Peer-to-Peer Responses to Body Shape in Young Children

Michelle Kilmurray

Submitted in accordance with the requirements for the degree of
Doctor of Clinical Psychology (D. Clin. Psychol.)

The University of Leeds

School of Medicine

Academic Unit of Psychiatry and Behavioural Sciences

January 2017

The candidate confirms that the work submitted is her own and that appropriate credit has been given where reference has been made to the work of others.

ACKNOWLEDGEMENTS

Firstly, I would like to thank my supervisor Professor Andy Hill. It has been a privilege working with you and I have learned so much from you. I am really grateful for the time and energy you have invested in guiding me through this research and for your endless support, patience, guidance and feedback. This research has been incredibly interesting and fun for the most part, but I would also like to thank you for being a voice of calm, reason and encouragement when needed.

I would also like to thank Dr Sylvie Collins for her support and guidance in the development of this research, sharing her thoughts on the thematic analysis and for being a source of support and wisdom throughout training. Again I am grateful for the time and energy you have invested.

I am also truly grateful to all the head teachers, class teachers, teaching assistants and school reception staff for their time, effort and support in making this research happen. I would like to especially thank Jackie Blake and Anita Noone for helping massively with recruiting schools to take part in this research. Thank you also to all of the children who took part in this research. It was so much fun and incredibly interesting to spend time with you all.

On a personal level, I owe a huge debt of gratitude to a lot of people for supporting me through this. I would like to thank my mum, Jean and sister, Nic for helping in so many ways, big and small to support the Kilmurray's through this. Thanks for the extra childcare, practical help, cups of tea and encouragement. Thanks especially for all the times you have given up a good night sleep so that we can have one. Thanks also to my brother, Jimmy and to Nat and Carrot Face (the rabbit) for helping out with childcare and making me (and Joe) laugh. I am also grateful to my friends (especially Clare, Hayley & Lauren) for bearing with me and always being there with words of support and encouragement.

Finally, I am so deeply grateful to my wonderful family. I am grateful to our lovely Son, Joe who brings fun, laughter and joy to our lives. To my incredible husband James, there are no words that can sufficiently express what I owe to you. Throughout this process you have been kind, loving, supportive, encouraging and endlessly patient. You have made a lot of sacrifices big and small to create the time and space for me to finish this research. We have tackled this, like all of life's challenges, side by side and I could not have done it without you. I am excited about less time on the computer and more time for family adventures.

ABSTRACT

There is global concern about the high prevalence of childhood obesity. It has been demonstrated that obese children face weight stigma in many aspects of their life. Experiencing childhood weight stigma has negative consequences for physical and psychological health, social relationships and academic development. Relatively little is known about the development of weight stigma in children, although parents, teachers, the media, and peers are thought to be the primary contributors. This study aimed to investigate peer-to-peer responses to overweight in young children.

A paired reading interaction was used to examine peer responses to obesity and transmission of stigma. Each reading pair included a younger child (aged 5-7) and an older child (aged 9-11). Eighty nine reading pairs (172 children) read a story which was identical except for the body shape of the main character. Prompts were built into this story asking children to predict the ending and to discuss their favourite part of the story. Conversations were recorded and analysed using thematic analysis. The conversations were compared for any differences between the healthy and overweight conditions in references to body shape, content of conversations, valence of responses, and non-verbal communication.

Overall, this study did not find clear evidence of negative attitudes to overweight. Within the results there were some occasions where there were significantly more negative comments or significantly less positive comments in the overweight condition, but this was not a clear pattern. There was also significantly more laughter in the overweight condition compared to the healthy weight condition. The results also demonstrated considerable variance in children's views, with one pair being extremely negative about overweight Alfie.

The current study suggests that the majority of young children (aged 5-7) have not yet developed weight stigma to a degree that previous literature might predict. This information is particularly valuable to those delivering health education or interventions related to preventing or tackling obesity.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

The rising prevalence of obesity and overweight in both children and adults has been described as a global 'epidemic' (Lupton, 2013; Puhl & Brownell, 2006; World Health Organisation, 2000). It is widely acknowledged that obese individuals face stigma in many aspects of life (Puhl & Heuer, 2009.) The present research is concerned with weight stigma directed at children. In particular, the research will focus on peer-to-peer interactions regarding body shape in young children.

The review of the literature will begin by briefly examining definitions and prevalence of obesity and the negative consequences of obesity. The review will then consider the negative responses of others to obesity including weight stigma, stereotypes and the implications of this. The review will move on to consider evidence around negative responses to obesity in childhood. Specifically sources of childhood weight stigma and negative consequences of weight stigma in childhood will be reviewed. Subsequently, the role of peers in the development of negative attitudes towards obesity will be explored. Methodological issues with the current literature will also be considered.

Definitions of Obesity

The World Health Organisation (WHO) defines overweight and obesity as an abnormal or excessive fat accumulation that may impair health (WHO, 2016). The WHO uses body mass index (BMI) calculations (a comparison of an individual's height and weight), to determine if someone is overweight or obese (WHO, 2016). BMI scores are the most common method of defining overweight in the literature, although this approach has been criticised by some authors (Daniels, 2009). The present study examines responses to obesity. The majority of the literature reviewed is

related to obesity. However, where this is unclear the author's terms used to describe excess weight have been maintained.

Prevalence of Obesity

There is global concern about the rising prevalence of obesity in both adult and child populations (WHO, 2016). The World Health Organisation recently reported that worldwide obesity has almost doubled since 1980 (WHO, 2016). For adults in western countries, the most recent statistics (from 2014) show that 54% of adults are overweight or obese (WHO, 2016) and so there are more adults who are overweight than healthy weight (Lupton, 2013; WHO 2016). In England, the most recent statistics from the Health and Social Care Information Centre (HSCIC, 2015) found that 26% of adults are obese.

Like the adult population, the prevalence of obesity in childhood has increased over the last 30 years (Wang & Lobstein, 2006; HSCIC, 2015; World Health Organisation, 2016). Globally, over 42 million children under the age of 5 are overweight or obese (WHO, 2016). The WHO European Childhood obesity surveillance initiative found that as many as 1 in 3 children aged 11 were overweight or obese (WHO Europe, 2016). In England, the most recent statistics found that 31% of children aged between 2 and 15 were overweight or obese (HSCIC, 2015). Due to the rising concern around levels of obesity in childhood, the National Child Measurement Programme was launched in England in 2006 to monitor children's weight when they are in the reception class and in year 6 (HSCIC, 2016). In the school year 2015/2016, it was reported that 9% of children in reception and 19% of children in year 6 were obese (HSCIC, 2016).

Negative Consequences of Obesity

Obesity may have negative consequences for a person's physical and psychological health and well-being in both children and adults. In adults, obesity is linked to a range of health problems including diabetes, heart problems, osteoarthritis, respiratory difficulties, reproductive problems, liver disease, gastrointestinal problems, some cancers and premature mortality (Department of Health, 2013; Public Health England, 2016; National Institute for Health and Clinical Excellence, 2006; WHO, 2016). In children, obesity is linked to asthma, an increased risk of fractures, musculoskeletal problems, obstructive sleep apnoea, cardiovascular risk factors and type 2 diabetes (Dea, 2011; Public Health England, 2016; WHO 2016). There is also an established connection between obesity, poorer psychological health and lower quality of life in adults and children (Harriger & Thompson, 2012; Public Health England, 2016; Puhl & Heuer, 2010; Rankin, Matthews, Cobley, Han, Sanders, Wiltshire et al., 2010).

Negative Responses of Others to Overweight

As mentioned above, excess weight can lead to a person experiencing negative responses from others. Evidence suggests that people with overweight body shapes continue to be viewed negatively by others (Hill, 2007). There are a series of terms found in the literature to describe negative responses towards overweight. "Stigma", "prejudice", "bias", "discrimination", "marginalisation" and "victimisation" are all used to describe the negative responses that people who are overweight may experience. When talking about children's experiences of negative responses of others, the terms weight-based "bullying" or "teasing" are also found. In a review of the literature, Brownell et al. (2005) found that "bias", "stigma" and "prejudice" were

the most common terms used to describe negative responses to people who are overweight. However, these terms appear to be used interchangeably and refer to similar constructs (Brownell et al., 2005; Deacon, 2006). There are no universally agreed definitions of these constructs or the differences between them (Brownell et al., 2005; Deacon, 2006). Several authors have concluded that this lack of definition of stigma and related terms is problematic (Brownell et al., 2005; Deacon, 2006; Link and Phelan, 2001). It is argued that the lack of widely accepted definitions can cause lack of clarity and make these ideas difficult to operationalise for research purposes (Deacon, 2006; Link & Phelan, 2001). Brownell et al. (2005) argue that having more precise definitions of terms such as stigma, bias and prejudice will allow research in this area to advance.

Overall, the most commonly used term in the literature to describe negative responses experienced by individuals who are overweight is stigma (Brownell et al. 2005; Puhl & Latner, 2007). As a consequence, the term stigma will be used in this research to describe negative responses to overweight people. However, when reviewing relevant literature the terms used by authors are maintained.

Definitions of Weight Stigma

One of the earliest authors to write about stigma was Goffman (Phelan, Link & Dovidio, 2008). Goffman (1963 p9) defines stigma as "*the situation of the individual who is disqualified from full social acceptance."* Similarly, it is suggested that stigmatisation occurs when a person is seen to be different from the norm and has characteristics that are perceived negatively by society, or linked to a devalued social identity (Corrigan, 2000; Dovidio, Major & Crocker, 2000). Similarly, Link and Phelan (2001) argue that stigma occurs when a person is seen to possess undesirable characteristics that are linked to negative stereotypes. These stereotypes increase the

likelihood of the person experiencing disapproval, status loss, discrimination, exclusion and rejection (Link & Phelan, 2001).

In terms of weight stigma, it is well documented that people with overweight and obese body shapes are viewed negatively in society (Brewis, 2014; Hill, 2007; Lupton, 2013; Tomiyama, 2014). However, there is no generally accepted definition of weight stigma. In fact, many authors write about weight stigma without defining the term (Puhl & Brownell, 2001; Puhl & Heuer, 2009; Puhl & Latner, 2008; Strauss & Pollack, 2003). Brewis (2014 p153) described weight stigma directed towards adults as, *"The moral discrediting or "social death" that people experience because of the negative social meanings attached to being overweight or obese."* Similarly, Puhl and Latner (2007 p558) define weight stigma towards children and young people as, *"negative weight related attitudes and beliefs that are manifested by stereotypes, bias, rejection and prejudice toward children and adolescents because they are overweight or obese."* The broad definitions suggested by Brewis (2014) and Puhl and Latner (2007) interpret stigma as including all negative responses of other people to a person who is overweight or obese.

Stereotypes Associated with Obesity

The literature on weight stigma highlights a range of negative stereotypes associated with obesity, including that people who are overweight are "mean", "stupid", "ugly" and "lazy" (Brewis, 2014; Puhl & Brownell, 2006; Puhl & Heuer 2009). There is evidence that demonstrates that people with obesity are perceived to lack self-control, lack intelligence, be emotionally unstable and to think more slowly than healthy weight people (Brewis, 2014; Puhl & Brownell, 2006; Puhl & Heuer 2009). Also, people who are obese may be characterised as non-compliant, unhappy, less competent, less socially able and more socially isolated (Brewis, 2014; Lupton,

2013; Penny & Haddock, 2007; Puhl & Brownell, 2006; Puhl & Heuer, 2009). Lupton (2013) also argues that there is a growing narrative that obese people are unlovable and must automatically have low self-esteem. Evidence demonstrates that these stereotypes are commonplace in the media and are widely accepted in the general population (Brewis, 2014; Lupton, 2013; Penny & Haddock, 2007; Puhl & Brownell, 2006; Puhl & Heuer, 2009).

Prevalence of Weight Stigma

It is difficult to determine the prevalence of weight stigma for either adults or children. However, there is a body of evidence demonstrating that weight stigma is widespread and continuing to rise (Brewis, 2014; Latner & Stunkard, 2003; Lupton, 2013; Tomiyama, 2014; Puhl & Latner, 2007; Puhl & Heuer 2009). Brewis (2014 p152) described the experience of being an obese adult as, *"a miserable, chronic predicament."* Similarly, Lupton (2013 p3) argues that, *"The fat body has become a focus of stigmatizing discourses"* and that those who are overweight are, *"socially marginalized and treated with derision and even repulsion."* One study has attempted to establish a global perspective on weight stigma (Brewis, Wutich, Faletta-Cowden & Rodriguex-Soto, 2011). Brewis et al. (2011 p269) gathered information from 680 adults in 10 countries and concluded that there is a *"profound global diffusion of negative ideas about obesity."* Although this is a relatively small sample, the findings do fit with the arguments presented in the literature outlined above.

Puhl and Brownell (2001 p788) argue that part of the reason for high levels of weight stigma is that it is seen as socially acceptable, with fat people being, *"the last acceptable targets of discrimination."* Several authors agree that weight stigma is viewed as socially acceptable because the overweight person is seen as entirely responsible for their body shape (Brewis, 2014; Latner & Stefano, 2016; Lupton,

2013; McMichael, 2013; Puhl & Heuer, 2009; Tomiyama, 2014). Brewis (2014 p152) argues that there are, *"deep-seated and barely-questioned cultural norms that assign individual responsibility, failure and blame to weight gain."*

Implications of Weight Stigma

Weight stigma can have a range of negative consequences and inequalities for a person who is obese. In the review by Puhl and Brownell (2001) (updated by Puhl and Heuer in 2009), they concluded that adults with obesity faced discrimination in many areas of life including employment, healthcare, the media and interpersonal relationships (Brewis, 2014; Puhl & Brownell, 2001; Puhl & Heuer, 2009). For example, research has found negative attitudes towards people who are obese in many groups of health professionals including doctors (Brewis, 2014; Drury & Louis, 2002; Puhl & Heuer, 2009), medical students (Puhl & Heuer, 2009; Wigton & McGaghie, 2001), fitness professionals (Brewis, 2014; Puhl & Heuer, 2009), dietitians (Harvey, Summerbell, Kirk & Hill, 2002; Puhl & Heuer, 2009), nurses (Drury & Louis, 2002; Brown, 2006) and radiographers (Aweidah, Robinson, Cumming & Lewis, 2016; Strudwick, 2016). Several studies have demonstrated that patients who are overweight and obese experience a range of negative responses from healthcare professionals including feeling judged, feeling that medical problems are dismissed due to their weight and feeling disrespected (Stunkard & Wadden, 1992; Puhl & Brownell, 2006; Puhl & Heuer, 2010). Although several studies have reported patients who are overweight experiencing negative attitudes from health professionals, the proportions have varied between studies. For example, Stunkard and Wadden (1992) found that 78% of overweight patients reported experiencing weight stigma from a doctor. Similarly, Puhl and Brownell's study (2006) reported that 69% of overweight people had experienced a negative response from a doctor. However, in a more recent

study, Gudzune, Bennett, Cooper and Bleich (2014) found that only 21% of participants had experienced weight stigma from a doctor. Puhl and Heuer (2009) argue that more research is needed in this area.

In addition to potential negative attitudes of health professionals, it has also been found that health professionals spend less time with patients who are obese and that weight bias can affect the judgement of professionals (Puhl & Brownell, 2001; Puhl & Heuer, 2010). Puhl and Heuer (2009) also argued that there is a structural bias against people who are obese in healthcare settings such as weight limits on equipment or chairs that are not big enough. Finally, there has been some evidence that suggests that weight stigma causes obese people to either delay or avoid seeking healthcare leading to a poorer quality of care (Drury & Louis, 2002; Puhl & Heuer, 2010).

Impact of Weight Stigma on Those with Obesity

Several authors describe encountering a completely unfounded argument suggesting that weight stigma may be useful as a means to motivate people with obesity to lose weight (Lupton, 2013; McMichael, 2013; Puhl & Latner, 2007). However, it seems more likely that in reality the opposite is true. Tomiyama (2014) created the 'cyclical obesity/weight based stigma model' (COBWEBS). In this model, Tomiyama conceptualises overweight as a vicious circle where experiencing weight stigma causes an increase in weight. Similarly, Brewis (2014) argues that weight stigma perpetuates overweight. Brewis identifies 4 mechanisms through which stigma perpetuates overweight namely: direct behavioural change (e.g. reducing exercise), indirect effect of social stress, indirect effect on social relationships and indirect structural effects of discrimination (e.g. earning lower wages due to weight stigma).

In addition to theoretical models, there is some research evidence supporting the idea that stigma causes increases in weight in adults. Drury and Louis (2002) found that experiences of stigma lead to an increase in BMI in a sample of 216 overweight women. Similarly, Major, Hunger, Bunyan and Miller (2013) exposed a sample of 93 female students to stigmatising messages about overweight. They found that women who perceived themselves to be overweight increased their consumption of calorific food after seeing stigmatising messages.

There is also some limited evidence that weight stigma may increase weight in children. Madowitz, Knats, Maginot, Crow and Boutelle (2012) found a link between experiences of weight based teasing and an increase in unhealthy eating behaviours, including binge eating in a sample 80 overweight children. Finally, Cinelli and O'Dea (2016) argue that messages contained in obesity prevention programmes for children can actually inadvertently cause an increase in weight because children perceive them as stigmatising.

Impact of Weight Stigma on Psychological Health

As mentioned above, obesity is linked to poorer psychological health. Several researchers in the field of weight stigma have argued that weight stigma is a significant contributing factor to this. Puhl and Heuer (2009) describe this as a relatively new area of research. However, there is evidence that suggests that weight stigma can lead to low self-esteem (Annis, Cash & Hrabosky, 2004; Puhl & Heuer, 2009). There is also a link between weight stigma and problems with body image, and between weight stigma and depression and impaired mood more generally (Carr & Friedman, 2005; Puhl & Heuer, 2009)

Weight Stigma in the Media

Wykes and Gunter (2005) argue that the media's representation of body image plays a key role in creating and maintaining weight stigma. With regard to the news media, it was found that news coverage of obesity had risen in recent years (Puhl & Heuer, 2009). Puhl and Heuer (2009 p950) concluded that, *"the media is unkind to overweight people."* They cite examples of the media reporting that people who are obese are partially to blame for a series of events such as global warming and rising fuel prices. They also found that the media tend to represent obesity in a way that emphasises personal responsibility and takes a blaming stance towards people that are overweight. Similarly, Boero (2007) found that obesity tended to be reported in terms that blamed individuals, and focussed on lack of willpower. Crandall (1994) believes that this is also the case in advertising media. Crandall argues that the advertising of weight loss products feeds into the 'blaming' of people who are obese through the portrayal of weight as easily controllable.

In addition to news reporting, negative attitudes to obesity are common in the entertainment media (Lupton, 2013; Puhl & Heuer, 2009). Lupton (2013) describes stigmatising messages portrayed by a series of reality television shows focussed on obese people attempting to lose weight. Lupton (2013) reports a dominant theme that obese people are unhappy, unlovable and should be punished. Similarly, several researchers conducting content analyses of entertainment media have concluded that overweight characters are underrepresented and tend to appear in minor and stereotypical roles as the object of humour and ridicule (Fouts & Burggraf, 1999; Fouts & Burggraff, 2000; Himes & Thompson, 2007).

Overall, there is evidence to demonstrate that people who are obese are subject to negative and stigmatising messages in the media (Ata & Thompson, 2010; Puhl & Heuer, 2009). Following rigorous reviews of weight bias in the media both Puhl and

Heuer (2009) and Ata and Thompson (2010) concluded that weight bias was present in the news media, the entertainment media and advertising media. Ata and Thompson (2010) found that people with obesity were portrayed in a stigmatizing manner in a wide range of media including television shows, books, newspapers and the internet. Puhl and Heuer (2009) concluded that on the whole, the media represent thin people as having positive attributes, and overweight people as having negative attributes. This appears to reflect the idea that weight stigma is socially acceptable (Lupton, 2013; McMichael, 2013).

Summary

The above literature demonstrates that despite the rise in prevalence of overweight and obesity, weight stigma is a significant problem. The evidence reviewed above has focussed on adults and has demonstrated that weight stigma can have a negative impact on many areas of an individual's life. The potential ramifications of these experiences can cause a person to increase their weight, have poorer health, be at a disadvantage in terms of interpersonal relationships, have a lower socioeconomic status and experience a lower quality of life (Brewis, 2014). Unlike other visible differences there is no legislative framework for dealing with stigma experienced as a result of weight (Puhl & Heuer, 2009). This may be in part due to weight stigma still being viewed as socially acceptable (Lupton, 2013; Puhl & Brownell, 2001).

Negative Responses to Overweight Children

This thesis is particularly concerned with negative responses to overweight and obesity in young children. Weight stigma directed towards children appears to be similar to stigma directed towards adults (Hill & Silver, 1995; Puhl & Brownell,

2003). This is particularly concerning as it is thought that children and young people are particularly vulnerable to weight stigma and the potential negative consequences arising from this (Puhl & Latner, 2007; Puhl & King, 2013). Peer relationships are thought to play an important role in a child or young person's development (Berndt& Ladd, 1989; Chen, French & Schneider, 2007; Puhl & Latner, 2007; Puhl & King, 2013). Experiencing weight stigma can therefore have negative consequences for a child or young person's social, emotional and academic development (Puhl & Latner, 2007; Puhl & King, 2013). There are however difficulties in assessing the nature, extent and prevalence of negative attitudes towards overweight amongst children (Puhl & Latner, 2007).

Weight Stigma from Educators

Weight discrimination from teachers has been an area of concern for over three decades. Hendry and Gillies (1978) expressed concern that teachers viewed children who are overweight or obese negatively, and may have lower expectations of them. Similarly, Puhl and Latner (2007) expressed concern about evidence suggesting that teachers hold more negative attitudes towards students who are overweight or obese. They argue that more research is needed into this issue.

2 studies have used surveys to gather information on teacher's attitudes. Neumark-Sztainer, Story and Harris, (1999) surveyed 115 teachers, and found that around a fifth of respondent's held negative beliefs about overweight pupils e.g. that they are untidy, they are more emotional or are less likely to succeed. Fontana, Furtado, Marston, Mazzardo and Gallagher (2013) surveyed 47 physical education (PE) teachers and 149 PE students. Participants completed a series of questionnaires and measures testing explicit and implicit bias. The researchers asked participants to complete measures that asked them clear questions about overweight students e.g.

"students who are obese have more difficulty following instructions" or "I would never date a fat person" in order to assess explicitly stated bias (Fontana et al. 2013 p18-19). They also used a measure of implicit association to measure bias that is implied or understood but not directly stated. Fontana et al. (2013) found no evidence of explicit bias expressed by PE teachers and students, but did find evidence of a significant implicit bias.

Kenney, Gortmaker, Davison and Austin (2015) analysed information from a longitudinal cohort study, which tracked various health and educational measures for 3362 children between the ages of 5 and 14. Kenney at al. (2015) found that an increase in BMI was significantly associated with worsening teacher perceptions of academic, irrespective of objectively measured, ability. This adds further evidence to the suggestion that teachers may exhibit weight stigma.

There is also evidence gathered from adolescents who are overweight. In a self-report study (n=361) 27% of participants reported experiencing weight based victimisation from a teacher (Puhl, Peterson & Luedicke, 2012). Specifically, 42% of participants described experiencing weight based victimisation from a PE teacher or sports coach. Puhl and Brownell (2006) conducted a retrospective analysis of adults' experiences of weight stigma as a child/adolescent. They found that 32% of their sample (n = 2449) had experienced weight stigma from a teacher.

Weight Stigma from Parents

There are several studies that suggest that parents may be a source of weight stigma for children. Puhl and Latner (2007) found evidence to suggest that parents both demonstrate and endorse weight stereotypes, and may even "tease" their overweight children. Davison and Birch (2004) assessed parental attitudes about

overweight (n=178) and concluded that parents held significantly more negative attitudes to children that are overweight compared to healthy weight children.

There have been several self-report studies that have gained information on lived experiences of weight bias from parents. In a survey of 361 adolescents classed as overweight, 37% of participants reported experiencing weight based victimisation from parents (Puhl, Peterson & Luedicke, 2012). Similarly, in a self-report study of 4746 adolescents, 47% of overweight girls and 34% of overweight boys reported experiencing weight-based teasing from a parent (Neumark-Sztainer, Falkner, Story, Perry, Hannan & Mulert, 2002). Although both studies relied on self-report measures, the sample sizes were relatively large (Puhl, Peterson & Luedicke, 2012, n = 361, Neumark-Sztainer et al., 2002, n = 4746) which increases the robustness of their findings. Furthermore, their findings are consistent with research that retrospectively analysed adults' own experiences of weight stigma (Puhl & Brownell, 2006). Puhl & Brownell (2006) found that 53% of their sample (n = 2449) had experienced weight stigma from their mother, and 44% from their father.

There has also been some limited experimental work into this field. Adams, Hicken and Salehi (1987) conducted a laboratory study with parents and pre-school aged children where parents were asked to tell three impromptu stories about 3 target characters. Parents were given three pictures depicting an average weight, obese and physically disabled target character. Parents were told that the children in the pictures were going to school for the first time in a new area. Overall, they found that within the parent's story the obese character had more negative descriptions made about them than the other two conditions. Also, the obese child and the physically disabled child were described as experiencing negative peer reactions within the parent's stories. Furthermore the obese child was less likely to have a successful outcome in terms of settling in to the new school. Adams, Hicken and Salehi (1987) therefore concluded

that parents may transmit stereotypic or negative information through their communication with their children. Although this study gives useful insight, the authors were cautious about the application of these findings due to the small sample size, and the restricted demographics of participants who were all white, middle class females.

In a more recent study, researchers conducted telephone interviews with 250 parents giving a description of a new child moving to the area (Wolfenden, McKeough, Bowman, Paolini, Francis, Wye & Puhl, 2013). In one condition the child was overweight and in the other they were healthy weight. Parents were then asked to complete a social interaction intention scale. It was found that parents exhibited bias based on weight, and that overweight children were likely to be offered less opportunities for social interaction.

Although there is limited research into weight stigma amongst parents, taken together the findings outlined above do seem suggest that parents may be a source of weight stigma for children who are overweight.

Weight Stigma in the Media

There is also evidence to suggest that weight bias is found in media aimed at children. Latner and Schwartz (2005) argued that this is an understudied area, but gave several examples of children's programmes and stories which portray overweight characters in a negative light e.g. overweight characters portrayed as "selfish", "lazy" or "mean". Klein and Shiffman conducted two content analyses of children's cartoons (2005; 2006) and concluded that there has been an increase in 'thin' cartoon characters and a decrease in overweight characters. They also found that overweight characters were significantly more likely to be portrayed as less intelligent that thin characters and were nine times more likely to be portrayed as the 'bad' character.

Overweight characters were also more likely to be depicted as angry and engage in violent and aggressive acts and less likely to engage in prosocial behaviours than healthy weight characters (Klein & Shiffman, 2005; 2006).

There has also been one study that analysed the content of 25 popular children's films and 20 books (Herbozo, Tantleff-Dunn, Gokee-LaRose & Thompson, 2004). Herbozo et al. (2004) found that in 64% of the films and 20% of the books, overweight characters were most often associated with negative characteristics, were more frequently 'evil' or 'cruel' and were more often disliked by others.

The scant evidence on bias in children's media outlined above does seem to suggest that like the adult media, children's media contains negative information about overweight body shapes. Latner and Schwartz (2005) and Ata and Thompson (2010) both concluded that children's media reinforces and perpetuates weight stigma directed at children.

