three papers in this review used a sample consisting of adolescents; Mayer et al. (2009), Bosmans et al. (2009) and Holland et al. (2011).

Mayer et al. explored the correlation between eating behaviour problems in late adolescents, with risk factors such as attachment style, low self-esteem, and negative affect. They concluded that attachment style and social anxiety had an indirect relationship to BMI and eating problems, whereas depression and self-esteem had a direct relationship to eating
behaviour. Despite not using a clinical sample, this study was included for its insights into the direct and indirect relationships between factors such as attachment style and disturbed eating behaviours. It also highlights the need for consideration for co-morbidities such as depression.

Bomsans et al. did not consider the impact of such negative affect in their study of overweight inpatient adolescents. They concluded that attachment to each parent influenced the participants in different ways, with attachment to the mother being linked to weight and shape concerns, and attachment to the father being linked to weight concerns only. Furthermore, a preoccupied and fearful attachment style was correlated with higher shape concerns. The authors highlight the need for attachment style to be taken into consideration when planning treatment for such youngsters. The use of a clinical sample is an advantage of this study, yet the omission of a control group and lack of consideration for possible co-morbidities as highlighted by Mayer et al. makes these findings less reliable.

Holland et al. (2011) investigated the relationship between obesity and attachment style using qualitative methods. The authors analysed the data using Interpersonal Phenomenological analysis, and found a dominant theme of emotion regulation. They concluded that complex, conflicted family relationships have influenced the participant’s attachment styles, with a reliance on food as a coping mechanism. The authors highlighted that these individual attachment behaviours needs to be considered when planning for interventions. The use of a standardised attachment measure, the Child Attachment Interview, enables this study to be more methodologically robust, as does the consideration for negative affect with the use of the BYI. However, as with any qualitative study, the subjective nature of this paper makes its generalisability limited. Furthermore, as in the case of Rommel et al. and Cooper and Warren’s papers, the use of a female only sample further restricts the generalisability of the findings.
The studies have been grouped by age range, as the age of participants is likely to have an impact on both the reported attachment styles and the behaviours that are exhibited as a result. Ward, Ramsey and Treasure (2000) have argued that in the research of eating disorders and attachment style, using a young sample may impact the nature of this relationship, as attachment issues in adolescence are radically different from those of middle years. This needs to be considered when investigating obesity also.
4. Discussion

The current review aims to present a picture of the current research surrounding the links between attachment style and the onset of obesity. To aid a better understanding of the relationship between attachment style and obesity, a number of highlighted issues will be examined in greater detail in this discussion. After addressing some of the general research limitations and problems, this discussion will look at future implications for both further research and those practicing in the field.

4.1. The current research

As shown in this review, there are relatively few articles in this area, and all of the articles included in this study have been conducted in last 4 years. This highlights that this is a relatively new area of research, which is therefore likely to have a number of gaps within the literature. The inclusion of all age ranges within this review further demonstrates the limited studies available that have considered the nature of obesity from an attachment angle.

4.1.1. Longitudinal vs. Cross-Sectional Designs:

The studies included in this review were a combination of both longitudinal and cross-sectional designs. Each has their merits and limitations; longitudinal studies allow an element of causality to be measured, whereas cross sectional studies are unable to make such inferences. Only three studies in this review used a longitudinal design, with one of these having a follow up period of just one year. Previous research has indicated that there is some stability in the path to obesity between childhood and adulthood (Eriksson, Forsén, Tuomilehto, Osmond & Barker, 2001; Freedman et al., 2005), however, with the increasing awareness and interventions being widely publicised (Department of Health, 2013), this
pattern may should not be assumed, and therefore cross sectional studies that predict a path of obesity should be read with caution.

