AN EXPLORATION OF EXPLICIT AND IMPLICIT ATTITUDES, PREFERENCES AND ANTICIPATED BEHAVIOURAL RESPONSES TOWARDS ANOREXIA NERVOSA AND OBESITY

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A thesis submitted to the University of Huddersfield in fulfilment of a Master's by Research degree

The University of Huddersfield

Resubmission date: March 2016

Abstract

Previous explicit mental health and weight bias studies have suggested that blame is attributed towards both anorexia nervosa (AN) and obesity sufferers for their conditions. Implicit weight bias research has consistently supported a preference towards underweight compared to overweight individuals. The present study aimed to examine the extent to which this preference existed when comparing the more extreme weights associated with AN and obesity, assessed using both explicit and implicit measures. Fifty-four undergraduate psychology students were recruited for the present experiment. After reading vignettes, participants were instructed to complete the Attribution Questionnaire (Corrigan, Markowitz, Watson, Rowan, & Kubiak, 2003) and the Social Distance Scale (Breheny, 2008) as the explicit measures of attitude and anticipated behavioural responses. Participants were then required to complete two Implicit Association Tests. Participants were instructed to group together different categories of words. The time taken to complete the categorisations is designed to reflect participant preference for one of the categories (Greenwald, McGhee, & Schwartz, 1998). The present experiment was a repeated measures design: all participants completed both implicit and explicit measures when considering both AN and obesity. The results from the explicit measures suggested a significantly higher level of blame was attributed towards the obese target when compared to the AN target. Significantly more pity was reported towards AN relative to obesity. In terms of the implicit measures, non-significant differences were found in response latencies between AN and obesity, indicating the lack of an implicit preference towards either condition. The implicit and explicit findings were correlated but no moderate to strong significant relationships were found, suggesting inconsistencies between the implicit and explicit measures of attitude and anticipated behavioural responses. This inconsistency between measures was consistent with previous research and is discussed in relation to the Model of Dual Attitude (Wilson, Lindsey, & Schooler, 2000).

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Dedications and Acknowledgements

Dedicated to Dr. Susanna Kola-Palmer

For her incredible support over the past two years through my undergraduate dissertation and my Master's by Research degree. Her advice, guidance and hard work were so appreciated throughout.

Introduction

Mental health stigma is still extremely prevalent (Fitzpatrick, 2015), with a higher level of discrimination and social distance being found to be associated with psychological disorders when compared to physical disabilities and 'normal' people (Jorm & Oh, 2009). Quinn, Williams and Weisz (2015) found that half of their sample of individuals with a psychological disorder had reported experiencing discrimination in the past, such as not getting hired for jobs and receiving poorer medical care. Perceived stigma and discrimination can have a negative impact on individuals with a psychological disorder such as reducing their self-esteem and self-confidence (Fung, Tsang, Corrigan, Lam, & Cheung, 2007; Sartorius, 2007) and contributing to a reluctance in seeking professional help (Barney, Griffiths, Jorm, & Christensen, 2006; Corrigan, Druss, & Perlick, 2014).

Along with mental health stigma, weight bias is also a prevalent issue (Puhl, Andreyeva, & Brownell, 2008), with weight bias referring to stigma and discrimination based on an individual's weight (Washington, 2011). Weight bias can affect both those with psychological disorders, such as anorexia nervosa, and those with conditions that are not generally considered psychological disorders, such as obesity (Puhl & Suh, 2015). Weight bias can affect all aspects of everyday life, including school (Puhl, Luedicke, & Heuer, 2011) and healthcare (Mulherin, Miller, Barlow, Diedrich, & Thompson, 2013). Similar to mental health stigma, weight bias can also have a negative impact on victims, such as a higher consumption of calories and the perception of reduced control over diet in overweight individuals (Major, Hunger, Bunyan, & Miller, 2014) and increased stress which could maintain weight (Tomiyama, 2014). Research into mental health stigma and weight bias can have practical implications; for example, the findings could be used to inform educational interventions.

Theory.

The Attribution Model (Corrigan, Markowitz, Watson, Rowan, & Kubiak, 2003) was the theoretical basis of the present study. It outlines the factors that contribute to the

public's discrimination towards individuals suffering with a mental disorder. It was developed by combining the attribution theory, the process by which the perception of causation is used to explain behaviour (Kelley & Michela, 1980), with the danger appraisal hypothesis, the idea that the assessment of the level of danger affects negative emotional responses and avoidance behaviours (Paterson & Neufeld, 1987). The model includes factors such as the familiarity with an illness, the level of responsibility attributed to the sufferer for their condition, the perception of the controllability of the illness, perceived dangerousness of the sufferer, and emotional reactions (e.g. pity and anger). The factors within the model predict behavioural responses towards the sufferer of a condition, including helping and discriminatory behaviours. The model predicts that if a lay individual perceived that a mental illness sufferer was responsible for the cause of their condition, negative emotional responses and the perception of the attribution of blame would increase, and therefore discriminatory behaviours would similarly increase and helping behaviours would decrease. Familiarity with an illness was predicted to increase positive emotional responses and decrease both the attribution of blame and discriminatory behaviours (Corrigan et al., 2003).

Corrigan et al. (2003) tested the Attribution Model on a sample of college students. They were required to read a vignette describing a target with schizophrenia then respond to the Attribution Questionnaire. The items on the questionnaire were designed to measure the different concepts included within the model. The results from the experiment supported various interactions outlined by the model; for example, if an individual with a mental illness was perceived to be responsible for the cause of their condition, participants anticipated more discriminatory behaviours. Additionally, perceived causal responsibility lead to increased negative emotions (i.e. fear and anger) and decreased pity, which predicted the increase in discriminatory behaviours. The familiarity with mental illnesses was found to be associated with increased helping behaviours, decreased discriminatory behaviours and increased pity towards the sufferer. Although, the attribution of blame towards an individual for their condition was

not found to be associated with familiarity as predicted. In terms of dangerousness, the results suggested it was strongly associated with fear responses and accounted for discriminatory behaviours. Overall the findings supported the majority of interactions and associations outlined by the model. The Attribution Questionnaire developed by Corrigan et al. (2003) has been utilised in previous stigma research, both in terms of general mental health stigma (e.g. Rusch, Todd, Bodenhausen, & Corrigan, 2010; Corrigan, Watson, Warpinski, & Gracia, 2004) and stigma specific to psychological disorders, such as self-harm (Law, Rostill-Brookes, & Goodman, 2009).

Anorexia Nervosa.

Anorexia Nervosa (AN) is characterised by a reduced energy intake resulting in low body weight, and a pathological fear of gaining weight (DSM-V; American Psychological Association, 2013). AN is associated with physical long-term consequences, such as cardiovascular complications and fertility problems (Meczekalski, Podfigurna-Stopa, & Katulski, 2013). AN remains a crucial psychological disorder to research due to its association with high mortality rates. Arcelus, Mitchell, Wales and Nielson (2011) reviewed 36 studies and found mortality rates were highest in AN than any other eating disorder after controlling for study sample size and the duration of follow-up periods. In terms of the stereotypes of AN, Watters and Malouff (2012) suggested a character with AN described in a vignette was perceived to have significantly lower levels of emotional stability, agreeableness, openness and extroversion relative to a character not described as having AN, indicating anorexics are perceived to possess more negative attributes. Being boring and insecure (Bannatyne & Abel, 2015), and having a lack of self-esteem (Darby, Hay, Mond, & Quirk, 2012) are further examples of negative perceptions of AN sufferers.

When specifically considering the Attribution Model (Corrigan et al., 2003), previous research has supported various factors included within the theory. The level of

blame and responsibility attributed to individuals with AN has been found to be a major contributor of stigmatising attitudes. Stewart, Keel and Schiavo (2006) compared perceptions of AN with asthma and schizophrenia. After reading vignettes and answering self-report measures, the results indicated that participants attributed significantly more blame to the AN target compared to the schizophrenia and asthma targets. Tantleff-Dunn, Hayes and Braun (2009) compared the level of blame attributed to an underweight female target whose weight status was either caused by an eating disorder, an illness or was hereditary. Participants perceived the target with an eating disorder to be more responsible for her weight when compared to the other two causes. Participants also associated more negative attitudes to the eating disorder target. This suggests the target suffering with the eating disorder was stigmatised by participants who were provided with minimal information as to the cause of her underweight status.

The cause of AN affecting the level of responsibility attributed to the sufferer was also researched by Crisafulli, Von Holle, and Bulik (2008) as they manipulated participants' perceptions through vignettes. Participants were required to read a vignette describing a target with AN then answer a series of questionnaires. Participants were either provided with a vignette that promoted a genetic causal factor or one that emphasised a sociocultural cause. The results indicated that participants were more likely to attribute blame to the AN target if they were exposed to the sociocultural stimulus when compared to the genetic stimulus. Although, when considering the overall level of attribution of blame towards either AN target the mean score was relatively low, indicating a low level of responsibility attributed to AN sufferers for their condition generally.

The attribution of responsibility factor of the Attribution Model (Corrigan et al., 2003) also included the level of controllability of an illness. Holliday, Wall, Treasure and Weinman (2005) compared perceptions of AN between anorexics and lay individuals, and found that the samples differed predominantly in regards to the controllability of the illness, with lay individuals perceiving the illness to be more controllable.

Anticipated emotional responses is another key factor of the Attribution Model that was hypothesised to contribute to discrimination (Corrigan et al., 2003). Previous research has suggested relatively positive anticipated emotional responses towards AN. Crisafulli et al. (2008) found that participants generally reported more positive (e.g. empathy and sympathy) than negative (e.g. anger and disgust) feelings towards the AN character in the vignette. Bannatyne and Abel (2015) found that participants were similarly relatively positive in terms of their anticipated feelings towards AN as they anticipated sympathy and patience if they interacted with a sufferer of AN. Bannatyne and Abel (2015) also assessed discrimination towards AN by including an item that assessed helping behaviour by asking if they would sign a petition to private healthcare providers to deliver the same level of cover of AN as other medical conditions. The high mean rating indicated participants were generally willing to sign the hypothetical petition and contribute to providing support for AN. Bannatyne and Abel's (2015) study generally suggested low levels of stigma and discrimination towards AN sufferers as participants anticipated both positive emotional and behavioural responses.

Although when AN has been compared to other conditions in previous studies, anticipated behavioural responses have been suggested to be more discriminatory. Stewart, Schiavo, Herzog and Franko (2008) compared perceptions of AN with other illnesses, including depression. A significantly higher level of discomfort was anticipated in terms of interaction with an individual with AN when compared to depression. A similar result was found in Stewart et al.'s (2006) research as a significantly higher level of discomfort was reported towards the AN target compared to an asthmatic target and a 'normal' control target. The findings from the previous research suggests a certain degree of discrimination towards AN when it is compared with other conditions and a 'normal' control. Overall, previous studies that have considered AN have suggested that the psychological disorder is associated with an attribution of responsibility towards AN sufferers, although anticipated emotional responses have been found to be relatively positive. Anticipated behavioural responses towards AN have been suggested to be

relatively positive in studies that have researched AN absent of comparison with other conditions. In previous studies with comparisons to other conditions, more anticipated discrimination is reported towards AN.

Obesity.

Obesity is defined by a BMI that exceeds 30 and is an extremely prevalent weight-related condition, increasing from 13.2% in males and 16.4% in females in 1993 to 26.0% in males and 23.8% in females in 2013 when considering adults living in the UK (Health & Social Care Information Centre [HSCIC], 2015). Volkow and O'Brien (2007) argued for the inclusion of obesity in the DSM-V when it was being developed, suggesting some forms of obesity involve an excessive drive for food and therefore should have been considered a mental illness. Common negative attitudes associated with obesity are laziness, sloppiness and the perception that obese individuals lack self-control (Puhl, & Brownell, 2001). Such stereotypes have also been supported implicitly: Horsburgh-McLeod, Latner and O'Brien (2009) found that participants instructed to compose a 'day in the life' story about a picture of an obese individual were significantly more likely to include activities associated with laziness and sloppiness, such as sleeping in late and lacking personal grooming, when compared to those shown a stimulus of a normal-weight target.

Obesity and AN could be considered opposites when considering the weights that are associated with the conditions, but they share common stigmatising negative attitudes, the most predominant concerns the level of responsibility attributed to the sufferer for their illness (Puhl, & Heuer, 2010). Ogden and Flanagan (2008) compared lay perceptions to GP perceptions in terms of the causation of obesity and found that the majority of both samples attributed blame heavily to the obese individual, as a 'behavioural cause' was reported by 97% of GPs and 79% of the lay sample. McFerran and Mukhopadhyay (2013) researched lay perceptions of obesity across five different countries and found that the most dominant theories as to the causation of the illness

were a lack of exercise and poor diet. Both of the perceived causes suggested an attribution of blame and responsibility towards obese individuals themselves.