Children's Negative Attitudes to Overweight

There are several studies that provide insight into the nature and extent children's negative attitudes towards overweight and obesity. These include evidence from reviews, self-report survey studies and experimental studies. Rees, Oliver, Woodman and Thomas (2011) conducted a systematic review of the attitudes to overweight in primary school aged children (4 – 11), finding 28 relevant studies. Overall, they concluded that children aged 4-11 make judgements based on body size and that discrimination on the basis of shape is normal for children in this age group. They also found that overweight bodies are seen as undesirable and that children consistently make negative attributions about overweight people. However, the authors expressed concern at the methodological quality of the included studies concluding that few study findings were generalisable. The authors reported that

children's views and engagement in discussions was not actively encouraged. Furthermore, the studies reviewed were set up to test existing theories established by adults and lacked in breadth and depth regarding children's views.

4 studies have used self-report survey methods to gather information on young people's experiences of weight stigma from their peers. Janssen, Craig, Boyce and Pickett (2004) conducted a survey of 5749 young people aged 11-16, gathering self-report information on experiences of bullying and self-reports of weight. They found that overweight and obesity were significantly related to experiences of overt verbal and physical bullying. Janssen et al. (2004) also found that overweight young people were significantly more likely to be the victims of relational bullying such as withdrawal of friendship or being the victim of rumours or lies.

Hayden-Wade, Stein, Ghaderi, Saelens, Zabinski and Wilfley (2005) compared the self-reported experiences of young people enrolled in a weight loss camp (n=70) with a comparable sample of non-overweight peers (n-86). All young people were aged between 10 and 14 years. They concluded that appearance related teasing was more prevalent, frequent and upsetting in the overweight condition. They also found that it was often perpetrated by peers in general than one or two specific individuals.

A further self-report survey gathered information from 80 overweight children aged 8-12 who were enrolled in a weight treatment programme (Madowitz, Knatz, Maginot, Crow & Boutelle, 2012). They found that 59% of the sample had been distressed by weight based teasing from peers. Finally, Puhl, Peterson and Luedicke (2012) conducted a detailed online survey with 361 young people aged 14-18 who were enrolled in several weight loss camps. They found that 64% of the sample reported experiencing weight based victimisation at school. Participants reported that peers (92%) and friends (70%) were the most common perpetrators of weight based teasing.

Finally, Neumark-Sztainer and Eisenberg (2005) conducted a qualitative study of adolescent girls classed as overweight (n = 50) asking them directly about their experiences. They found that the overweight children describe a range of unpleasant experiences from their peers including verbal teasing and abuse (Neumark-Sztainer & Eisenberg, 2005).

Evidence from Adult's Self-report Surveys

There have been 2 survey based studies that have sought the perspectives of adults on the nature and extent of weight stigma in children. Puhl and Luedicke (2014) employed an online survey to gain the perspectives of 919 parents. They found that parents perceived youth who are overweight or obese to be considerably more vulnerable to bullying. Another study used a web based survey to gain the views of 2866 adults in 4 countries (America, Canada, Australia and Iceland) about weight based victimisation in youth (Puhl, Latner, O'Brien, Luedicke, Forhan & Danielsdottir, 2015). Across all countries weight based bullying was identified as the most common reason for a child or young person to be bullied.

A further study retrospectively analysed adults' experiences of weight stigma as a child/adolescent (Phul & Brownell, 2006). They found that 64% of their sample (n = 2449) had experienced weight stigma from their peers at school.

Evidence from Experimental Research

There have been several experimental studies that have examined the extent and nature of weight stigma in children. Several researchers have used line drawings of body shapes to examine weight stigma in children. One of the earliest attempts to measure the extent of weight stigma involved showing older primary school aged

children (aged 10 to 11) 6 line drawings of other children. These pictures depicted 4 children with physical disabilities, an obese child and a child with no physical difference (Richardson, Goodman, Hastorf & Dornbusch, 1961). They asked the participants to rank each picture in order of which child they liked best. They found that the child with no visible difference was ranked most highly and the obese child received the lowest rankings and was rated to be the least likeable. In a more recent replication of this research (Latner & Stunkard, 2003) the child depicted as obese again received the lowest preference rankings. Indeed, the drawing of an obese child was rated lower than in Richardson et al.'s 1961 study suggesting that negative views had worsened.

Brylinski and Moore (1994) built on the study by Richardson et al. (1961) by asking participants (n=368, aged 5-10) to rate line drawings of thin, average weight and obese body shapes on 12 pairs of bi-polar adjectives e.g. smart/stupid, nice/mean. They found a significant difference with thinner body shapes being rated positively and the obese body shape being rated negatively.

Nabors, Thomas, Vaughn, Adams, Amaral and Olsen (2011) conducted a similar study with 161 children aged 8-12. Participants were given a vignette about name calling and then presented with line drawings of an obese and healthy weight character. Participants then had to choose which child was the target of the name calling and asked for ideas about what the victim should do next. Nabors et al. (2011) found that the obese child was more likely to be selected as the victim (67% of participants) than the healthy weight child (33% of participants). Participants who chose the overweight child as the target of name calling frequently suggested that the child either needed to lose weight to be accepted, or should just ignore the name calling. However where the participant chose the healthy weight child as the target they tended to report that the name calling would probably just stop.

Penny and Haddock (2007) also examined weight bias in primary school children aged 5 to 10. They examined children's perceptions of obesity using short stories and character drawings. They found that overall, children aged 5 to 8 were likely to rate a child drawn as obese as less likely to have high levels of athletic ability, academic ability, social ability and artistic ability than a healthy weight child. In line with other research, this demonstrates a continuation of negative responses in an older age group. Also, it shows that obese children are perceived to be less able across all domains of competence studied. Interestingly, for the children aged 9 – 10, Penny and Haddock (2007) found that they still rated the child drawn as obese to be less likely to have high levels of athletic ability. However, they rated the obese character as more likely to have high levels of social ability. Neutral responses were given for academic and artistic ability. Penny and Haddock (2007) suggested that this may be due to a greater awareness in older children that it is wrong to be prejudiced and so social desirability may have influenced these findings.

Klaczynski (2007) used creative methodology to examine weight bias in children aged between 7 and 10. Klaczynski (2007) first told children a story about a child becoming ill after eating unfamiliar food. The story then shows the child coughing on some other children. In one condition, the other children become ill, and in the other condition they do not. The children were later presented with identical soft drinks to children that had supposedly been created by either average weight or overweight children. Klaczynski (2007) then asked children to rate the drinks. He found that taste ratings were lower and chances of feeling sick were rated higher when children believed that drinks had been prepared by an overweight child. In this case, Klaczynski (2007) argues that the biased representation develops into a perception of illness by contamination or contagion, whereby drinking the drink created by an

overweight child is more likely to make you sick. These findings represented a shift from bias into judgements about the person's competence.

The evidence outlined so far has shown some evidence that demonstrates negative attitudes towards overweight in children aged between 5 and 11. There are also some studies examining negative attitudes to overweight and obesity in younger children aged 3-5. Cramer and Steinwert (1998) described two experiments conducted with preschool children aged 3 – 5 (n=30). In the first part of the study, children were read four short stories, where one character was 'mean' and one was 'nice.' After the reading of the story, the children were shown drawings of an obese child and an average weight child and asked to choose which character was the 'mean' one and which was the 'nice' one. They found that the children consistently rated the obese character as the 'mean' one.

In the second part of Cramer and Steinwert's (1998) study, a shorter version of the story task in part one of the study was repeated, but this time children were asked for a reason for their choice. In addition, children were asked to attribute a list of bi-polar adjectives (e.g. smart/stupid or brave/afraid) to the target characters. They were then asked questions about their attitudes to their own body shape and to complete a playmate preference task.

In terms of the story based task, they again found that the obese target character was consistently rated as the 'mean' character. When analysing children's reasons for this choice, they found that 3 year olds were unable to verbally identify body size as a reason for their attribution of meanness but that the 5 year old children clearly focussed on body shape as the reason. Similarly, children tended to assign negative attributes to the obese character in the adjective attribution task, and this increased with the age of the child. They also found that overweight was viewed as an undesirable self-image, and overweight children were seen as an undesirable play

mate. For all of these findings, the negative responses increased with the age of the child. There are some methodological issues with this study. Cramer and Steinwert (1998) expressed concern that the younger children may not have been able to accurately identify body shape. Also, the second part of the study required children to attend to several tasks in a row, which may have been more challenging for younger children. Finally the children in this study were all drawn from pre-schools with white, middle class children which may influence the findings. That said, the findings of this study appear to be consistent with the idea that negative responses toward overweight begin in early childhood and get worse over time.

Tremblay, Losvin, Zecevic and Lariviere (2010) studied the early emergence of negative responses to overweight. In this study, researchers interviewed 144 children aged 3 – 5 examining their perception and satisfaction with their body weight. They found a strong tendency in overweight children to underestimate their body shape. They argue that this misperception of body shape is due to, *"the internalisation of negative social attitudes toward being overweight"* (Tremblay et al. 2010 p290). Tremblay et al. (2010) attempted to overcome methodological concerns around young children's understanding by matching tasks to the participant's level of cognitive development, and by completing training tasks to ensure that children understood key concepts. They argued that their findings were therefore not the result of children's developmental limits.

Similarly, Su and DiSanto (2011) investigated preschool children's (age 3 – 5) perceptions of overweight peers. Specifically, they examined if children at this age perceived overweight children to be more likely to possess negative characteristics than healthy weight children. Similarly to Cramer and Steinwert's study (1998), this study used stories about social interactions where one child behaves in a 'nice' way and another child in a 'mean' way. The researchers then showed the children two

target characters, one average weight and one obese. Children then had to choose which figure was ‘nice’ and which was the ‘mean’ character. Consistent with the findings of Cramer and Steinwert (1998), Su and DiSanto (2011) found that children were more likely to rate the obese character as being ‘mean’ rather than ‘nice.’

The three studies described above (Cramer & Steinwert, 1998; Tremblay et al. 2010; Su & DiSanto, 2011) concluded that weight bias is present in children under the age of 5, with this increasing as children get older. All three of these studies reflect on the challenges of conducting research with young children. Taken together, the studies raise issues about young children’s level of cognitive development confounding results and matching tasks to a child’s abilities. They also reflect on the need to ensure that methods used are enjoyable to children to maximise the chances of full engagement with the tasks. They also note the difficulties around recruiting a representative sample of preschool aged children (Cramer & Steinwert, 1998; Tremblay et al. 2010; Su & DiSanto, 2011).

There have been some concerns raised about the reliability and validity of experimental findings described above. Rees et al. (2011) argue that samples are not representative and therefore findings cannot be generalised. Also, Harrison, Rowlinson and Hill (2016) report that the materials used in previous research have generally been poor quality and as such would be unrealistic and unfamiliar to younger children. They also argue that the previous methods used to gain children’s views could lead to an overestimation of negativity. In the majority of experimental studies outlined above, children are forced to rank line drawings in order of preference or match adjectives to figures. In the majority of these studies children are therefore forced to label one body shape negatively irrespective of how far they agree with any statement they are asked about. This means the findings of the studies above may not

accurately represent how negative children's attitudes are and may potentially over estimate negativity.

Harrison et al., (2016) began to address the methodological issues outlined above in two studies designed to explore young children's responses to obesity and disability. The two studies used storybooks that used established children's story characters and were professionally illustrated. This ensures that the materials used were of age appropriate, were of high quality and would be familiar to children. In the first study, 126 children aged 4-6 were shown one of three versions of the same story which featured four story characters (two boys, one girl and a cat). In the three versions of the story one of the main characters (Alfie) was depicted as healthy weight, in a wheelchair or as obese. After reading the story children were asked rate several attributes and behaviours for the 2 male story characters (Alfie and Thomas). For example, children were asked to rate how likely each character would be to win in a race using a visual scale. Children were then asked to choose which of the two characters would be most likely to win a race. Children completed 9 attribution tasks in this way and were then asked which child they would most like to be friends with. Overall, they found different degrees of negativity towards 'fat' Alfie depending on the type of ratings (Harrison et al., 2016). In the rating tasks, fat Alfie was rated slightly less positively than healthy weight Alfie, but all ratings were either neutral or positive. However, when forced to make a choice between 2 characters, fat Alfie was widely rejected in favour of the healthy weight character, Thomas. Therefore, it was concluded that the degree of negativity towards the overweight character differed greatly depending on the method used to assess their views.

The second study in Harrison et al. (2016) aimed to repeat the first study but with female main characters (Alfina and Holly), and to investigate if the body shape of the main characters friends influenced ratings of the main character. Like the first

study, findings suggested that when forced to choose, obese characters were rejected. However, in ratings tasks overweight Alfina's ratings tended to be on the positive side of the scale. This suggests a preference for healthy weight body shapes but not an outright rejection of overweight. Taken together, these two studies corroborate that the methodology used in previous research could have resulted in an overestimation of weight stigma in young children.

Baxter, Collins and Hill (2015) also used the storybooks described above to explore young children's understanding of body weight change. In this study, 100 children aged 4-6 read the story featuring either a healthy weight or obese main character. After reading the story the main character was described as either gaining or losing weight. Semi-structured interviews were used to explore the participant's understanding of the characters weight change. They found that the majority of children (94%) identified the change in weight. They also found that weight loss was viewed positively for both physical and social reasons whilst weight gain was viewed negatively. Participants gave a range of responses that suggest that young children have an understanding of the physical and social consequences of overweight. Like the other studies described above, this study suggests that young children have an awareness that being overweight is socially undesirable.

Summary

The literature reviewed above suggests that children experience stigma from a range of sources including educators, parents, the media and their peers. Evidence on children's experiences of weight stigma from a range of methodologies has been described and appraised. Whilst most studies agree that children who are overweight and obese are the victims of stigma, the degree of negativity found was heavily influenced by the methodology used. That said, negative attitudes towards obesity

were found in children under the age of 5. Also, there was agreement across several studies that negative attitudes towards overweight increase as children get older. It was also widely agreed that more research is needed in this area to clarify the nature and extent of weight stigma in children (e.g. Puhl & Latner, 2007; Rees et al., 2011).

Implications of Negative Responses to Children with Obesity

Puhl and Latner (2007) argue that weight stigma directed at children is concerning as children are vulnerable to negative consequences of weight stigma, particularly as social relationships are key to a child's development. They argue that experiencing weight stigma as a child has negative consequences that persist into adulthood. The negative implications for weight stigma directed at children are similar to those for adults outlined above. Weight stigma can impact on children's physical and psychological health. For example, in a study of 217 adolescents, Matthews, Salomon, Kenyon and Zhou (2005) found that participants who felt that they had been unfairly treated due to their physical appearance (including their weight) had a higher blood pressure than those who did not report unfair treatment. In a self-report study of adolescents (n=2516) overweight participants who had been the victim of weight based teasing were significantly more likely to engage in binge eating behaviours (Haines, Neumark-Sztainer, Eisenberg & Hannan, 2006). Similarly, Feeg, Candelaria, Krenitsky-Korn and Vessey (2004) found a relationship between self-reported weight based teasing and an increase in measured BMI. Also, Madowitz et al. (2012) found that overweight children who experienced weight based teasing have higher levels of unhealthy eating behaviours including binge eating and unhealthy dieting.

Weight stigma has been linked to psychological consequences in children similar to those observed in adult populations described above. Firstly, there is some research suggesting a link between obesity and difficulties with body image or body

dissatisfaction in children (Ricciardelli & McCabe, 2011; Rees et al. 2011; Wardle & Cooke, 2005). Children with obesity are more likely to experience low self-esteem (Latner & Stunkard, 2003; Puhl & Latner, 2007, Su & DiSanto, 2011). It is thought that children who experience weight based teasing or victimisation are more likely to develop poor esteem and/or body image (Davison & Birch, 2001; Davison & Birch, 2002; Puhl & Latner, 2007).

There is also a link between obesity and difficulties with low mood and depression (Carr & Friedman, 2005; Madowitz et al., 2012; Puhl & Latner, 2007). Wardle and Cooke (2005) found that children who are obese have an increased vulnerability to depression. However, as with self-esteem and body image, it is thought that weight-based teasing is a mediating factor between overweight and problems with low mood and depression (Eisenberg, Neumark-Sztainer & Story, 2003; Wardle & Cooke, 2005).

There is evidence that weight stigma can have a negative impact socially. Dixey, Sahota, Atwal and Turner (2001) found that social discrimination based on weight was seen as normal amongst older children (aged 9 – 11) and summed up the prevailing attitude with a quote from a participant stating, *"It's not a good image if you are going around with a fat person"* (Dixey et al. 2001 p21). In the review by Rees et al. (2011) they concluded that children who are overweight were isolated and less socially accepted than healthy weight peers and were likely to have fewer friends. Also, children believed that being overweight was a barrier to making friends. In a large scale investigation of social networks of adolescents aged between 13 and 18, Strauss and Pollack (2003) found that overweight adolescents were significantly more likely to be socially isolated and less likely to be nominated as a friend by a healthy weight peer.

Unsurprisingly, several studies have shown that overweight children perform less well at school than their healthy weight peers (Kenney et al., 2015; Krukowski, West, Perez, Bursac, Phillips & Raczynsk, 2009; Puhl & Heuer, 2009; Puhl & Latner, 2007). However, there is little research that directly explores the link between experiences of weight stigma and academic performance. Krukowski et al. (2009) used telephone survey data from parents of 1071 adolescents to explore relationships between weight status, weight based teasing and academic performance. They found a significant relationship between overweight, weight-based teasing and reduced academic performance in children with obesity (Krukowski et al., 2009).

Development of Weight Stigma

Despite the potentially serious implications of weight stigma aimed at children, there has been relatively little research about how children learn negative information about body shape and thus acquire weight stigma (Latner & Schwartz, 2005). The evidence outlined above suggests that children under 5 have a preference for 'thin' body shapes and display negativity towards overweight body shapes. However, Latner and Schwartz (2005) concluded that there is little evidence about the methods of transmission of negative attitudes to young children and that this is a key area for future research.

It is widely agreed in the child development literature that a child's development is heavily influenced by the environment and social world that they live in (Asamen, Ellis & Berry, 2008; Brown, 2008; Harris, 2008). A broad range of factors may effect a child's development, including the development of their attitudes to obesity (Asamen, Ellis & Berry, 2008; Brown, 2008; Caprio, Daniels, Drewnowski, Kaufman, Palinkas, Rosenbloom et al., 2008; Harris, 2008). It is argued that parental weight, parental attitudes to obesity, attitudes of relatives to obesity, ethnicity, culture

and access to the media are all factors that may affect the development of a child's responses to overweight (Asamen, Ellis & Berry, 2008; Caprio et al., 2008; Harris, 2008). It makes sense that the main sources of stigma aimed at overweight children outlined above (peers, educators, parents and the media) are important factors in establishing and maintaining weight stigma in children (Puhl & Heuer, 2009; Puhl & Latner, 2007; Adams, Hicken & Salehi, 1987).

Role of Peers in the Development of Weight Stigma

The focus of the present research is on the transfer of attitudes or stigmatising messages from peers. Although peers are frequently described as playing an important role in both child development and the development of weight stigma, many authors do not define what they mean by peers (e.g. Chen, French & Schneider, 2007; Gregory, Long & Volk, 2004; Puhl & Latner, 2007; Puhl & King, 2013). Pellegrini and Blatchford (2000) argue that the term 'peer' refers to individuals of equal status. Along similar lines, the Oxford English Dictionary (2017) describes a peer as *"A person of the same age, status or ability as another specified person."* In the school setting, Aronson and Steele (2005) argue that a child's peers are their fellow students. Although this is not explicitly stated or defined, several authors refer to a child's fellow pupils at school as their peers (e.g. Hayden-Wade et al., 2005; Janssen et al., 2004; Puhl & Latner, 2007; Puhl, Peterson & Luedicke, 2012). For the purposes of this study, the term peer relates to children who are pupils at the same school. This is in line with definitions of peers in the literature around paired reading (Atherley, 1989; Winter, 1991).

In terms of the role of peers in the development of weight stigma, research to date has focussed on investigating the nature and extent of weight stigma that children who are overweight or obese experience from their peers (Puhl & Latner, 2007).

Despite rigorous literature searching, it has not been possible to find any evidence around children's acquisition of negative information about overweight from their peers, although this is acknowledged as an important area for future research (Latner & Schwarz, 2005). Given the evidence described above demonstrating that children make negative attributions about overweight, it seems to make sense that children learn negative information about overweight from their peers. Also, it is widely acknowledged in the wider literature that peers are influential in other areas of a child's development (Howe, 2010; Ladd, 1989; Siegler, DeLoache & Eisenberg, 2011). The context around the role of peers in child development will be briefly reviewed.

Role of Peers in Child Development

Historically, child development has been viewed as a process that is external from the child (Lerner, 1982; Slater, Hocking & Loose, 2004). A turning point in this view was the work of Jean Piaget (Gleitman, Gross & Reisberg, 2010; Howe, 2010; Ladd, 1989; Slater et al, 2004). Slater, Hocking and Loose (2004 p42) argue that prior to Piaget's work, a child was, *"seen as a passive recipient of his or her upbringing."* However, Piaget argued that children are active in shaping their own development (Lerner, 1982; Piaget, 1932; Slater, Hocking & Loose, 2004).

Piaget (1932) was amongst the first theorists to emphasise the importance of peer relationships in a child's development. He argued that interaction with peers provides opportunities to interact without the presence of an authority figure. As a result a child must verify ideas for themselves rather than accepting ideas from an authority figure (Siegler, DeLoache & Eisenberg, 2011). This in turn leads to the child being exposed to new ideas (Siegler, DeLoache & Eisenberg, 2011). Writing at a similar time to Piaget, Vygotsky also emphasised the role of peers in child

development arguing that problem solving with more able peers allows a child to enter in to new areas of development (Ladd; 1989; Slater Hocking & Loose, 2004; Vygotsky, 1978).

Despite the emphasis of early theorists on the role of peers in child development, this is a relatively recent field in research terms (Howe, 2010). Ladd (1989 p5) noted the discrepancy between the stated importance of peers in child development and lack of evidence stating, *" We have been struck by the frequency with which researchers refer to the importance of peers in child development and by how little evidence has been assembled to support this claim"* (Ladd, 1989 p5).

In more recent years, there has been some writing and research into the importance of peers in child development (Chen, French & Schneider, 2007; Harris, 2008; Siegler, DeLoache & Eisenberg, 2011). There is emerging evidence suggesting that peers can play an important role in helping a child to develop literacy skills (Gregory, Long & Volk, 2004; Howe & Mercer, 2007; National Literacy Trust, 2016). Similarly, Howe (2010) argues that co-operative learning amongst peers may boost a child's performance across all areas of the curriculum. There has also been more writing about the role of peers in social development, and the consequences of experiencing hostility from peers (Howe, 2010; Puhl & Latner, 2007; Slater et al, 2004; Siegler, DeLoache & Eisenberg, 2011). However, all authors argue the need for further research into this complex area (Howe, 2010; Ladd, 1989; Puhl & Latner, 2007; Slater et al, 2004; Siegler, DeLoache & Eisenberg, 2011).

Summary

It has been demonstrated that children experience weight stigma which may have a range of negative consequences for their physical and psychological health, their social relationships and academic development. The negative implications may

persist well into adulthood. Relatively little is known about the development of weight stigma in children, although parents, teachers, the media and peers are thought to contribute to the development and maintenance of negative attitudes to children who are overweight or obese.

The evidence available suggests that peers are common perpetrators of weight based stigma, including bullying, victimisation and teasing. However, most of this information is gathered from older children and little is known about younger children's experiences of weight stigma. However, evidence also suggests that peers play an important role in child development. Despite this connection, there is little known about the role peers play in the development of weight stigma. The literature reviewed above also suggests that there are some methodological challenges and opportunities in this field of research.

Qualitative Research with Young Children

As mentioned above, there have been concerns raised about procedures such as ranking in quantitative studies. Several researchers have successfully conducted qualitative research with younger children, and have emphasised the value and importance of their participation in research. For example, Kirk (2007) conducted a review of qualitative research with young children and noted the importance of ensuring that research tasks are at a developmentally appropriate level to allow children to be active participants. Also, Davis (1998) highlights the importance of conducting research in a context that is familiar for the child (e.g. school or home) and using familiar tools (e.g. stories or pictures).

Recent studies (Baxter et al., 2015; Harrison et al., 2016) have demonstrated that high quality story materials can be effectively used to explore young children's responses to obesity. This study will also use the high quality illustrations employed in

the studies by Baxter et al. (2015) and Harrison et al. (2016). In addition, the current study will use paired reading as a method to investigate the unexplored area of peer-to-peer responses to body shape in young children.

Paired Reading

As mentioned above, little is known about the peer transmission of negative information about obesity, especially in children. Although it is well established that peers are a source of weight stigma for children with obesity, there is currently no research into how peers talk to each other about body shape. This is probably in part due to the difficulties inherent in conducting research. However, several authors argue that everyday conversations with peers are a key source of learning for children (Asamen, Ellis & Berry, 2008; Berndt& Ladd, 1989). Therefore it follows that peers may transmit negative information about obesity to each other. Observing peer conversations may give further insight into the development of weight stigma. The present study employed a novel approach to access peer-to-peer responses to an obese story character using paired reading.

Paired reading (also known as peer reading or peer tutoring) involves an older child supporting a younger child to read a story (National Literacy Trust, 2016). The older child takes the role of "tutor" or "buddy" to a younger child. Typically, the younger child will read the story to the older child. The older child will listen and correct the younger child if they make a mistake, or support them to read a word if they get stuck. The older child is encouraged to break difficult words down if needed. The older child is also encouraged to discuss the story with the younger child (Brooks, 2002; National Literacy Trust, 2016; Topping, 2001).

Paired reading is an established method of improving children's literacy in primary schools (Atherley 1989, Brooks, 2002; Gregory, Long & Volk, 2004;

National Literacy Trust, 2016; Topping, 2001). Paired reading has been shown to be beneficial to both children taking part, and be an enjoyable experience for children (Atherley, 1989; National Literacy Trust, 2016; Topping, 2001). Paired reading schemes are common in primary schools in England (Hepburn, 2011). It is difficult to determine what proportion of schools use paired reading, and this appears to vary across the UK. However, these schemes are recommended by the National Literacy Trust (2016) and the Department of Education and Skills (Brooks, 2002).

In line with the recommendations for qualitative research with young children (Davis 1998; Kirk, 2007), paired reading will be used as a naturalistic mechanism to investigate the peer-to-peer responses to body shape. Reading a high quality, age appropriate story in a school environment will allow the researcher to explore peer interactions between an older and younger child. As part of paired reading, children are prompted to discuss the story at various points (National Literacy Trust, 2016). This study will include discussion prompts as part of the story and will not ask the participants to rate story characters or attribute any characteristics to them. Accordingly, it is envisaged that the use of paired reading will allow for a more natural discussion to take place between peers.

Rationale for Current Research

It is widely acknowledged that action is needed to tackle growing rates of childhood overweight and obesity. Younger children are increasingly becoming the targets of weight management interventions and surveillance programmes (e.g. Baxter et al., 2015). However, several authors have stressed the importance of gaining a better understanding of weight stigma in young children in order to ensure that such interventions are effective and do not cause harm (Cinelli & O'Dea, 2016; Harrison et al., 2016; Rees et al., 2011). Careful thought is required regarding how weight

messages are presented. If not, it is possible that weight reduction interventions could cause harm, increase stigma and thereby potentially cause increases in weight (Barry, Gollust, McGinty & Niederdeppe; 2014; Cinelli & O'Dea, 2016; Major et al. 2013; Tomiyama, 2014).

The current review has demonstrated that there is a gap in the literature around young children's responses to body shape. There is no research to date about how peers discuss body shape with each other. The present research aimed to begin to address this gap in the literature. This research also aimed to add to our understanding of the role of peers in the development of weight stigma in young children. This information will in turn contribute to our understanding of weight stigma in young children and therefore provide added information to aid stigma reduction.

Aims of Research

This study aimed to investigate peer-to-peer responses to overweight in young children. A paired reading interaction between an older and younger child aimed to explore peer responses to body shape in a naturalistic way.