4.1.2. Sample:

The nature of the samples used in the studies that have been examined in this review vary hugely. The comparison of different the age ranges of the participants may present an inaccurate picture when looking at attachment style; Ward et al. (2000) highlight that attachment style may change between adolescence and adulthood. In terms of eating disorders and difficulties, chronicity is linked with age, and Ward et al. suggest that this may be a marker of different underlying attachment problems. None of these studies used in this review acknowledge the impact of the age range of their participants on their attachment style, however, this is likely to be due to the assumption that attachment style remains relatively stable over time (Mikulincer & Shaver, 2003). This considered, the display of symptoms linked to attachment style is likely to fluctuate throughout the lifespan, such as during times of stress and through older age (Van Assche et al., 2013). Much of the research conducted into obesity and its links with attachment used child and adolescent participants, which may be an inaccurate representation of the relationship.

Cultural differences may also need to be considered. This review included mostly international studies; six were conducted in Europe, two studies were conducted in the USA, and the remaining 3 studies were based in the UK; only one of these involved a clinically obese sample. Cross-cultural differences and variations in the administration and adaptation of specific measures need to be considered when interpreting and comparing results. In addition, this review highlights the need for further research with an adult UK based population when considering the relationship between attachment style and obesity. Further to this, the use of non-clinical samples when looking at BMI and its links to attachment style
may cloud the picture when assessing the relationship between attachment style and obesity, and this needs to be held in mind when comparing studies.

4.1.3. Emotional eating:

Three studies included in this review considered the role of emotional eating and how overeating in response to emotional states places an individual at risk of obesity. All of these studies specifically linked the overeating to the likelihood of an insecure attachment style. As previously noted, an insecure attachment style is commonly displayed in an inability to regulate emotions, and it follows that this could place individual’s at risk of emotional eating. There is further research in this field that has considered the role of emotional eating and obesity (Chesler, 2012), yet has not explicitly connected emotional eating as being a symptom of an insecure attachment style. It is likely that the marrying of these two research areas would present a richer picture regarding the relationship between attachment style and obesity. Furthermore, articles such as by Chesler (2012) underline the current disconnection between the findings in this area, and its lack of implementation in clinical services.

4.1.4. Co-morbid disorders:

A number of studies highlighted the impact of co-morbid disorders such as anxiety, depression, and eating disorders. However, only three studies considered the interaction of these symptoms with attachment style and the development of obesity. This is a major limitation of the studies reviewed here; it has been previously demonstrated that obese individuals often suffer with co-morbid disorders such as depression and eating disorders including binge-eating disorder and bulimia nervosa. However, due to this high percentage, it is understandable why this may not necessarily have been used as an exclusion criteria due to a resulting smaller sample pool, and the ethical difficulties managing the depressive
symptoms once they are acknowledged (Keiswetter et al., 2010), particularly within a non-clinical sample.

4.1.5. Diagnostic instruments:

The difficulty in accurately measuring an individual’s attachment style has been well documented in the literature, and the variability in the measures used in the studies included in this review highlight the variation in preference for attachment measures. Ravitz, Maunder, Hunter, Sthankiya, and Lancee (2010) conducted a review of the measurement of attachment style over the last 25 years, and concluded that the Adult Attachment Interview (George, Kaplan, and Main, 1985) is still considered to be the gold standard in the measures of attachment style, but due to the need for training, time and resources to administered it, less time consuming self-report measures have been developed. Ravitz et al. identified 29 different measures of attachment, and stated the need for the consideration of what relationship is the focus, for example, romantic partner or parents, and what type of attachment constructs, dimensions, or categories are of specific interest.

Further to this, a number of researchers have contested the ability to categorise individuals into Ainsworth’s (1978) previously identified three organized patterns of attachment style (secure, avoidant, and resistant/ambivalent) through self-report measures. Therefore, several authors have broken the type-descriptions into agree-disagree items, factor-analysed the items, and turned them into continuous scales of attachment avoidance and anxiety (Bartholomew, 1990). Bartholomew & Horowitz (1991) then went on to develop a four-type conceptual scheme that included the previous attachment styles and added a second kind of avoidance, dismissing-avoidance. Measures such as Brennan, Clark, and Shaver’s (1998) Experiences in Close Relationships (ECR) questionnaire, and the revised version by Fraley, Waller and Brennan (2000), plot an individual’s attachment traits on these anxiety and avoidance dimensions, as opposed to placing them within a category. However,
measures such as the Attachment History Questionnaire offer a composite score of attachment style. Therefore, drawing comparisons between these two different approaches of measures attachment needs to be done with caution.