Further cross cultural support for the attribution of blame came from a study that included a representative German sample. A lack of physical activity and overeating were perceived to be the biggest causes of obesity, whereas a hereditary cause was perceived to be the smallest contributor to obesity (Hilbert, Rief, & Braehler, 2007). Research that assessed the perceptions of a British sample found that blame was also attributed elsewhere. Beeken and Wardle (2013) found that a higher percentage of the sample attributed blame towards the availability of unhealthy foods (61%) with a slightly lower percentage blaming the individual (57%) and an even lower percentage for a hereditary cause (45%). These findings suggest that responsibility is attributed towards obese individuals for their illness, but could also be attributed elsewhere towards the availability of unhealthy foods.

Emotional responses were also included in the Attribution Model (Corrigan et al., 2003). Vartanian, Thomas and Vanman (2013) assessed the prevalence of negative emotion towards obesity as participants were required to rate their feelings of contempt, disgust and anger. Although disgust had the highest mean rating (2.84), overall this figure was quite low when considering participants used a scale from one to seven, suggesting such negative emotion was skewed more towards the weaker end of the scale. Consistent with this finding, Sikorski et al. (2015) researched both positive and negative emotional responses towards obese individuals, and found sympathy and wanting to help received the highest scores indicating positive feelings were more prevalent towards obese individuals than negative feelings.

Obese discrimination can affect all aspects of life including employment, healthcare and education (Puhl, & King, 2013), therefore previous studies have investigated obesity bias in various hypothetical situations. O'Brien, Latner, Ebneter and Hunter (2012) investigated obese discrimination in hypothetical employment scenarios. Obese targets were rated significantly lower than normal weight targets on numerous factors associated with employment suitability including leadership skills, predicted long

term success in the business and the likelihood of hiring, indicating a significant level of discrimination towards the obese target. Agerstrom and Rooth (2011) similarly researched obese discrimination in an employment context but did so in real life hiring situations. Managers were sent applications describing a normal-weight and an obese individual, and were given an implicit measure of bias a few months later. The results suggested that managers with more implicit bias against obesity were less likely to offer an interview to the obese applicant, which suggests the real life implications of obese bias. In terms of anticipated discrimination in more general contexts, Sikorski et al. (2015) suggested that social distance was highest when participants considered the likelihood that they would recommend an obese person for a job, with the next highest involving the introduction of an obese person to a friend and renting a room to an obese person, further indicating that obese discrimination is anticipated across numerous contexts and at various levels of interaction.

Generally previous studies suggested the prevalence of the attribution of blame towards obese individuals for their condition. Anticipated emotional responses have been found to be mildly positive but behavioural responses have been suggested to involve a high level of discrimination.

Comparing AN and obesity*.*

A small pool of studies have compared AN and obesity when considering attitudes and anticipated behavioural responses. Research findings have been varied in terms of which condition is more likely to be discriminated against. Star, Hay, Quirk and Mond (2015) researched the perception of discrimination towards anorexic and obese individuals. Participants were required to read vignettes describing targets suffering with AN and obesity, and state if they thought the target would be discriminated against by others. The results indicated that a higher percentage of participants perceived that the obese target would be discriminated against when compared to the AN target (66% vs. 48%, respectively). Although when considering AN, the percentage of participants that

perceived discrimination is still high, with almost half of the sample perceiving the AN target would be discriminated against. Overall, obesity may be perceived to be the more likely to be discriminated against, but the high percentages suggested that participants perceived possible discrimination towards both conditions.

Swami, Chan, Wong, Furnham, & Tovee's (2008) findings were consistent with this previous research as they researched anticipated discrimination towards emaciated (BMI < 15) and obese (BMI > 30) individuals. Anticipated discrimination was assessed through hypothetical employment and helping scenarios. Participants were provided with 10 photos, two photos for each BMI category ranging from having an emaciated BMI to a normal BMI to an obese BMI, and were instructed to rate each photo in terms of the likelihood of hiring and helping after a car accident. The mean rating of the likelihood of hiring an obese target was significantly lower than the other four weight categories. Emaciated and overweight were the next least likely to be hired with significantly lower mean ratings than underweight and normal weight targets. The mean rating of the likelihood of helping the obese target was also significantly lower than the other weight categories. The emaciated target was the next least likely to be helped as the mean rating was significantly lower than the other three weight conditions. The findings overall suggest obese individuals were the most discriminated against followed by the emaciated target when compared to overweight, underweight and normal weight conditions.

Later studies by Swami and colleagues did not support this previous study by Swami et al. (2008). Similar levels of anticipated discrimination between AN and obesity were found by Swami, Pietschnig, Stieger, Tovee and Voracek (2010). Participants were provided with 10 photos ranging from an emaciated individual to an obese individual and one of five vignettes requiring the participant to choose one of the individuals in the photos to hire, promote, terminate employment, allow to foster a child or help after a car accident. Participants were instructed to use a rating scale as an indication of the most likely and least likely individual they would select for their vignette, lower ratings

indicated the emaciated individual and the highest ratings represented the obese individual. Discrimination against the emaciated and obese targets was strongest in the hiring and fostering conditions as the lowest number of participants rated the lowest and highest figures. Emaciated and obese individuals received the most ratings when participants were deciding with who they would most likely terminate employment. Overall this suggests similar levels of discrimination towards emaciated and obese individuals in comparison to underweight, normal-weight and overweight individuals, as participants were more likely to terminate employment, less likely to hire and less likely to allow the adoption of a child to an emaciated or obese person in hypothetical situations.

Swami and Monk's (2013) findings were in support of Swami et al. (2010) as they researched discrimination against emaciated and obese individuals in university acceptance scenarios. The same photographic rating scale was utilised in Swami and Monk's (2013) study as in the previous research by Swami et al. (2010), and participants were required to use this to rate to whom they would most and least likely offer a final university place. The fewest participants rated the emaciated and obese targets as the most likely to be given the university place. Consistent with this, the most participants rated the emaciated and obese targets as the least likely to be awarded the university place. This suggests that participants anticipated more discrimination towards emaciated and obese individuals alike, when compared to underweight, normal-weight and overweight individuals.

Unlike Swami et al. (2010) and Swami and Monk (2013), Zwickert and Rieger's (2013) findings did not suggest similar levels of anticipated discrimination towards individuals with AN and obesity. The study compared AN and obesity in terms of anticipated emotional responses towards sufferers, the desire for social distance and the level of blame attributed to the sufferer for their condition. Participants were required to respond to self-report measures, including the Social Distance Scale (Penn et al., 1994). No significant differences were found between AN and obesity in anticipated emotional

responses. A lower mean social distance score was found for AN when compared to obesity (13.5 vs. 16.8, respectively). The difference was significant and, with lower scores indicating a higher desire for social distance, the findings suggested a higher level of anticipated discrimination towards AN when compared to obesity. The possible responses ranged from zero to 24; both the AN and obesity means were skewed more towards the upper half of the range indicating less anticipated discrimination generally towards the two conditions. Participants attributed significantly more blame towards the obese target for her condition when compared to AN. Consistent with this finding, participants rated personal choice significantly higher for obesity than AN for the perception of the cause of the target's condition. These findings suggest more responsibility and blame is attributed to obese individuals for their condition when compared to AN.

Ebneter and Latner (2013) found similar results to Zwickert and Rieger (2013), as they compared attitudes towards a number of eating disorders, obesity and depression. Participants were required to read vignettes describing characters with each of the conditions and answer self-report measures after each. One of the measures that was included assessed the perception of blame attributed to the targets within the vignettes for their condition. The results suggested the obese target was attributed significantly more blame for their condition when compared to the targets suffering with eating disorders and depression. The target with depression was attributed significantly less blame compared to all the other conditions. Overall the findings indicate that obesity is attributed more blame than AN; however, both are attributed more blame when compared with depression.

Ebneter, Latner, & O'Brien's (2011) study was not consistent with the aforementioned research (Zwickert & Rieger, 2013; Ebneter & Latner, 2013) as they examined the perception of responsibility through perceived causal factors. Ebneter et al. (2011) assessed causal factors of AN and obesity, which included a number of factors that were associated with an attribution of blame towards the individual. Participants

were instructed to rate the causal factors in relation to their contribution to the conditions. Parenting and a lack of self-discipline were causal factors associated with AN stigma. A lack of self-discipline is a factor that attributes responsibility towards the AN sufferer for their condition, whereas parenting attributes blame away from the individual. A lack of self-discipline and parenting were also associated with obesity stigma, along with weaker beliefs that genetics could be a cause. The weak perception of genetics as a cause of obesity attributes responsibility to the individual. The causal factors found to be associated with stigma suggested that some responsibility was attributed to AN and obesity sufferers for their condition, but similarly some was attributed away from the individual, indicating similar levels of blame attributed to AN and obese targets.

Overall, previous research that used self-report measures has been inconsistent. The levels of negative attitude and anticipated discrimination suggested to be attributed towards anorexic or emaciated individuals and obese individuals have been varied. Specifically in terms of anticipated behavioural responses, Star et al. (2015) and Swami et al. (2008) found that obese individuals were more likely to be discriminated against compared to AN and emaciated individuals, although both weights were discriminated against more than other conditions. Swami et al. (2010) and Swami and Monk (2013) suggested similar levels of anticipated discrimination towards emaciated and obese individuals, whereas Zwickert and Rieger (2013) found that participants desired more social distance from AN sufferers when compared to obese individuals. In regards to the level of blame attributed to the sufferer for their condition, previous research has suggested that obese individuals are attributed more blame than anorexic individuals (Zwickert & Rieger, 2013; Ebneter & Latner, 2013) and similar levels of responsibility towards both conditions (Ebneter et al., 2011). The contrasting findings between the studies could have been due to the utilisation of different measures.

Moving towards an implicit methodology.

A substantial limitation of the previous research that compared AN and obesity is the use of explicit methodologies. The use of self-report to research such sensitive topics of weight and mental health stigma and discrimination can massively increase the impact of social desirability bias producing invalid data (Krumpal, 2013) and could have contributed to the discrepancies in the findings of previous research (e.g. Zwickert & Rieger, 2013; Ebneter & Latner, 2013; Ebneter et al., 2011). As recommended by Zwickert and Rieger (2013) and Wingfield, Kelly, Serdar, Shivy and Mazzeo (2011) more implicit methods should be taken advantage of to advance the research in the field. A widely used implicit measure to investigate attitude is the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998). The IAT is based on the concept of priming in which stimuli that are more closely related are activated at an increased rate than those that are less closely related (Tulving & Schacter, 1990). To test this concept, experiments usually involve the presentation of a prime stimulus followed by either a closely related or non-related stimulus. The response latency involved in processing the related stimulus is reduced when compared with the non-related stimulus (Tulving & Schacter, 1990). The IAT incorporates this theory of priming in an experiment that involves the categorisation of stimuli. The task involves pairing four categories of stimuli using two response keys. The four categories included in a task consist of a target concept (e.g. flower vs. insect) and an attribute or attitude (e.g. positive vs. negative). Participants are required to pair the target concept with an attribute as predefined by the experimenter. Response latencies are shorter when categorising congruent pairings of a target concept with an attribute (e.g. flowers and positive attributes) due to the strength of association when compared to incongruent pairings (e.g. flowers and negative attributes) indicating a preference for the congruent pairing (Greenwald et al., 1998).

IATs have been used in previous research to assess perceptions of mental illness (e.g. Rusch, et al., 2010). It has been utilised both in cross cultural research (e.g. Cheon, & Chiao, 2012) and in studies that have assessed implicit stigma towards mental

illness in different age groups, such as children and adolescents (O'Driscoll, Heary, Hennessy, & McKeague, 2012). IATs have also been used to study implicit stigma towards different mental illnesses such as schizophrenia (Norman et al., 2010).

Specifically when considering the study of implicit weight bias, previous IAT research has generally focussed on the comparison between underweight and overweight (e.g. Edelstein & Gillis, 2008) or overweight and normal-weight (e.g. Brochu & Morrison, 2007) to determine if a preference exists towards a certain weight. Brochu and Morrison (2007) utilised the IAT to determine if a preference existed towards overweight or normal-weight in a university sample. The IAT involved the categorisation of overweight and normal-weight images with positive and negative attitude words. Explicit measures were also included in the study to determine the relationship between implicit and explicit weight bias. The explicit measures assessed both attitudes and anticipated behavioural responses towards the overweight and the normal-weight targets. Response latencies (the time taken from the onset of the presentation of a stimulus to the correct response made by the participant) were transformed into *D*-scores as recommended by Greenwald, Nosek, and Banaji (2003) to control extraneous participant variables, with a positive *D*-score indicating a preference for normal-weight. The mean *D*-score was .88, suggesting a normal-weight preference and a bias against overweight. In terms of the correlational analyses, only one significant correlation was found between an explicit and implicit measure. This was between the *D*-score and a negative attitude explicit measure (Person-Perception Task). However, the significant correlation only reached a weak to moderate coefficient of .33, suggesting only a weak to moderate relationship between the IAT and an explicit measure.