Specifically, it was hypothesised that:

- Body shape will be referred to by children more often when the main story character is overweight compared to when the character is healthy weight.
- There will be more negative comments in the interactions between the older and younger child when the main story character is overweight compared to when the character is healthy weight
- The conversation content will be different when the main story character is overweight compared to when the character is healthy weight

METHOD

Participants

Participants were recruited from 7 schools in the north of England of which 6 schools were in the Warrington area and 1 school was in the Holme Valley, Kirklees. In 6 of the included schools the researcher had established contacts within the school and so these schools were selected for pragmatic reasons. A further 10 schools were approached by letter and followed up by telephone. Of these 10 schools, only 1 head teacher agreed to participate. For all the schools included in this research the majority of pupils were from a white, British or European background (Kirklees Council, 2015; Warrington Borough Council, 2016). According to the English deprivation indices (HM Government, 2016), the included schools are located in areas that are associated with a range of high, medium and low levels of deprivation (Kirklees Council 2015; Warrington Borough Council, 2016). Included participants therefore were likely to be from a wide range of socioeconomic backgrounds. The ages for younger and older children to be included in the study were decided upon based on the guidelines from the National Literacy Trust (2016) and consultation with a head teacher and a class teacher. It was agreed that the demands of the paired reading task may be too great for children in reception who are just learning to read. The younger children were therefore drawn from year one and two. The National Literacy Trust guidelines (2016) for paired reading stipulate that the older child must be a minimum of two years older and must have sufficient reading skill to support the younger child. Based on this, and the head teachers experience of running paired reading schemes, it was agreed that the older children should be from years five and six. The head teachers from each school chose the year groups from the identified range to be invited to participate. Once the head teacher had identified which classes to include, all of the parents/guardians of

children in those classes were approached by letter to ask for consent for their child to participate.

Consent was obtained for 140 older children out of a possible 228 (61.4% consented). For the younger children, consent was obtained for 92 out of a possible 241 children (38.2% consented). For participation in the study each younger child was paired with an older child of the same sex. Where there were more older children than younger children of the same sex, the older children were selected to participate at random. Also, six older children participated in the study twice to allow all the younger children to participate in a pair with an older child of the same sex.

In total, there were 92 pairs of older and younger children. One of these pairs did not participate due to the younger child being absent from school. A further two pairs were excluded. In one case the younger child did not wish to participate. The second pair was excluded because the younger child was unable to engage with the task. Therefore there were 89 reading pairs included in the analysis, with 172 children participating in total (89 younger children and 83 older children). The younger children's ages were between 5 and 7 (mean = 6.1, SD = 0.6) and the older children's ages ranged between 9 and 11 (mean = 9.48, SD = 0.7). Seventy four of the participants were male (43.0%) and 98 (57.0%) were female.

Ethical approval for this study was granted by the Leeds University School of Medicine Research Ethics Committee (SoMREC) on 29/4/2014 (Appendix 1).

Materials

Story Books

2 story books were created specifically for use in this study (Appendix 2). These stories were identical apart from the illustrations of the main character, Alfie. In

one version of the story Alfie was healthy weight and in the other he was clearly overweight. The illustrations of Alfie were created by a professional illustrator and have been successfully used in previous research studies at the University of Leeds (Baxter et al, 2015; Harrison et al., 2016). The story was short, colourful and designed to be enjoyable for children to read. The story presentational style was similar to other stories in use in English primary schools (e.g. Oxford reading tree) and in line with the National Literacy Trust's (2016) guidance on paired reading.

The story was presented over 8 pages. In pages 1-6 it describes Alfie going to the park with his mum for a picnic. When Alfie sits down for the picnic, a duck takes Alfie's sandwich from his hand and flies off with it. When designing the story cues were built into the text to maximise the chances of accessing peer-to-peer responses to body shape e.g. Alfie feeling hungry, the duck stealing the sandwich. For the same reason, the reading pairs were prompted to discuss possible endings of the story. Page 7 contains the following story ending prompts (SEP's):

- What do you think Alfie does next?
- What do you think mum does next?
- What do you think the duck does next?

The final page shows the duck dropping Alfie's sandwich in the bin and describes Alfie's mum buying everyone an ice-cream. The children then saw a card with the following the discussion prompts (DP's):

- What was your favourite bit of the story?
- Why?

Body Shape Ratings

The Collins body shape scale (1991) was used by the researcher to rate the body shape of participants (Appendix 3). This seven point pictorial scale shows a range of children's body shapes from very thin to obese. The Collins scale (1991) was developed for children to rate their own perceptions of body shape and so there is no information about the reliability of ratings made by researchers. However, the Collins scale was used as it provided a quick, practical way for the researcher to rate the body shape of all participants. These ratings then allowed the researcher to identify any clearly overweight children in the sample and examine if their responses were different from those of their peers. There was only one participant who was clearly overweight and no differences were identified.

Procedure

Head teachers were initially contacted by telephone to ask if they would be interested in the study taking place in their school. Those potentially interested were sent further information in writing (head teacher letter, Appendix 4). Where head teachers were happy to proceed, a meeting was arranged (either in person or by telephone) to discuss the practical details including identifying the classes to invite to participate, arranging dates for data collection and the most appropriate location for data collection. Following this, the parents/guardians of all the children in the identified classes were sent an information letter about the study (Appendix 5) and a consent form (Appendix 6) asking for their permission for their child to participate.

Pairing

The next stage was to generate the reading pairs of a younger and older child of the same sex. Prior to data collection the researcher compiled lists of all the younger children and older children with consent to participate. Where there were more older children than younger children of the same sex with consent it was necessary to select older children to participate. This was done by drawing names from a bag at random. Where there were too few older children of the same sex with consent, older children were allowed to participate twice. The older child to participate twice was again chosen at random by drawing names out of a bag. The older child repeating the paired reading would do so within the same condition. This happened on six occasions.

Once the lists of older children and younger children were complete, the relevant class teachers reviewed the lists to ensure there were no reasons why any of the children should not be paired together e.g. history of bullying, family relationship. The only issue identified was on two occasions there were siblings of the same sex in the younger and older class. On these occasions the teacher of the younger class was asked to avoid pairing the child with their sibling.

Other than ensuring that siblings did not participate together, the pairing was done at random by the teachers. An older child from the list was sent by the teacher to the area identified for data collection. Once the older child had been briefed by the researcher, they went to the younger class and asked for the next child to participate. The teacher of the younger class was briefed to always send a child of the same sex as the older child.

Allocation

Each reading pair was allocated to either the healthy weight main character version or the overweight main character version of the story. As the teacher was unaware which condition the child would be assigned to, and the children were unknown to the researcher, blind allocation to the conditions was ensured. The reading pairs were alternately allocated to the overweight and health weight conditions. This alternation was done within the male and female reading pairs to ensure that there was a relatively even spread of each sex in both conditions.

Paired Reading

Older Child Briefing

Each paired reading interaction took place in a quiet location that was usually used for reading. On the data collection days the teachers of both classes briefly introduced the researcher to the class and made the children aware that some of them would be asked to go and complete a reading task with the researcher. The teacher of the older class chose the order in which the children participated. The older child was asked by the teacher to go to the area that had been identified for data collection.

When the older child arrived they were asked for their agreement to participate (assent) and when this was given the researcher then briefed the older child (older chid briefing, Appendix 7). This briefing was developed in line with the guidance from the National Literacy Trust (2016) and with input from a head teacher with experience of paired reading. In this briefing the researcher outlined several key points as follows:

- Explained that we were doing ‘an experiment’ and that they were going to run it
- Explained that they were going to be given a younger partner

- Explained that their partner should read the story but that they could help them if they get stuck
- Drew the older child's attention to the story ending prompts and after the story discussion card. Told the older child that the researcher was interested in their ideas and their partner's ideas
- Explained that the interaction would be audio recorded and how to operate audio recording equipment
- Explained that when their partner arrived the researcher would do a brief introduction and then let them run the paired reading
- Explained that they could stop and ask the researcher for help at any time if they were unsure

When the researcher felt that the older child understood the task the older child was asked to go to the younger class and ask the teacher to identify their partner. The teacher then chose a child of the same sex to accompany the older child.

Younger Child Introduction

When the younger child arrived the researcher did a brief introduction to the task outlining that they were going to read a story with the older child and then discuss the story. The researcher also explained that this would be audio recorded and asked the younger child for their agreement to participate. Following this the researcher asked both children their ages and then handed over to the older child.

Paired Reading Interaction

During the paired reading interaction, the researcher was positioned a short distance from the reading pair in order to reduce the impact of the researcher on the

interaction. This was also in line with guidance on paired reading (National Literacy Trust, 2016). However, the researcher monitored the interaction throughout and intervened when necessary. In 33 of the 89 pairs (37.1%), the researcher provided minor prompts such as reminding both children to answer the story ending prompt questions or providing reassurance if children asked a question. In 5 pairs (5.6%) the researcher intervened to ensure no participants experienced distress. In the remaining 51 pairs (61.4%) the paired reading interaction proceeded with no input from the researcher.

Analysis

The recordings of the paired reading interactions were analysed using thematic analysis as described by Braun and Clarke (2013). All comments made by both the younger and older children were included in this analysis. This method of analysis was chosen because it allows a flexible approach to identifying themes and patterns from the data without being driven by a pre-existing theoretical framework. Using the Braun and Clarke (2013) framework for thematic analysis enabled the researcher to conduct a thorough inductive analysis and thereby create a summary of the content of the data.

The thematic analysis was completed in several stages. Firstly, the recordings were transcribed verbatim by the researcher allowing the researcher to become familiar with the data from the outset. Once transcription was complete, the researcher read each transcript several times in order to become familiar with the data. During this stage notes were made on items of interest using sticky notes. This allowed the researcher to have a tactile way to easily group ideas and items of interest together and move these around as the analysis progressed.

The second stage of the thematic analysis was to undertake the complete coding of the data. In line with Braun and Clarke's guidelines (2013) everything that

the participants said was coded. In this way the codes were derived from the data providing a succinct summary of the explicit content of the data. The third stage of the thematic analysis was to collate codes. Initially this was done manually, using different coloured paper to represent similar codes. The codes for each story ending prompt and discussion prompt were then tabulated and organised using Microsoft Excel for windows. This allowed for easy manipulation of data when collating the codes into initial ideas for themes.

The fourth stage of the thematic analysis was to search the codes for themes. This was an evolving process which allowed initial ideas for themes to be reviewed and refined before naming the final themes. Throughout this process themes were discussed and checked with the researchers supervisor and grounded in examples. The final agreed themes for each story ending prompt and discussion prompt were again organised using Microsoft Excel. This allowed the frequency of themes to be calculated and compared across weight condition, gender and older and younger children.

Once the thematic analysis was complete, the next phase of the data analysis involved completing valence ratings for all comments made by participants. All responses by participants for each story ending prompt (SEP) and discussion prompt (DP) were rated as positive, negative or neutral. Again the frequencies of positive, negative and neutral responses were calculated and tabulated using Excel allowing comparison between conditions, gender and older and younger children. Again data was compared using descriptive statistics and calculating z scores where appropriate.

The data from the thematic analysis and valence analysis was firstly compared using descriptive statistics. Subsequently a 2 proportion z-test was conducted to examine if differences in proportions of themes and valence ratings were statistically significant. Although use of a Chi-square analysis was considered, there were too few

responses in several categories to conduct this analysis and so the 2 population proportion z-test was used. The z-tests were conducted using z score calculator for 2 population proportions (http://www.socscistatistics.com/tests/ztest/Default2.aspx). For each SEP and DP, z- tests were conducted for the frequency of themes and valence ratings to assess if any differences in proportions were statistically significant. The following comparisons were conducted:

- Condition: Healthy weight Alfie compared to overweight Alfie
- Age: Younger child compared to older child between weight condition
- Age: Younger child compared to older child within weight condition
- Gender: Girls compared to boys between weight condition
- Gender: Girls compared to boys within weight condition

The results from the z-tests can be found in full in Appendix 9. The key findings will be discussed in the results section.

The next phase of the analysis mapped the patterns of interactions between younger and older children for each SEP. This was done to examine if there were any clear patterns that emerged within reading pairs. Specifically this examined whether older and younger participant's responses were thematically matched or different and whether this varied depending on which child responded first. Also, for positive and negative valence comments the researcher noted which child initiated the positive/negative comment and if both participants responses were matched or different. This allowed the researcher to identify any potential patterns of interaction.

Finally, additional observations made during the paired reading interactions were analysed. This included analysing any comments made during the reading of the story, comparing incidences of laughter between conditions and comparing any occurrences of non-verbal communication of relevance to the research question.

Quality Checks

During the analysis, steps were taken to ensure the reliability and quality of the thematic analysis in accordance with guidelines (Braun & Clarke, 2013; Elliott, Fischer & Rennie, 1999). At each stage of the thematic analysis, themes were discussed and checked with my supervisor. Also, all themes were grounded in examples. To determine reliability of coding, Cohen's κappa was run to determine inter-rater agreement in coding of the valence of children's responses; specifically, whether there was agreement between 2 raters' judgement (MK and AH). Both raters coded the valence of story ending prompt (SEP) 2 (some 20% of total responses). This coding framework can be found in appendix eight. A very high level of agreement was found between the 2 raters' judgements, $\kappa = 0.908$ (95% CI, .841 to .925), $p < .001$.

RESULTS

Story Ending Prompt (SEP) 1 - What do you Think Alfie Does Next?

Overall, 154 participants from a potential 178 provided a response to SEP1 (86.5%). The remaining participants either did not respond at all (n = 14, 7.9%) or responded that they did not know (n=10, 5.6%). In the story showing healthy weight Alfie, all of the participants who responded (n= 73, 100%) described Alfie as doing something in response (e.g. *"I think he chased after the duck"* or *"I think he'll ask mum for another one"*). Similarly, in the overweight Alfie story the majority of participants (n=77, 95%) described a behaviour in response. The other 4 children described Alfie as experiencing a feeling.

Overall, the two most common themes were *retrieve* and *replace.* Table 1 shows that in both the healthy weight and overweight conditions the most common theme was that Alfie made some attempt to *retrieve* his sandwich from the duck (e.g. *"Think he might try and find the duck and try and get his sandwich back"*). There was no significant difference between conditions in the frequency of *retrieve* responses (z=1.49, p=0.14, NS). In the healthy weight condition the next most common theme was *replace,* where Alfie replaced the sandwich (e.g. *"Asks mum for another sandwich").* However, in the overweight condition proportionately fewer children's responses related to Alfie replacing the sandwich compared to the healthy weight condition (z=2.25, p=0.02).

Table 1 shows that there were several themes with smaller clusters of responses. 13 children said that Alfie would go and do *another activity* such as *"I think Alfie goes on the slide next"* and *"Go on a climbing area."* A further 7 children's responses fell within the *tell mum* theme e.g. *"I think he goes and tells his mum that a duck took his sandwich."* A further 3 children, all in the overweight

condition, said that Alfie would *go home* e.g. *"Went home, gonna go home."* A significant difference between the In the overweight condition, 4 children described Alfie as experiencing a *feeling,* a difference that was statistically significant (z=-2.00, p=0.05). 2 of these children said that Alfie would feel hungry and that he would be upset e.g. *"I think he'd feel upset and hungry.*" 1 child responded that Alfie would just feel hungry saying, *"Go hungry [both children laugh] he hasn't got a sandwich anymore [both children laugh]."* The final child of the 4 reported that Alfie would be *"angry"* that the duck stole his sandwich. The remaining 'other' responses (n=7) were unrelated to any other theme.

Table 1: The percentage (%) and number (n) of responses for each key theme

	Healthy Weight Alfie			**Overweight Alfie**		
Theme	Younger Child (n=44)	Older Child (n=44)	**Total** (n=88)	Younger Child (n=45)	Older Child (n=45)	**Total** (n=90)
Retrieve	31.8% (14)	65.9% (29)	**48.9%** (43)	48.9% (22)	71.1% (32)	**60.0%** (54)
Replace	20.5% (9)	18.2% (8)	**19.3%** (17)	8.9% (4)	6.7% (3)	**7.8%** (7)
Another activity	9.1% (4)	9.1% (4)	**9.1%** (8)	6.7% (3)	4.4% (2)	**5.6%** (5)
Tell mum	4.5% (2)	0.0% (0)	**2.3%** (2)	2.2% (1)	6.7% (3)	**4.5%** (4)
Go home	0.0% (0)	0.0% (0)	**0.0%** (0)	4.4% (2)	2.2% (1)	**3.3%** (3)
Feeling	0.0% (0)	0.0% (0)	**0.0%** (0)	4.4% (2)	4.4% (2)	**4.4%** (4)
Other	4.5% (2)	2.3% (1)	**3.4%** (3)	6.7% (3)	2.2% (1)	**4.4%** (4)
Don't know/ no response	29.6% (13)	4.5% (2)	**17.0%** (15)	17.8% (8)	2.2% (1)	**10.0%** (9)

Looking at the age of the child, it was noted above that in both the healthy and overweight conditions the younger child was significantly more likely to either not respond or to say that they did not know ($z=3.95$, $p<0.001$). The older child was also significantly more likely to give a 'retrieve' response ($z=3.76$, $p<0.001$). There was only one significant difference identified in the themes of responses between male and female participants, with boys being more likely to respond that Alfie would do *another activity* ($z=-3.27$, p,0.01).

Valence

Table 2 shows the frequency of responses coded as positive, negative or neutral (excluding those who did not respond/did not know). In both conditions the majority of responses were neutral for all children, but there were positive comments in both of the story conditions. Overall, there were fewer negatively coded responses but nearly all of those were in the story with overweight Alfie, a difference in proportions that was statistically significant ($z=2.03$, $p=0.04$). Overall, older children were significantly more likely to make positive comments than younger children ($z=2.78$, $p=0.03$). There were no other differences in responses between older and younger children.

Table 2: Table showing the percentage (%) and number (n) of responses from the younger child and older child that were neutral, positive and negative

	Healthy Weight Alfie			**Overweight Alfie**		
	Younger Child (n=31)	**Older Child** (n=42)	**Total** (n=73)	**Younger Child** (n=37)	**Older Child** (n=44)	**Total** (n=81)
Neutral	**93.6%** (n=29)	**83.3%** (n=35)	**87.7%** (n=64)	**89.2%** (n=33)	**79.6%** (n=35)	**84.0%** (n=68)
Positive	**3.2%** (n=1)	**16.7%** (n=7)	**10.9%** (n=8)	**2.7%** (n=1)	**11.4%** (n=5)	**7.4%** (n=6)
Negative	**3.2%** (n=1)	**0%** (n=0)	**1.4%** (n=1)	**8.1%** (n=3)	**9.1%** (n=4)	**8.6%** (n=7)

Again there was no significant difference in the frequencies of neutral, positive and negative comments made by male and female participants.

Paired Reading Patterns of Interaction

Figure 1 below shows that overall there were significantly more reading pairs where the responses of both participants matched rather than being different ($z=2.92$, $p=0.004$). Where responses matched, there was no difference between which child answered first. However, when responses were different, the younger child was significantly more likely to answer first ($z=1.98$, $p=0.05$).

Figure 1: The frequency of responses that matched and which child answered first

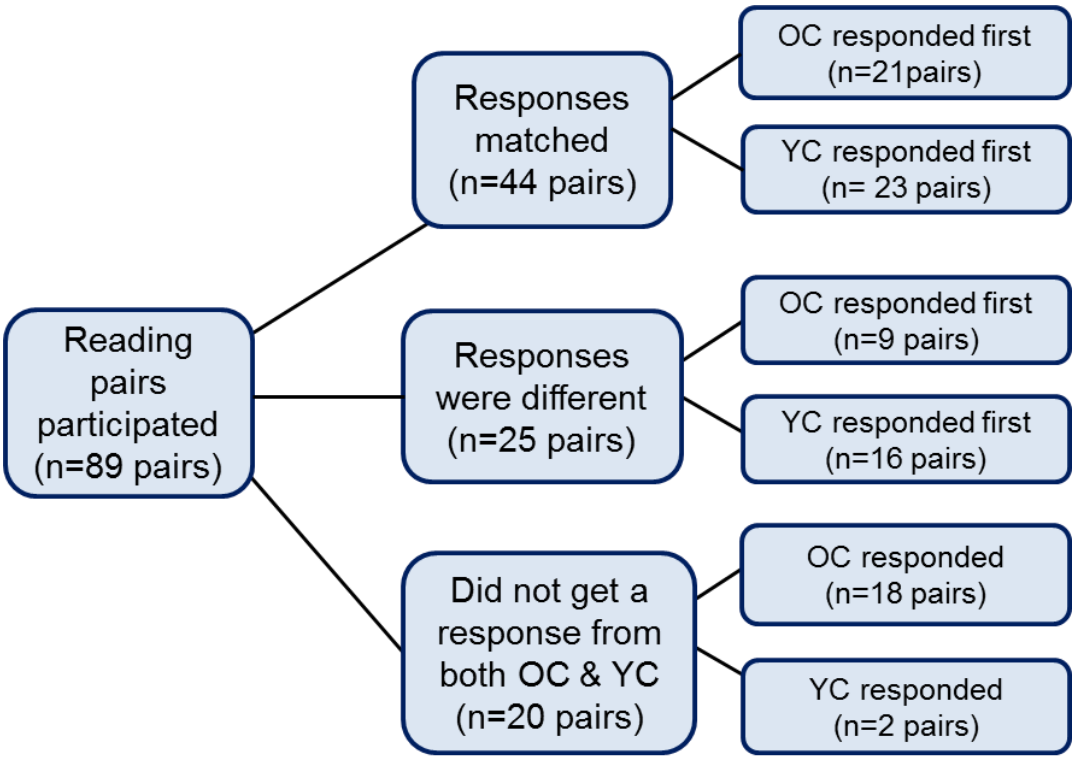
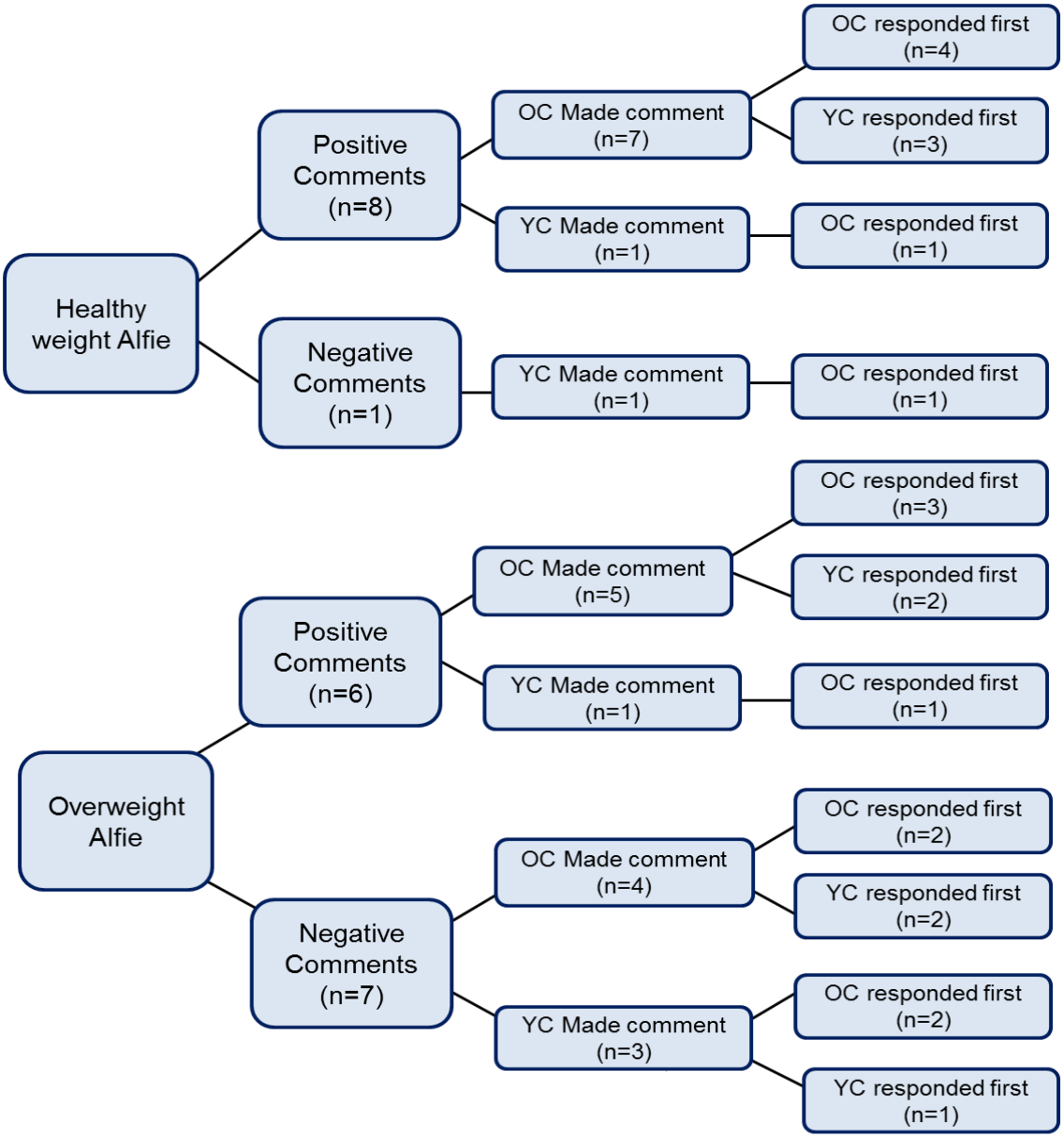


Figure 2 shows the paired reading interaction related to the valence of responses. In the healthy weight condition, for all positive and negative comments made the reading partner made a neutral comment. Figure 2 shows that there were no significant differences in which child answered first in the healthy weight condition. In the overweight condition, of the 7 negative responses made overall, 2 pairs both gave negative responses. The remaining three children who gave negative responses were paired a child who gave a neutral response. Again Figure 2 shows that there were no significant differences in which child answered first.

Figure 2: The patterns of interaction for positive and negative responses



Story Ending Prompt (SEP) 2 - What do you Think Mum Does Next?

Overall, 150 participants from a potential 178 provided a response to SEP 2 (84.3%). The remaining participants either did not respond at all (n = 26, 14.6%) or responded that they did not know (n=2, 1.1%). Table 3 (below) shows that like SEP 1, a significantly greater proportion of younger children (n=19) than older children (n=9)

did not respond (z=2.06, p=0.04). Again, almost all the responses to this prompt described mum as doing something in response to the situation, with only one response in the overweight condition describing mum as just experiencing a feeling.

Table 3 shows that in both the healthy weight and overweight conditions the most common theme was *replace*, where participants responded that mum replaced Alfie's sandwich e.g. *"She would give him another sandwich"* and *"Mum might go and buy him a new one."* There was no significant difference between conditions in the frequency of the replace response (z=0.04, p=0.97). The other key theme that emerged was *retrieve*, where children responded that mum would make an attempt to retrieve the sandwich e.g. *"She'll help Alfie get the sandwich"* and *"Mum chases after the bird, and gets the sandwich out of its beak."* Again, there was no significant difference in the in the frequency of the replace response between conditions (z=0.45, p=0.65).

In addition to the most common themes, Table 3 demonstrates that there were several themes with smaller clusters of responses. In the *intervenes* theme, children said that mum would intervene in what Alfie's doing e.g. *"Tell him to come back" and "His mum would chase after Alfie."* In a further 9 children's responses mum there is *no acknowledgement* from mum that anything has happened to Alfie and mum does an unrelated activity e.g. *"mum might sit on the rug with a read, reading book and she'll read it"* and *"I think she'll be getting the sun, like sunbathing."* 7 children gave responses that fell within the *goes home* theme e.g. *"Go back home"* and *"I think she goes with Alfie home."* 7 children described a *negative response* from mum (healthy weight Alfie n=1, overweight Alfie n=6, z=1.90, p=0.57 NS). This included *"I think she shouts at the duck", "The mum will shout at Alfie because he held the sandwich and the duck flew by and got it"* and *"I think mum just doesn't care."* Table 3 also shows that 4 children responded that mum *clears the picnic away* e.g. *"pack all*

of it away." All 4 of these responses were in the overweight condition, a difference that was statistically significant (z=-2, p=0.05). A further 4 children gave responses that fell within the *wonders what happened* theme e.g. *"I think she'll be wondering where he's gone."* 4 participants gave responses where mum *plays with Alfie* e.g. *"Mum plays with Alfie."* Finally, the 5 *other* responses were unrelated to each other or any other theme. Again there were no significant differences between conditions for any of these themes.