However, despite the format of these questionnaires, self-report measures in general have been criticised for being passive, as attachment theory states that attachment behaviours need to be activated, often by stressful situations (Mikulincer & Shaver, 2003). In addition, Ravitz et al. (2009) highlight that self-report measures focus on the views that individuals currently hold about themselves and others, and therefore may not detected a stable attachment style.

4.2. Future Directions

4.2.1. For Practitioners

At present, obese patients receive little in the way of psychological support or treatment; even those undergoing bariatric surgery receive limited psychological intervention pre or post-surgery. This review has highlighted a number of areas that need to be further explored and considered when working with obese patients and deciding whether they would be appropriate for obesity intervention.

When looking at these studies together, it is clear that attachment style has an impact on the development and onset of obesity and weight gain, and it would therefore follow that, unless the attachment behaviour is modified, interventions for obesity would be likely to fail. Therefore, further exploration of additional assessment and treatment methods for those with insecure attachment styles, such individual psychotherapy, need to be considered.

Although attachment and its implications are usually seen within a psychodynamic perspective (Shaver & Mikulincer, 2005), the consequences of an insecure attachment style, such as emotional regulation and emotional eating, may benefit from being treated using a
Cognitive Behavioural Model. Further to this, Chesler’s (2012) review indicates that a Cognitive Behavioural approach could alleviate symptoms of emotional eating, and therefore potentially improve weight loss interventions, should be explored within the clinical domain.

A need for aware of attachment style for those involved in obesity interventions is evident. These studies have primarily focused on the attachment between an individual and parent, and explored the impact of this relationship on the individual’s BMI. However, an attachment also exists between a patient and a therapist; Keisewetter et al. (2010) indicate the necessity of the consideration of the ability of the patient to form any attachment to their therapist, in order to optimise obesity treatment outcomes. Therefore, it is important for practitioners to be aware of such attachment, or lack thereof, throughout their interventions to reduce BMI.

4.2.2. For Researchers:

As previously discussed, there were a limited number of articles found on the subject of attachment style and its impact on adult obesity; the majority of the papers included in this review focuses on the onset of childhood obesity. This highlights the need for further research in the area of attachment style and adult obesity in general; much of the previous literature that was excluded from this review focused on the links between attachment style and eating disorders. In the last decade there has been increasing research that has found strong links between attachment behaviours and both the onset and success of treatment of eating disorders, yet little has been done to expand this into the area of obesity.

The majority of studies in this review focused on the implications of attachment style on the onset of obesity. However, as previously mentioned, it is likely that with such prominent links with the onset of obesity, it is likely that this stable attachment style will then infiltrate any possible treatment intervention. This may disrupt treatment compliance, motivation, and overall success. Therefore, it would be beneficial to explore this further, in
particular with those undergoing more invasive interventions, such as bariatric surgery patients.

Further to this, only three longitudinal studies were found in this literature search. Additional longitudinal research in this would enable the stability of attachment style to be seen in a variety of populations, as well as add stronger evidence to the possible influence of attachment on obesity outcomes. In addition, a number of the studies in this design have a criticism regarding not being able to infer causality that attachment style leads to obesity, and a range of longitudinal studies would help to clarify this relationship.

A number of studies addressed the impact of emotional eating on obesity onset, but much more needs to be done to question emotional eating as a symptom of insecure attachment. Furthermore, emotional eating is clearly a risk factor for obesity, and its role in the implementation of obesity interventions could also been researched further. Chesler’s review (2012) specifically examines the impact of emotional eating with the outcome of bariatric surgery, however, she highlights that currently there are only three published studies in this area.

As previously mentioned, the majority of the research conducted in obesity and attachment style has been conducted internationally. This highlights the need for further investigation regarding the role of attachment style in the UK population, and with the use of clinical sample. Further, the exploration of the impact of attachment style with the more severely obese may produce especially interesting findings.