Roddy, Stewart and Barnes-Holmes (2010) replicated this study on a similar university sample to determine if a preference existed towards either 'fat' or 'slim' weights. The IAT involved the categorisation of 'fat' and 'slim' images with positive (e.g. healthy, attractive, and active) and negative (e.g. ill, ugly, and lazy) attitudes. Participants also completed an Implicit Relational Assessment Procedure (IRAP), an

implicit measure of attitude which required participants to decide if positive and negative words were the 'same' or 'opposite' to 'fat' and 'slim' photos when a word and photo were paired on the computer screen together. Similar explicit measures were included as in Brochu and Morrison's (2007) study to allow for a relatively direct comparison. They were also used to determine a relationship between implicit and explicit weight bias. The response latencies during the IAT and IRAP were similarly transformed according to Greenwald et al. (2003). A mean IAT D-score of .68 was found which was significantly different to zero, which suggested a preference towards 'slim' and a bias against 'fat', consistent with the previous study by Brochu and Morrison (2007). The mean slim IRAP D-score was significantly different to zero but the mean fat IRAP D-score was not significantly different to zero, suggesting participants were more pro-slim than anti-fat. The correlational analyses comparing the IAT to the explicit measures found no significant correlations at alpha level .05, suggesting there were no significant relationships between implicit and explicit weight bias. This was similarly consistent with the previous study, indicating unconvincing relationships between the IAT and the explicit measures included in the two studies. This inconsistency between explicit and implicit measures raises the debate as to which is the more valid methodology when assessing both attitude generally and weight bias specifically.

Waller, Lampman and Lupfer-Johnson (2012) assessed implicit weight bias by comparing overweight and average/underweight targets in a nursing and psychology student sample. The IAT included positive (e.g. successful and motivated) and negative (e.g. failure and unmotivated) attitudes that were compiled from numerous previous explicit weight bias studies (e.g. Schwartz, O'Neal Chambliss, Brownell, Blair, & Billington, 2003) to determine the extent to which these explicit attitudes were reflected through implicit measures. Response latencies and error rates produced during the IAT were assessed as a reflection of congruency of a pairing, with faster response latencies and fewer errors indicated a more congruent pairing. Significantly faster mean response latencies were found during the congruent pairings (i.e. overweight-negative and

average/underweight-positive pairings) when compared to the incongruent pairings (i.e. overweight-positive and average/underweight-negative pairings). Significantly fewer errors were also made during the congruent pairings than the incongruent pairings. There was no significant interaction between nursing and psychology students, and the congruent and incongruent pairings. The results overall suggested a preference towards average/underweight targets and a bias against overweight, consistent with previous research (Brochu & Morrison, 2007; Roddy et al., 2010), which was consistent across university students.

Unlike the compilation of stimuli from previous explicit research in Waller et al.'s (2012) study, Edelstein and Gillis (2008) utilised an IAT that had already been previously established. The Fat People-Thin People IAT consists of overweight and underweight target images and positive (e.g. Joy, love, and peace) and negative (e.g. horrible, nasty, and evil) stimuli (Full stimuli list at www.implicit.harvard.edu). The study included registered dieticians, who offer weight-related advice to obese individuals, to determine if they had an implicit weight bias. The results indicated a significant moderate to strong preference for underweight targets over overweight targets. This result was compared to the general population who also displayed a preference for underweight targets, but not to the extent of the registered dieticians. This suggests registered dieticians show a stronger weight bias against obese individuals when compared to underweight targets. This could be due to the disagreement of dieticians with an obese person's unhealthy diet and lifestyle. Alternatively, the weight bias against obese individuals could indicate increased familiarity with obesity increases stigma.

The Fat People-Thin People IAT was also utilised by Nosek et al. (2013) in a study that included participants from 71 nations. The study focussed on implicit weight bias at an individual level as well as a national level to determine the effect of BMI. The participants provided demographic information then completed the IAT. One explicit measure was also included as participants were asked if they prefer 'fat' people or 'thin' people. Response latencies were transformed using the *D*-algorithm (Greenwald et al.,

2003) utilised by previous research (Brochu & Morrison, 2007; Roddy et al., 2010). Individual BMIs were calculated using height and weight provided during the demographic items, and nationwide overweight status consisted of the national average BMI, and the national percentage of overweight and underweight people. The results suggested an implicit and explicit preference for thin people over overweight people generally. A significant correlation was found between the IAT and the explicit measure, although only a weak correlation was found at .21. In terms of the effect of individual weight status, higher BMIs were associated with a weaker implicit weight bias against the overweight target. At a national level, greater nationwide obesity was associated with a stronger implicit weight bias against the overweight target when compared to the thin target. A higher national weight status increases the familiarity with obesity which increases implicit weight bias against the overweight target. This relationship is consistent with Edelstein and Gillis (2008).

Rationale and justification of methodology.

With the aim to improve the research in the field, the present study considered the limitations and strengths of previous studies in the development of the methodology. The present study also aimed to contribute to the field of implicit weight bias by researching areas that have previously been lacking. The most predominant of differences between the present and previous implicit weight bias research is the comparison between AN and obesity. Previous IAT research considered weight bias by comparing overweight and underweight (e.g. Edelstein & Gillis, 2008; Roddy et al., 2010), or overweight and normal-weight (e.g. Brochu & Morrison, 2007). A preference towards underweight targets and a bias against overweight targets were consistently supported by previous research. This is perhaps an unsurprising finding due to the perceived negative attitudes attributed to a higher body weight (Vartanian & Silverstein, 2013). To develop the field of weight bias research, the more extreme weights associated with AN and obesity were assessed in the present study.

Obesity was also specifically chosen as the comparison group rather than a healthy control group to increase the specificity of the results relative to the weight-related condition. If AN was compared to a healthy control group within the IAT and the results, for example, suggested a bias against the AN category it would be ambiguous as to whether this bias was towards disordered eating generally or towards AN specifically. By comparing AN to another weight-related condition, any discrimination towards disordered eating generally is almost controlled for and kept constant, and therefore any bias indicated by the IATs would be specific to the condition itself.

If this is the case, it questions the selection of obesity over any other weight-related condition, such as bulimia. Obesity was selected to be compared to AN as the two initially appear absolute contrasts when considering their associated BMIs. However, research assessing AN and obesity separately has suggested lay perceptions of the two weight-related conditions are relatively similar, such as the perception of the level of responsibility attributed to the sufferer for their condition (e.g. Stewart et al., 2006; Puhl & Heuer, 2010), therefore any difference in negative attitude or discrimination between the two conditions would contribute significantly to existing research.

To compare AN and obesity in terms of preference in the IAT, the two weight-related conditions need to be compared directly. For example, Waller et al. (2012) compared overweight targets with normal/underweight targets within the IAT. Because of this, the results could not distinguish if a preference was more towards normal-weight or underweight, only that participants showed a bias against the overweight target. To improve this, AN-associated stimuli and obesity-associated stimuli were directly compared in opposing pairings of the IAT. The results would then indicate a definite preference towards either AN or obesity.

In terms of the attitude stimuli used within the IAT of the present study, the findings of previous explicit research were utilised to form the stimuli lists. This improves the previous research of Nosek et al. (2013) and Edelstein and Gillis (2008) who included the Fat People-Thin People IAT in their studies. Although this is an IAT that has

been previously established, the attribute stimuli are not specific to AN and obesity (e.g. Positive stimuli: love and peace. Negative stimuli: horrible and evil). The present study compiled stereotypes and attitudes associated with AN and obesity that were found by previous research which used explicit methodologies (e.g. Katterman & Klump, 2010; Schwartz et al., 2003). The compilation of attitudes from explicit research had been similarly utilised by other implicit weight bias studies (e.g. Waller et al., 2013). Due to the use of stimuli that is specific to AN and obesity, the present study is an improvement of the research that used the Fat People-Thin People IAT (Nosek et al., 2013; Edelstein & Gillis, 2008) as stereotypes were compiled from previous explicit AN and obesity research to determine the extent to which attitudes were associated implicitly. When considering the AN and obesity stimuli themselves, previous research had used pictures to represent the different weights associated with the two conditions (e.g. Brochu & Morrison, 2007; Roddy et al., 2010). However, due to the exploratory nature of the present study and to further the research in the field, words associated with AN and obesity were used as an alternative to images. Foroni and Bel-Bahar (2010) found differences in effect sizes between picture IATs and word IATs.

To determine preference in an IAT, responses to the stimuli pairings need to be recorded. Previous implicit weight bias research focussed on response latencies to reflect preference (e.g. Brochu & Morrison, 2007; Roddy et al., 2010; Edelstein & Gillis, 2008), therefore this was also the key focus of analyses of the present study. Error rates could also be used as a reflection of preference, with fewer errors indicating a more congruent pairing. Waller et al. (2013) included error rates in the analyses and found that they were consistent with the hypotheses as significantly fewer errors were made during the congruent pairings (i.e. overweight-negative and normal/underweight-positive) when compared to the incongruent pairings (i.e. overweight-positive and normal/underweight-negative), therefore suggesting the potential validity of the use of error rates as a reflection of preference. Some previous general IAT studies have also utilised error rates in analyses (e.g. Sriram & Greenwald, 2009; Amd & Barnes-Holmes, 2014). Due to the

exploratory nature of the present study, both response latencies and error rates were examined as a reflection of preference to determine the validity of the measures when utilised in an AN-obesity IAT.

In addition to the attitude IAT, a second IAT was included in the present study. Previously only attitude has been assessed in weight bias research (e.g. Brochu & Morrison et al., 2007; Roddy et al., 2010; Waller et al., 2012). The present study additionally included an IAT to assess implicit anticipated behavioural responses towards AN and obesity. No previous research could be found that has developed a behavioural IAT, both in terms of general and weight bias research, therefore this novel IAT means the present research makes an original contribution to the field of research. The behavioural IAT was primarily developed to enable direct examination between explicit and implicit measures. This is an improvement of previous research; for example, Brochu and Morrison (2007) compared the results from the IAT with explicit measures. The attitude IAT was correlated with an explicit measure of anticipated behaviour and a non-significant correlation was found between the two measures. To improve this previous research, the behaviour IAT would be correlated with the explicit measures of anticipated behaviour in the present study, to determine if the relationship between implicit and explicit measures would increase in strength due to direct correlation. In regards to the development of the behavioural stimuli lists and unlike the attitude IAT, compilations of stimuli could not be formed using previous research due to the lack of IAT behaviour research. Alongside the correlation between implicit and explicit anticipated behavioural responses, the attitude IAT and explicit measures of attitude could also be directly correlated.

The main explicit measure included in the present study was the Attribution Questionnaire (Corrigan et al., 2003) which consisted of both attitude and anticipated behavioural responses, enabling correlational analyses between the implicit measures. An alternative version of the Attribution Questionnaire was developed by Brown (2008) to improve its psychometric qualities. However, the newer version was not utilised in the

present study due to the deletion of the blame and responsibility subscale. Previous research suggested how crucial the perception of blame is in terms of the stigma towards AN (Stewart et al., 2006; Darby et al., 2012; Crisafulli et al., 2008) and obesity (Puhl & Heuer, 2010; McFerran & Mukhopadhyay, 2013; Ogden & Flanagan, 2008), therefore it was imperative to include a subscale that assessed this, especially to enable the comparison between the two weight-related conditions.

The Social Distance Scale was also included as an additional measurement of anticipated behaviour. The present study utilised a contemporary version of the scale by Breheny (2008) which assesses the willingness of a participant to engage in increasing levels of interaction with a target individual. The Social Distance Scale requires participants to rate their willingness in terms of everyday situations, therefore the items are relatable. This is an improvement on some previous research that measured discrimination explicitly through situations to which participants could not necessarily relate. For example, O'Brien et al. (2012) assessed obese discrimination in undergraduate students through hypothetical employment scenarios. The results suggested the participants were discriminatory towards obese candidates over normal-weight candidates. Swami and Monk (2013) examined anticipated discrimination in a university selection scenario, and found that emaciated and obese individuals were least likely to be awarded the university place by participants over underweight, normal weight and overweight individuals. Overall, weight bias was suggested by previous research; however, due to the use of employment and university selection scenarios, in which most participants would never have been before, the discrimination that the participants displayed may not be consistent in other contexts, therefore the findings may not be representative of everyday situations. The Social Distance Scale (Breheny, 2008) was included in the present study so the level of discrimination suggested would be a reflection of that displayed in everyday life. Vignettes were also included as an explicit measure as recommended by Corrigan et al. (2003) and Breheny (2008) for use

before their scales, and due to the consistent use in previous weight bias research (e.g. Zwickert & Rieger, 2013; Ebneter et al., 2011; Crisafulli et al., 2008).

Research aims and hypotheses.

The aim of the present study was to examine both explicit and implicit attitudes and anticipated behavioural responses towards AN and obesity. Key improvements were discussed which have informed the research hypotheses.