Table 3: The percentage (%) and number (n) of responses for each key theme

	Healthy Weight Alfie			**Overweight Alfie**		
Theme	Younger Child (n=44)	Older Child (n=44)	**Total** (n=88)	Younger Child (n=45)	Older Child (n=45)	**Total** (n=90)
Replace	29.5% (13)	43.2% (19)	**36.4%** (32)	31.1% (14)	42.2% (19)	**36.7%** (33)
Retrieve	20.5% (9)	22.7% (10)	**21.6%** (19)	15.6% (7)	22.2% (10)	**18.9%** (17)
Intervenes	6.8% (3)	4.5% (2)	**5.7%** (5)	6.7% (3)	2.2% (1)	**4.4%** (4)
No acknowledgement	2.3% (1)	4.5% (2)	**3.4%** (3)	6.7% (3)	6.7% (3)	**6.7%** (6)
Goes home	6.8% (3)	2.3% (1)	**4.5%** (4)	6.7% (3)	0.0% (0)	**3.3%** (3)
Negative response	2.3% (1)	0.0% (0)	**1.1%** (1)	4.4% (2)	8.9% (4)	**6.7%** (6)
Wonders what happened	0.0% (0)	6.8% (3)	**3.4%** (3)	2.2% (1)	0.0% (0)	**1.1%** (1)
Clears the picnic away	0.0% (0)	0.0% (0)	**0.0%** (0)	4.4% (2)	4.4% (2)	**4.4%** (4)
Plays with Alfie	4.5% (2)	2.3% (1)	**3.4%** (3)	2.2% (1)	0.0% (0)	**1.1%** (1)
Other	0.0% (0)	2.3% (1)	**1.1%** (1)	4.4% (2)	4.4% (2)	**4.4%** (4)
Don't know/ no response	27.3% (12)	11.4% (5)	**19.3%** (17)	15.6% (7)	8.9% (4)	**12.2%** (11)

There were no significant differences in the key themes in the responses of the older child and younger child. There only significant gender difference was that in the overweight condition, boys were more likely to not respond or say that they did not know than girls (z=2.36, p=0.02).

Valence

In both conditions the most common rating of responses was neutral, with no significant difference between conditions (z=1.12, p=0.23, Table 4). There were significantly more positive responses in the healthy weight condition compared to the overweight condition (z=2.02, p=0.04). Although more negative comments were made in the overweight condition, this difference was not statistically significant (z=1.56, p=0.12).

Table 4: Table showing the percentage (%) and number (n) of responses from the younger child and older child that were neutral, positive and negative

	Healthy Weight Alfie			**Overweight Alfie**		
	Younger Child (n=32)	**Older Child** (n=39)	**Total** (n=71)	**Younger Child** (n=38)	**Older Child** (n=41)	**Total** (n=79)
Neutral	59.4% (19)	53.8% (21)	**56.3%** (40)	71.1% (27)	61.0% (25)	**65.8%** (52)
Positive	37.5% (12)	43.6% (17)	**40.8%** (29)	23.7% (9)	26.8% (11)	**25.3%** (20)
Negative	3.1% (1)	2.6% (1)	**2.8%** (2)	5.3% (2)	12.2% (5)	**8.9%** (7)

Again there were no significant differences identified between older and younger children and male and female participants.

Figure 3 below shows that unlike SEP1, there were no significant differences in whether responses of both participants matched or were different

Like SEP1, where responses matched, there was no difference between which child answered first. However, as in SEP 1 when responses were different, the younger child was significantly more likely to answer first (z=2.63, p=0.009).

Figure 3: Figure showing the frequency of responses that matched and were different and which child answered first

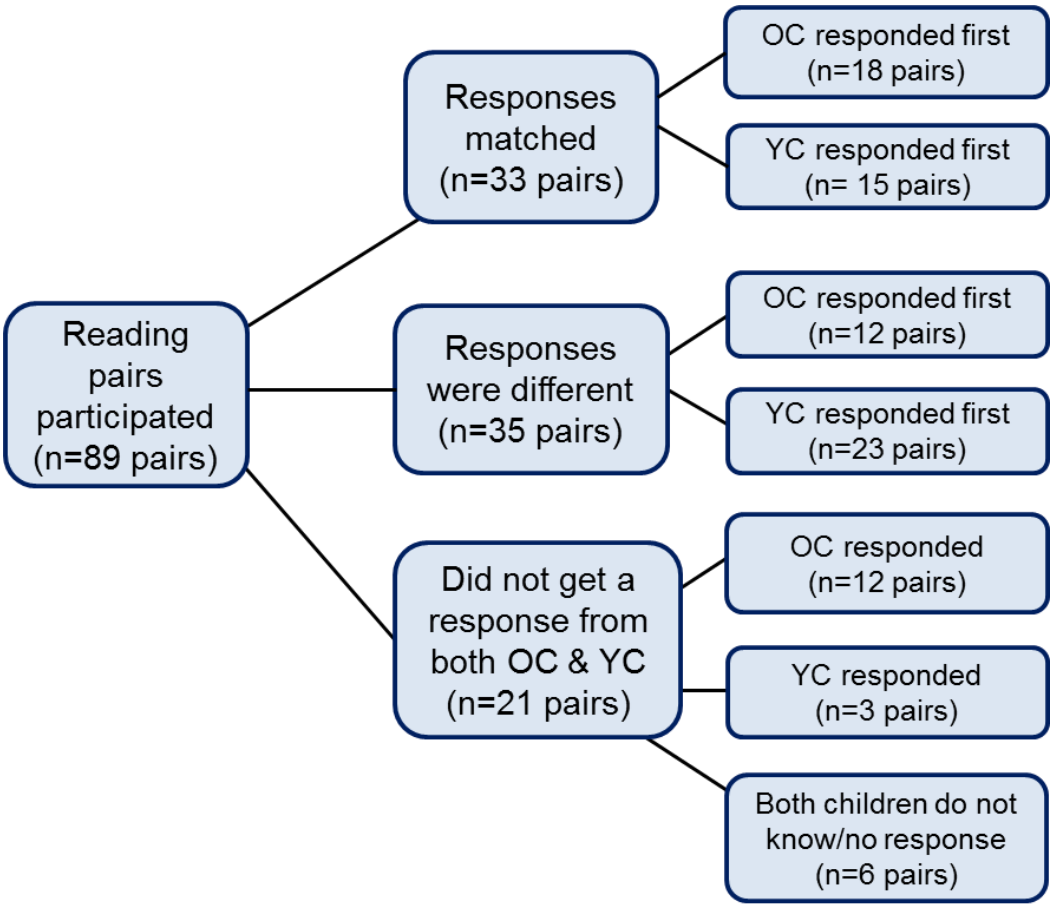
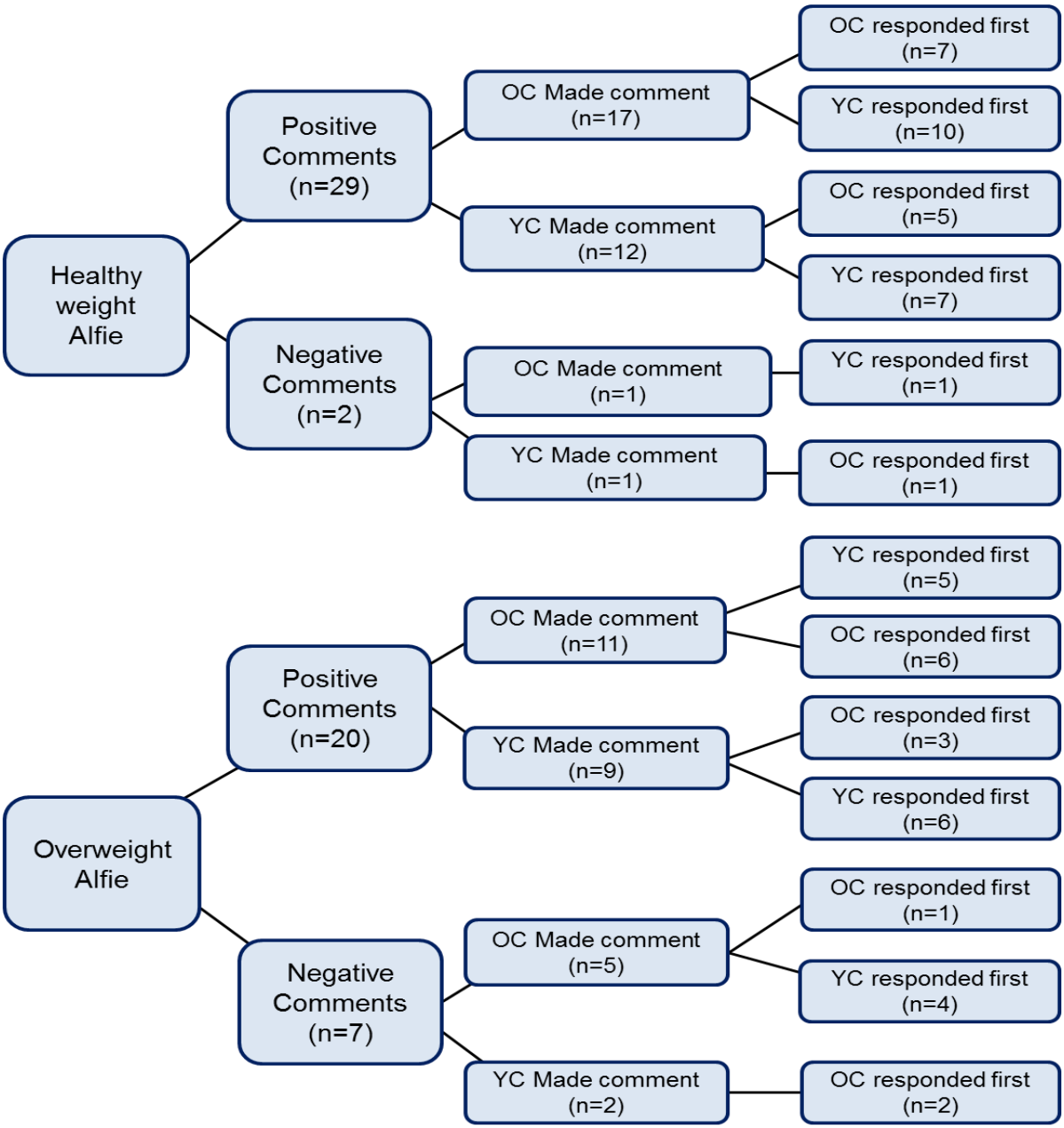


Figure 4 shows the paired reading interaction as related to the valence of responses. In the healthy weight condition, 5 pairs both made positive comments. The remaining positive comments were paired with neutral comments (n=11), no response (n=7), and on one occasion with a negative comment. The other negative comment

made was paired with a neutral response. Figure 4 shows that there were no significant differences in which child answered first. In the overweight condition, 6 pairs both made positive comments. The remaining positive comments made were paired with neutral responses (n=7) and on one occasion with a negative comment. Of the negative comments made, 6 were paired with neutral comments and one with a positive comment. Again there were no significant differences identified in which child answered first between comment type or condition.

Figure 4: Figure showing the patterns of interaction for positive and negative responses



Story Ending Prompt (SEP) 3 - What do you Think the Duck Does Next?

For this question 155 participants from a potential 178 provided a response (87.1%). The remaining participants either did not respond at all (n = 17, 9.6%) or responded that they did not know (n=6, 3.4%). Table 5 (below) shows that of the 23 children that did not provide a response, slightly but not significantly more younger

children (n=15) than older children (n=8) did not provide a response (z=1.56, p=0.12 NS).

In both story versions all of the responses described the duck as doing something after he had taken the sandwich. Table 5 shows that the two most common themes were *escapes,* where the duck escaped with the sandwich e.g. "*Probably tries to get away, flies as high as it can and gets away"* and *eats it,* where the duck ate the sandwich e.g. *"I think the duck ate the sandwich."* Another theme that emerged was *steals something else,* where participants responded that the duck would steal something else from Alfie e.g. *"Takes the nother one that he's got."* The final two themes were *drops it,* where children responded that the duck would drop Alfie's sandwich e.g. *"It might drop it in the water" a*nd *shares it* e.g. *"I think the duck will feed its babies, it might have some babies."* The remaining 'other' responses (n=15) were unrelated to each other or any other theme. There were no statistically significant differences in the frequencies of themes between the healthy weight and overweight conditions.

Table 5: The percentage (%) and number (n) of responses for each key theme

	Healthy Weight Alfie			Overweight Alfie		
Theme	Younger Child (n=44)	Older Child (n=44)	**Total** (n=88)	Younger Child (n=45)	Older Child (n=45)	**Total** (n=90)
Escapes	25.0% (11)	34.1% (15)	**29.5%** (26)	26.7% (12)	22.2% (10)	**24.4%** (22)
Eats it	27.3% (12)	29.5% (13)	**28.4%** (25)	26.7% (12)	37.8% (17)	**32.2%** (29)
Steals something else	13.6% (6)	9.1% (4)	**11.4%** (10)	17.8% (8)	13.3% (6)	**15.6%** (14)
Drops it	4.5% (2)	4.5% (2)	**4.5%** (4)	2.2% (1)	8.9% (4)	**5.6%** (5)
Shares it	0.0% (0)	4.5% (2)	**2.3%** (2)	2.2% (1)	4.4% (2)	**3.3%** (3)
Other	9.1% (4)	9.1% (4)	**9.1%** (8)	11.1% (5)	4.4% (2)	**7.8%** (7)
Don't know/ no response	20.5% (9)	9.1% (4)	**14.8%** (13)	13.3% (6)	8.9% (4)	**11.1%** (10)

For SEP 3 there were no significant differences identified between the older and younger child. Like SEP 2, male participants in the overweight condition were more likely to not respond or say that they "*don't know"*(z=-3.42, p=<0.01) .

Valence

Table 6 shows the frequency of positive, negative and neutral responses. In both conditions neutral was the most common coded response. Although there appeared more positive responses in the healthy weight condition compared to the overweight condition, this difference was not statistically significant (z=1.41, p=0.16). Similarly, there appeared to be more negative comments made by children in the overweight condition but again this difference was not statistically significant (z=1.56,

p=0.12). In both conditions, younger children tended to make slightly more negative comments than older children. Also, in both conditions older children made more positive comments than younger children, a difference that was statistically significant in the healthy weight condition (z=-1.97, p=0.05) but not in the overweight condition (z=-0.59, p=0.56 NS).

Table 6: Table showing the percentage (%) and number (n) of responses from the younger child and older child that were neutral, positive and negative

	Healthy Weight Alfie			**Overweight Alfie**		
	Younger Child (n=35)	**Older Child** (n=40)	**Total** (n=75)	**Younger Child** (n=39)	**Older Child** (n=41)	**Total** (n=80)
Neutral	77.1% (27)	72.5% (29)	**74.7%** (56)	64.1% (25)	75.6% (31)	**70.0%** (56)
Positive	2.9% (1)	15.0% (6)	**9.3%** (7)	2.6% (1)	4.9% (2)	**3.8%** (3)
Negative	20.0% (7)	12.5% (5)	**16.0%** (12)	33.3% (13)	19.5% (8)	**26.3%** (21)

In the valence ratings for SEP 3 there were no identifiable gender differences in the neutral and positive ratings. While it appeared that girls made more negative comments than boys (8 of the 12 negative comments in healthy weight condition and 16 of the 21 negative comments in the overweight condition), this difference was not statistically significant (z=0.59, p=0.56).

Although there was no significant difference between the frequency of negative comments made in the two conditions, there were some qualitative differences observed. In the healthy weight condition, the majority of the negative comments (n=10 out of 12, 83.3%) related to the duck stealing something else from Alfie e.g. *"Steal the next sandwich."* In the overweight condition, a smaller proportion

of comments (n =14 out of 21, 66.7%) were related to the duck stealing something else from Alfie. The remaining comments included more extreme negative events including that the duck *"just bites mum", the duck "poos on him"* (Alfie) and the duck *"nibbles the, the butty in front of them to make them jealous."*

Paired Reading Patterns of Interaction

Figure 5 below shows that there were no significant differences in whether responses of pairs of participants matched or were different. For SEP 3 the younger child was significantly more likely to answer first both when responses matched (z=2.43, p=0.02) and when responses were different (z=3.21, p=0.001).

Figure 5: Figure showing the frequency of responses that matched and were different and which child answered first

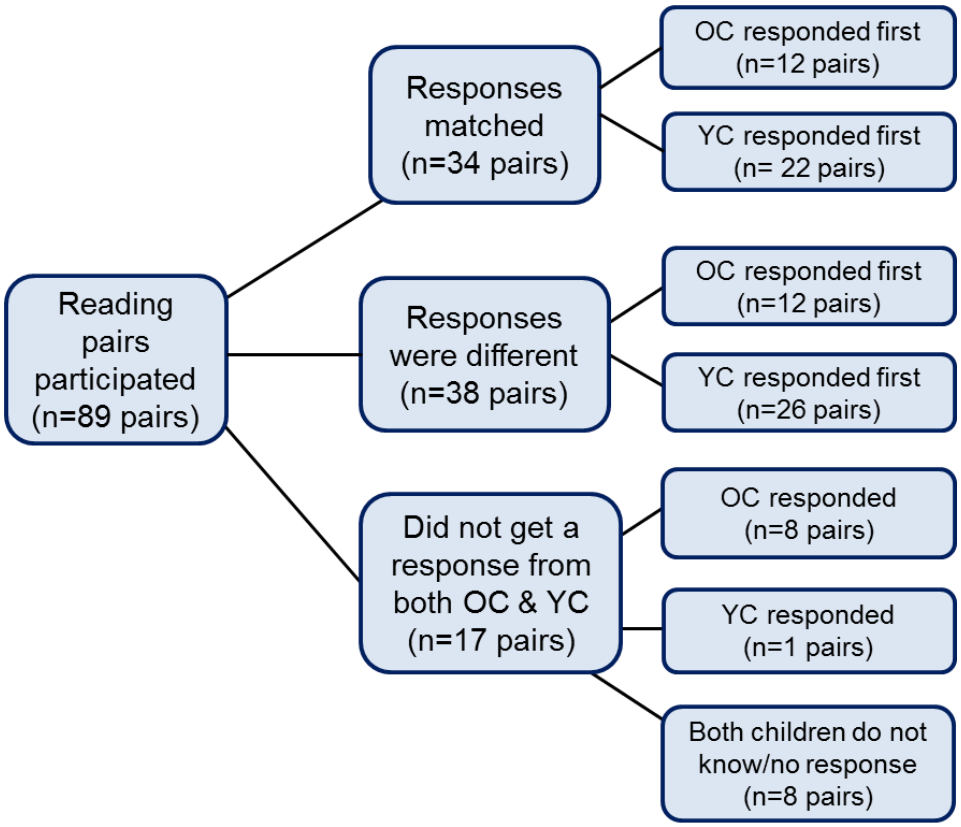
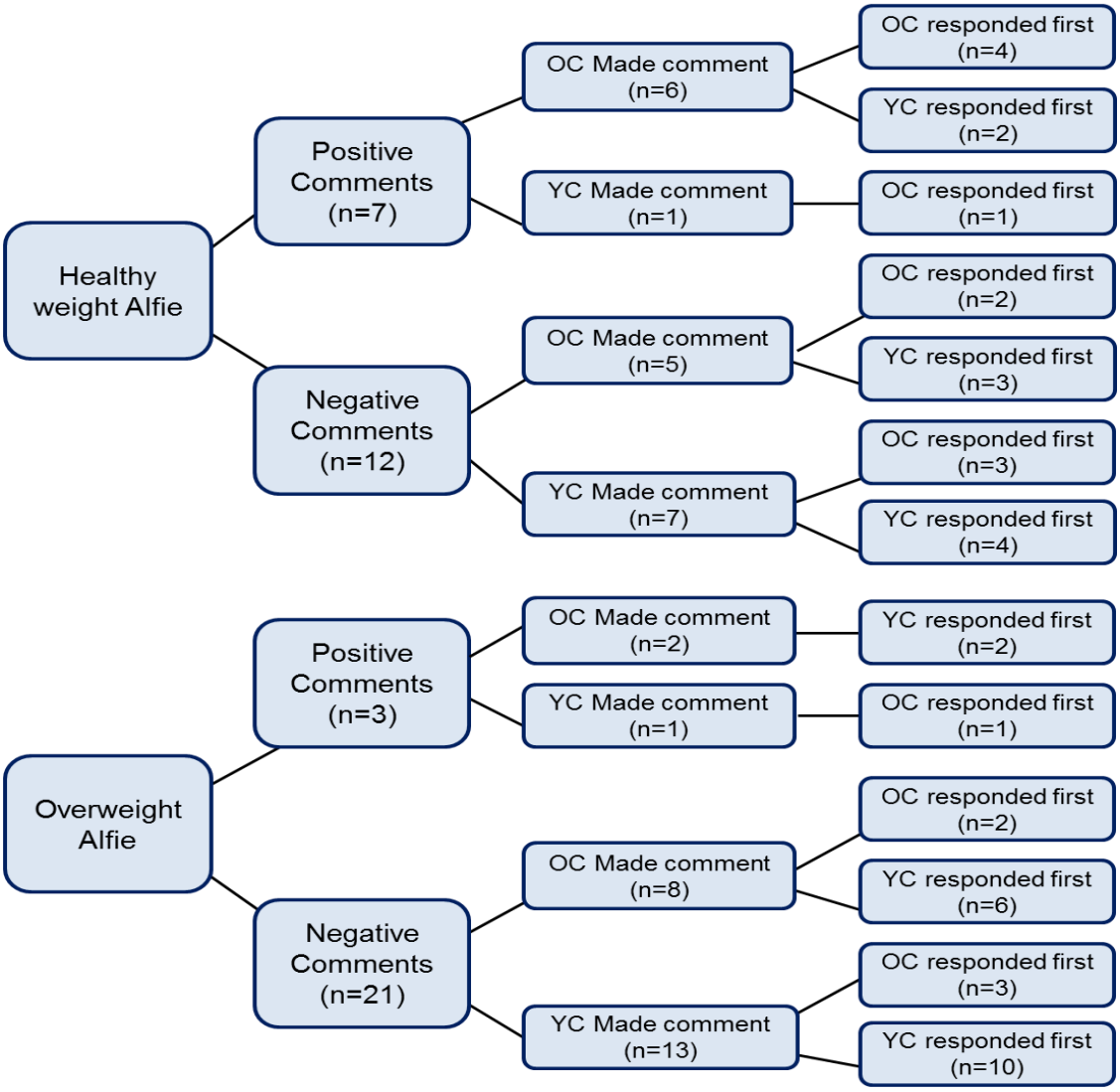


Figure 6 shows the paired reading interaction related to the valence of responses. In the healthy weight condition there were 7 positive comments, 5 were paired with neutral responses and the remaining 2 with no response. Two pairs both made negative comments and the remaining 8 negative responses were paired with neutral comments. Figure 6 shows that there were no differences in which child answered first for positive and negative comments. In the overweight condition all 3 positive comments were paired with neutral comments. For the negative comments, 6 were paired with another negative comment, 8 were paired with neutral comments and 1 was paired with no response. Again, there were no significant differences identified in which child answered first between the valence of the comment or the condition.

Figure 6: Figure showing the patterns of interaction for positive and negative responses



Discussion Prompt (DP) 1 - What was Your Favourite Part of the Story?

Responding to this question, 172 participants from a potential 178 provided a description (96.6%), with 6 participants not responding at all (3.4%). Table 7 shows that overall the two most common themes were when the duck drops Alfie's sandwich in the bin (e.g. *"My favourite bit was when the duck drops the sandwich in the bin")* and when the duck steals Alfie's sandwich (e.g. *"Mines gotta be when the duck took the sandwich")*. The other theme that emerged was that a particular activity was the participants' favourite part e.g. *"My favourite part was when Alfie was on the*

roundabout" and *"When Alfie goes on the swing."* There were no significant differences in the frequency of these responses between the healthy weight and overweight conditions.

Table 7 also shows there were several less common themes with small clusters of responses. 11 responses fell within the *ice-cream* theme, where participants responded that their favourite part was when Alfie got an ice-cream e.g. "*So I think my favourite bit was when mum gave Alfie an ice-cream"* Participants stated that *the end* of the story (n=6) or *the start* of the story (n=2) was their favourite part, but were not more specific. A total of 4 participants gave responses that fell into the *Alfie got off the roundabout theme* e.g. *"My favourite part of the story was when he got off the roundabout and he was really dizzy"* and *"When he was on the roundabout and he got spun round and he felt dizzy and nearly fell over."* Table 7 also shows that 2 participants said that their favourite part was when Alfie saw some *friends* e.g. *"Where he got a friend."* A further 2 children said that their favourite part was when *"Alfie went* to *the park*." 2 other participants said that *the picnic* was their favourite part e.g. *"My favourite bit was when he sat down for a picnic."* The remaining 'other' responses (n=2) were unrelated to any other theme or each other. There were no significant differences in these themes between the healthy weight and overweight condition.

Table 7: The percentage (%) and number (n) of responses for each key theme

	Healthy Weight Alfie			Overweight Alfie		
Theme	Younger Child (n=44)	Older Child (n=44)	**Total** (n=88)	Younger Child (n=45)	Older Child (n=45)	**Total** (n=90)
Duck drops Sandwich	36.4% (16)	47.7% (21)	**42.0%** (37)	24.4% (11)	40.0% (18)	**32.2%** (29)
Duck steals sandwich	36.4% (16)	22.7% (10)	**29.5%** (26)	44.4% (20)	22.2% (10)	**33.3%** (30)
Activity	11.4% (5)	9.1% (4)	**10.2%** (9)	8.9% (4)	8.9% (4)	**8.9%** (8)
Ice-cream	9.1% (4)	4.5% (2)	**6.8%** (6)	0.0% (0)	11.1% (5)	**5.6%** (5)
The end	2.3% (1)	2.3% (1)	**2.3%** (2)	6.7% (3)	2.2% (1)	**4.4%** (4)
Alfie got off roundabout	0.0% (0)	2.3% (1)	**1.1%** (1)	0.0% (0)	6.7% (3)	**3.3%** (3)
The start	2.3% (1)	0.0% (0)	**1.1%** (1)	0.0% (0)	2.2% (1)	**1.1%** (1)
The picnic	2.3% (1)	2.3% (1)	**2.3%** (2)	0.0% (0)	0.0% (0)	**0.0%** (0)
Friends	0.0% (0)	0.0% (0)	**0.0%** (0)	2.2% (1)	2.2% (1)	**2.2%** (2)
The park	0.0% (0)	0.0% (0)	**0.0%** (0)	4.4% (2)	0.0% (0)	**2.2%** (2)
Other	0.0% (0)	0.0% (0)	**0.0%** (0)	4.4% (2)	0.0% (0)	**2.2%** (2)
Don't know/no response	0.0% (0)	9.1% (4)	**4.5%** (4)	4.4% (2)	4.4% (2)	**4.4%** (2)

Overall, younger and older children gave similar responses, with only three significant differences. Firstly, in the healthy weight condition the younger child was significantly more likely to not respond or respond that they did not know ($z=-2.05$, $p=0.04$). The other two differences were in the overweight Alfie condition. The

younger child was significantly more likely to respond that the duck stealing the sandwich was their favourite part (z=2.24, p=0.03). Also, the older child was significantly more likely to report that Alfie having an ice-cream was their favourite part (z=-2.30, p=0.02). There was just one significant gender difference. In the healthy weight condition, girls were significantly more likely to choose an activity as their favourite part (n=8) than boys (n=1, z=2.05, p=0.04).