4.2.3. Future research questions

In conclusion, a number of potential future research questions have been highlighted. These include:

- What is the role of attachment in a clinically obese UK population?
• Does attachment style influence decision making regarding obesity intervention?
• How does attachment style influence treatment outcomes?
• Does attachment style influence compliance in obesity treatments?
• Is attachment style linked to perceived levels of control in the obese population?
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Summary of Clinical Experience

Date: October 2012 – September 2013

Placement: Adult mental health: Community Mental Health Team (CMHT)

Experience: Within the CMHT, I was responsible for the undertaking of various (often complex) psychological assessments, including standardised neuropsychological assessments, self-report measures, observations, risk assessments, initial screening assessments, interviews with service users, family members and others involved in the service users care. I provided short and longer term psychological interventions for a range of mental health presentations, including depression, anxiety, PTSD, psychosis and personality disorder. I gained experience in using a range of models; my interventions often included the use of CBT, DBT and narrative approaches. These interventions were always informed by the collaborative use of formulation with the service user and team. These inventions were delivered in various parts of the community (e.g. the service users home, day centre, within clinics) through varying formats (e.g. 1:1 therapy, group therapy such as STEPPS, consultation with staff and family members). This placement gave me the opportunity to liaise with a number of other services, including those in primary care and tertiary services such as Early Intervention in Psychosis. Within this placement, I was able to spend a number of days working within the Assertive Outreach Team, supporting service users to remain out of hospital and integrate into the community.

Date: October 2013– March 2014

Placement: Child: Child and Adolescent Mental Health Service (CAMHS)

Experience: Within my CAMHS placement, I conducted a range of both therapeutic and diagnostic assessments. This included detailed neuropsychological assessment for the diagnosis of neurodevelopmental disorders, such as ASD and ADHD. I often used individual
CBT sessions to tackle psychological problems with a child, and in parallel implemented systemic ideas with the child’s family. I gained experience of writing detailed reports suitable for service users, parents and other health professionals to read. I regularly attended professional meetings (e.g. Care Programme Approach meetings, school liaison meetings) with a range of services involved in the child’s care. This placement also gave me the opportunity to provide supervision to an honorary assistant psychologist.

**Date:** October 2013 – March 2013

**Placement:** Older Adult: Memory Assessment Service (MAS)

**Experience:** Within the MAS team, I was involved in the extensive neuropsychological assessment for the diagnosis of a range of dementias. This involved detailed testing and information gathering, and close MDT working with others, such as nurses and psychiatrists in order to provide a clear diagnosis. This placement also enabled me to develop a number of psychosocial interventions; I was required to write and facilitate an adjustment group for patients following diagnosis. Furthermore, I was involved with the development and facilitation of Memory Management Groups and Carer’s Wellbeing Groups. This placement also required me to provide consultation to care homes and additional services to inform patient care. In addition, I co-facilitated a systemic reflective practitioner group for nursing staff with another trainee, which widened my knowledge of MDT working and the challenges that other disciplines face.

**Date:** September 2014- March 2015

**Placement:** Learning Disability: Community Learning Disabilities Team (CLDT)

**Experience:** This placement required me to provide individual assessment and interventions for those with often complex psychological, physical and developmental needs. I was able to
learn and develop skills using a Cognitive Analytic Approach within my individual work, as well as within a health support group for service users with type 2 diabetes. I also had the opportunity to participate in a CAT supervision group on a regular basis, as well as through 1:1 supervision. This experience also strengthened my consultation and teaching skills, as I was required to provide services to residential homes regarding the support of those with dementia. Through this placement, I gained experience of adapting my approach for diverse contexts and audiences. This placement also developed my supervision skills, as I had the opportunity to supervise two honorary assistant psychologists.