The Attribution Questionnaire (Corrigan et al., 2003) and the Social Distance Scale (Breheny, 2008) were included as the explicit measures of the present study. These two scales form the first hypothesis: there will be significant differences between AN and obesity in mean scores on subscales of the Attribution Questionnaire and the Social Distance Scale. This was hypothesised as the previous research that compared AN or emaciated conditions with obesity generally found differences between the two, although the findings differed between studies as to which was more discriminated against (e.g. Star et al., 2015; Zwickert & Rieger, 2013), therefore a direction could not be predicted.

To further the implicit weight bias research, AN and obesity were directly compared within the IAT with stimuli compiled from previous research (e.g. Katterman & Klump, 2010). A novel behaviour IAT was also included, and both response latencies and error rates were utilised to reflect preference. These modifications informed the next two research hypotheses: second, there will be significant differences in mean latencies and error rates between the pairings of 'AN-negative attitudes and obesity-positive attitudes', and the pairings of 'AN-positive attitudes and obesity-negative attitudes'. Thirdly, there will be a significant difference in mean latencies and error rates when comparing 'AN-discriminatory behaviour and obesity-interactional behaviour' pairings, with 'AN-interactional behaviour and obesity-discriminatory behaviour' pairings. These significant differences were predicted as previous research that had compared overweight and

underweight categories had also found significant differences (e.g. Waller et al., 2012; Roddy et al., 2010). Although, a direction was not predicted because it could not be assumed that results found during previous research that had compared underweight and overweight conditions would suggest the same preferences when AN and obesity were compared.

Explicit and implicit measures were included to enable correlational analyses which would contribute to previous research (e.g. Brochu & Morrison, 2007; Roddy et al., 2010). The final research aim was more exploratory: to investigate relationships between explicit and implicit measures to determine if attitude and anticipated behavioural responses varied and to what extent they varied across the measures when researching AN and obesity. It was an exploratory research aim as previous research had not correlated explicit and implicit measures of attitude, and explicit and implicit measures of anticipated behaviour before.

The findings of the present study could be of relevance when informing educational interventions as to which negative attitudes and anticipated discriminatory behaviours to target. The present study is also useful in contributing to the field of research. As it is the first to compare AN and obesity using an IAT and the first to trial an IAT assessing behavioural responses, it may add novel findings to the field and therefore could have theoretical and practical importance.

Method

Design.

The present study utilised a repeated measures design, with all participants completing all implicit and explicit measures in terms of both AN and obesity. The independent variable was the type of weight-related condition with two levels: AN and obesity. The dependent variables were the scores provided on the explicit measures, and *D*-scores (response latencies were transformed into *D*-scores for the analyses) and error rates on the implicit measures.

Sample.

A sample of 54 undergraduate psychology students was recruited through the University of Huddersfield's online participant recruitment system. The sample was predominantly female (87%) with a mean age of 22.2 (*SD* = 5.39) years old, ranging from 18 to 44 years old. Participants were awarded course credits for their participation in the study.

Ethical implementations.

Ethical approval was granted by the university's ethics panel. Before signing up to the study, exclusion criteria were outlined to minimise the possibility of participant distress. Exclusion criteria concerned any previous or present diagnoses of eating disorders, or sensitivity to topics relating to dieting and weight. Informed consent was retrieved before each participant completed the experiment through a participant information sheet (Appendix 1) and a consent form (Appendix 2). Anonymity was achieved as participants were not required to provide any identifiable information which could link their responses to them. They were required to sign the consent form but this could not be linked to their computer-based responses in any way. After the experiment, participants were provided with a debrief sheet (Appendix 3). A unique participant number could be found at the bottom of the debrief sheet; if a participant wanted to

withdraw their data after leaving the laboratory, they could do so by contacting the researcher with their unique number.

Apparatus.

The questionnaires were programmed using Qualtrics and the IATs were developed using SuperLab 4.0. Participants completed the experiment in a laboratory within the university campus. The experiment was run on Windows 7 computer systems and displayed on LCD screens. Participants responded to the questionnaires using a mouse and keyboard, and were required to use the red and blue buttons on a response pad during the IATs. During the IATs black words were displayed on a white background.

Measures.

Explicit measures.

The questionnaires considered explicit attitudes and anticipated behavioural responses towards AN and obesity. The explicit measures were developed by compiling previously validated questionnaires and by adapting those from previous studies. Cronbach's alphas were included as an indication of internal reliability when used to study AN and obesity.

Demographics. Demographic information concerned sex, age, race, height and weight. Height and weight were included to enable the calculation of the participants' BMIs.

AN and obesity vignettes. The vignettes described a character with one of the two weight-related conditions. The AN vignette was adapted from a scenario used in previous research (Angermeyer et al., 2013). The vignette included DSM-V (2013) diagnostic criteria of AN, including low body weight ('Severely underweight'), a fear of gaining weight ('She is also very afraid of putting on weight'), and a disturbance in the perception of the sufferer's own body weight ('She herself has the feeling that she is

overweight'), therefore the vignette was valid in the representation of AN. The cause of Anna's weight loss ('A strict diet and lots of sports') was excluded from the vignette used in the present study as this could have influenced further items relating to the perception of the level of responsibility attributed to the AN target for her condition. The obesity vignette was developed using the structure of the AN vignette and both were similar in word length (see Appendix 4 for full vignettes).

The Attribution Questionnaire (AQ; Corrigan et al., 2003). This 28-item scale is used to assess attitude and anticipated emotional and behavioural responses towards sufferers of mental illnesses. Alterations were kept to a minimum as too many may have invalidated the measure: The names were changed throughout the questionnaire to relate to each of the two vignettes; A definition of a group home was added ('Note: A group home enables a small group of people with similar conditions to live and be cared for in the community'); The terms 'asylum' and 'psychiatric hospital' were replaced with 'hospital' when considering the obesity target as these terms were deemed not applicable to an illness that is not generally perceived as a psychological disorder. Participants were asked to respond to the questionnaire in relation to the targets in the vignettes and rated the extent to which the statements reflected their perceptions on a scale from 1 to 9. The majority of items were scored with higher values representing more stigma or discrimination, except the help and pity items which were reverse scored. During data processing, familiarity items were summed to form an overall familiarity score. Items on the help and pity subscales were recoded and reversed with larger scores representing more stigma, consistent with the other factors. Scores on each item within each subscale were averaged to form an overall subscale score. Cronbach's alpha values for obesity indicated good internal reliability for all subscales of the AQ ranging from .67 (segregation) to .94 (angry). In terms of AN good internal reliability was found for four out of the six subscales of the AQ ranging from .61 (help) to .85 (angry). Values for the fear and segregation subscales were .37 and .53, respectively. A single item deletion analysis indicated that it was not possible for the

values to increase to an adequate level of internal reliability, therefore the fear and segregation subscales concerning AN were excluded from further analyses.

Social Distance Scale (SDS; Breheny, 2007). This 10-item questionnaire uses rating scales to determine how willing a participant would be to engage in differing levels of interaction with a character described in a vignette. Participants ranked their willingness to interact on a 10-point Likert scale, with higher values representing a greater willingness to interact. SDS items were recoded and reversed with higher scores indicating a desire for more social distance and more discrimination (Breheny, 2007) to ensure consistency with the AQ. Scores were then summed resulting in one SDS AN score and one SDS obesity score per participant, ranging from 10-100. The version of the SDS has been used in previous studies (e.g. Lee et al., 2014). Excellent internal reliability was found with a Cronbach's alpha of .90 for AN and .93 for obesity.

Implicit measures.

Implicit preference and behavioural responses towards AN and obesity were measured using two IATs. The IATs were structured according to Greenwald, Nosek and Banaji's (2003) seven block structure. Blocks 1, 2 and 5 of each IAT were single categorisation phases. Participants were required to group two categories of words using two response keys (e.g. press 'red' for negative words and press 'blue' for positive words). In block 1 of both IATs, participants were required to group AN and obesity words. Block 2 required the categorisation of attitude words on one IAT and behaviour words on the other IAT. Block 5 was similar to block 1, the difference being participants were instructed to use opposite response keys to group the AN and obesity words. The single categorisation blocks were practice phases and data was not recorded.

Blocks 3 and 6 were practise combination phases. Participants were required to group four categories of words using two response keys. Words related to AN and obesity were combined with either attitude words on one IAT or behaviour words on the

other IAT (e.g. press 'red' for AN and negative words, and press 'blue' for obesity and positive words). Blocks 3 and 6 gave participants the opportunity to practice the combination categorisations before the test blocks, so that any delayed response latencies or increased error rates could be attributed to the categorisations themselves as opposed to a lack of practice.

Blocks 4 and 7 were test combination phases. Participants were required to make the same categorisations they had made in the practice combination block immediately prior to the test block. Blocks 3 and 4 combined the target concept with the attitude or behaviour that had been categorised using the same response key in the previous single categorisation blocks (e.g. press 'red' for AN and negative words as both had previously been categorised using the red response key). Blocks 6 and 7 were similar in that the attitude or behaviour words were still categorised using the same response key, but were now paired with the opposing target concept. Table 1 outlines the seven block structure that formed both IATs.

Preferences towards either AN or obesity were assessed using 12 negative and 12 positive attitudes. The attitude stimuli were sourced from previous research (Katterman & Klump, 2010; Schwartz, O'Neal Chambliss, Brownell, Blair, & Billington, 2003; Bacon, Scheltema, & Robinson, 2001). Compilations of words sourced from explicit research has been similarly utilised in previous studies (e.g. Waller et al., 2012).

The IAT designed to assess behavioural responses towards AN and obesity consisted of 12 discriminatory behaviour words and 12 interactional behaviour words. Behavioural responses have not been assessed using IATs before, therefore words were not sourced from previous research but were antonyms and synonyms of 'interact' and 'avoid'.

During both IATs 12 AN-related words and 12 obesity-related words were included as the target concepts. An initial list of five words were sourced from the previous research of Schwartz et al. (2003) which was expanded using antonyms and synonyms of these words (see Appendix 5 for full word lists).

Table 1. Summary of the attitude and anticipated behavioural response IATs outlining the stimuli in each block

Block	Function	Response key 'red'	Response key 'blue'
		Negative vs. Positive Attitude IAT	
1	Practice	AN	Obesity
2	Practice	Negative	Positive
3	Practice	AN + Negative	Obesity + Positive
4	Test	AN + Negative	Obesity + Positive
5	Practice	Obesity	AN
6	Practice	Obesity + Negative	AN + Positive
7	Test	Obesity + Negative	AN + Positive
		Discriminatory vs. Interactional IAT	
1	Practice	AN	Obesity
2	Practice	Discrimination	Interaction
3	Practice	AN + Discrimination	Obesity + Interaction
4	Test	AN + Discrimination	Obesity + Interaction
5	Practice	Obesity	AN
6	Practice	Obesity + Discrimination	AN + Interaction
7	Test	Obesity + Discrimination	AN + Interaction

During the single categorisation blocks, each of two groups of stimuli were presented to participants once, therefore each block consisted of 24 trials. Both the practice and test combination blocks consisted of 24 trials. Each stimulus was presented once across blocks 3 and 4, and again across blocks 6 and 7. Stimuli were randomised within blocks and between the combination blocks.

Procedure.

Prior to data collection, the experimental protocol was piloted on five undergraduate students. This was necessary to determine the length of the protocol. The pilot participants were also asked to give feedback on the experiment. Any amendments that were recommended were corrected before data collection.

For both the pilot and data collection, participants were initially seated at a computer with a keyboard and response pad in front of them. Participants were tested in varying group sizes up to six participants per group. Participants were required to read a participant information sheet which detailed information about the study (Appendix 1), and then were instructed to read and sign a consent form (Appendix 2). The participants were required to answer the questionnaires as the first part of the experiment. Questions concerning demographic information were asked initially. Participants were then required to read the vignette describing the AN character and answer the AQ (Corrigan et al., 2003) and SDS (Breheny, 2007) in regards to the target. The vignette describing the obesity target was then displayed. Participants were required to answer the two questionnaires in the same order completed previously.

Participants then completed the IAT section of the experiment. The IATs were counterbalanced in that half of the sample completed the attitude IAT first then the behaviour IAT after, and the other half completed the two IATs in reverse order. The counterbalancing process was based on the unique participant number that had been assigned to each participant, with odd numbers corresponding with the completion of the attitude IAT first and even numbers with the completion of the behaviour IAT first. Each IAT was completed one after the other. Before each block participants viewed an instruction screen outlining the categorisations they were required to perform (e.g. press the red key for anorexia words and press the blue key for obesity words). There was a 1500ms delay before the phase would then begin. For each trial a word was displayed in the centre of the screen and was displayed until the participant responded. If the participant responded correctly (i.e. made the correct categorisation) there was a 400ms delay until the presentation of the next word. If the participant incorrectly responded, the word was replaced with the word 'incorrect' which was presented for 2000ms. The same word would then appear in the centre of the screen again. The participant could only proceed to the next trial once a correct categorisation had been made.