Valence

Table 8 shows the frequency of responses coded as positive, negative or neutral (excluding those who did not respond/did not know). In both conditions negative responses were the most common with participants choosing an aspect of the story where something negative happened to a story character as their favourite part. There were no significant differences in ratings between the healthy weight and overweight conditions, between older and younger children or between male and female participants.

Table 8: Table showing the percentage (%) and number (n) of responses from the younger child and older child that were neutral, positive and negative

	Healthy Weight Alfie			**Overweight Alfie**		
	Younger Child (n=44)	**Older Child** (n=40)	**Total** (n=84)	**Younger Child** (n=43)	**Older Child** (n=43)	**Total** (n=86)
Neutral	**15.9%** (n=7)	**12.5%** (n=5)	**14.3%** (n=12)	**18.6%** (n=8)	**16.3%** (n=7)	**17.4%** (n=15)
Positive	**11.4%** (n=5)	**7.5%** (n=3)	**9.5%** (n=8)	**7.0%** (n=3)	**14.0%** (n=6)	**10.5%** (n=9)
Negative	**72.2%** (n=32)	**80.0%** (n=32)	**76.2%** (n=64)	**74.4%** (n=32)	**69.8%** (n=30)	**72.1%** (n=62)

Discussion Prompt 2 - Why was This Your Favourite Part?

Overall, 147 participants from a potential 178 provided a response to DP2 (82.6%), with 2 participants (1.1%) saying that they do not know and 29 participants (16.3%) not responding at all. Table 9 shows that the most common theme was that it was funny e.g. *"because it was just funny"* and *"because it was kind of really funny."* There was no significant difference in the frequency of the 'funny' response between the healthy weight and the overweight conditions. A number of children liked Alfie getting an ice-cream e.g. *"because he got an ice-cream"* and *"because Alfie gets a new ice-cream."* Again, there were no significant differences in the frequency of this response between conditions.

There were several themes which included smaller clusters of responses. In the overweight condition, 5 participants responded that they chose their favourite part based on what they like e.g. *"because I like swings"* and *"because I like, love roundabouts."* In contrast, in the healthy weight condition there were no children who gave responses that fell into this theme, a difference that was statistically significant ($z=2.24$, $P=0.03$). Table 9 demonstrates that 3 children in the overweight condition said that they had chosen their favourite part of the story because *Alfie had fun* e.g. *"because he was having lots of fun."* A further 3 participants in the overweight condition reported that they chose their favourite part because the duck was *cheeky* or mischievous e.g. *"because like it was a cheeky bird."* Table 9 also shows that 3 children chose their favourite part because Alfie played with his *friends* e.g. *"he played with all his friends"* and 3 children responded that their favourite part was unexpected e.g. *"because it was unexpected and you would think that he would have ate it."* 2 children in the overweight condition said they chose their favourite part because the *duck dropped the sandwich* e.g. *"because the duck dropped it in the bin*

and Alfie looked a bit sad." In the healthy weight condition, 2 children responded that they chose their favourite part because *it is nice* e.g. *"because it's nice"* and a further 2 participants said they chose their favourite part because Alfie could not eat the sandwich e.g. *"because he wanted to eat it and couldn't."* The remaining 'other' responses (n=11) were unrelated to each other or any other theme. There were significantly more responses in the other category in the overweight condition ($z=2.14$, $p=0.03$).

Table 9: The percentage (%) and number (n) of responses for each key theme

	Healthy Weight Alfie			Overweight Alfie		
Theme	Younger Child (n=44)	Older Child (n=44)	**Total** (n=88)	Younger Child (n=45)	Older Child (n=45)	**Total** (n=90)
Funny	45.5% (20)	72.7% (32)	**59.1%** (52)	53.3% (24)	55.6% (25)	**54.4%** (49)
Ice-cream	13.6% (6)	2.3% (1)	**8.0%** (7)	0.0% (0)	11.1% (5)	**5.6%** (5)
Child likes it	0.0% (0)	0.0% (0)	**0.0%** (0)	8.9% (4)	2.2% (1)	**5.6%** (5)
Alfie had fun	0.0% (0)	0.0% (0)	**0.0%** (0)	2.2% (1)	4.4% (2)	**3.3%** (3)
Cheeky	0.0% (0)	0.0% (0)	**0.0%** (0)	6.7% (3)	0.0% (0)	**3.3%** (3)
Friends	4.5% (2)	0.0% (0)	**2.3%** (2)	0.0% (0)	2.2% (1)	**1.1%** (1)
Unexpected	0.0% (0)	2.3% (1)	**1.1%** (1)	0.0% (0)	4.4% (2)	**2.2%** (2)
Duck dropped the sandwich	0.0% (0)	0.0% (0)	**0.0%** (0)	2.2% (1)	2.2% (1)	**2.2%** (2)
It's nice	2.3% (1)	2.3% (1)	**2.3%** (2)	0.0% (0)	0.0% (0)	**0.0%** (0)
Alfie can't eat it	4.5% (2)	0.0% (0)	**2.3%** (2)	0.0% (0)	0.0% (0)	**0.0%** (0)
Other	2.3% (1)	2.3% (1)	**2.3%** (2)	11.1% (5)	8.9% (4)	**10%** (9)
Don't know/no response	27.3% (12)	18.2% (8)	**22.7%** (20)	15.6% (7)	8.9% (4)	**12.2%** (11)

There were some differences identified between the older and younger child. In the healthy weight condition older children gave significantly more responses that were categorized as funny ($z=2.60$, $p=0.009$) and significantly fewer gave a response related to ice-cream ($z=1.97$, $p=0.05$). Conversely, in the overweight condition,

significantly more older children gave responses relating to Alfie having an ice-cream (z=-2.30, p=0.02). Again no significant differences between male and female participants were found.

Valence

Table 10 shows the frequency of positive, negative and neutral comments made when participants explained why they had chosen their favourite part of the story. In both conditions a positive rating was the most common response. However, participants in the healthy weight condition made significantly more positive comments that those in the overweight condition (z=2.28, p=0.02). Although more negative comments were made in the overweight condition, this difference in proportions was not statistically significant (z=1.61, p=0.11).

Table 10: Table showing the percentage (%) and number (n) of responses from the younger child and older child that were neutral, positive and negative

	Healthy Weight Alfie			**Overweight Alfie**		
	Younger Child (n=32)	**Older Child** (n=36)	**Total** (n=68)	**Younger Child** (n=38)	**Older Child** (n=41)	**Total** (n=79)
Neutral	**3.1%** (n=1)	**2.8%** (n=1)	**2.9%** (n=2)	**10.5%** (n=4)	**7.3%** (n=3)	**8.9%** (n=7)
Positive	**90.6%** (n=29)	**91.7%** (n=33)	**91.2%** (n=62)	**81.6%** (n=31)	**73.2%** (n=30)	**77.2%** (n=61)
Negative	**6.3%** (n=2)	**5.6%** (n=2)	**5.9%** (n=4)	**7.9%** (n=3)	**19.5%** (n=8)	**13.9%** (n=11)

There were no significant differences in valence ratings between the older and younger children. There was one significant difference in gender, with female

participants being significantly more likely to give a positive response than males in the overweight condition (z=2.03, p=0.04).

Additional Observations During the Reading of the Story

The recordings of the paired reading of the story were checked for any additional comments made about the characters or the story whilst it was being read. This only happened on 2 occasions (both male pairs in the overweight condition). On 1 occasion, the younger child made a comment about Alfie feeling dizzy when he got off the roundabout:

> Story text: Next Alfie went on the roundabout. His Mum pushed him so fast that he was dizzy. When he got off the roundabout Alfie nearly fell over.
>
> YC: *"He went really fast and fell over."*

In the other pair there were a string of comments related to Alfie's body shape. The younger child interrupted his reading of the story to make the first comments about Alfie's weight e.g. *"Ok, that guys fat"*, *"Look at that guy that guy, look how fat he is"* and *"Why is that guy so fat?"* The reading of the story was punctuated with comments about Alfie's body shape and other negative comments from both the younger child (YC) and the older child (OC).

On2 occasions (both in the overweight condition) there were non-verbal references to Alfie's body shape. In one pair of male participants, when the younger child opened the story he pointed at Alfie and then rubbed his own stomach. He then began to read the story. The other occasion of non-verbal reference to body shape was in a female pair. The story states that *"Alfie started to feel very hungry"* at which

point the older child laughed, pointed at the picture of Alfie and adopted a humorous facial expression.

All incidences of laughter during the paired reading interaction were recorded and examined. They were all related to the story, the story characters, or the story ending prompts/discussion prompts. In total there were 67 times when the children laughed, with 19 (28.4%) in the healthy weight condition and 48 (71.6%) in the overweight condition. Accordingly, there was significantly more laughter in the overweight condition ($z=5.01$, $p<0.001$). In addition to the individual incidences of laughter the number of pairs where one or more incidences of laughter occurred was also compared. In the healthy weight condition, 9 pairs (20.5%) had one or more episode of laughter during the paired reading interaction. In the overweight condition significantly more pairs (n=18, 40%) had at least one episode of laughter during the interaction ($z=2.01$, $p=0.05$). Across both conditions girls were significantly more likely than boys to laugh ($z=3.63$, $p<0.001$).

DISCUSSION

This study aimed to investigate peer-to-peer responses to overweight in young children. Specifically, it was hypothesised that there would be differences in the content of paired reading conversations when comparing responses from children in the healthy weight and overweight conditions. It was also predicted that there would be more references to body shape and more negative attitudes apparent in the overweight condition. Overall, this study did not find any clear evidence to support either of these hypotheses and failed to show clear evidence of negative attitudes to overweight. The key findings related to each hypothesis will be summarised before considering the results of this study in the context of the established literature.

Summary of Key Findings

Regarding hypothesis 1, it was envisaged that body shape would be referred to more often by children in the overweight condition. However, this hypothesis was not supported. Only 1 reading pair explicitly mentioned body shape (overweight condition, male pair). In this pair, both the older and younger child made several comments about overweight Alfie's body shape and a series of negative comments about Alfie more generally. A further 2 reading pairs in the overweight Alfie condition made non-verbal references to body shape using gestures, facial expressions and then laughing. There were no references to body shape at all by children in the healthy weight Alfie condition.

With regards to hypothesis 2 and the expectation of more negative comments when the main story character was overweight, the results demonstrated that for all the story ending prompts (SEPs 1-3) the most common valence rating was neutral. The proportion of neutral responses varied for each of the three SEP's (SEP 1 over 80%

neutral in both conditions, SEP 2 over 55% neutral in both conditions and SEP 3 over 70% neutral in both conditions). Some differences in positive and negative comments were found. In SEP 1 (What do you think Alfie does next?) there were significantly more negative comments made in the overweight condition compared to the healthy weight condition. However, this difference represented a small proportion of participants in the overweight condition with only 8.6% giving a negatively valenced response. Broadly similar numbers of positive comments were made in both conditions. The findings for SEP 2 (What do you think mum does next?) showed that significantly more positive comments were made in the healthy weight condition (40.8% in the healthy weight condition compared to 25.3% in the overweight condition). Like SEP 1, only a small proportion of responses were negative (2.8% in the healthy weight condition and 8.9% in the overweight condition).

For SEP 3 (What do you think the duck does next?), there were more negative comments across both conditions than there were in SEP 1 and 2 (16.0% in the healthy weight condition and 26.3% in the overweight condition). This is perhaps due to the fact that at this point in the story the duck has just stolen the main characters sandwich. However, this difference was not statistically significant.

The most common response for DP1 (What was your favourite part of the story?) was negative (76.2% in the healthy weight condition and 72.1% in the overweight condition). Therefore the majority of participants chose an aspect of the story where something negative happened to one of the characters as their favourite part of the story. There were no significant differences found in valence ratings between conditions in DP1. In contrast with DP1, the results for DP2 found that in both conditions positive responses were most common (91.2% in the healthy weight condition compared to 77.2% in the overweight condition). Therefore the majority of participants in both conditions gave a positive reason for choosing their favourite part.

There were significantly more positive responses in the healthy weight condition compared to the overweight condition.

Overall, the results offer very limited support for hypothesis 2. For the 3 SEP's, the vast majority of responses in both conditions were neutral. There were significantly more negatively valenced responses in the overweight condition compared to the healthy weight condition for SEP 1. This suggests a small number of participants viewed overweight Alfie more negatively than healthy weight Alfie when asked what Alfie might do next. That said, there were more negative comments overall when participants were discussing the duck than when they were discussing Alfie. For all SEP's and DP's the patterns of results suggested a tendency for there to be slightly more positive comments in the healthy weight condition compared to the overweight condition. However, these findings were only statistically significant on 2 occasions (SEP 2 and DP 2).

The results relating to hypothesis 3 showed that conversation content between the children was mostly similar for both overweight and healthy weight conditions. However, there were some minor differences. For SEP 1, in the healthy weight condition, all of the participants described Alfie doing something in response to the duck stealing his sandwich. However, in the overweight condition 95% of participants reported a behaviour and 5% described Alfie as experiencing a feeling. Similarly for SEP 2, only one participant in the overweight condition gave a response that was not a behaviour. All responses for SEP 3 related to the duck 'doing' something. Although these slight differences were identified, most responses related to a behaviour rather than an emotion. This may be due to the age and developmental stage of participants. Developmental theory suggests that both recognition of emotion and emotional processing increases and improves with age (Herba, Landau, Russell, Ecker & Phillips, 2006; Hietanen, Gierean, Hari & Nummenmaa, 2016). This may mean that

primary school age children are more likely to be focussed on what the story characters are doing rather than what they are feeling. In terms of differences in the most common themes, the two most common themes for SEP 1 were that Alfie would attempt to retrieve the sandwich and that Alfie would replace the sandwich. There were no differences between the conditions in the frequency of the retrieve response but there were significantly less replace responses in the overweight condition. There were no significant differences in the frequency of the most common themes for all other SEP's and DP's.

Although there was little difference in the verbal content of the conversation, a difference was found in the non-verbal content of the interactions. Specifically, there was significantly more laughter in the paired reading interactions in the overweight condition compared to the healthy weight condition. This would suggest that children found the main story events (e.g. Alfie having his sandwich stolen and dropped in the bin) funnier when Alfie was overweight compared to healthy weight.

The results from the verbal content of the paired reading interactions in the present study do not support hypothesis 3 as there was only one significant difference in themes arising from the conversations between the healthy weight and overweight condition. That said, the difference in levels of laughter may indicate that the story was seen as more humorous when the main character was overweight.

Key Results in the Context of Existing Literature

The literature reviewed earlier in this thesis suggests that children view overweight body shapes negatively from a young age. Rees et al. (2011) concluded that children aged 4-11 make judgements based on body shape and that to view overweight negatively is viewed as 'normal' for this age group. In addition, several self-report studies provided information on experiences of weight stigma during

childhood and adolescence. All of these studies demonstrated that overweight children and young people experiences negative responses from their peers due to their weight (Hayden-Wade et al., 2005; Janssen et al., 2002; Madowitz et al., 2012; Neumark-Sztainer & Eisenberg, 2005; Puhl & Brownell, 2006; Puhl, Peterson & Luedicke, 2013). These studies reported similar levels of experiences of weight stigma from peers, with studies reporting between 59% and 64% experiencing a negative response due to their weight. However, it is worth bearing in mind that the majority of participants in these studies were adolescents, with just one study including children aged eight and above. There have been no studies identified that ask younger children about their experiences of weight stigma or attitudes to overweight directly.

Given the existing evidence, it was predicted that there would be clear differences in the paired reading interactions when comparing the healthy weight and overweight condition in terms of references to body shape, frequency of negative comments and content of the paired reading interactions. However, the study outcomes were in contrast to the negativity outlined in the evidence above. One potential explanation for the differences between the previous findings and the results of this study are differences in the methodology used. Many of the experimental studies reviewed earlier in this thesis used line drawings and ranking, rating, attribution or forced choice tasks to assess negative attitudes to overweight children (Brylinski & Moore, Cramer & Steinwert, 1998; 1994; Latner & Stunkard, 2002; Nabors et al. 2010; Penny & Haddock, 2007; Richardson et al., 1961 Su & DiSanto, 2011). All of these studies reported a significant negative response to overweight characters, with overweight characters being assessed more negatively than healthy weight characters.

There have been cautions raised about whether the results of these studies are related to features of the methods used (Harrison et al., 2016; Rees et al. 2011). For

example, Richardson et al.'s (1961) study was set up in a way that meant that one of the three characters had to be ranked as least acceptable; here and in many other studies using this ranking approach it was the overweight child. This does not necessarily mean that the least acceptable child was viewed in a negative way. Similarly, in Cramer and Steinwert's (1998) study, child participants were asked to choose which target character was 'mean.' Children consistently chose the overweight target character for the label 'mean', but it does not follow that all young children think overweight people are mean. Recent studies by Baxter et al. (2015) and Harrison et al. (2016) demonstrated that the method used to assess negative responses to body shape had an impact effect on the degree of negativity found. Both found less negativity compared to previous research (on attribute ratings) but confirmed that young children ranked overweight characters below a healthy weight character (on some character attributes). Importantly, these attitudes were not held by all children and were overall weakly expressed.

Two further issues are pertinent. First, the present study did not ask any direct questions about weight or require any kind of attribution, ranking or forced choice tasks. In contrast with the majority of existing research, children were not prompted in any way that a character's body shape was the main object of interest or that they should be looking at weight or shape in their responses within the story protocol. This was assisted by using a between subjects rather with repeated measures design, where children would have seen the different variants in character presentation. Second, the study was set up to take a child's view of the materials and story line rather than examine whether they agreed with an adult's perspective based on evidence for, and experience, of anti-fat attitudes. It can be argued that the majority of previous research studies were designed to test existing theories established by adults (Rees et al., 2011). As such, the majority of previous studies outlined above expected a

negative response to overweight and were designed to capture this e.g. asking children to choose whether a healthy weight or overweight character is 'mean.' This approach to assessing negative attitudes can be seen as self-fulfilling as the design ensures that negativity will be expressed. In contrast, the present study was considerably more child-centred. Unlike the majority of previous research, children's engagement in discussions and points of view were actively encouraged by the study design (Rees et al., 2011). The approach taken in this study was to present children with familiar story materials and create a situation where children could have a conversation about the story. It could therefore be argued that the findings of this study may more accurately represent children's views than previous studies, giving a better insight into children's true thoughts and feelings.

The lack of negativity found in the present study is perhaps even more surprising given that one of the children in each reading pair was aged 9 - 11. The established literature has demonstrated that negative attitudes to weight begin in early childhood and are more apparent as children get older (Cramer & Steinwert, 1998; Puhl & Latner, 2007). In particular, the evidence is clear that children aged 8 and above hold negative attitudes towards obese peers. Based on this, it was expected that older children would show more negativity towards overweight Alfie in this study and would share this with the younger child. However, there was no evidence of the older child being more negative to overweight or that they used body shape or weight in their dialogue with the younger child. Both older and younger children appeared to focus on the storyline itself rather than the appearance or feelings of the characters in the story.

This was confirmed by looking at the social interactions between the younger and older child. The content and valence of responses for all three SEPS were analysed in order to ascertain if the younger and older children's responses matched or

were different, which child answered first, and whether this was different between the two conditions. Although some differences were found there were no clear patterns identified. The analyses showed that there were no differences in the patterns of interaction between the two weight conditions. Based on the literature described above, it was expected that older children may be more likely to hold and transmit negative information to younger children. However, the results from this study did not fit with this prediction.

In addition to the methodological differences described above, there are several other potential explanations for the differences between the results of this study and the established literature. Firstly, it is possible that social desirability influenced these results. Tinson (2009) argues that younger children (aged eight and below) are particularly anxious to please researchers and therefore may respond in the way they believe the researcher wants them to. Penny and Haddock (2007), in contrast to the literature cited above, found that younger children (aged 5 – 8) were more likely to express stereotyped views than older children (aged 8 – 10). They argued that this finding could be explained by social desirability as older children may be more likely to feel that it is wrong to be overtly negative about overweight in front of researchers. In the present study the researcher was sat at a distance from the paired reading interaction in order to minimise the chances of social desirability affecting the findings. However, for ethical reasons the researcher remained at a distance where the paired reading interaction could be heard. It is possible therefore that social desirability and a belief that it is wrong to be overtly negative could have influenced the findings of this study.

In the same vein, it is possible that conducting the research in a school environment may have constrained the emergence of negative views. Commenting on the main character's obesity could be something viewed negatively in school and

therefore children may be less likely to verbally express negativity. However, other studies have been conducted in schools and have found negative attitudes to obese characters (e.g. Klaczynski, 2007; Penny & Haddock, 2007). Also, children are frequently encouraged to discuss issues at school, perhaps more than they would do at home. It is possible therefore that the findings in gathered in this more naturalistic study are a more accurate reflection of children's feelings and thoughts.

Another explanation for the difference in outcomes between this study and the existing literature is that the present study looked for variation in children's views, something generally overlooked in this literature. Typically, study findings are communicated as group mean scores of judgements and choices. There is very little information about the variation in children's views, aside from measures such as standard deviations. The present study observed one pair of children who consistently expressed very negative views about the obese story character. It also allowed the researcher to capture elements of the social interaction that occurred between the two children during the paired reading task. In particular, there was significantly more laughter in the overweight condition suggesting that participants found the story more humorous when the main character was overweight. Laughter is something that has not been captured by previous research and so there are no previous findings to compare this to. That said, several researchers have distinguished between overt, explicit bias and more subtle, implicit forms of negative responses to overweight (e.g. Brewis & Wutich, 2012; Jansenn et al., 2002; Fontanta et al., 2013). For example, Jansenn et al. (2002) found that in addition to direct comments about their weight, overweight children also reported more subtle forms of weight-based bullying including withdrawal of friendship and spreading of rumours etc. The difference in occurrence of laughter found in this study could reflect a more subtle form of negative response to overweight.

Finally, for all hypotheses the impact of gender and researcher ratings of participants body shape were compared. To assess the impact of gender, the responses of male and female participants for each SEP and DP were compared. There were some differences between male and female participants that were statistically significant. However, taken together the results of this study show no significant overall gender differences in the paired reading interactions across both the healthy weight and overweight conditions. The findings in this study with regards to gender are again similar to other recent studies in this area (Baxter et al., 2015; Harrison et al., 2016).

In order to assess the impact of participant's body shape, the researcher rated each participant using the Collins Scale (1991). As mentioned previously, this scale is not validated for use by young children, confirmed in previous research that shows great variation in the ratings made by children this age (Harrison et al. 2016). Also, it is likely that asking parents to consent to their child being weighed and measured would have decreased participation. However, it was felt that the Collins scale (1991) was the most practical method to generate researcher ratings of each child's body shape. With the exception of one child, all of the participants were scored between 3 and 5 indicating that they were in the healthy weight range. One child scored 6.5 and was the only participant who was overtly overweight. No differences were observed between this child's responses and that of other participants.

Strengths and Limitations

There are several strengths to this study. Firstly, the materials used were of a high quality. The stories used in this study were illustrated with characters similar to those in the Oxford Reading Tree. The story was bright, colourful and designed to be fun and enjoyable for children to read. The study had a large sample, with a total of

172 children participating. Also, in each school, the study was conducted in a quiet area used for reading and so the study took place in a familiar environment.

The use of paired reading was notable. It was used to create a social interaction to examine the nature of peer-to-peer responses. This is an innovative method that has not been used before in examining anti-fat attitudes or their transmission. This study has established it is a feasible method with schools allowing the research to take place and parents/guardians giving consent for children to participate. It has also demonstrated that the task was acceptable and enjoyable for children to complete.

Another advantage of paired reading is that it created a naturalistic social interaction for a younger and older child. The resulting conversations gave the researcher access to rich, detailed information including the content of conversations and non-verbal communication. This allowed for both quantitative and qualitative analysis of results, providing a detailed picture of the verbal and non-verbal aspects of the interaction. Again, this is something that researchers examining responses to overweight have not accessed before.

In addition, building the prompts for discussion into the story required the older child to facilitate the discussion. This kept the researchers role in the interaction to a minimum. Also, the prompts were designed to create a conversation but did not ask direct questions about weight. Unlike the majority of previous research, there were no ranking, rating, attribution or forced choice tasks. This design therefore allowed for a conversation that was as natural as possible between to peers.

Previous research has recommended that the views of children towards obesity should be actively sought (Baxter et al., 2015; Puhl & Latner, 2007; Rees et al., 2011). In particular, there are very few studies that seek the views of young children (Baxter at al., 2015). This may be in part due to perceptions around young children's cognitive development and abilities to express themselves verbally (Docherty & Sandeloski,

1999). Young children may be perceived to lack insight and therefore have their perspectives deemed to be unreliable (Docherty & Sandeloski, 1999; Kirk, 2007). However, like Baxter et al. (2016), this study again demonstrated the value of engaging children in conversations. In line with recommendations from Puhl and Latner (2007), this study also showed that creative and innovative methodologies can be employed to engage young children in conversations.

There are a number of limitations to be noted. For example no information was gathered on children's ethnicity, socio-economic status or bodyweight. All of these variables are thought to impact on negative responses to obesity in older children and adults (Puhl & Latner, 2007; Puhl & Heuer, 2009). However, gathering this information would have created ethical challenges and could be seen as intrusive, particularly ascertaining participant's body weight. It is likely, for example, that gathering information on these variables would have had a negative impact on recruiting participants. Also, the schools participating in this research were from a relatively small geographical area in in the North of England. Accordingly, this may limit the generalisability of these findings.

It is worth observing that fewer younger children received parental consent than older children. In total 61.4% of older children received consent compared to 38.2% of younger children. This meant that several older children were not able to participate as they did not have a younger reading partner. This may suggest that parents of younger children were more concerned about their child participating than parents of older children. Alternatively, fewer letters about the study made their way home to parents and back again in the younger age group.

Although these illustrations were high quality, there may be differences in how participants respond to a story character compared to how they would respond to a

peer. Therefore we cannot be certain that negative responses to a character would translate into negative attitudes towards children.

Finally, it could be argued that this study failed to find a negative response to obesity because the cues built into the story were not strong enough to create a response. In this way it could be argued that the method used did not access the phenomena of interest (negative attitudes to overweight). However, there are several factors that counteract this argument. Firstly, the study by Harrison et al. (2016) confirmed that young children are able to identify healthy weight and overweight characters used in this study and so it is unlikely that children of this age did not notice overweight Alfie's body shape. Second, in the studies described above that capture children's lived experience, it seems that a person's body shape is enough to trigger negativity. Third, there were multiple cues built into the story that related to weight e.g. references to exercise, hunger, food, and food being removed. Finally, the variance in responses and the significant differences in laughter reported above would also refute the argument that this method would not access children's negative responses.

Practical Implications

It is widely documented in the literature reviewed above that weight stigma directed at children is a significant problem that can lead to a range of negative consequences for a child (e.g. Puhl & Latner, 2007). It is thought that children are particularly vulnerable to the negative consequences of weight stigma and that the negative implications of experiencing weight stigma can persist into adulthood (Puhl & Latner, 2007). This study, in line with recommendations from previous research (Puhl & Latner, 2007; Rees et al., 2011), has used creative methodology to increase knowledge of children's responses to obesity. Several authors have documented the

practical value of gaining knowledge to add to our understanding of the nature, extent and development of weight stigma in children (Harrison et al., 2016; Puhl & Latner, 2007; Rees et al., 2011).