**Date:** March 2015 – September 2015

**Placement:** Specialist: Acute Inpatient Neuropsychology and Intensive Neuropsychological Rehabilitation.

**Experience:** My specialist neuropsychology placement involved working in both acute medical settings and inpatient rehabilitation. My acute experience consisted of providing assessment and consultation to an acute traumatic brain injury ward. This included the management of challenging behaviour and the training of staff to utilise behavioural approaches. This work regularly required detailed risk and capacity assessments, often completed with other members of the MDT. In addition, I have provided comprehensive complex neuropsychological assessments within epilepsy surgery clinics, as well as in general neurology clinics. I also worked within an intensive inpatient rehabilitation unit, providing assessment, intervention, and consultation to the MDT. This included systemic work with families, supporting staff to carry out behavioural interventions, and conducting neuropsychological testing.
# Table of Assessments

## Year I Assessments

<table>
<thead>
<tr>
<th>PROGRAMME COMPONENT</th>
<th>TITLE OF ASSIGNMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fundamentals of Theory and Practice in Clinical Psychology (FTPCP)</td>
<td>Short report of WAIS-IV data and practice administration</td>
</tr>
<tr>
<td>FTPCP – practice case report</td>
<td>A cognitive behavioural therapy assessment and intervention with a woman in her thirties presenting with symptoms consistent with posttraumatic stress disorder.</td>
</tr>
<tr>
<td>Problem Based Learning – Reflective Account</td>
<td>Problem Based Learning – Reflective Account</td>
</tr>
<tr>
<td>Research – Literature Review</td>
<td>What is the relationship between obesity and attachment?</td>
</tr>
<tr>
<td>Adult – case report</td>
<td>A Cognitive Behavioural approach to the assessment and intervention for a male in his early twenties presenting with social anxiety.</td>
</tr>
<tr>
<td>Adult – case report</td>
<td>A Cognitive Behavioural approach to the assessment and intervention for a male in his forties presenting with recurrent depression.</td>
</tr>
<tr>
<td>Research – Qualitative Research Project</td>
<td>The judicious use of self-disclosure in therapy amongst first year Trainee Clinical Psychologists</td>
</tr>
<tr>
<td>Research – Major Research Project Proposal</td>
<td>What is the relationship between weight loss after obesity surgery and attachment?</td>
</tr>
</tbody>
</table>

## Year II Assessments

<table>
<thead>
<tr>
<th>PROGRAMME COMPONENT</th>
<th>TITLE OF ASSESSMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research</td>
<td>Research Methods and Statistics test</td>
</tr>
<tr>
<td>Professional Issues Essay</td>
<td>What are professional boundaries, boundary crossings and boundary violations? Critically discuss the significance these issues have for the practice of clinical psychology, focussing in particular on ethical concerns surrounding dual relationships and how we manage these.</td>
</tr>
<tr>
<td>Problem Based Learning – Reflective Account</td>
<td>Y2 Problem Based Learning – Reflective Account</td>
</tr>
<tr>
<td>People with Learning Disabilities/Child and Family/Older People – Case Report</td>
<td>A neuropsychological assessment of a teenage girl presenting with anxiety and school refusal.</td>
</tr>
<tr>
<td>Personal and</td>
<td>Personal and Professional Learning Discussion Groups –</td>
</tr>
<tr>
<td>Professional Learning Discussion Groups – Process Account</td>
<td>Process Account</td>
</tr>
<tr>
<td>----------------------------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>People with Learning Disabilities/Child and Family/Older People – Oral Presentation of Clinical Activity</td>
<td>Oral Presentation of Clinical Activity: A memory management group for people with dementia.</td>
</tr>
</tbody>
</table>

### Year III Assessments

<table>
<thead>
<tr>
<th>Programme Component</th>
<th>Assessment Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research - SRRP</td>
<td>An evaluation of the value and utility of Service Related Research Projects</td>
</tr>
<tr>
<td>Research – MRP Portfolio</td>
<td>Attachment, eating behaviour and weight loss: A cohort study of patients before and after bariatric surgery</td>
</tr>
<tr>
<td>Personal and Professional Learning – Final Reflective Account</td>
<td>On becoming a clinical psychologist: A retrospective, developmental, reflective account of the experience of training</td>
</tr>
<tr>
<td>Child and Family/People with Learning Disabilities/Older People/Specialist – Case Report</td>
<td>A CAT informed extended assessment of a male in his early 20’s with a learning disability and anger difficulties.</td>
</tr>
</tbody>
</table>