After participants had completed both IATs, they were asked to read a debrief sheet (Appendix 3), thanked for their participation and were given the opportunity to ask any questions. On average, the experiment took around 30 minutes to run.

Statistical analyses.

Data were analysed using IBM SPSS 22 for Windows. Data satisfied assumptions for parametric analyses. Two-tailed tests were used throughout due to the non-directional nature of the experimental hypotheses, and the alpha level was .05. To investigate the significance of the implicit data, one sample t-tests were utilised. Specifically in terms of error rates, paired sample t-tests were used to compare mean error totals between the various combinations of stimuli pairings. Paired sample t-tests were also used to compare mean scores provided on the subscales of the AQ and the SDS between obesity and AN. Pearson's correlations were conducted to analyse relationships between explicit subscales and the SDS, and between implicit and explicit measures.

Results

Demographics.

Table 2 displays the demographics of the present sample. The sample was predominantly female (87%) with a mean age of 22.2 (*SD* = 5.39) years. The sample was predominantly white (73%). BMIs were calculated for each participant from the heights and weights provided on the explicit measures. Four participants did not provide their weight, therefore analysis was based on 50 BMIs. Mean BMI was 24.6 (*SD* = 5.26) which is at the upper limit of the average weight category, with 25.0 indicating an overweight BMI. Five (10%) participants were underweight with BMIs of 18.4 or below. Twenty three (46%) participants had BMIs between 18.5 and 24.9 indicating average weight. Fifteen (30%) participants were classified as overweight as BMIs were between 25.0 and 29.9. Seven (14%) participants had BMIs over 30.0 which indicated obesity.

Table 2. Demographic information

Demographic	N (%)	Mean (SD)	Range
Sex			
Female	47 (87)		
Male	7 (13)		
Age		22.2 (5.39)	18-44
Race			
White	40 (73)		
Asian	8 (15)		
Black	1 (2)		
Chinese	1 (2)		
Mixed	2 (4)		
Other	2 (4)		
BMI		24.6 (5.26)	17-42.1

Explicit measures.

Initial bivariate correlational analyses indicated numerous significant correlations between subscales of the AQ and the SDS (Table 3). In terms of AN, the strongest significant correlations were between the SDS and the help subscale ($r = .63$, $p < .001$) and the SDS and the pity subscale ($r = .42$, $p = .003$), indicating that as the desire for social distance increased, anticipated discrimination and a lack of pity increased (due to reversed coding). On the obesity measures a significant strong positive correlation was found between the SDS and help subscale ($r = .82$, $p < .001$). A significant moderately strong correlation was also found between the responsibility and pity subscales ($r = .65$, $p < .001$), meaning that as the perception of personal responsibility towards an obese individual increased, the likelihood of a lack of pity increased.

Table 4 displays the mean and SD scores for AN and obesity on the AQ and SDS. Participants reported a higher familiarity with obesity with a mean of 3.41 compared to the AN mean of 1.45. In terms of the responsibility subscale, a higher mean score was found for obesity (5.35) compared to AN (2.93) suggesting that a higher level of blame was attributed towards the obese target for her condition. The AN mean score was based towards the lower end of the scale, indicating a low level of blame attribution towards the AN target, compared to the obesity mean which was skewed more towards the upper end of the scale. Generally both AN and obesity means for the pity subscale were based in the lower half of the scale indicating that participants reported a relatively high level of pity for both conditions. Although, the AN mean pity score (2.72) was lower than obesity (4.31) indicating participants reported more pity towards the AN target. The mean anger scores were similar for AN and obesity, and were based at the lower end of the scale suggesting that a lack of anger was felt towards the targets. The fear and segregation means for obesity were very low indicating a lack of fear and a lack of desire to segregate. With the help subscale and the SDS, with lower means suggesting the anticipation of more helping behaviours, the AN and obesity means were based towards the lower end of the scale and were relatively similar (Table 4).

Table 3. Bivariate correlations between implicit *D*-scores and explicit subscales of the AQ and SDS for AN and obesity

	Implicit measures		Explicit measures							
	Attitude *D*-score	Behaviour *D*-score	Familiarity	Responsibility	Pity	Angry	Fear	Help	Segregation	SDS
Attitude *D*-score		.43**	-.17	-.05	.07	.09	.05	.26	.02	.23
Behaviour *D*-score	.43**		.16	.10	.25	.07	.04	.30*	.16	.42**
Familiarity	-.27	.13		-.09	-.05	.18	.17	-.15	-.13	-.18
Responsibility	.15	.01	-.32*		.65**	.44**	.11	.54**	.23	.56**
Pity	.20	.17	-.33*	.36**		.25	-.01	.63**	.22	.54**
Angry	.34*	.11	.01	.25	.14		.26	.43**	.18	.32*
Fear	-	-	-	-	-	-		.15	.32*	.21
Help	.34*	.18	-.25	.15	.31*	.33*	-		.30*	.82**
Segregation	-	-	-	-	-	-	-	-		.30*
SDS	.29*	.24	-.19	.35*	.42**	.42**	-	.63**	-	

**p < .01, *p < .05. AN below diagonal, obesity above diagonal. AN fear and segregation subscales were excluded from the analysis due to poor internal reliability.

Table 4. Means and *SD*s for AQ subscales and the SDS for AN and obesity

Variable (Possible range)	AN Mean (SD)	Obesity Mean (SD)
AQ		
Familiarity (0-7)	1.45 (1.14)	3.41 (1.54)*
Responsibility (1-9)	2.93 (1.34)	5.35 (1.96)*
Pity (1-9)	2.72 (1.23)	4.31 (2.12)*
Angry (1-9)	2.56 (1.54)	2.88 (2.16)
Fear (1-9)		1.43 (.96)
Help (1-9)	2.48 (1.14)	2.59 (1.44)
Segregation (1-9)		1.64 (.97)
SDS (10-100)	38.07 (15.94)	36.09 (17.07)

Note: *p <.001 between AN and obesity. Fear and segregation AN subscales were not included due to poor internal consistency. Higher values indicate more stigma/ discrimination, excluding familiarity in which higher scores represent more familiarity with the illness

When comparing mean scores between AN and obesity on the AQ and the SDS, there were some significant differences. Familiarity scores were significantly higher for obesity when compared to AN ($t(50) = -9.71$, $p < .001$). Mean scores for the responsibility subscale were significantly higher for obesity compared to AN ($t(53) = -9.40$, $p < .001$) suggesting participants blamed obese individuals more for their illness compared to anorexics. Participants also reported feeling less pity for obese individuals as significantly higher pity scores (reversed scoring) were found when considering obesity compared to AN ($t(53) = -6.24$, $p < .001$), indicating a higher level of stigma towards obesity.

Implicit measures.

Data were recorded from the practice (blocks 3 and 6) and test (blocks 4 and 7) combination blocks of each IAT in the form of response latencies and errors. An error was recorded when an incorrect categorisation was made. A response latency was

recorded for each stimulus and represented the total time taken in milliseconds (ms) from the initial presentation of a stimulus to a correct response given by the participant. Response latencies was transformed into D-scores using the D-algorithm outlined by Greenwald et al. (2003) and utilised widely in previous research (e.g. Brochu & Morrison, 2007; Barnes-Holmes, Murtagh, Barnes-Holmes, & Stewart, 2010; Roddy et al., 2010). Data were initially processed by recoding singular values over 10,000ms as missing values and eliminating full data sets if 10% of all response latencies were under 300ms. No data sets were excluded in the present study. For each IAT, mean latencies were calculated for each of the combination blocks of 3, 4, 6 and 7. A standard deviation was then calculated for blocks 3 and 6 combined, and another for both blocks 4 and 7. The mean latencies for block 3 were subtracted from those of block 6, and the mean latencies for block 4 were subtracted from block 7 means, forming two difference scores. Each difference score were divided by its corresponding standard deviation, the two resulting figures were finally summed and divided by 2. A final D-score remained for each participant per IAT; a positive figure indicated a preference for obesity over AN and a negative figure represented a preference for AN over obesity, whereby a preference suggested either more positive attitude or the anticipation of more interactional behaviour towards a sufferer. The D-scores had a possible range of 2 to -2 (Nosek et al., 2013).

D-scores.

The mean D-score calculated for the attitude IAT was -.0097 (SD = .38) suggesting a preference towards AN over obesity. D-scores ranged from -.70 to .88 with 51.9% of participants with a negative D-score. The preference for AN over obesity was not significant as the mean D-score was compared to zero ($t(53)$ = -.19, p = .853). The mean D-score for the behaviour IAT was -.0756 (SD = .38) suggesting a preference towards AN over obesity. D-scores ranged from -.80 to .96 with 63.0% of participants with a negative D-score. However, this preference was not significant ($t(53)$ = -1.468, p = .148) when the mean D-score was compared to zero.

Error rates.

Overall error rates across all combination blocks on both IATs ranged from 6 (3.1%) to 69 (35.9%) errors out of 192 trials with a mean of 19.1 (9.9%) errors. Differences in error rates between practice and test blocks were assessed and were non-significant ($p \geq .05$), therefore errors in practice and test blocks were summed to give a total per combination. In terms of the mean error rates on the attitude IAT, 5.06 ($SD = 3.75$) errors were made during the 'AN-negative and obesity-positive' blocks compared to 5.37 ($SD = 4.45$) errors during the 'AN-positive and obesity-negative' blocks. The lower mean error rate when AN-negative and obesity-positive words were paired together suggests these to be the more congruent pairings. However, the difference was not significant ($t(53) = -.59$, $p = .557$) suggesting neither categorisation combination was significantly congruent in terms of error rates. On the behaviour IAT, a lower mean error rate for 'AN-discrimination and obesity-interaction' pairings of 3.54 ($SD = 2.42$) was found compared to 5.09 ($SD = 4.15$) for the 'AN-interaction and obesity-discrimination' pairings, suggesting the first categorisations to be the more congruent. This difference was significant ($t(53) = -2.88$, $p = .006$) indicating significantly less errors were made when AN-discrimination and obesity-interaction were paired together, suggesting more anticipated discriminatory behaviours towards AN and more anticipated interactional behaviours towards obese individuals.

Explicit vs. implicit measures.

Table 3 displays findings from the bivariate correlations between implicit and explicit measures. When examining the difference between implicit and explicit attitude the key focus was determining a correlation between the attitude *D*-score and the responsibility subscale on the AQ. The perception of blame and responsibility attributed to a sufferer for their condition is a dimension of attitude and so the responsibility subscale was selected to be correlated with the attitude *D*-score. Non-significant correlations were

found both in terms of AN and obesity suggesting the dissimilarity between results found using implicit and explicit methodologies when measuring attitude. When considering implicit and explicit anticipated behaviours, the behaviour D-score was correlated with the help subscale on the AQ and the SDS. In terms of AN non-significant correlations were found between the D-score and both measures of anticipated behaviours. However, some significant correlations were found when assessing obesity, as weak to moderate positive correlations were found between the behaviour D-score and the help subscale ($r = .30$, $p = .05$), and the D-score and the SDS ($r = .42$, $p = .01$). The significant positive correlation between the D-score and the help subscale indicates that as a preference for AN shifted to obesity (as values increased from negative to positive values), help mean scores increased. Due to reverse coding higher mean help scores indicate more discrimination, therefore as an implicit preference for obesity increased explicit discrimination increased. Similarly for the SDS, higher total scores indicated a higher desire for social distance, therefore as an implicit preference for obesity increased, the explicit desire for social distance increased.

Discussion

Main findings.

The present study aimed to assess negative attitude and anticipated behavioural responses to AN and obesity through implicit and explicit measures. In regards to the first hypothesis, some significant differences were found between AN and obesity. Participants were significantly more familiar with obesity compared to AN. Significantly more blame was attributed to sufferers of obesity when compared to AN, and significantly less pity was anticipated by participants towards obese individuals compared to anorexics. With some significant differences, the first hypothesis was partially supported.

In terms of implicit attitude, the mean negative D-score and the higher percentage of participants with a negative D-score compared to a positive D-score indicated a preference towards AN over obesity. However, a non-significant difference was found between the mean D-score and zero, therefore the preference towards AN was not significant. Differences in error rates were also non-significant between the 'AN-negative and obesity-positive' condition and the 'AN-positive and obesity-negative' condition, therefore hypothesis two could not be accepted. For hypothesis three, on the behaviour IAT, a preference for AN over obesity was also suggested by a mean negative D-score and a high percentage of participants with mean negative D-scores than positive D-scores. The preference was not statistically significant, though. Significantly lower error rates were found during the 'AN-discrimination and obesity-interaction' condition when compared to the 'AN-interaction and obesity-discrimination' condition suggesting the former to be the more congruent which indicated a preference towards obesity over AN.