Global concern about childhood obesity has led to an increase in obesity surveillance, prevention and intervention programmes aimed at young children to try and tackle the still growing rates of childhood obesity (Baxter et al., 2015; Harrison et al., 2016; HSCIC, 2016). The government childhood obesity strategy (HM Government, 2016) also places an emphasis on the importance of creating healthy habits in younger children. In practical terms, this means that teachers and a range of other professionals are becoming more involved in both weight monitoring and promoting healthy eating and activity with young children. Several authors have expressed concern that school based programmes and monitoring may be harmful to overweight children. In particular there are concerns that such programmes may have an impact on the self-esteem of a child with obesity and may unintentionally perpetuate or increase weight stigma directed at children who are obese (Ikeda, Crawford & Woodward-Lopez, 2006; 2012; Puhl & Latner, 2007). The present study found no strong negative responses to overweight in the majority of children. The participants in this study were drawn from schools located in areas associated with a range of socioeconomic backgrounds. Other factors influencing development of negative attitudes to obesity (e.g. parental weight, parental attitudes, exposure to media) were not measured to promote participation. However, it is likely that included participants varied in relation to broader factors that impact on attitudes to obesity. The lack of negativity found provides reassurance to those working in health promotion related to weight that obesity monitoring and prevention programmes do not necessarily cause harm to overweight children. Furthermore, there is some evidence that interventions with young children can have a positive impact on weight

related behaviours e.g. increase in healthy eating, reduction in sedentary activities etc. (Hesketh & Campbell, 2010). The findings from this study also suggest that primary school age is potentially a better time to engage children in obesity prevention work, as the evidence suggests that negative attitudes to overweight worsen as children get older.

Several authors have also concluded that promoting health literacy skills in young children is an important part of successfully engaging children (and parents) in obesity prevention strategies (Baxter at al., 2015). Improving health literacy in young children is seen as valuable as it can also improve a range of health outcomes (Baxter et al., 2015; Sanders, Frederico, Klass, Abrams & Dreyer, 2009). Baxter et al. (2015) assessed young children's knowledge and understanding of weight change and concluded that young children are able to reflect on physical functions and health. Taking the findings of this research and previous studies together, it would suggest that it may be helpful to provide young children with fact based education on weight change (Baxter et al., 2015). The findings of the current study suggest that the majority of children would not display a negative attitude towards a peer due to their weight at this age and therefore improving health literacy at this time is unlikely to create or worsen weight stigma. Similarly, it can be argued that providing fact based information to young children about overweight may help to reduce misunderstandings of overweight and reduce negative attitudes (Baxter et al., 2015). Irving (2000) argues that providing education in a way that promotes understanding, compassion and tolerance of different body shapes is helpful in reducing weight stigma.

Recommendations for Future Research

Firstly, because the findings of this study were surprising and less negativity was found than predicted, it would be helpful to verify the findings of this study. Repetition of this study, perhaps in a different geographical location would be helpful in ascertaining the reliability and validity of the findings of the current study. Also, the design of this study could be modified to make further comparisons. For example, changes could be made to the story so that something more negative happens to Alfie, or that the story does not have a happy ending. In addition, stronger cues to prompt thinking about overweight could be included e.g. in the story Alfie could play a more active sport such as football instead of playing frisbee etc. The story could also be used with different age groups (e.g. two younger children, adapted for two older children) to see if this affected the findings.

As mentioned previously, this study did not gather information on several variables that may have influenced the findings. Further research could explore the impact of ethnicity, socio-economic status and body weight on negative attitudes to overweight children. It may also be helpful to conduct research away from the school environment in other environments such as at home or in social settings. This could also help relate children's attitudes to other aspects of their social environment. The presence of siblings, parental attitudes to weight, experiences of parental dieting or parental obesity may all effect the development of negative attitudes to overweight in children. This may also add to our understanding of the development of negative attitudes to overweight.

The literature review demonstrated that very little is known about the development of negative responses to obesity in young children. This study examined the role of an older peer in transmitting negative information to younger children. However, this study found considerably less negativity than expected and did not

identify any patterns regarding the transmission of information between peers. This research was undertaken in a school setting. It may be helpful to consider other ways and settings in which children communicate with peers such as in social settings or electronically through social media and computer games etc. Further research into the development of negative attitudes would be helpful in planning effective stigma reduction strategies. The evidence reviewed earlier in this thesis suggests that peers, teachers, parents and the media play a role in the development of weight stigma in children. There is clear evidence of negative attitudes to overweight in children's media and exposure to these media has been demonstrated to lead to an increase in negative attitudes towards obesity (Ata & Thompson, 2010; Latner, Rosewall & Simmonds, 2007). However, knowledge of interpersonal relationships and their role in the development of weight stigma is an under researched area (Puhl & Latner, 2007). It would be helpful to learn more about the basis of children's negative attitudes to overweight and how children acquire these attitudes. In particular, gaining further information about the weight related messages children receive from parents, peers and teachers would be beneficial. It would also be helpful to use qualitative methods to ask young children where their views and ideas come from. Also, it would be helpful to know the extent to which negative attitudes are translated into behaviour and the processes that underlie this. Finally, although it may present ethical challenges, it would be helpful to gain knowledge of the experiences of young children who are overweight.

Conclusion

This study explored peer-to-peer responses to body shape. Analysis of the results of this study found no clear evidence of negative attitudes towards overweight. That said, on some individual occasions there were significantly more negative

comments made in the overweight condition, and significantly less positive comments than in the healthy weight condition. There was also significantly more laughter in the overweight condition suggesting that children found the events of the story funnier when the main character was overweight. Taken together, the findings of this study did not find enough evidence to support the hypotheses that there would be clear differences in the content and negativity of conversations between the weight conditions.

The findings of this research contrast with earlier experimental evidence which found much higher levels of negativity in young children. More recently, valuable contributions have been made in exploring new ways of investigating weight stigma in younger children (Baxter et al., 2015; Harrison et al., 2016). Like the present study, these studies demonstrated lesser degrees of negativity than the majority of the previous literature. However, as demonstrated in the literature, the stigma associated with obesity is clearly established and the consequences of this stigma are undeniable. This research does not challenge the existence of negative attitudes to overweight or the damage that such attitudes can do. However, several authors have called for a more child-centred way of exploring the nature and extent of negative attitudes to obesity in young children. The child-centred nature of this study has shown that young children's views of the world are different to that of adults. As previously discussed, the majority of the existing studies have imposed an adult's point of view and set out to test this. This study suggests that previous research has overestimated the extent of weight stigma in young children. It is important to have information and knowledge that is as accurate as possible as the basis for planning effective anti-stigma and anti-obesity strategies. Children, as they develop and get older, will be exposed to negative messages about overweight and obesity from the media and potentially from a range of interpersonal sources including parents, teachers and peers. The current study

suggests that the majority of young children (aged 4-6) have not yet developed weight stigma to a degree that previous literature suggests it has. This information is particularly valuable to those delivering health education or interventions related to preventing or tackling obesity.

LIST OF REFERENCES

Adams, G. R., Hicken, M. & Salehi, M. (1988). Socialization of the physical attractiveness stereotype: Parental expectations and verbal behaviors. *International Journal of Psychology, 23*(1-6), 137-149. doi:10.1080/00207598808247757

Annis, N. M., Cash, T. F. & Hrabosky, J. I. (2004). Body image and psychosocial differences among stable average weight, currently overweight, and formerly overweight women: the role of stigmatizing experiences. *Body Image, 1*(2), 155-167. doi:10.1016/j.bodyim.2003.12.001

Aronson, J. & Steele, C. M. (2005). Stereotypes and the fragility of academic competence, motivation and self-concept. In A. J. Elliot and C. S. Dweck (Eds.) *Handbook of Competence and Motivation* (pp.436-456). New York: Guildford.

Asamen, J. K., Ellis, M. L. & Berry, G. L. (2008). *The SAGE Handbook of Child Development, Multiculturalism, and Media.* London: Sage

Ata, R. N. & Thompson, J. K. (2010). Weight bias in the media: A review of recent research. *Obesity Facts, 3,* 41-46. doi:10.1159/000276547

Atherley, C. A. (1989). 'Shared reading': An experiment in peer tutoring in the primary classroom. *Educational Studies, 15*(2), 145-152.

Aweidah, L., Robinson, J., Cumming, S. & Lewis S. (2016). Australian diagnostic radiographers' attitudes and perceptions of imaging obese patients: A study of self, peers and students. *Radiography, 22*(4), 258-263. doi:10.1016/j.radi.2016.06.002

Barry, C. L., Gollust, S. E., McGinty, E. E. & Niederdeppe, J. (2014). Effects of messages from a media campaign to increase public awareness of childhood obesity. *Obesity, 22(2),* 466–473. doi:10.1002/oby.20570

Baxter, S.L., Collins, S.C. & Hill, A.J. (2015). "Thin people…. they're healthy." Young children's understanding of body weight change. *Pediatric Obesity, 11,* 418-24. doi:T10.1111/ijYpo.12081

Berndt, T. J. & Ladd, G. W. (eds.) (1989). *Peer Relationships in Child Development.* Chichester: Wiley & Sons

Boero, N. All the news that's too fat to print: the American "obesity epidemic" and the media. *Qualitative Sociology, 30*(1), 41-60. doi:10.1007/s11133-006-9010-4
Braun, V. & Clarke, V. (2013). *Successful qualitative research: A practical guide for beginners.* Los Angeles : SAGE, 2013.

Brewis, A. A. (2014). Stigma and the perpetuation of obesity. *Social Science and Medicine, 118,* 152-158. doi:10.1016/j.socscimed.2014.08.003

Brewis, A. A., Wutich, A., Faletta-Cowden, A. & Rodriguex-Soto, I. (2011). Body norms and fat stigma in global perspective. *Current Anthropolgy, 52*(2), 269-276. doi:10.1086/659309

Brooks, G. (2002). *What Works for Children with Literacy Difficulties? The Effectiveness of Intervention Schemes.* Sheffield: Department for Education and Skills. Retrieved 19 December 2016 from http://www.interventionsforliteracy.org.uk/widgets_GregBrooks/What_works_for_children_fourth_ed.pdf

Brown, C. (2008). *Developmental Psychology.* London: Sage

Brown, I. (2006). Nurses' attitudes towards adult patients who are obese: literature review. *Journal of Advanced Nursing, 53,* 221–232. doi:10.1111/j.1365-2648.2006.03718.x

Brownell, K. Puhl, R., Schwartz, M. Rudd, L. (Eds.) (2005). *Weight Bias: Nature, Consequences and* Remedies. London: Guilford Press.

Brylinski, J. A. & Moore, J. C. (1994). The identification of body build stereotypes in young children. *Journal of Research in Personality, 28,* 170–181. doi:10.1006/jrpe.1994.1014

Caprio, S., Daniels, S. R., Drewnowski, A., Kaufman, F. R., Palinkas, L. A., Rosenbloom, A. L. & Schwimmer,J. B. (2008). Influence of race, ethnicity, and culture on childhood obesity: Implications for prevention and treatment. A consensus statement of shaping America's health and the obesity society. *Diabetes Care, 31*(11), 2211-2221.

Carr, D. & Friedman, M. A. (2005). Is obesity stigmatizing? Body weight, perceived discrimination, and psychological wellbeing in the United States. *Journal of Health and Social Behaviour, 46,* 244-259.

Chen, X., French, D. C. & Schneider, B. H. (2007). *Peer Relationships in Cultural Context.* Cambridge: Cambridge University Press

Cinelli, R.L. & O'Dea, J.A. (2016). Obesity prevention programs in children: Impact on weight, shape and food concern. *Current Obesity Reports*, *5*(1), 88-96. doi:10.1007/s13679-016-0195-x

Collins, M. E. (1991). Body figure perceptions and preferences among preadolescent children. *International Journal of Eating Disorders, 10*(2), 199–208. doi:10.1002/1098-108X(199103)10:2<199::AID-EAT2260100209>3.0.CO;2-D

Corrigan, P. W. (2000). Mental health stigma as a social attribution: Implications for research methods and attitude change. *Clinical Psychology: Science and Practice, 7*(1), 48-67. doi:10.1093/clipsy.7.1.48

Cramer, P. & Steinwert, T. (1998). Thin is good, fat is bad: How early does it begin? *Journal of Applied Developmental Psychology*, *19,* 429-451. doi:10.1016/S0193-3973(99)80049-5

Crandall, C. S. (1994). Prejudice against fat people: Ideology and self-interest. *Journal of Personality and Social Psychology, 66*(5), 882-894. doi:10.1037/0022-3514.66.5.882

Daniels, S. R. (2009). The use of BMI in the clinical setting. *Pediatrics,* 124, 535-541. doi:10.1542/peds.2008-3586F

Davis, J. M. (1998). Understanding the Meaning of Children: A Reflexive Process. *Children and Society, 12*, 325-335. doi:10.1111/j.1099-0860.1998.tb00089.x

Davison, K. K., & Birch, L. L. (2001). Weight status, parent reaction, and self-concept in five-year-old girls. *Pediatrics, 107*, 46–53. doi:10.1542/peds.107.1.46

Davison, K. K., & Birch, L. L. (2002). Processes linking weight status and self-concept among girls from ages 5 to 7 years. *Developmental Psychology, 38,* 735–748. doi:10.1037//0012-1649.38.5.735

Davison, K. K. & Birch, L. L. (2004). Predictors of fat stereotypes among 9-year-old girls and their parents. *Obesity Research, 12,* 86 – 94. doi:10.1038/oby.2004.12

Dea, T. L. (2011). Pediatric obesity and type 2 diabetes. *The American Journal of Maternal/Child Nursing, 31*(1), 42-48.

Deacon, H. (2006). Towards a Sustainable Theory of Health-Related Stigma: Lessons from the HIV/AIDS Literature. *Journal of Community & Applied Social Psychology, 16,* 418–425.

Department of Health (2013). *Policy: Reducing obesity and improving diet.* Retrieved 3/08/2016 from https://www.gov.uk/government/policies/reducing-obesity-and-improving-diet

Dixey, R., Sahota, P., Atwal, S. & Turner, A. (2001). "Ha ha, you're fat, we're strong''; a qualitative study of boys' and girls' perceptions of fatness, thinness, social pressures and health using focus groups. *Health Education, 101,* 206–216. doi:10.1108/EUM0000000005644

Docherty, S. & Sandelowski, M. (1999). Focus on qualitative methods: Interviewing children. *Research in Nursing and Health, 22,* 177-185. doi: 10.1002/(SICI)1098-240X(199904)22:2<177::AID-NUR9>3.0.CO;2-H

Dovidio, J. F., Major, B., & Crocker, J. (2000). Stigma: introduction and overview. In T. F. Heatherton, R. E. Neck, M. R. Hebl, & J. G. Hull (Eds.), *The Social Psychology of Stigma* (pp. 1–28). New York: Guilford Press.

Drury, C. A. A. & Louis, M. (2002). Exploring the association between body weight, stigma of obesity, and health care avoidance. *Journal of the American Academy of Nurse Practitioners, 14*(12), 554 - 561. doi:10.1111/j.1745-7599.2002.tb00089.x

Eisenberg, M. E., Neumark-Sztainer, D. & Story, M. (2003). Associations of weight-based teasing and emotional well-being among adolescents. *Archives of Pediatric & Adolescent Medicine, 157,* 733-738. Doi:10.1001/archpedi.157.8.733

Elliott, R., Fischer, C., & Rennie, D. (1999). Evolving Guidelines for Publication of Qualitative Research Studies in Psychology and Related Fields. *British Journal of Clinical Psychology, 38,* 215-229. doi:10.1348/014466599162782

Feeg, V. D., Candelaria, L. M., Krenitsky-Korn, S. & Vessey, J. A. (2014). The relationship of obesity and weight gain to childhood teasing. *Journal of Pediatric Nursing, 29,* 511–520. doi:10.1016/j.pedn.2014.08.011

Fontana, F., Furtado, O., Marston, R., Mazzardo, O. & Gallagher, J. (2013). Anti-Fat bias among physical education teachers and majors. *The Physical Educator, 70,* 15-31.

Fouts, G. & Burggraf, K. (2000). Television situation comedies: female weight, male negative comments, and audience reactions. *Sex Roles, 42,* 925–932. doi:10.1023/A:1007054618340

Fouts, G. & Burggraf, K. (1999). Television situation comedies: female body images and verbal reinforcements. *Sex Roles, 40,* 473–481. doi: 10.1023/A:1018875711082

Gleitman, H., Gross, J. & Reisberg, D. (2010). *Psychology.* Eight Edition. New York: W W Norton

Goffman, E. (1990). *Stigma: Notes on the Management of Spoiled Identity.* London: Penguin (Original work published in 1963)

Gregory, E., Long, S. & Volk, D. (2004). *Many Pathways to Literacy: Young Children Learning with Siblings, Grandparents, Peers and Communities.* New York: Routledge Falmer

Gudzune, K. A., Bennett, W. L., Cooper, L. A. & Bleich, S. N. (2014). Patients who feel judged about their weight have lower trust in their primary care providers. *Patient Education and Counseling, 97(*1), 128-131. doi:10.1016/j.pec.2014.06.019.

Harriger, J. A. & Thompson, J. K. (2012). Psychological consequences of obesity: Weight bias and body image in overweight and obese youth. *International Review of Psychiatry, 24*(3), 247-253. doi: 10.3109/09540261.2012.678817

Harris, M. (2008). *Exploring Developmental Psychology: Understanding Theory and Methods.* London: Sage

Harvey, E. L., Summerbell, C. D., Kirk, S. F. L. & Hill, A. J. (2002). Dietitians' views of overweight and obese people and reported management practices. *Journal of Human Nutrition and Dietetics, 15*, 331–347. doi:10.1046/j.1365-277X.2002.00385.x

Haines, J., Neumark-Sztainer, D., Eisenberg, M. E., & Hannan, P. J. (2006). Weight teasing and disordered eating behaviors in adolescents: Longitudinal findings from Project EAT (Eating Among Teens). *Pediatrics*, *117*(2), 209–215. doi:10.1542/peds.2005-1242

Harrison, S., Rowlinson, M. & Hill, A.J. (2016). No fat friend of mine: young children's responses to overweight and disability. *Body Image, 18,* 65–73. doi:10.1016/j.bodyim.2016.05.002

Hayden-Wade, H. A., Stein, R. I., Ghaderi, A., Saelens, B. E., Zabinski, M. F. & Wilfley, D. E. (2005). Prevalence, characteristics, and correlates of teasing

experiences among overweight children vs. non-overweight peers. *Obesity Research, 13*(8), 1381–1392. doi:10.1038/oby.2005.167

Health and Social Care Information Centre. (2015). *The Health Survey for England: 2014. Chapter 10: Children's Body Mass Index, Overweight and Obesity.* Leeds: Health and Social Care Information Centre. Retrieved 7 January 2017 from http://content.digital.nhs.uk/catalogue/PUB19295/HSE2014-ch10-child-obe.pdf

Health and Social Care Information Centre. (2015). *The Health Survey for England: 2014. Chapter 9: Adult Obesity and Overweight.* Leeds: Health and Social Care Information Centre. Retrieved 7 January 2017 from http://content.digital.nhs.uk/catalogue/PUB19295/HSE2014-ch9-adult-obe.pdf

Health and Social Care Information Centre. (2015). *Statistics on Obesity, Physical Activity and Diet.* Leeds: Health and Social Care Information Centre. Retrieved 7 January 2017 from http://content.digital.nhs.uk/catalogue/pub16988/obes-phys-acti-diet-eng-2015.pdf

Health and Social Care Information Centre. (2016). *National Child Measurement Programme England, 2015/16 School Year.* Leeds: Health and Social Care Information Centre. Retrieved 7 January 2017 from http://content.digital.nhs.uk/searchcatalogue?productid=23381&q=national+child+measurement+programme&sort=Relevance&size=10&page=1#top

Hietanen, J. K., Gierean, E., Hari, R. & Nummenmaa, L. (2016). Bodily maps of emotions across child development. *Developmental Science, 19*(6), 1111-1118.

Her Majesty's Government (2016). *English Indices of Deprivation 2015.* Retrieved 28 February 2017 from https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015

Her Majesty's Government (2016). *Childhood Obesity: A Plan for Action.* Retrieved 2 January 2017 from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/546588/Childhood_obesity_2016__2__acc.pdf

Hendry, L. B., & Gillies, P. (1978). Body type, body esteem, school and leisure: A study of overweight, average, and underweight adolescents. *Journal of Youth and Adolescence, 7,* 181-194.

Hepburn, G. (2011, 2nd September). Peer tutoring and reading in the primary classroom. *The Guardian.* Retrieved 30/12/2015 from http://www.theguardian.com/teacher-network/2011/sep/22/reading-peer-tutoring-teaching-resources/print

Hesketh, K. D. and Campbell, K. J. (2010). Interventions to prevent obesity in 0–5 year olds: An updated systematic review of the literature. *Obesity*, *18*,(supplement 1), S27–S35. doi:10.1038/oby.2009.429

Herba, C. M., Landau, S., Russell, T., Ecker, C. & Phillips, M. L. (2006). The development of emotion-processing in children: effects of age, emotion, and intensity. *Journal of Child Psychology and Psychiatry*, *47*(11), 1098-1106.

Herbozo, S., Tantleff-Dunn, S., Gokee-LaRose, J. & Thompson, J. K. (2004). Beauty and thinness messages in children's media: a content analysis. *Eating Disorders, 12*(1), 21–34. doi:10.1080/10640260490267742

Hietanen, J. K., Gierean, E., Hari, R. & Nummenmaa, L. (2016). Bodily maps of emotions across child development. Developmental Science, 19(6), 1111-1118.

Hill, A. J. (2007). The development of children's shape and weight concerns. In I. Jaffa & B. McDermott. (Eds.) *Eating Disorders in Children and Adolescents* (pp. 32-44). Cambridge: Cambridge University Press.

Hill, A. J. & Silver, E. K. (1995). Fat, friendless and unhealthy: 9-year old children's perception of body shape stereotypes. *International Journal of Obesity and Related Metabolic Disorders, 19*(6), 423-430.

Himes, S. M. & Thompson, J. K. (2007). Fat stigmatization in television shows and movies: a content analysis. *Obesity, 15,* 712–718. doi:10.1038/oby.2007.635

Howe, C. (2010). *Peer Groups and Children's Development.* West Sussex: Wiley-Blackwell

Howe, C. & Mercer, N. (2007). *Children's Social Development, Peer Interaction and Classroom Learning: Primary Review Research Survey 2/1b.* Cambridge: University of Cambridge. Retrieved 7 January 2017 from http://cprtrust.org.uk/wp-content/uploads/2014/06/research-survey-2-1b.pdf

Ikeda, J. P., Crawford, P. B., & Woodward-Lopez, G. (2006). BMI screening for schools: Helpful or harmful? *Health Education Research, 21*(6), 761-769. doi:10.1093/her/cyl144

Irving, L. M. (2000). Promoting Size Acceptance in Elementary School Children: The EDAP Puppet Program. *Eating Disorders: The Journal of Treatment & Prevention, 8*(3), 221-232.

Janssen, I., Craig, W. M., Boyce, W. F. & Pickett, W. (2004). Associations between overweight and obesity with bullying behaviors in school-aged children. *Pediatrics, 113*(5), 1187-1195.

Kenney, E. L., Gortmaker, S. L. Davison, K. K. & Austin, S. B. (2015). The academic penalty for gaining weight: a longitudinal, change-in-change analysis of BMI and perceived academic ability in middle school students. *International Journal of Obesity, 39,* 1408–1413. doi:10.1038/ijo.2015.88

Kirk, S. (2007). Methodological and ethical issues in conducting qualitative research with children and young people: A literature review. *International Journal of Nursing Studies, 44,* 1250-1260. doi:10.1016/j.ijnurstu.2006.08.015
Kirklees Council (2015). *Kirklees Factsheets 2015.* Retrieved 28 February 2017 from https://www.kirklees.gov.uk/beta/information-and-data/pdf/fact-2015.pdf

Klaczynski, P. A. (2007). There's something about obesity: Culture, contagion, rationality, and children's responses to drinks "created" by obese children. *Journal of Experimental Child Psychology, 99,* 58-74. doi:10.1016/j.jecp.2007.08.005

Klein, H. & Shiffman, K.S. (2005). Thin is “in” and stout is “out”: What animated cartoons tell viewers about body weight. *Eating and Weight Disorders, 10,* 107–116. doi:10.1007/BF03327532

Klein, H. & Shiffman, K.S. (2006). Messages about physical attractiveness in animated cartoons. *Body Image, 3*(4), 353–363. doi:10.1016/j.bodyim.2006.08.001

Krukowski, R. A., West, D. S. Perez, A. Bursac, Z., Phillips, M. M. & Raczynski, J. M. (2009). Overweight children, weight-based teasing and academic performance. *International Journal of Pediatric Obesity 4*(4), 274-80. doi:10.3109/17477160902846203.

Ladd, G. W. (1989). Introduction: Contributions of peer relationships. In T. Berndt & G. Ladd (Eds.) *Peer Relationships in Child Development.* (pp. 1-11). Chichester: Wiley & Sons

Latner, J. D., Rosewall, J. K. & Simmonds, M. B. (2007). Childhood obesity stigma: Association with television, videogame, and magazine exposure. *Body Image, 4,* 147–155. doi:10.1016/j.bodyim.2007.03.002

Latner, J. D. & Schwartz, M. B. (2005) Weight bias in a childs world. In K. Brownell, R. Puhl, M. Schwartz & L. Rudd (Eds.) *Weight Bias: Nature, Consequences and* Remedies (pp. 54-67). London: Guilford Press.

Latner, J. D. & Stunkard,A. J. (2003). Getting Worse: The stigmatization of obese children. *Obesity Research, 11,* 452 – 456. doi: 10.1038/oby.2003.61

Latner, J. D. & Stefano, E. C. (2016). Obesity stigmatization and the importance of the research of A. J. Stunkard. *Current Obesity Reports, 5*(1), 121-125. doi:10.1007/s13679-016-0198-7.

Lerner, R. M. (1982). Children and adolescents as producers of their own development. *Developmental Review, 2,* 342-370.

Link, B. G. & Phelan, J. C. (2001). Conceptualising Stigma. *Annual Review of Sociology, 27,* 363-385. doi:10.1146/annurev.soc.27.1.363

Lupton, D. (2013). *Fat.* Oxon: Routledge

Madowitz, J., Knats, S., Maginot, T., Crow, S. J. & Boutelle, K. N. (2012). Teasing, depression and unhealthy weight control behaviour in obese children. *Pediatric Obesity, 7,* 446-452. doi:10.1111/j.20I47-6T310.2012.00078.x

Major, B., Hunger, J. M., Bunyan, D. P. & Miller, C. T. (2013). The ironic effects of weight stigma. *Journal of Experimental Social Psychology, 51,* 74-80. doi: 0.1016/j.jesp.2013.11.009

Matthews, K. A., Salomon, K., Kenyon, K., & Zhou, F. (2005). Unfair treatment, discrimination, and ambulatory blood pressure in Black and White adolescents. *Health Psychology, 24,* 258–265. doi:10.1037/0278-6133.24.3.258

McMichael, L. (2013). *Acceptable Prejudice? Fat, Rhetoric and Social Justice.* Nashville: Pearlsong press

Nabors, L., Thomas, M., Vaughn, L. Adams, R., Amaral J. & Olsen, B. T. (2011). Children's attitudes about an overweight or non-overweight weight victim. *Journal of Developmental and Physical Disabilities, 23*(2), 87-98. doi: 10.1007/s10882-010-9203-3

National Institute for Health and Clinical Excellence (2006). *Obesity: Guidance on the Prevention, Identification, Assessment and Management of Overweight and Obesity in Adults and Children.* London: National Institute for Health and Clinical Excellence

Neumark-Sztainer, D. & Eisenberg, M. (2005). Weight bias in a teens world. In K. Brownell, R. Puhl, M. Schwartz & L. Rudd (Eds.) *Weight Bias: Nature, Consequences and* Remedies (pp. 68-*79*). London: Guilford Press.

Neumark-Sztainer, D., Falkner, N., Story, M., Perry, C., Hannan, P. J. & Mulert, S. (2002). Weight teasing among adolescents: correlations with weight status and

disordered eating behaviors. *International Journal of Obesity, 26,* 123-131. doi:10.1038/sj.ijo.0801853

Neumark-Sztainer, D., Story, M. & Harris, T. (1999). Beliefs and attitudes about obesity among teachers and school health care providers working with adolescents. *Journal of Nutrition Education, 13,* 3-9. doi: 10.1016/S0022-3182(99)70378-X

Oxford English Dictionary (2017). Retrieved 3 March 2017 from https://en.oxforddictionaries.com/definition/peer

Piaget, J. (1932). *The Moral Judgment of the Child*. London: Routledge and Kegan Paul.

Pellegrini, A. D. & Blatchford, P. (2000). *The Child at School: Interactions With Peers and Teachers.* London: Routledge

Penny, H. & Haddock, G. (2007). Children's stereotypes of overweight children. *British Journal of Developmental Psychology, 25,* 409–418. doi:10.1016/j.jesp.2006.07.002

Phelan, J. C., Link B. G. & Dovidio, J. F. (2008). Stigma and prejudice: One animal or two? *Social Science & Medicine,* 67, 358–367. doi:10.1016/j.socscimed.2008.03.022

Public Health England. (2016). *Health Risks of Adult Obesity.* Retrieved 2 January 2017 from http://www.noo.org.uk/NOO_about_obesity/obesity_and_health/health_risk_adult

Public Health England. (2016). *Health Risks of Childhood Obesity*. Retrieved 2 January 2017 from http://www.noo.org.uk/NOO_about_obesity/obesity_and_health/health_risk_child

Puhl, R. M. & Brownell, K. D. (2001). Bias, Discrimination, and Obesity. *Obesity Research,* 9 (12), 788-805. doi: 10.1038/oby.2001.108

Puhl, R. M. & Brownell, K. D. (2003). Ways of coping with obesity stigma: review and
conceptual analysis. *Eating Behaviors, 4,* 53–78.
doi: 10.1016/S1471-0153(02)00096-X

Puhl, R. M. & Brownell, K. D. (2006). Confronting and coping with weight stigma: An investigation of overweight and obese adults. *Obesity, 14*(10), 1802-1815). doi:10.1038/oby.2006.208

Puhl, R. M. & Heuer, C. A. (2009). The stigma of obesity: A review and update. *Obesity, 17*(5), 941–964. doi:10.1038/oby.2008.636

Puhl, R. M. & Heuer, C. A. (2010). Obesity stigma: Important considerations for public health. *American Journal of Public Health, 100*(6), 1019-1028. doi:10.2105/AJPH.2009.159491

Puhl, R. M. & King, K. M. (2013). Weight discrimination and bullying. *Best Practice & Research Clinical Endocrinology & Metabolism 27*, 117–127. doi:10.1016/j.beem.2012.12.002

Puhl, R. M. & Latner, J. D. (2007). Stigma, obesity and the health of the nation's children. *Psychological Bulletin, 133*(4), 557-580. doi:10.1037/0033-2909.133.4.557

Puhl, R. M. & Luedicke, J. (2014). Parental support of policy measures and school based efforts to address weight-based victimization in youth. *International Journal of Obesity, 38,* 531-538. doi:10.1038/ijo.2013.207

Puhl, R. M., Peterson, J. L. & Luedicke, J. (2013). Weight-based victimization: Bullying experiences of weight loss treatment–seeking youth. *Pediatrics, 131*(1), 1-9. doi:10.1542/peds.2012-1106

Puhl, R. M., Latner, J. L., O'Brien, K., Luedicke, J. L., Forhan, M. & Danielsdottir, S. (2015). A multi-national examination of weight bias: Predictors of anti-fat attitudes

across four countries. *International Journal of Obesity*, *39*(7), 1166-1173. doi:10.1038/ijo.2015.32

Rankin, J., Matthews, L., Cobley, S., Han, A., Sanders, R., Wiltshire, H. D., & Baker, J. S. (2010). Psychological consequences of childhood obesity: psychiatric comorbidity and prevention. *Journal of Adolescent Health, Medicine and Therapeutics, 7,* 125-146. doi:10.2147/AHMT.S101631

Rees, R., Oliver, K., Woodman, J. & Thomas, J. (2011). The views of young children in the UK about obesity, body size, shape and weight: A systematic review. *Biomedical Central Public Health, 11*(188), 1-12. doi:10.1186/1471-2458-11-188

Ricciardelli, L. A. & McCabe, M. P. (2001). Children's body image concerns and eating disturbance: A review of the literature. *Clinical Psychology Review, 21,* 325-344. doi:10.1016/S0272-7358(99)00051-3

Richardson, S. A., Goodman, N., Hastorf, A. H. & Dornbusch, S. M. (1961). Cultural uniformity in reaction to physical disabilities. *American Sociological Review, 26,* 241-247. doi:10.2307/2089861

Sanders, L. M., Federico, S., Klass, P., Abrams, M. A. & Dreyer, B. (2009) Literacy and child health: A systematic review. *Archives of Pediatrics and Adolescent Medicine, 163*(2),131-140. doi:10.1001/archpediatrics.2008.539

Siegler, R., DeLoache, J. & Eisenberg, N. (2011). *How Children Develop: International Edition.* New York: Worth Publishers

Slater, A. & Bremner, G. (Eds). (2004). *An Introduction to Developmental Psychology.* Oxford: Blackwell

Slater, A., Hocking, I. & Loose, J. (2004). Theoretical issues in child development. In A. Slater & G. Bremner (Eds). *An Introduction to Developmental Psychology.* (pp. 35-63). Oxford: Blackwell

Strauss, R. S. & Pollack, H. A. (2003). Social marginalization of overweight children. *Archives of Pediatrics and Adolescent Medicine, 157*(8), 746-752. doi:10.1001/archpedi.157.8.746

Strudwick, R. M. (2016). Labelling patients. *Radiography, 22*(1), 50-55. doi:10.1016/j.radi.2015.05.004

Stunkard, A. J. & Wadden, T. A. (1992). Psychological aspects of severe obesity. *The American Journal of Clinical Nutrition, 55*(2), 524-532.

Su, W. & DiSanto, A. (2011). Preschool children's perceptions of overweight peers. *Journal of Early Childhood Research, 10*(1), 19-31. doi:10.1177/1476718X11407411

The Literacy Trust (2016) *Paired Reading Schemes: A teacher toolkit*. London: The Literacy Trust accessed online on 10/11/2016 at http://www.literacytrust.org.uk/assets/0001/1015/Paired_reading_scheme_toolkit.pdf

Tinson, J. (2009) *Conducting Research with Children & Adolescents: Design, Methods and Empirical Cases.* Oxford: Goodfellow.

Tomiyama, A. J. (2014). Weight sitgma is stressful. A review of evidence for the Cyclic Obesity/Weight-Based Stigma model. *Appetite, 82*, 8-15. doi.org/10.1016/j.appet.2014.06.108

Topping, K. (2001). *Research Project – Read on.* Retrieved 15/07/2013 from http://www.dundee.ac.uk/eswce/research/projects/readon/

Tremblay, L., Losvin, T., Zecevic, C. & Lariviere, M. (2011). Perceptions of self in 3 – 5 year old children: A preliminary investigation into the early emergence of body dissatisfaction. *Body Image, 8*, 287-292. doi:10.1016/j.bodyim.2011.04.004

Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Mental Processes.* Cambridge MA: Havard University Press (original work published in 1930, 1933 & 1935).

Wang, Y. & Lobstein, T. (2006). Worldwide trends in childhood overweight and obesity. *International Journal of Pediatric Obesity, 1,* 11-25. doi:10.1080/17477160600586747

Wardle, J. & Cooke, L. (2005). The impact of obesity on psychological well-being. *Best Practice & Research Clinical Endocrinology & Metabolism, 19,* 421-440. doi:10.1016/j.beem.2005.04.006

Warrington Borough Council (2016). *Warrington Ward Health Summaries.* Retrieved 28 February 2017 from https://www.warrington.gov.uk/.../warrington_ward_health_summary_2016pdf.pdf

Wigton, R. S. & McGaghie, W. C. (2001). The effect of obesity on medical students' approach to patients with abdominal pain. *Journal of General Internal Medicine, 16*(4), 262-265. doi: 10.1046/j.1525-1497.2001.016004262.x

Winter, S. (1991). What really happends during a paired reading project? *British Journal of Special Education, 18*(1), research supplement 20-24. doi:10.1111/j.1467-8578.1991.tb00832.x/epdf

Wolfenden, L., McKeough, A., Bowman, J., Paolini, S., Francis, L., Wye, P. & Puhl, R. M. (2013). Experimental investigation of parents and their children's social interaction intentions towards obese children. *Journal of Paediatrics and Child Health, 49,* 604-607. doi:10.1111/jpc.12285

World Health Organisation (2000). *Consultation on Obesity. Obesity: Preventing and Managing the Global Epidemic.* WHO technical report series 894. Switzerland: World Health Organisation

World Health Organisation (2016). Obesity and overweight. Fact sheet no. 311. *World Health Organisation Media Centre.* Retrieved 30/12/2016 from http://www.who.int/mediacentre/factsheets/fs311/en/

World Health Organisation (2016). *Commission on Ending Childhood Obesity.* Retrieved 30/12/2016 from http://www.who.int/end-childhood-obesity/en/

World Health Organisation Europe (2016). *Disease Prevention - Nutrition: Data and Statistics.* Retrieved 30/12/2016 from http://www.euro.who.int/en/health-topics/disease-prevention/nutrition/data-and-statistics

Wykes, M. & Gunter, B. (2005). *The Media and Body Image: If Looks Could Kill.* London: Sage

APPENDICES

Appendix 1: Confirmation of Ethical Approval

UNIVERSITY OF LEEDS

Faculty of Medicine and Health Research Office
School of Medicine Research Ethics Committee (SoMREC)

Room 10.110, level 10
Worsley Building
Clarendon Way
Leeds, LS2 9NL
United Kingdom

✆ +44 (0) 113 343 4361

29 April 2014

Mrs Michelle Kilmurray
Psychologist in Clinical Training
Clinical Psychology
Charles Thackrah Building
101 Clarendon Road
University of Leeds, LS2 9LJ

Dear Michelle

Ref no: **SoMREC/13/047**

Title: **Peer transmission of information about body shape to younger children**

We are pleased to inform you that your research ethics application has been approved following review by the School of Medicine Research Ethics Committee (SoMREC). This approval is based on the following documents received from you:

Document	*Version*	*Date Submitted*
MichelleKilmurrayethicsapplication Including: • Research Protocol • Parental letter • School invitation letter • Extracts from the story • Outline of key points for a class briefing • Instructions for older children	1	30.01.14
Parentalconsentform	1	17.02.14
Parentalconsentletterhead	2	03.04.14

Please notify the committee if you intend to make any amendments to the original research ethics application or documentation. All changes must receive ethics approval prior to implementation. Please contact the Faculty Research Ethics Administrator for further information (fmhuniethics@leeds.ac.uk)

Ethics approval does not infer you have the right of access to any member of staff or student or documents and the premises of the University of Leeds. Nor does it imply any right of access to the premises of any other organisation, including clinical areas. The committee takes no responsibility for you gaining access to staff, students and/or premises prior to, during or following your research activities.

Please note: You are expected to keep a record of all your approved documentation, as well as documents such as sample consent forms, and other documents relating to the study. This should be kept in your study file, which should be readily available for audit purposes. You will be given a two week notice period if your project is to be audited.

It is our policy to remind everyone that it is your responsibility to comply with Health and Safety, Data Protection and any other legal and/or professional guidelines there may be.

We wish you every success with the project.

Yours sincerely

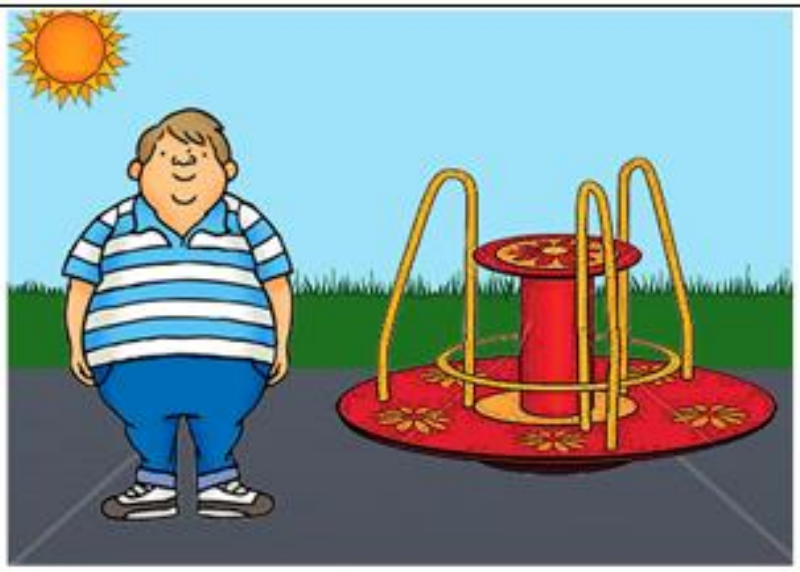
Dr Roger Parslow
Co-Chair, SoMREC, University of Leeds

Dr John Sandars
Co-Chair, SoMREC, University of Leeds

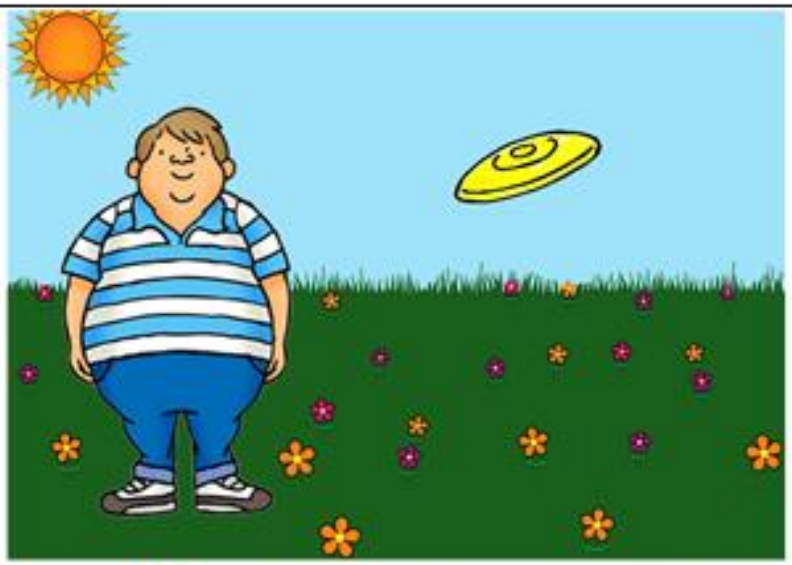
(Approval granted by Dr John Sandars on behalf of SoMREC Co-Chairs)

Appendix 2: The Story Used for the Paired Reading Task

The story used in the overweight condition in shown below.



Next Alfie went on the roundabout. His Mum pushed him so fast that he was dizzy. When he got off the roundabout Alfie nearly fell over.



Then Alfie saw some friends. One of his friends had a Frisbee. They all played catch with the Frisbee. Alfie started to feel very hungry.

Alfie asked Mum if they could have the picnic now. Alfie chose a lovely spot near the duck pond. They sat down on a rug.

Alfie was just about to bite his sandwich, when he saw a duck flying. As the duck flew past, he took Alfie's sandwich in his beak and flew away with it.

What do you think Alfie does next?

What do you think Mum does next?

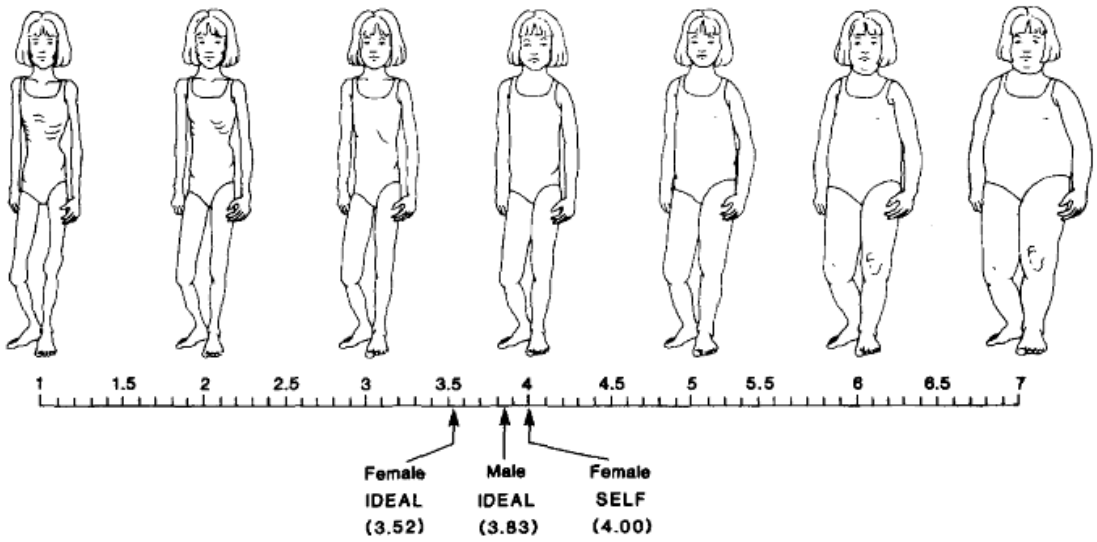
What do you think the duck does next?

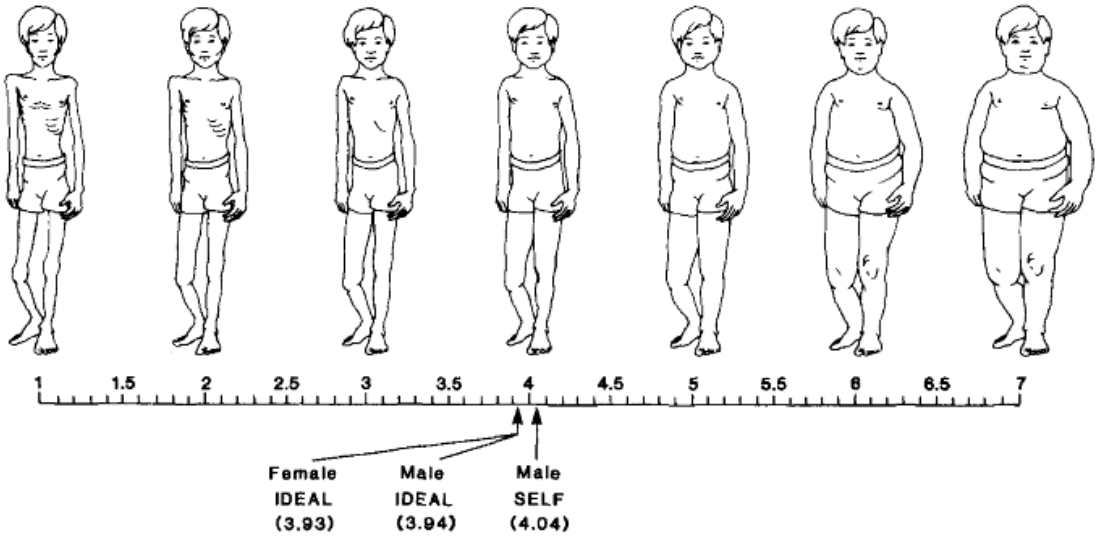
Alfie looked so surprised. They watched the duck fly off. All of a sudden the duck dropped Alfie's Sandwich and it landed in the bin. Everyone laughed. Mum bought Alfie an ice cream.

The following is an extract from the story used in the healthy weight condition to illustrate the difference between the two stories.

Alfie looked so surprised. They watched the duck fly off. All of a sudden the duck dropped Alfie's Sandwich and it landed in the bin. Everyone laughed. Mum bought Alfie an ice cream.

Appendix 3: The Collins Scale (1991)





Appendix 4: Head Teacher Letter

Leeds Institute of Health Sciences
Faculty of Medicine and Health

Charles Thackrah Building
101 Clarendon Road
Leeds
LS2 9LJ

Tel: 0113 343 0815

UNIVERSITY OF LEEDS

Date

Dear [Head teachers name]

I am a graduate psychologist currently working towards a Doctorate in clinical psychology at the University of Leeds. As part of my training I am completing a research project. I would like to explain a little about the research and would welcome the opportunity to discuss with you the possibility of undertaking this project in your school.

The research is looking at how younger children learn from older peers. It is one of a sequence of studies directed by my supervisors looking at children's responses to visible physical difference. This study will examine how information about body shape is passed from older to younger children.

I have created an illustrated written story specifically for this study. In one version of the story the main character is normal weight; in the other he is clearly overweight. The story is colourful, clear and simple, and aims to be fun and enjoyable for the children taking part.

The research would involve me supervising a paired reading interaction, in which an older child (Year 4 or 5) supports a younger child (year 1) to read the story. This interaction will be audio recorded. Ideally the paired reading would take place in an area the school uses for reading so there would be minimum disruption. The parents of children in the relevant classes would be sent a letter asking for consent for their child's participation.

I am looking to include children from around four Primary schools. If you feel your school is in a position to help with this study then in return we will be able to provide a summary of the final report.

I will ring you shortly to ask whether I could arrange an appointment to come and discuss the study further. Alternatively, you can contact me via email at ummor@leeds.ac.uk or my supervisor Andrew Hill on the above telephone number or address.

Many thanks,
Yours sincerely,

Michelle Kilmurray
Psychologist in Clinical Training

Professor Andrew J Hill
Professor of Medical Psychology

Dr Sylvie Collins
Clinical Psychologist

Appendix 5: Information Letter for Parents/guardians

Leeds Institute of Health Sciences
Faculty of Medicine and Health

Charles Thackrah Building
101 Clarendon Road
Leeds
LS2 9LJ

Tel: 0113 343 0815

UNIVERSITY OF LEEDS

Dear Parent/Guardian,

Your child's head teacher has agreed to help with a research project about how older children share information with younger children about body shape. This project is part of my Doctoral degree in Clinical Psychology. This project is based on paired reading, where older children help younger children to read a story. The older children will be year five pupils. The younger children will be year two pupils. I am experienced and qualified to work with children.

Paired reading has been found to be an enjoyable and positive experience for children taking part. A colourful children's story has been prepared and printed for use in this study. The task should be fun to complete for children.

Your child's participation in this study is entirely voluntary. The study will form part of normal classroom activities. The only information I need to record about your child is their age and gender. To help with the analysis and write-up of the study, your child's paired reading will be recorded on a digital voice recorder. This will be fully anonymous so your child can not be identified. All information collected will be kept strictly confidential.

If you agree to your child's participation please complete the permission slip enclosed and return it to your child's teacher as soon as possible. Please speak to your child about taking part and if you or your child have any questions about the research project, please speak to your child's school, email me at the address above or leave a message for myself at the address/ number above.

With many thanks,

Michelle Kilmurray
Psychologist in Clinical Training

Supervised by Professor Andrew Hill and Dr Sylvie Collins

Appendix 6: Consent Form

Leeds Institute of Health Sciences
Faculty of Medicine and Health

Charles Thackrah Building
101 Clarendon Road
Leeds
LS2 9LJ

Tel: 0113 343 0815

UNIVERSITY OF LEEDS

How older children share information with younger children

Permission to participate form

- ☐ I have received and understood the information provided
- ☐ I understand that my child's participation is voluntary
- ☐ I understand that I am free to withdraw them from the study until the paired reading has taken place, without giving any reason
- ☐ I agree to my child's responses being audio recorded
- ☐ I agree that anonymised extracts of my child's responses can be used
- ☐ I agree for my child to take part in the above study

Name of Child .....

Name of Parent / Guardian .....

Signed by ..... Date .....

Relationship to the child (i.e. parent/guardian) .....

If you have any questions about this research, you can contact the researcher (Michelle Kilmurray) by email at ummor@leeds.ac.uk. You can also write to the Doctor of Clinical Psychology Training Programme at the above address. Alternatively, you can contact Professor Andrew Hill by telephone on 0113 343 0815.

Appendix 7: Older Child Briefing

Older children were briefed individually before the younger child was collected to participate.

The following key points were explained verbally by the researcher:

* We are doing a study/experiment where we would like you to help a younger child read a story

* We are interested in how you read this story together

* You will be put into pairs with a younger child

* Your partner will read the story

* If they get stuck on a word we would like you to help them with it

* If they get a word wrong we would like you to ask them to go back to it and help them get it right

* Ask older children what someone "helping" someone should be like with aim of facilitating answers like kind, patient, nice etc.

Practical briefing

* We would like to record you and your partner reading the story together so we can listen back to it later and think about how you read it together. We will have lots of children taking part so it will help us to remember

* When it's your turn to help your partner to read our story, before you start we would like you to turn the voice recorder on

* Near the end of the story, one of the pages says "what do you think happens next?"

* We would like you and your partner to talk about what might happen next. You can think of as many ideas as you like.

* When you have finished the story we would like you and your partner to talk about whether you liked the story or not.

* We would like you to ask them if they liked the story and what their favourite bit was.

The older child was also provided with a written summary of the key instructions as follows:

Your partner is going to read a story and you can help them if they get stuck

Before your partner reads the story I would like you to turn the voice recorder on.

One of the pages says “what do you think happens next?” You and your partner can talk about what you both think happens next. You can have as many ideas as you like.

When you have finished the story, I would like you and your partner to talk about two questions.

1. Did you like the story?
2. What was your favourite bit?

Appendix 8: Valence coding framework for SEP 2

Positive

- Something good happens to the character(s)
- The character does something good - in an active way and therefore requiring some effort/personal sacrifice
- A positive comment is made about the character(s)
- An element of prosocial behaviour - in an active way therefore requiring some effort or/personal sacrifice

Examples of comments rated as positive include:

1. Give her, Alfie her sandwich

2. His mum, might have one, he might give cause Alfie's very hungry, might give hers to Alfie

Negative

- Something bad happens to the character(s)
- The character does something bad
- The character experiences a negative emotion
- A negative comment is made about the character(s)
- An element of active anti-social behaviour

Examples of comments rated as negative include:

1. Tells him to stop whining and complaining and gives him another sandwich

2. Mum will shout at, shout at the bird and says you naughty bird give me, give me back the sandwich

Neutral

- Describes activity/features of the story/character
- An absence of positive/negative comments

Examples of comments rated as negative include:

1. Just give him another sandwich

2. I think mum will probably just tell err Alfie to get on with it and he'll have another sandwich

Appendix 9: Z test results

Z-test results for all analyses conducted are displayed below. All significant differences are highlighted.