For the fourth research aim, explicit and implicit findings were correlated to determine the extent to which the measures were related. No significant correlations

were found for AN when the attitude *D*-score was correlated with the responsibility subscale, or when the behaviour *D*-score was correlated with the SDS and the help subscale. Similarly, the attitude *D*-score and the responsibility subscale were not significantly correlated when considering obesity. Significant relationships were found for obesity when correlating the behaviour *D*-score with the help and SDS subscale. However, the correlations were weak to moderate and they were not in the expected direction: the correlations suggested that as an implicit preference shifted from AN to obesity, explicit anticipated discrimination towards obesity increased. Possible explanations for these correlations and whether either explicit or implicit measures can be considered the more valid measure will be discussed.

Comparison with previous explicit research.

The attribution of blame.

The main explicit finding of the present study comparable to previous research that compared AN and obesity considered the level of blame attributed to individuals for their condition. The present results indicated that significantly more blame was attributed to the obese target for her condition relative to the AN target, suggesting a higher level of stigma and negative attitude towards obesity compared to AN. When comparing this finding with previous research, it is in line with Zwickert and Rieger's (2013) and Ebneter and Latner's (2013) studies, which similarly found that a significantly higher level of blame was attributed to the obese target when compared to the AN target.

The present study's findings were not as consistent with Ebneter et al.'s (2011) findings, though. Ebneter et al. (2011) suggested that relatively similar levels of blame are attributed to individuals with AN and obesity as a number of factors were perceived to contribute to the cause of the two conditions, some attributed blame towards the sufferer (e.g. lack of self-discipline) and some to external factors (e.g. parenting). The discrepancy between these findings and the present and previous research's findings

(Zwickert & Rieger, 2013; Ebneter & Latner, 2013) is most likely due to the difference in measures utilised. Participants in Ebneter et al.'s (2011) study were asked which factors they perceived to be the causes of AN and obesity. The factors chosen implied the level of blame attributed to the sufferers for their condition, whereas the present and previous research (Zwickert & Rieger, 2013; Ebneter & Latner, 2013) directly asked participants the level of responsibility they would attribute to the AN and obese targets. The way in which participants could respond to the explicit measures in Ebneter et al.'s (2011) meant that factors associated with attributing varying levels of blame could be rated similarly, but the rating scale in the present study forced participants to either attribute a low or high level of blame to the targets in the vignettes. The key finding suggesting obese individuals were attributed more responsibility for their condition than anorexics was consistent with previous research that included similar methodologies (Zwickert & Rieger, 2013; Ebneter & Latner, 2013). This consistently suggests that obese individuals are stigmatised more than AN sufferers.

Anticipated emotional responses.

In regards to anticipated emotional responses, the present study found that significantly more pity was reported towards the AN target relative to the obese target. Previous research that assessed anticipated emotional responses towards AN and obesity did so separately and did not compare the two weight-related conditions, therefore comparisons between the present and previous research consider general trends as opposed to comparisons between AN and obesity. Crisafulli et al. (2008) and Bannatyne and Abel (2015) found that participants responded with relatively positive anticipated emotion towards AN. The present study's findings supported the previous research as significantly more pity was anticipated towards AN compared to obesity.

Vartanian et al. (2013) assessed negative emotional responses towards obese individuals in an undergraduate sample and found that significantly higher levels of disgust and contempt were anticipated towards obese individuals relative to anger. The

present study's findings are in line with this when considering that significantly less pity was reported towards the obese target in comparison to the AN target, indicating more negative anticipated emotion towards the obese target. Additionally, the present findings were consistent with the previous research in that a non-significant difference was found between obesity and AN in terms of anticipated anger, with low mean anger scores indicating low levels of anticipated anger towards obese individuals. Vartanian et al. (2013) compared the findings with a community sample, and found that the undergraduate sample anticipated more negative emotion when compared to the comparison sample. This finding could lend an explanation for the significantly lower level of pity anticipated towards the obese target relative to the AN target found in the present study, suggesting the use of undergraduate samples increases the level of anticipated negative emotional responses towards obese individuals.

Consistent with this were the findings suggested by Sikorski et al. (2015). Results from a community sample indicated high levels of pity were anticipated towards obese individuals which were not significantly different when anticipated towards overweight and average weight individuals. The variation in findings between studies that recruited undergraduate students samples (the present study and Vartanian et al., 2013) and those that recruited community samples (Vartanian et al., 2013; Sikorski et al., 2015) suggests that perhaps younger age groups anticipate more negative emotional responses and are more stigmatising towards obese individuals compared to older age groups.

The significant difference between AN and obesity in terms of anticipated pity could also be explained by the Attribution Model (Corrigan et al., 2003), which outlined that the increased attribution of blame towards a sufferer for their condition was associated with increased negative emotional responses towards the individual. Consistent with this, both significantly more blame was attributed and significantly less pity was anticipated towards the obese target relative to the AN target.

Familiarity.

The present study found that participants were significantly more familiar with obesity than they were with AN. This finding is most likely a reflection of the variance in prevalence rates of the two weight-related conditions, as obesity is a more prevalent condition than AN (HSCIC, 2015; Smink, van Hoeken, & Hoek, 2012). The finding is most likely due to prevalence rates as the familiarity items considered the level of contact the participants have had with individuals with either weight-related condition, as opposed to the participants' perceived knowledge of the weight-related conditions which would have been a more subjective representation of the participants' level of familiarity with AN and obesity.

Anticipated behavioural responses.

The present study found no significant differences in the mean scores on the helping subscale of the AQ and the SDS between AN and obesity, suggesting no significant difference in the level of discrimination anticipated towards individuals with either weight-related condition. Swami et al.'s (2010) and Swami and Monk's (2013) findings were consistent with the present study in that they also found emaciated and obese targets were discriminated against similarly. Although, the previous research suggested a higher level of discrimination towards obese and emaciated individuals compared to underweight, normal-weight and overweight targets, whereas the mean scores in the present study for both AN and obesity indicated that participants anticipated more interactional and helping behaviours over discriminatory behaviours. The variance in the present findings and the previous studies' findings (Swami et al., 2010; Swami & Monk, 2013) could be explained threefold.

First, the inconsistency could be due to the settings in which discrimination was assessed. The previous research assessed discrimination in a university selection context (Swami & Monk, 2013) and employment and adoption contexts (Swami et al., 2010),

whereas the present study assessed discrimination in more general situations, therefore the difference in findings could suggest that there is a higher level of discrimination towards individuals with extreme weights in situations involving a selection process in which 'discriminating' between candidates is required (i.e. selection for a university place, employment or adoption) compared to everyday interactions.

Second, the discrepancy between the previous and present studies' findings could have been due to the inexperience of the previous samples. For example, in Swami and Monk's (2013) hypothetical university place selection task, the participants from the community sample would generally have had no previous experience with this type of selection process, therefore the decisions made may not necessarily be reflective of those made by individuals on a university selection panel and so the level of discrimination suggested by the results towards the emaciated and obese candidates may not be representative. This lack of representativeness of the findings was further exaggerated as the participants would have been very aware of the lack of real life consequences of their decision making, which would have increased the lack of validity in terms of the measurement of discrimination in the university selection process. The discrepancy between the present study's and Swami and Monk's (2013) findings could have been due to the participants' lack of experience in the hypothetical scenario in the previous study, whereas the present study included situations in which participants would have had more experience.

Third, the methodology of the previous studies could have exaggerated the level of discrimination towards the emaciated and obese targets. For example, in Swami and Monk's (2013) study, the hypothetical candidates had the same eligibility and suitability for the university place with the only differing factor being their weight. Participants were forced to make a decision solely based on the candidates' weight, therefore exaggerating the influence of their BMIs on their decision making. In addition, because participants were forced to select only one candidate as 'the most likely' for the university place, the participant would be discriminating against the other candidates of different weights by

not selecting them, further exaggerating the level of discrimination. These flaws in the methodology contribute an explanation to the higher level of anticipated discrimination found towards the emaciated and obese targets in the Swami and Monk's (2013) than in the present study.

Star et al. (2015) and Zwickert and Rieger (2013) also researched discrimination towards AN and obesity but they suggested a higher level of discrimination towards one of the conditions. Star et al. (2015) compared discrimination towards binge eating disorder and AN sufferers, and suggested a higher level of discrimination towards binge eating disorder sufferers due to the association with a higher BMI. This is inconsistent with the present study as no significant differences were found between AN and obesity when considering mean help and SDS scores. However, the difference in Star et al.'s (2015) study could have been because perceptions of other people's discrimination towards the conditions were assessed, not the participants' own anticipated behavioural responses. The difference in findings perhaps suggests that a higher level of discrimination is perceived in others towards obesity when compared to the participants' perceptions of themselves.

Zwickert and Rieger (2013) found significantly more discrimination when considering AN when compared to obesity. The SDS was used to assess the level of discrimination, similar to the present study. The mean desire for social distance towards obesity found in the previous study was similar to that of AN and obesity means found in the present study. However, significantly more social distance towards AN compared to obesity was desired in Zwickert and Rieger's (2013) study. The findings were inconsistent with the present study. This discrepancy is most likely due to the variation in samples. Undergraduate students were recruited in both the present study and Zwickert and Rieger's (2013) study, with the difference being that psychology students were recruited in the present study and students from across courses were recruited in the previous research. Due to AN being a psychological disorder, the present psychology sample may have been more accepting and less discriminatory towards the AN target,

represented through the mean scores, whereas the general community sample in the previous research may have been more discriminatory due to a lack of knowledge or psychological background. This suggests that education lowers anticipated discrimination towards AN and provides support for the use of educational interventions to improve stigma and discrimination towards disordered eating sufferers.

Overall, the present study's key explicit findings were relatively consistent with previous research but with some discrepancies between results. The statistically significant finding which considered that more blame is attributed to obese individuals for their condition relative to anorexics was consistent with previous research (Zwickert & Rieger, 2013; Ebneter & Latner, 2013). Ebneter et al.'s (2011) results were not consistent with these findings and the discrepancy was suggested to be due to the variation in the self-report measures. The significantly higher level of pity anticipated towards the AN target compared to the obese target was relatively in line with previous research that assessed the weight-related conditions separately. The discrepancies between the present and previous findings was attributed to the variation in samples. The high level of blame attributed to the obese target could also have contributed to the significantly lower levels of pity reported compared to the AN target (Corrigan et al., 2003). No significant differences were found in anticipated discrimination towards AN and obesity. The discrepancies between the present and previous findings were attributed to differences in measures (Swami & Monk, 2013; Swami et al., 2010; Star et al., 2015) and samples (Zwickert & Rieger, 2013). The differences in findings between the present and previous studies provided explanations as to the outcome of the results. Due to the improvements made to previous research's methodology (e.g. Swami and Monk, 2013), the present study's findings could be considered more valid and representative of the everyday anticipated behavioural responses towards individuals with AN and obesity. In addition, the higher level of anticipated interaction with the AN target in the present study than in previous research (Zwickert & Rieger, 2013) was most likely due to the recruitment of university psychology students. The present

findings, therefore, may exaggerate the acceptance of AN when compared to the general population.

Comparison with previous implicit research.

The present study aimed to research the extent to which a weight bias existed when considering the extreme weights associated with AN and obesity. The present study's main implicit results were that non-significant differences were found between the mean attitude D-score and zero, and the mean behaviour D-score and zero when considering AN and obesity. The present study was most similar to Brochu and Morrison's (2007) and Roddy et al.'s (2010) research as university student samples were recruited and response latencies were transformed into D-scores during data processing. Brochu and Morrison (2007) and Roddy et al. (2010) found mean D-scores which indicated a preference for underweight relative to overweight. The present study found an attitude mean D-score of -.0097 and a behaviour mean D-score of -.0756, with negative scores indicating a preference towards AN over obesity. The D-scores were not found to be significantly different from zero. The non-significant differences found in the present study when considering AN and obesity are not consistent with the previous research (Brochu & Morrison, 2007; Roddy et al., 2010) suggesting a weight bias against overweight and a preference towards underweight is not apparent when considering the more extreme weights associated with AN and obesity.

Implicit weight bias was also compared by Edelstein and Gillis (2008), and Nosek et al. (2013) who utilised the well-established Fat People-Thin People IAT to determine a preference towards either underweight or overweight targets. Using different samples compared with the present study, Edelstein and Gillis (2008) and Nosek et al. (2013) found significant preferences towards 'thin' compared with 'fat'. The present study's findings were not consistent with the previous results as a statistically significant preference was not found towards AN over obesity.

Waller et al. (2012) compared overweight and average/underweight targets within their IAT to determine a preference in a student sample. The results suggested a preference towards the average/underweight target and a bias against the overweight target. The present study's non-significant findings were not consistent with the previous findings of Waller et al. (2012), although the *D*-algorithm was not utilised in the previous study which is recommended for use by Greenwald et al. (2003). The *D*-algorithm was developed to control participant effects and extraneous variables that affect response latencies (Greenwald et al., 2003), therefore it cannot be assumed that a significant difference would still be found in the previous study if the results were processed using the *D*-algorithm.