Story ending prompt 1 - thematic analysis

Overall Condition: Healthy weight Alfie compared to overweight Alfie

Theme	Healthy Weight (n=88)	Overweight (n=90)	z	p
Retrieve	43	54	-1.49	0.14
Replace	**17**	**7**	**2.25**	**0.02**
Another activity	8	5	0.91	0.36
Tell mum	2	4	-0.8	0.42
Go home	0	3	-1.73	0.08
Feeling	**0**	**4**	**-2.00**	**0.05**
Other	3	4	-0.36	0.72
Don't know/ no response	15	9	1.38	0.17

Overall Age: Younger child compared to older child between weight condition

Theme	Younger Child (n=88)	Older Child (n=89)	z	p
Retrieve	**36**	**61**	**-3.76**	**<0.001**
Replace	13	11	0.44	0.66
Another activity	7	6	0.29	0.77
Tell mum	3	3	0.00	1.00
Go home	2	1	0.58	0.56
Feeling	2	2	0.00	1.00
Other	5	2	1.16	0.25
Don't know/ no response	**21**	**3**	**3.95**	**<0.001**

Age: Younger child compared to older child within weight condition

	Healthy Weight Alfie				Overweight Alfie			
Theme	Younger Child (n=44)	Older Child (n=44)	z	p	Younger Child (n=45)	Older Child (n=45)	z	p
Retrieve	**14**	**29**	**-3.20**	**<0.01**	**22**	**32**	**-2.15**	**0.03**
Replace	9	8	0.27	0.79	4	3	0.39	0.70
Another activity	4	4	0.00	1.00	3	2	0.46	0.65
Tell mum	2	0	1.43	0.15	1	3	-1.02	0.31
Go home	0	0	-	-	2	1	0.59	0.56
Feeling	0	0			2	2	0.00	1.00
Other	2	1	0.59	0.56	3	1	1.02	0.31
Don't know/ no response	**13**	**2**	**3.12**	**<0.01**	**8**	**1**	**2.46**	**0.01**

Overall gender: Girls compared to boys between weight condition

Theme	Girls (n=104)	Boys (n=74)	z	p
Retrieve	57	40	0.10	0.92
Replace	13	11	-0.46	0.65
Another activity	**2**	**11**	**-3.27**	**<0.01**
Tell mum	5	1	1.26	0.21
Go home	3	0	1.47	0.14
Feeling	3	0	1.47	0.14
Other	6	2	0.97	0.33
Don't know/ no response	15	9	0.44	0.66

Gender: Girls compared to boys within weight condition

	Healthy Weight Alfie				Overweight Alfie			
Theme	Girls (n=50)	Boys (n=38)	z	p	Girls (n=54)	Boys (n=36)	z	p
Retrieve	26	17	0.68	0.50	31	23	0.61	0.54
Replace	8	9	-0.90	0.37	5	2	0.64	0.52
Another activity	2	6	-1.91	0.06	**0**	**5**	**2.82**	**<0.01**
Tell mum	1	1	-0.20	0.84	4	0	1.67	0.09
Go home	0	0	-	-	3	0	1.44	0.15
Feeling	0	0	-	-	3	0	1.44	0.15
Other	2	1	0.35	0.73	4	1	0.94	0.35
Don't know/ no response	11	4	1.42	0.16	4	5	- 1.00	0.32

Story ending prompt 1 - valence analysis

Overall Condition: Healthy weight Alfie compared to overweight Alfie

Rating	Healthy Weight (n=88)	Overweight (n=90)	z	p
Neutral	64	68	-0.43	0.67
Positive	8	6	0.6	0.55
Negative	**1**	**7**	**-2.14**	**0.03**
Don't know/no response	15	9	1.38	0.17

Overall Age: Younger child compared to older child between weight condition

Rating	Younger Child (n=89)	Older Child (n=89)	z	p
Neutral	62	70	1.37	0.17
Positive	**2**	**12**	**2.78**	**<0.01**
Negative	4	4	0	1
Don't know/ no response	**21**	**3**	**3.95**	**<0.01**

Age: Younger child compared to older child within weight condition

Healthy Weight Alfie					Overweight Alfie			
Theme	Younger Child (n=44)	Older Child (n=44)	z	p	Younger Child (n=45)	Older Child (n=45)	z	p
Neutral	29	35	-1.44	0.15	33	35	-0.49	0.62
Positive	**1**	**7**	**-2.22**	**0.03**	1	5	-1.69	0.09
Negative	1	0	1.01	0.31	3	4	-0.39	0.70
Don't know/ no response	**13**	**2**	**3.12**	**<0.01**	**8**	**1**	**2.46**	**0.01**

Overall Gender: Girls compared to boys between weight condition

Overweight Alfie				
Theme	Girls (n=104)	Boys (n=74)	z	p
Neutral	76	56	0.39	0.70
Positive	9	5	0.46	0.65
Negative	4	4	-0.49	0.62
Don't know/ no response	15	9	0.44	0.66

Gender: Girls compared to boys within weight condition

Healthy Weight Alfie					Overweight Alfie			
Theme	Girls (n=50)	Boys (n=38)	z	p	Girls (n=54)	Boys (n=36)	z	p
Neutral	35	29	-0.65	0.51	41	27	0.10	0.92
Positive	4	4	0.41	0.68	5	1	1.21	0.23
Negative	0	1	-1.15	0.25	4	3	-0.16	0.87
Don't know/ no response	11	4	1.42	0.16	4	5	-1.00	0.32

Story ending prompt 2 - thematic analysis

Overall Condition: Healthy weight Alfie compared to overweight Alfie

Theme	Healthy Weight (n=88)	Overweight (n=90)	z	p
Replace	32	33	-0.74	0.97
Retrieve	19	17	0.45	0.65
Intervenes	5	4	0.38	0.70
No acknowledgement	3	6	-0.99	0.32
Goes home	4	3	0.42	0.67
Negative response	1	6	-1.90	0.06
Wonders what happened	3	1	1.03	0.30
Clears the picnic away	**0**	**4**	**-2.00**	**0.05**
Plays with Alfie	3	1	1.03	0.30
Other	1	4	-1.34	0.18
Don't know/ no response	17	11	1.30	0.19

Overall Age: Younger child compared to older child between weight condition

Theme	Younger Child (n=88)	Older Child (n=89)	z	p
Replace	27	38	-1.71	0.09
Retrieve	16	20	-0.75	0.45
Intervenes	6	3	1.03	0.30
No acknowledgement	4	5	-0.34	0.73
Goes home	6	1	1.93	0.05
Negative response	3	4	-0.39	0.70
Wonders what happened	1	3	-1.01	0.31
Clears the picnic away	2	2	0.00	1.00
Plays with Alfie	3	1	1.01	0.31
Other	2	3	-0.45	0.65
Don't know/ no response	**19**	**9**	**2.06**	**0.04**

Age: Younger child compared to older child within weight condition

	Healthy Weight Alfie				Overweight Alfie			
Theme	Younger Child (n=44)	Older Child (n=44)	z	p	Younger Child (n=45)	Older Child (n=45)	z	p
Replace	13	19	-1.33	0.18	14	19	-1.09	0.28
Retrieve	9	10	-0.26	0.79	7	10	-0.81	0.42
Intervenes	3	2	0.46	0.65	3	1	1.02	0.31
No acknowledgement	1	2	-0.59	0.56	3	3	0.00	1.00
Goes home	3	1	1.02	0.31	3	0	1.76	0.08
Negative response	1	0	1.01	0.31	2	4	-0.85	0.40
Wonders what happened	0	3	-1.76	0.08	1	0	1.01	0.31
Clears the picnic away	0	0	-	-	2	2	0.00	1.00
Plays with Alfie	2	1	0.59	0.56	1	0	1.01	0.31
Other	0	1	-1.01	0.31	2	2	0.00	1.00
Don't know/ no response	12	5	1.89	0.06	7	4	0.97	0.33

Overall Gender: Girls compared to boys between weight condition

Theme	Girls (n=104)	Boys (n=74)	z	p
Replace	39	26	0.32	0.75
Retrieve	21	15	-0.01	0.99
Intervenes	7	2	1.21	0.23
No acknowledgement	6	3	0.51	0.61
Goes home	3	4	-0.85	0.40
Negative response	5	2	0.71	0.50
Wonders what happened	4	0	1.71	0.09
Clears the picnic away	3	1	0.68	0.50
Plays with Alfie	1	3	-1.37	0.17
Other	2	3	-0.85	0.40
Don't know/ no response	13	15	-1.40	0.16

Gender: Girls compared to boys within weight condition

Healthy Weight Alfie					Overweight Alfie			
Theme	Girls (n=50)	Boys (n=38)	z	p	Girls (n=54)	Boys (n=36)	z	p
Replace	18	14	-0.08	0.94	21	12	0.54	0.59
Retrieve	8	11	-1.46	0.14	13	4	1.54	0.12
Intervenes	4	1	1.08	0.28	3	1	0.63	0.53
No acknowledgement	3	0	1.54	0.12	3	3	-0.52	0.60
Goes home	2	2	-0.28	0.78	1	2	-0.96	0.34
Negative response	1	0	0.88	0.38	4	2	0.35	0.73
Wonders what happened	3	0	1.54	0.12	1	0	0.82	0.41
Clears the picnic away	0	0	-	-	3	1	0.63	0.53
Plays with Alfie	1	2	-0.84	0.40	0	1	-1.23	0.22
Other	0	1	-1.15	0.25	2	2	-0.42	0.67
Don't know/ no response	10	7	0.19	0.85	**3**	**8**	**-2.36**	**0.02**

Story ending prompt 2 - valence analysis

Overall Condition: Healthy weight Alfie compared to overweight Alfie

Rating	Healthy Weight (n=88)	Overweight (n=90)	z	p
Neutral	40	44	-0.46	0.65
Positive	29	23	1.09	0.28
Negative	2	6	-1.41	0.16
Don't know/no response	17	16	0.26	0.79

Overall Age: Younger child compared to older child between weight condition

Rating	Younger Child (n=88)	Older Child (n=89)	z	p
Neutral	46	46	0	1
Positive	21	28	-1.17	0.24
Negative	3	6	-1.03	0.3
Don't know/ no response	**19**	**9**	**2.06**	**0.04**

Age: Younger child compared to older child within weight condition

Theme	Healthy Weight Alfie				Overweight Alfie			
	Younger Child (n=44)	Older Child (n=44)	z	p	Younger Child (n=45)	Older Child (n=45)	z	p
Neutral	19	21	-0.43	0.67	27	25	0.43	0.67
Positive	12	17	-1.13	0.26	9	11	-0.51	0.61
Negative	1	1	0.00	1.00	2	5	-1.18	0.24
Don't know/ no response	12	5	1.89	0.06	7	4	0.97	0.33

Overall gender: Girls compared to boys between weight condition

Theme	Girls (n=104)	Boys (n=74)	z	p
Neutral	56	36	0.68	0.50
Positive	29	20	0.13	0.90
Negative	6	3	0.51	0.61
Don't know/ no response	13	15	-1.40	0.16

Gender: Girls compared to boys within weight condition

Theme	Healthy Weight Alfie				Overweight Alfie			
	Girls (n=50)	Boys (n=38)	z	p	Girls (n=54)	Boys (n=36)	z	p
Neutral	24	16	0.55	0.58	32	20	0.35	0.73
Positive	15	14	-0.68	0.50	14	6	1.04	0.30
Negative	1	1	-0.20	0.84	5	2	0.64	0.52
Don't know/ no response	10	7	0.19	0.85	**3**	**8**	**-2.36**	**0.02**

Story ending prompt 3 - thematic analysis

Overall Condition: Healthy weight Alfie compared to overweight Alfie

Theme	Healthy Weight (n=88)	Overweight (n=90)	z	p
Escapes	26	22	0.77	0.44
Eats is	25	29	-0.55	0.58
Steals something else	10	14	-0.82	0.41
Drops it	4	5	-0.31	0.76
Shares it	2	3	-0.43	0.67
Other	8	7	0.32	0.75
Don't know/ no response	13	10	0.73	0.47

Overall Age: Younger child compared to older child between weight condition

Theme	Younger Child (n=88)	Older Child (n=89)	z	p
Escapes	23	25	-0.34	0.73
Eats is	24	30	-0.98	0.33
Steals something else	14	10	0.88	0.38
Drops it	3	6	-1.03	0.30
Shares it	1	4	-1.36	0.17
Other	9	6	0.81	0.42
Don't know/ no response	15	8	1.56	0.12

Age: Younger child compared to older child within weight condition

	Healthy Weight Alfie				Overweight Alfie			
Theme	Younger Child (n=44)	Older Child (n=44)	z	p	Younger Child (n=45)	Older Child (n=45)	z	p
Escapes	11	15	-0.93	0.35	12	10	0.49	0.62
Eats is	12	13	-0.24	0.81	12	17	-1.13	0.26
Steals something else	6	4	0.67	0.50	8	6	0.58	0.56
Drops it	2	2	0.00	1.00	1	4	-1.38	0.17
Shares it	0	2	-1.43	0.15	1	2	-0.59	0.56
Other	4	4	0.00	1.00	5	2	1.18	0.24
Don't know/ no response	9	4	1.50	0.13	6	4	0.67	0.50

Overall Gender: Girls compared to boys between weight condition

Theme	Girls (n=104)	Boys (n=74)	z	p
Escapes	27	21	-0.36	0.72
Eats is	34	20	0.81	0.42
Steals something else	17	7	1.33	0.18
Drops it	6	3	0.51	0.61
Shares it	3	2	0.07	0.94
Other	7	8	-0.97	0.33
Don't know/ no response	10	13	-1.56	0.12

Gender: Girls compared to boys within weight condition

Theme	Healthy Weight Alfie				Overweight Alfie			
	Girls (n=50)	Boys (n=38)	z	p	Girls (n=54)	Boys (n=36)	z	p
Escapes	14	12	0.36	0.72	13	9	0.10	0.92
Eats is	13	12	0.57	0.57	21	8	1.66	0.10
Steals something else	6	4	0.22	0.83	11	3	1.54	0.12
Drops it	2	2	0.28	0.78	4	1	0.94	0.35
Shares it	2	0	1.25	0.21	1	2	-0.96	0.34
Other	4	4	0.41	0.68	3	4	-0.96	0.34
Don't know/ no response	9	4	0.98	0.33	**1**	**9**	**-3.42**	**<0.01**

Story ending prompt 3 - valence analysis

Overall Condition: Healthy weight Alfie compared to overweight Alfie

Rating	Healthy Weight (n=88)	Overweight (n=90)	z	p
Neutral	56	56	0.20	0.84
Positive	7	3	1.34	0.18
Negative	12	21	-1.66	0.10
Don't know/no response	13	10	0.73	0.47

Overall Age: Younger child compared to older child between weight condition

Rating	Younger Child (n=88)	Older Child (n=89)	z	p
Neutral	52	60	-1.24	0.21
Positive	2	8	-1.95	0.05
Negative	20	13	1.35	0.18
Don't know/ no response	15	8	1.56	0.12

Age: Younger child compared to older child within weight condition

Theme	Healthy Weight Alfie				Overweight Alfie			
	Younger Child (n=44)	Older Child (n=44)	z	p	Younger Child (n=45)	Older Child (n=45)	z	p
Neutral	27	29	-0.44	0.66	25	31	-1.30	0.19
Positive	**1**	**6**	**-1.97**	**0.05**	1	2	-0.59	0.56
Negative	7	5	0.62	0.54	13	8	1.25	0.21
Don't know/ no response	9	4	1.50	0.13	6	4	0.67	0.50

Overall gender: Girls compared to boys between weight condition

Theme	Girls (n=104)	Boys (n=74)	z	p
Neutral	66	46	0.18	0.86
Positive	4	6	-1.22	0.22
Negative	24	9	1.85	0.06
Don't know/ no response	10	13	-1.56	0.12

Gender: Girls compared to boys within weight condition

	Healthy Weight Alfie				Overweight Alfie			
Theme	Girls (n=50)	Boys (n=38)	z	p	Girls (n=54)	Boys (n=36)	z	p
Neutral	30	26	-0.81	0.42	36	20	1.07	0.28
Positive	3	4	-0.78	0.44	1	2	-0.96	0.34
Negative	8	4	0.74	0.46	16	5	1.73	0.08
Don't know/ no response	9	4	0.98	0.33	**1**	**9**	**-3.42**	**<0.01**

Discussion prompt 1- thematic analysis

Overall Condition: Healthy weight Alfie compared to overweight Alfie

Theme	Healthy Weight (n=88)	Overweight (n=90)	z	p
Duck drops sandwich	37	29	1.36	0.17
Duck steals sandwich	26	30	-0.51	0.59
Activity	9	8	0.30	0.76
Ice-cream	6	5	0.35	0.73
The end	2	4	-0.80	0.42
Alfie got off roundabout	1	3	-0.99	0.32
The start	1	1	0.02	0.98
The picnic	2	0	1.44	0.15
Friends	0	2	-1.41	0.16
The park	0	2	-1.41	0.16
Other	0	2	-1.41	0.16
Don’t know/no response	4	2	0.86	0.39

Overall Age: Younger child compared to older child between weight condition

Theme	Younger Child (n=88)	Older Child (n=89)	z	p
Duck drops sandwich	27	39	-1.86	0.06

Duck steals sandwich	**36**	**20**	**2.58**	**0.01**
Activity	9	8	0.26	0.79
Ice-cream	4	7	-0.93	0.35
The end	4	2	0.83	0.41
Alfie got off roundabout	**0**	**4**	**-2.02**	**0.04**
The start	1	1	0.00	1.00
The picnic	1	1	0.00	1.00
Friends	1	1	0.00	1.00
The park	2	0	1.42	0.16
Other	2	0	1.42	0.16
Don't know/no response	2	6	-1.45	0.15

Age: Younger child compared to older child within weight condition

	Healthy Weight Alfie				Overweight Alfie			
Theme	Younger Child (n=44)	Older Child (n=44)	z	p	Younger Child (n=45)	Older Child (n=45)	z	p
Duck drops sandwich	16	21	-1.08	0.28	11	18	-1.58	0.11
Duck steals sandwich	16	10	1.40	0.16	**20**	**10**	**2.24**	**0.03**
Activity	5	4	0.35	0.73	4	4	0.00	1.00
Ice-cream	4	2	0.85	0.40	**0**	**5**	**-2.30**	**0.02**
The end	1	1	0.00	1.00	3	1	1.02	0.31
Alfie got off roundabout	0	1	-1.01	0.31	0	3	-1.76	0.08
The start	1	0	1.01	0.31	0	1	-1.01	0.31
The picnic	1	1	0.00	1	0	0		
Friends	0	0	-	-	1	1	0.00	1.00
The park	0	0	-	-	2	0	1.43	0.15
Other	0	0	-	-	2	0	1.43	0.15
Don't know/no response	**0**	**4**	**-2.05**	**0.04**	2	2	0.00	1.00

Overall Gender: Girls compared to boys between weight condition

Theme	Girls (n=104)	Boys (n=74)	z	p
Duck drops sandwich	37	29	-0.49	0.62
Duck steals sandwich	30	26	-0.89	0.37
Activity	13	4	1.59	0.11
Ice-cream	8	3	0.99	0.32
The end	3	3	-0.43	0.67
Alfie got off roundabout	2	2	-0.34	0.73
The start	1	1	-0.24	0.81
The picnic	2	0	1.20	0.23
Friends	1	1	-0.24	0.81
The park	2	0	1.20	0.23
Other	2	0	1.20	0.23
Don't know/no response	3	5	-1.23	0.23

Gender: Girls compared to boys within weight condition

	Healthy Weight Alfie				Overweight Alfie			
Theme	Girls (n=50)	Boys (n=38)	z	p	Girls (n=54)	Boys (n=36)	z	p
Duck drops sandwich	23	14	0.86	0.39	14	15	-1.57	0.12
Duck steals sandwich	11	15	-1.78	0.08	19	11	0.46	0.65
Activity	**8**	**1**	**2.05**	**0.04**	5	3	0.15	0.88
Ice-cream	3	3	-0.35	0.73	5	0	1.88	0.06
The end	0	2	-1.64	0.10	3	1	0.63	0.53
Alfie got off roundabout	0	1	-1.15	0.25	2	1	0.24	0.81
The start	1	0	0.88	0.38	0	1	-1.23	0.22
The picnic	2	0	1.25	0.21	0	0	-	-
Friends	0	0	-	-	1	1	-0.29	0.77
The park	0	0	-	-	2	0	1.17	0.24
Other	0	0	-	-	2	0	1.17	0.24
Don't know/no response	2	2	-0.28	0.78	1	3	-1.46	0.14

Discussion prompt 1 - valence analysis

Overall Condition: Healthy weight Alfie compared to overweight Alfie

Rating	Healthy Weight (n=88)	Overweight (n=90)	z	p
Neutral	12	15	-0.56	0.58
Positive	8	9	-0.21	0.83
Negative	64	62	0.56	0.58
Don't know/no response	4	4	0.03	0.98

Overall Age: Younger child compared to older child between weight condition

Rating	Younger Child (n=88)	Older Child (n=89)	z	p
Neutral	15	12	0.63	0.53
Positive	8	9	-0.26	0.79
Negative	64	62	0.33	0.74
Don't know/ no response	2	6	-1.45	0.15

Age: Younger child compared to older child within weight condition

	Healthy Weight Alfie				Overweight Alfie			
Theme	Younger Child (n=44)	Older Child (n=44)	z	p	Younger Child (n=45)	Older Child (n=45)	z	p
Neutral	7	5	0.62	0.54	8	7	0.28	0.78
Positive	5	3	0.74	0.46	3	6	-1.05	0.29
Negative	32	32	0.00	1.00	32	30	0.46	0.65
Don't know/ no response	**0**	**4**	**-2.05**	**0.04**	2	2	0.00	1.00

Overall gender: Girls compared to boys between weight condition

Theme	Girls (n=104)	Boys (n=74)	z	p
Neutral	19	8	1.37	0.17
Positive	13	4	1.59	0.11
Negative	69	57	-1.54	0.12
Don't know/ no response	3	5	-1.23	0.22

Gender: Girls compared to boys within weight condition

Theme	Healthy Weight Alfie				Overweight Alfie			
	Girls (n=50)	Boys (n=38)	z	p	Girls (n=54)	Boys (n=36)	z	p
Neutral	9	3	1.37	0.17	10	5	0.58	0.56
Positive	5	3	0.34	0.73	8	1	1.86	0.06
Negative	34	30	-1.14	0.25	35	27	-1.02	0.31
Don't know/ no response	2	2	-0.28	0.78	1	3	-1.46	0.14

Discussion prompt 2- thematic analysis

Overall Condition: Healthy weight Alfie compared to overweight Alfie

Theme	Healthy Weight (n=88)	Overweight (n=90)	z	p
Funny	52	49	0.63	0.53
Ice-cream	7	5	0.64	0.52
Child likes it	**0**	**5**	**-2.24**	**0.03**
Alfie had fun	0	3	-1.73	0.08
Cheeky	0	3	-1.73	0.08
Friends	2	1	0.6	0.55
Unexpected	1	2	-0.56	0.58
Duck dropped the sandwich	0	2	-1.41	0.16
It's nice	2	0	1.44	0.15
Alfie can't eat it	2	0	1.44	0.15
Other	**2**	**9**	**-2.14**	**0.03**
Don't know/no response	20	11	1.85	0.06

Overall Age: Younger child compared to older child between weight condition

Theme	Younger Child (n=88)	Older Child (n=89)	z	p
Funny	**44**	**57**	**-1.97**	**0.05**
Ice-cream	6	6	0.00	1.00
Child likes it	4	1	1.36	0.17
Alfie had fun	1	2	-0.58	0.56
Cheeky	3	0	1.75	0.08
Friends	2	1	0.58	0.56
Unexpected	0	3	-1.75	0.08
Duck dropped the sandwich	1	1	0.00	1.00
It's nice	1	1	0.00	1.00
Alfie can't eat it	2	0	1.42	0.16
Other	6	5	0.31	0.76
Don't know/no response	19	12	1.38	0.17

Age: Younger child compared to older child within weight condition

Theme	Healthy Weight Alfie				Overweight Alfie			
	Younger Child (n=44)	Older Child (n=44)	z	p	Younger Child (n=45)	Older Child (n=45)	z	p
Funny	**20**	**32**	**-2.60**	**<0.01**	24	25	-0.21	0.83
Ice-cream	**6**	**1**	**1.97**	**0.05**	**0**	**5**	**-2.30**	**0.02**
Child likes it	0	0	-	-	4	1	1.38	0.17
Alfie had fun	0	0	-	-	1	2	-0.59	0.56
Cheeky	0	0	-	-	3	0	1.76	0.08
Friends	2	0	1.43	0.15	0	1	-1.01	0.31
Unexpected	0	1	-1.01	0.31	0	2	-1.43	0.15
Duck dropped the sandwich	0	0	-	-	1	1	0	1.00
It's nice	1	1	0.00	1	0	0	-	-
Alfie can't eat it	2	0	1.43	0.15	0	0	-	-
Other	1	1	0.00	1.00	5	4	0.35	0.73
Don't know/no response	12	8	1.02	0.31	7	4	0.97	0.33

Overall Gender: Girls compared to boys between weight condition

Theme	Girls (n=104)	Boys (n=74)	z	p
Funny	64	38	1.35	0.18
Ice-cream	6	5	-0.27	0.79
Child likes it	5	0	1.91	0.06
Alfie had fun	1	2	-0.89	0.37
Cheeky	2	1	0.29	0.77
Friends	3	0	1.47	0.14
Unexpected	2	1	0.29	0.77
Duck dropped the sandwich	0	2	-1.69	0.09
It's nice	2	0	1.20	0.23
Alfie can't eat it	1	1	-0.24	0.81
Other	4	7	-1.53	0.13
Don't know/no response	14	17	-1.65	0.10

Gender: Girls compared to boys within weight condition

Theme	Healthy Weight Alfie				Overweight Alfie			
	Girls (n=50)	Boys (n=38)	z	p	Girls (n=54)	Boys (n=36)	z	p
Funny	33	19	1.51	0.13	31	19	0.43	0.67
Ice-cream	2	5	-1.57	0.12	4	0	1.67	0.09
Child likes it	0	0	-	-	5	0	1.88	0.06
Alfie had fun	0	0	-	-	1	2	-0.96	0.34
Cheeky	0	0	-	-	2	1	0.24	0.81
Friends	2	0	1.25	0.21	1	0	0.82	0.41
Unexpected	0	1	-1.15	0.25	2	0	1.17	0.24
Duck dropped the sandwich	0	0	-	-	0	2	-1.75	0.08
It's nice	2	0	1.25	0.21	0	0	-	-
Alfie can't eat it	1	1	-0.20	0.84	0	0	-	-
Other	0	2	-1.64	0.10	4	5	-1.00	0.32
Don't know/no response	10	10	-0.70	0.48	4	7	-1.71	0.09

Valence Analysis

Overall Condition: Healthy weight Alfie compared to overweight Alfie

Rating	Healthy Weight (n=88)	Overweight (n=90)	z	p
Neutral	2	7	-1.68	0.09
Positive	62	61	0.39	0.70
Negative	4	11	-1.84	0.07
Don't know/no response	20	11	1.85	0.06

Overall Age: Younger child compared to older child between weight condition

Rating	Younger Child (n=88)	Older Child (n=89)	z	p
Neutral	5	4	0.34	0.73
Positive	60	63	-0.49	0.62
Negative	5	10	-1.35	0.18
Don't know/ no response	19	12	1.38	0.17

Age: Younger child compared to older child within weight condition

Theme	Healthy Weight Alfie				Overweight Alfie			
	Younger Child (n=44)	Older Child (n=44)	z	p	Younger Child (n=45)	Older Child (n=45)	z	p
Neutral	1	1	0.00	1.00	4	3	0.39	0.70
Positive	29	33	-0.93	0.35	31	30	0.23	0.82
Negative	2	2	0.00	1.00	3	8	-1.61	0.11
Don't know/ no response	12	8	1.02	0.31	7	4	0.97	0.33

Overall gender: Girls compared to boys between weight condition

Theme	Girls (n=104)	Boys (n=74)	z	p
Neutral	4	5	-0.87	0.38
Positive	**79**	**44**	**2.35**	**0.02**
Negative	7	8	-0.10	0.33
Don't know/ no response	14	17	-1.65	0.10

Gender: Girls compared to boys within weight condition

Theme	Healthy Weight Alfie				Overweight Alfie			
	Girls (n=50)	Boys (n=38)	z	p	Girls (n=54)	Boys (n=36)	z	p
Neutral	0	2	-1.64	0.10	4	3	-0.16	0.87
Positive	38	24	1.31	0.19	**41**	**20**	**2.03**	**0.04**
Negative	2	2	-0.28	0.78	5	6	-1.05	0.29
Don't know/ no response	10	10	-0.70	0.48	4	7	-1.71	0.09