Error rates were also analysed in Waller et al.'s (2012) study as a reflection of preference which further indicated a preference for the average/underweight target and a bias against the overweight target. The present study's findings were not consistent with the previous research as a non-significant difference in mean error rates was found between the 'AN-negative and obesity-positive' condition and the 'AN-positive and obesity-negative' condition. A significant difference was found in mean error rates during the behaviour IAT with a lower mean rate during the 'AN-discrimination and obesity-interaction' condition when compared to the 'AN-interaction and obesity-discrimination' condition. This suggests that the 'AN-discrimination and obesity-interaction' pairings were the more congruent, indicating a significant preference towards obesity over AN.

However, this finding could question the validity of the use of error rates as a reflection of preference in an AN-obesity IAT as the significant difference both conflicts with the non-significant mean *D*-scores in the present study and previous research (Waller et al., 2012). The significant difference in error rates in the present study could have been due to the counterbalancing method employed during the IAT. The attitude and behaviour IATs were counterbalanced in that half the participants completed the attitude IAT first then the behaviour IAT, and the other half completed them in reverse order. However, within the IATs, the blocks were not counterbalanced. In the behaviour

IAT, the 'AN-discrimination and obesity-interaction' blocks always came before the 'AN-interaction and obesity-discrimination' blocks. Attention could have decreased during the IAT which could contribute an explanation as to the significantly lower mean error rate found in the first combination blocks in comparison to the second combination blocks. This explanation would suggest that error rates are a reflection of inattention rather than preference.

Overall the present study's implicit findings that suggested no significant preferences towards either AN or obesity were not consistent with the previous research that found preferences towards underweight and thin, and biases against overweight and fat (Brochu & Morrison, 2007; Roddy et al., 2010; Nosek et al., 2013; Edelstein & Gillis, 2008; Waller et al., 2012). The variation in the non-significant differences found in the present study and the significant differences found in the previous research was most likely due to the focus of the more extreme weights associated with AN and obesity in the present study. The previous research found strong support for a preference towards underweight, but the present findings suggest this preference is not so overwhelming that it extends to the extreme weight associated with AN. The non-significant differences in preferences towards AN and obesity could also have been found as both weight-related conditions were perceived as disordered eating and therefore implicit attitude was not significantly different between the two.

Although, the difference in non-significant and significant findings between the present and previous research could have been due to a methodological issue. A reduced number of trials were included in the test blocks of the present study's IATs. The number of trials was roughly halved in the test blocks when compared to the recommendations of Greenwald et al. (2003) and the amount included in previous studies (e.g. Roddy et al., 2010). This was to reduce the cognitive pressure on participants when completing two IATs, one after the other, and additional explicit measures. With the reduced number of trials, there may not have been enough data to determine significant differences.

Error rates were also included due to the exploratory nature of the present study to reflect preference. A significantly higher error rate was found during the 'AN-discrimination and obesity-interaction' condition compared to the reversed pairings. This would suggest a significant preference towards obesity over AN. Due to the conflicting nature of the significant difference with previous research (Waller et al., 2012), the present study's non-significant mean *D*-scores and the counterbalancing method utilised, the significant difference was also discussed in terms of the validity of the use of error rates to reflect preference, and that they could be more a representation of inattention as opposed to preference.

The examination of the difference between explicit and implicit measures.

Correlational analyses were conducted in the present study to examine the difference between explicit and implicit measures when assessing attitudes and anticipated behavioural responses towards AN and obesity. Statistically moderate to strong correlations between the implicit and explicit measures would have suggested a consistency between the two measures. Non-significant correlations were found between the attitude *D*-score and the mean responsibility scores, and the behaviour *D*-score and the help and SDS mean scores in terms of AN, therefore suggesting there were no significant relationships between the AN implicit and explicit measures. A non-significant correlation was also found between the attitude *D*-score and the mean responsibility score for obesity. Significant correlations were found between the behaviour *D*-score and the mean help and SDS scores, although the correlations were relatively weak. Overall, no significant moderate to strong correlations were found between the implicit and explicit measures when assessing AN and obesity, therefore indicating a lack of consistency between the measures.

Previous research by Nosek et al. (2013) also conducted a correlational analysis by correlating the implicit *D*-score with an explicit item of preference towards either fat or thin people. A significant positive correlation was found between the implicit and explicit measures, indicating that as an implicit thin preference increased, an explicit thin preference also increased. However, this correlation between the implicit and explicit measures was weak. This lack of consistency between the implicit and explicit measures was supported by the previous study as the correlational analyses similarly indicated no significant moderate to strong relationships between the measures.

Brochu and Morrison (2007) and Roddy et al. (2010) also compared explicit and implicit measures. The two studies examined differences between similar implicit and explicit measures by correlating the IAT *D*-score with attitude and anticipated behaviour self-report measures. Brochu and Morrison (2007) only found one significant correlation between the *D*-score and one explicit measure. A significant positive weak to moderate correlation was found between the *D*-score and negative attitude when considering the overweight target, suggesting that as the *D*-score shifted from a preference for overweight to a preference for normal-weight (figures shifting from negative to positive), negative attitude towards the overweight target increased. This correlation would support a relationship between implicit and explicit measures; although, the correlation was weak to moderate and it was the only correlation between the implicit and explicit measures in the study, therefore the findings were unconvincing considering a relationship between explicit and implicit measures. Roddy et al. (2010) found similarly unconvincing relationships between implicit and explicit measures. Using similar explicit and implicit measures as Brochu and Morrison (2007), no significant correlations were found at the standard alpha level of .05.

In terms of the correlations between the implicit attitude *D*-score and the explicit measures of anticipated behavioural responses found in previous research, it is perhaps not so surprising that the two did not significantly correlate as they are designed to measure two different aspects of stigma. The present study aimed to research this

further through the introduction of the behaviour IAT to determine the extent to which the relationships differed when explicit and implicit measures of anticipated behaviour were correlated. In terms of AN, no significant correlations were found between the explicit and implicit measures of attitude or anticipated behavioural responses. Similarly, a non-significant correlation was found between the attitude D-score and the explicit measure of attitude concerning obesity. Significant correlations were found between the behaviour D-score and the explicit measures of anticipated behaviour when assessing obesity, although the correlations were weak. This suggests that even with the addition of the behaviour IAT to correlate with the explicit behaviour measures, no significant moderate to strong correlations were consistently found between the measures, which supports the previous research (Brochu & Morrison, 2007; Roddy et al., 2010).

One possible explanation for the lack of significant moderate to strong correlations in the present study could be that different aspects of attitude and anticipated behaviour were assessed across the implicit and explicit measures. For example, stereotypes associated with AN and obesity were included on the attitude IAT, whereas attitude on the AQ was assessed in terms of the perception of responsibility and blame attributed to the target individual for their condition. This difference in measures could also be found in the previous research (Brochu & Morrsion, 2007; Roddy et al., 2010) which could explain their weak correlational findings similarly. Although, Ahern and Hetherington (2006) utilised an IAT and explicit measures that were conceptually similar but still did not find significant correlations between the two. This indicates the explanation as to the lack of relationship between explicit and implicit measures may not be due to the content of the measures themselves.

Another explanation for the difference in explicit and implicit results could be due to the effect of social desirability bias. Due to the sensitivity of the topic of weight bias, participants may have provided socially desirable responses on the explicit measures (Krumpal, 2013) which may not be reflective of their implicit and unconscious preferences, and suggesting why there was no significant moderate to strong

relationships between findings from the two measures, both in the present study and previous research (Nosek et al., 2013; Brochu & Morrison, 2007; Roddy et al., 2010; Ahern & Hetherington, 2006). This would compromise the validity of the explicit measures. Although, the validity of the IAT has similarly been previously debated considering the use of response latencies to reflect preference (e.g. Greenwald, Nosek, & Sriram, 2006). However, with the third possible explanation for the conflict between implicit and explicit measures, the effect of social desirability bias on findings and debates over validity seem insufficient.

The third explanation considers that implicit and explicit measures assess two different types of attitude. The Model of Dual Attitude (Wilson, Lindsey, & Schooler, 2000) suggests that implicit and explicit attitude coexist in memory. Previous research that have tested the model have found supportive results (e.g. Karpinski & Hilton, 2001; Ahern & Hetherington, 2006). Responses to explicit measures are dependent on the participant's capacity to retrieve explicit attitude: if the participant is able and motivated, explicit attitude will be utilised when responding to explicit measures. However, if the participant does not have the capacity or motivation to retrieve explicit attitude, implicit attitude is reported on explicit measures. A key variable that determines a participant's capacity to retrieve explicit attitude is the perception of limited time. If there is not a time limit for participants to respond to explicit measures, the Model of Dual Attitude (Wilson et al., 2000) suggests that explicit attitude can be retrieved. Conversely, if a participant had a time limit when responding to explicit measures, implicit attitude would be utilised. If this theory was to be supported, the relationship between explicit and implicit measures would increase in strength due to the utilisation of implicit attitude during both tasks.

Specifically when relating the Model of Dual Attitude (Wilson et al., 2000) to the present study's findings, stigma could be considered as two types. Initial processing of the two weight-related conditions would be unconscious and fast. Due to this, the initial attitude would consist of general perceptions concerning 'not normal' and disordered

eating. An example of a general disordered eating attitude would consider that the same level of blame would be attributed to individuals for their weight (Ebneter & Latner, 2013). This initial processing of the general disordered eating attitude could be considered as the implicit attitude in the Model of Dual Attitude (Wilson et al., 2000). The fast and unconscious processing of general disordered eating attitude implies that implicit attitude towards AN and obesity would be the same. This is supported by the present study's findings in that non-significant differences in D-scores were found on the IATs, suggesting no differences in implicit preferences or attitude towards either weight-related condition.

After the initial fast and unconscious processing, the general disordered eating attitude develops into more specific attitude. Due to increased time and cognitive processing, attitude more specific to AN and obesity is developed and considers what aspects specifically about AN and obesity are 'disordered'. This type of condition-specific attitude relates to the explicit attitude in the Model of Dual Attitude and requires slower conscious cognitive processing (Wilson et al., 2000). This condition-specific explicit attitude would be relatively different when considering perceptions of AN and obesity. This is supported by the significant differences between AN and obesity found on the explicit measures, such as the significantly higher level of blame attributed to the obese target for her condition when compared to the AN target, and the significantly higher level of pity anticipated towards the AN target relative to the obesity target. Although, condition-specific explicit attitude between weight-related conditions may not necessarily be different as participants could consciously perceive similar attitude towards the two. This is also supported by the present study's findings as non-significant differences were also found on the explicit measures, such as the anticipation of helping and discriminatory behaviours towards the targets of the two conditions. Overall, this suggests that condition-specific explicit attitude share both similarities and differences between AN and obesity, whereas the implicit general disordered eating attitude would be the same between the two weight-related conditions.

In addition, the present study's findings are consistent with the model in that no significant moderate to strong correlations were found between the explicit and implicit measures, supporting the theory that the two are separate constructs. Participants did not have a time limit when responding to the explicit measures, therefore had the capacity to retrieve explicit and more specific attitude to each condition, whereas the IATs involved time limits and so implicit general disordered eating attitude was utilised, hence further supporting the theory as an explanation for the lack of significant correlations between the two measures. Participants also would have had the motivation to provide explicit attitude during the self-report measures due to the pressure of providing socially desirable answers. This is further supported by Hofmann, Gawronski, Gschwendner, Le and Schmitt's (2005) review article as they suggested that studies that examined more sensitive topics (such as weight bias) found weaker correlations between implicit and explicit measures due to the increased motivation to provide socially desirable responses.

To conclude, in terms of the association between implicit and explicit measures, previous research had consistently found unconvincing relationships between the measures (Nosek et al., 2013; Brochu & Morrison, 2007; Roddy et al., 2010), which the present study supported. Explicit and implicit measures were also included in the present study with the aim to determine the more valid measure when assessing attitudes towards AN and obesity. However, the Model of Dual Attitude (Wilson et al., 2000) suggests the debate over validity to be inappropriate as both types of measure are necessary to access the different aspects of attitude. Implicit measures are necessary to access general disordered eating implicit attitude and explicit measures, with their lengthened time limit and the participant's motivation to provide socially desirable answers, access explicit attitude more specific to each weight-related condition, therefore both should continue to be used in attitude research.

Limitations and future research.

The present study was subject to limitations though, the main limitation being the sample size and its restricted demographic range. Due to the use of undergraduate psychology students, the sample was skewed in terms of age, sex and race with higher proportions of young, female and white participants. Previous research has suggested that these demographic variables affect weight bias; for example, in terms of a sex difference, Swami and Monk (2013) and Star et al. (2015) suggested an overall bias against obese individuals but female participants were more likely to be less discriminatory than their male counterparts. When considering this sex difference, a sample that is more representative of the proportion of males in the general population may produce findings that indicate an even stronger implicit or explicit weight bias against obese individuals. BMI should also be given more focus in future research. The present study included BMI as a demographic variable because previous research suggested it to be an affecting factor (Sikorski et al., 2015; Nosek et al., 2013; Star et al., 2015; Swami & Monk, 2013). However, the sample was not large enough to study the effect of BMI. Although the sample size and restricted demographic range were limitations, due the exploratory nature of the present study, the main focus was the development of the methodology and so a readily available sample was utilised. In future research age, sex, race and BMI need to be further assessed to determine the extent to which they affect attitudes and anticipated behavioural responses towards AN and obesity.

During data analysis, multiple inferential tests were carried out. Because of this, the chance of an occurrence of a Type 1 error could have increased. To control for Type 1 error, a Bonferroni correction could have been included during data analysis which would have minimised the chance of a Type 1 error by dividing the standard alpha level of 0.05 by the number of inferential tests conducted. Although the key significant differences found between AN and obesity on the explicit measures had a significance value equal to or less than 0.001, therefore there is a strong possibility that the

differences would still be significant if the alpha level was adjusted using a Bonferroni correction. In addition, future research may not require the use of the same number of inferential tests carried out in the present study but were necessary due to the exploratory nature of the present research.

A further limitation of the present study was the reduced number of trials in the test phases of the IAT. Standard test phases in other studies that utilised the *D*-algorithm (Greenwald et al., 2003) consisted of almost twice the number of trials as the present study's test phases (e.g. Barnes-Holmes et al., 2010). This could have contributed to the non-significant preferences found during the IATs. However, due to the use of two IATs tested alongside explicit measures, the protocol would have been too long for participants to concentrate of the tasks if the IATs included the extra trials. This was based on the feedback provided during the pilot studies. Future research should consider the use of the full length protocol with additional test trials if only one IAT is to be given to participants.

Additional suggestions for future research involve the development of the behaviour IAT and examination of the Model of Dual Attitude (Wilson et al., 2000). In terms of the behaviour IAT further research is recommended to develop the novel IAT into a valid measure that can be utilised by other studies. Trials of the behaviour IAT would need to be researched on different samples that are more reflective of the general population, and tested alongside varying target concepts. Different stimuli lists of varying words and number of words would also need to be researched in multiple studies to develop a robust IAT that can be used in many fields of research.

In addition, future research could test the aforementioned Model of Dual Attitude (Wilson et al., 2000). Hofmann et al.'s (2005) review article found overall weak correlations between implicit and explicit measures, which the present study was consistent. Future research could involve the application of time limits to explicit measures to determine the effect on correlational strength. The model suggests that if participants are restricted by time limits on explicit measures, they would respond with

fast and unconscious implicit attitude as opposed to the slower and conscious explicit attitude. If findings were to support the model, the strength of relationships between the explicit and implicit measures would increase to indicate the use of implicit general disordered eating attitude on both measures. Alongside this, explicit measures without a time limit would need to be included to compare the relationships between the implicit measures and the explicit measures with or without a time limit. If the results indicated improved associations between the time-limited explicit measures and the implicit measures, the theory would be supported suggesting the existence of dual attitude.

Implications and applications.

The key explicit significant differences found between AN and obesity are useful in informing practical applications. The main significant findings that suggested more blame was attributed to obese individuals, and less pity was anticipated towards obese individuals when compared to sufferers of AN indicate that obese people are stigmatised more when compared with AN sufferers. Although the low level of familiarity with AN could indicate that there is still a lack of knowledge of the psychological disorder generally. The findings could be used to inform practical applications such as educational schemes to improve stigma aimed towards obese individuals and to increase knowledge of AN.

Previous research has suggested that stigma has a negative impact on individuals with psychological disorders and therefore why it is necessary to try and improve stigma. A reduction of self-esteem and self-confidence (Fung et al, 2007; Sartorius, 2007) and an increased reluctance to seek professional help (Barney et al., 2006; Corrigan et al., 2014) have been found to be the effect of stigma on sufferers of psychological disorders. Weight bias can also have a negative impact on victims, including an increase in the likelihood of the continuation of disordered eating behaviours (Puhl & Suh, 2015; Major et al., 2014), and increased stress which could maintain weight (Tomiyama, 2014).

Weight bias and discrimination has been shown to occur in different contexts (Puhl & King, 2013), including in schools (Puhl et al., 2011), healthcare (Mulherin, et al., 2013) and employment (O'Brien et al., 2014), therefore educational interventions should be implemented in these key settings.

In terms of the correlational analyses conducted between the explicit and implicit measures, the findings indicated a lack of significant correlations between the measures. The findings were discussed in relation to the Model of Dual Attitude (Wilson et al., 2000) which suggested the implicit and explicit measures accessed different aspects of attitude. Due to the quick responses required during the implicit measures general attitude towards disordered eating was accessed, and attitude more specific towards AN and obesity was accessed on the explicit measures due to the increased time allowances. This should be used to inform future attitude research as both explicit and implicit measures should be included to enable the access of both aspects of attitude.

Conclusion.

AN and obesity were compared in the present study to determine if certain attitudes are towards disordered eating generally or are instead specific to each weight-related condition. The present study aimed to research attitude and anticipated behavioural responses towards AN and obesity both explicitly and implicitly. The explicit measures indicated a weight bias against obesity with significantly higher blame attributed to the individual for their condition and significantly less pity was anticipated by participants. There were no significant differences between AN and obesity in anticipated helping behaviours, with means suggesting participants were relatively willing to help the targets. The implicit findings suggested no significant preferences towards AN or obesity. Consistent with previous research, the implicit and explicit measures were not significantly moderately to strongly correlated. Overall, the findings were discussed in terms of the Model of Dual Attitude (Wilson et al., 2000) in which the non-significant

differences in implicit preferences were due to general disordered eating attitude, and the significant differences found on the explicit measures were due to condition-specific explicit attitude.

In terms of the contribution of the present study to the field, it was the first to trial a novel IAT that assessed anticipated behaviour. In future research, the novel behaviour IAT should be further developed to increase its reliability. The present study also contributed to both explicit and implicit weight bias research by comparing AN and obesity which, specifically in implicit weight bias research, had not been done before.

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Appendices

Appendix 1

Participant Information Sheet.

Title of Project: Comparing Lay Perceptions of Anorexia Nervosa and Obesity Both Explicitly and Implicitly.

Invitation and Purpose of Study

As an undergraduate you have been invited to take part in this study to enable you to gain credits towards your course. Before participating please read this information sheet informing you of the purpose of the study and what is involved.

The aim of the research is to compare perceptions and stigmatising views of anorexia nervosa and obesity. They will be measured both explicitly using questionnaires and implicitly using a type of categorisation task. The findings will inform future educational interventions in regards to the stigmatising views that need to be targeted and improved.

What the experiment involves

You will be instructed to read vignettes describing characters with anorexia nervosa and obesity, after each of which you will answer questionnaires in relation to these scenarios. Then you will be instructed to complete categorisation tasks which requires you to sort groups of words into two categories in the quickest time possible.

How long will my part in the study last?

It will take approximately 40 minutes to complete the questionnaires and the tasks.

Do I have to take part?

Participation in the study is completely voluntary. You are free to withdraw at any point throughout the experiment and will not be asked for a reason for your withdrawal. If you are uncomfortable answering a specific question on a questionnaire you can miss it out.

What are the possible benefits in taking part?

Your participation in the experiment will contribute to the overall findings of the study which will further research in the field of perceptions of mental illness and could inform future educational interventions in school and work place settings.

What are the possible disadvantages and risks of taking part?

There are no foreseen risks caused by the participation in this study. However if you would like to talk to someone about any of the issues raised in the study we will recommend someone to you.

What will happen after participation in the experiment?

Your data will be kept anonymous, confidential and will be stored securely on a database protected by a password. When all participants have been recruited and the results have been analysed, the findings will form a master's dissertation and will be published in scientific journals.

What happens if I change my mind after the study?

You will be provided with a debrief sheet to take away with you detailing the researcher's email address and your unique participation number. If you would like to withdraw your results, email the researcher and quote your unique participation number.

Who do I contact for more information, if I have further concerns or if I would like a summary of the research findings after the study reaches completion?

Catherine Brown, email: u1156903@hud.ac.uk

Appendix 2

Consent form.

Consent form for participation in the study entitled 'Comparing Lay Perceptions of Anorexia Nervosa and Obesity Both Explicitly and Implicitly'

Researcher: Catherine Brown, Masters by Research student at the University of Huddersfield, email: u1156903@hud.ac.uk

Supervisor: Dr Susanna Kola-Palmer, Senior Lecturer in Psychology at the University of Huddersfield, email: s.kola-palmer@hud.ac.uk

	Please tick box
1. I confirm that I have read and understand the information sheet for the above study.	
2. I have been given the opportunity to ask questions, and my questions have been answered to my satisfaction.	
3. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason and without there being any negative consequences. In addition, should I not wish to answer any particular question or questions, I am free to decline.	
4. I understand that I will not be identified or identifiable in any report subsequently produced by the researcher.	
5. I agree to take part in the above study.	
6. I understand that the information will be retained for up to 5 years when it will be deleted/destroyed.	

Print name: _____ Signed: _____ Date: _____

Appendix 3

Debrief sheet.

Participant Debrief Report- Please take away with you

Study title: 'Explicit vs Implicit Perceptions: Comparing Lay Perceptions and Behavioural Reactions towards Anorexia Nervosa and Obesity'

Researcher: Catherine Brown, u1156903@hud.ac.uk

Research supervisor: Dr Susanna Kola-Palmer, s.kola-palmer@hud.ac.uk

Study aims:

The aim of the research was to assess the difference in lay perceptions and behavioural reactions towards anorexia nervosa and obesity. Perceptions were assessed both explicitly through questionnaires and implicitly through implicit association tests (IATs). Negative attitudes and discriminatory behaviours were assessed both on the questionnaires and during the two IATs. During the IATs you were asked to categorise negative/positive attitudes and discriminatory/interactional behaviours into groups with words associated with either anorexia or obesity. The time taken for you to categorise each word into the predefined group was recorded as a reflection of implicit perception. Quick reaction times suggest that a predefined grouping of two sets of words was congruent which therefore reflects implicit perceptions.

Usefulness of the study:

Previous research examining lay perceptions of anorexia nervosa and obesity implicitly has been lacking with the majority only using self-report as a reflection of perceptions. When using self-report to assess perceptions data can be seriously affected by social desirability bias, hence the need for research to take a more implicit approach.

The results from the study could be used to inform future educational interventions in terms of the perceptions that should be specifically targeted to improve negative attitudes and discrimination against anorexia and obesity sufferers.

Contact information:

If you have any concerns about the issues raised in the study you can contact the following services:

The University's Student Counselling Service: Telephone 01484 472675, Email internalcounsel@hud.ac.uk

Eating Disorders Support Helpline: Telephone 01494 793223, Email support@eatingdisorderssupport.co.uk

If you would like to ask any questions, receive a summary of the results or withdraw your data after taking part in the experiment, please contact the study's researcher Catherine Brown (details at the top of the page). If you would like to withdraw your data, quote your unique participation number in the email.

Your unique participation number: _____

Thank you for your participation! When you are finished, please feel free to leave the lab quietly. If you have any questions, stay seated until the rest of the group has finished and I will answer your queries.

Appendix 4

Vignettes used in the present study.

AN vignette:

'15-year-old Anna has become severely underweight after losing a lot of weight. Her parents' attempts to persuade her to eat are rejected vehemently by Anna. She herself has the feeling that she is overweight, even though she is significantly underweight. She is also very afraid of putting on weight again.'

Obesity vignette:

'15-year-old Beckie has become severely overweight after gaining a lot of weight. Beckie has attempted to lose weight but quickly puts it back on again. Beckie finds it difficult to exercise due to her weight. She is aware that she is severely overweight and is afraid of putting on more weight.'

Appendix 5

Full stimuli list.

Target		Attitude		Behaviour	
AN	*Obesity*	*Negative*	*Positive*	*Discrimination*	*Interaction*
Thin	Fat	Self-inflicted	Innocent	Disconnect	Interact
Skinny	Large	Vain	Humble	Shun	Approach
Slim	Excess	Self-indulgent	Selfless	Isolate	Help
Gaunt	Big	Unattractive	Attractive	Avoid	Socialise
Slender	Hefty	Insecure	Secure	Distant	Close
Skeletal	Plump	Weak	Strong	Dodge	Contact
Starved	Oversize	Unhealthy	Healthy	Withdraw	Cooperate
Emaciated	Stocky	Careless	Perfectionist	Neglect	Communicate
Malnourished	Overfed	Lazy	Motivated	Reject	Greet
Light	Heavy	Stupid	Intelligent	Exclude	Include
Bony	Weighty	Worthless	Valuable	Ostracise	Support
Underweight	Overweight	Unsociable	Sociable	Ignore	Meet